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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI |

**CONFIRMATION NO. 1137**

**POWER OF ATTORNEY NOTICE**

25962
SLATER & MATSIL, L.L.P.
17950 PRESTON RD, SUITE 1000
DALLAS, TX 75252-5793

*OC000000071281259*

Date Mailed: 10/15/2014

## NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/07/2014.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/dtdinh/

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Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



TCL EXHIBIT 1007
Page 1 of 1144

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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | P08877-US3 (ERI-888RI) |

**CONFIRMATION NO. 1137**

112093
Boisbrun Hofman, PLLC
12900 Preston Road
Suite 204
Dallas, TX 75230

**POA ACCEPTANCE LETTER**

*OC000000071281292*

Date Mailed: 10/15/2014

## NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 10/07/2014.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/dtdinh/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

PTO/SB/81A (12-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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# PATENT - POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

| | |
|---|---|
| Patent Number | RE43931 |
| Issue Date | January 15, 2013 |
| First Named Inventor | John Joseph Hayes Jr. |
| Title | RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER... |
| Attorney Docket Number | P08877-US3 (ERI-888RI) |

I hereby revoke all previous powers of attorney given in the above-identified patent.

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: 112093

OR

☐ I hereby appoint Practitioner(s) named below as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

| Practitioner(s) Name | Registration Number |
|---|---|
| | |
| | |
| | |
| | |

Please recognize or change the correspondence address for the above-identified patent to:

☒ The address associated with the above-mentioned Customer Number.

OR

☐ The address associated with Customer Number:

OR

| | | | | | |
|---|---|---|---|---|---|
| ☐ Firm or Individual Name | | | | | |
| Address | | | | | |
| City | | State | | Zip | |
| Country | | | | | |
| Telephone | | Email | | | |

I am the:

☐ Inventor, having ownership of the patent.

OR

☒ Patent owner.

*Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on* 12/30/1997

**SIGNATURE of Inventor or Patent Owner**

| | | | |
|---|---|---|---|
| Signature | Roger Burleigh | Date | 10/6/14 |
| Name | Roger S. Burleigh | Telephone | 972-583-5799 |
| Title and Company | Ericsson Inc., Assistant Secretary | | |

NOTE: Signatures of all the inventors or patent owners of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

PTO/AIA/96 (08-12)
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# STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Ericsson Inc.

Application No./Patent No.: RE43931 (parent case 6131047) Filed/Issue Date: January 15, 2013

Titled: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

Ericsson Inc., a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☑ The assignee of the entire right, title, and interest.

2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):

   ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.

   ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

   Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (*e.g.*, bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

A. ☑ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 008951, Frame 0747, or for which a copy thereof is attached.

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

   The document was recorded in the United States Patent and Trademark Office at

   Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

   The document was recorded in the United States Patent and Trademark Office at

   Reel _____, Frame _____, or for which a copy thereof is attached.



This collection of information is required by37 CFR3.73(b). The information is required toobtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentialityis governed by35 U.S.C. 122and 37 CFR1.11 and1.14. Thiscollection is estimated to take 12 minutes to complete, including gathering, preparing, and submittingthe completed application form to the USPTO.Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent tothe Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS.**SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

PTO/AIA/96 (08-12)
Approved for use through 01/31/2013. OMB 0651-0031
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## STATEMENT UNDER 37 CFR 3.73(c)

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☑ As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

| | |
|---|---|
| /Glenn W. Boisbrun/ | October 7, 2014 |
| Signature | Date |
| Glenn W. Boisbrun | 39615 |
| Printed or Typed Name | Title or Registration Number |

# Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that yoube given certain informationin connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, pleasebe advised that: (1) the general authority forthe collection of thisinformation is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and(3) the principal purpose forwhich the information isused by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent applicationor patent. If you do not furnish the requested information,the U.S. Patent and Trademark Office may not be able to process and/or examineyour submission,which may result in termination of proceedings or abandonment of the applicationor expiration of the patent.

The informationprovided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the informationin order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an InternationalApplication filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, arecord may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from thissystem of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 20352821 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Customer Number:** | 25962 |
| **Filer:** | Glenn W. Boisbrun/Elizabeth Schumacher |
| **Filer Authorized By:** | Glenn W. Boisbrun |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 07-OCT-2014 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 16:33:46 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Power of Attorney | RE43931_POA.pdf | 346598<br>683ef7635bf127be44e269b2f998b5c03ea01008 | no | 1 |

| | |
|---|---|
| **Warnings:** | |
| **Information:** | |

| | | | | | |
|---|---|---|---|---|---|
| 2 | Assignee showing of ownership per 37 CFR 3.73. | RE43931_373.pdf | 118542<br>5613a92ba1b92c320f9bfa7d9430438cf7283843 | no | 3 |

| | |
|---|---|
| **Warnings:** | |
| **Information:** | |
| **Total Files Size (in bytes):** | 465140 |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

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| APPLICATION NO. | ISSUE DATE | PATENT NO. | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 01/15/2013 | RE43931 | ERI-888RI | 1137 |

25962 7590 12/22/2012

SLATER & MATSIL, L.L.P.
17950 PRESTON RD, SUITE 1000
DALLAS, TX 75252-5793

# ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

## Determination of Patent Term Extension or Adjustment under 35 U.S.C. 154 (b)

A reissue patent is for "the unexpired part of the term of the original patent." See 35 U.S.C. 251. Accordingly, the above-identified reissue application is not eligible for Patent Term Extension or Adjustment under 35 U.S.C. 154(b).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

John Joseph Hayes JR., Wake Forest, NC;
Curtis Wayne Thornton, Cary, NC;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

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Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

25962 7590 12/14/2012

SLATER & MATSIL, L.L.P.
17950 PRESTON RD, SUITE 1000
DALLAS, TX 75252-5793

| EXAMINER | |
|---|---|
| LY, NGHI H | |
| **ART UNIT** | **PAPER NUMBER** |
| 2642 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 12/14/2012 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@slater-matsil.com

| Response to Rule 312 Communication | Application No. | Applicant(s) |
|---|---|---|
| | 11/078,916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | NGHI H. LY | 2642 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address –*

1. ☒ The amendment filed on *16 November 2012* under 37 CFR 1.312 has been considered, and has been:

a) ☐ entered.

b) ☒ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.

Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

/NGHI H LY/
Primary Examiner, Art Unit 2642

# PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
**or Fax** (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

25962 7590 11/02/2012
SLATER & MATSIL, L.L.P.
17950 PRESTON RD, SUITE 1000
DALLAS, TX 75252-5793

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

**Certificate of Mailing or Transmission**
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

TITLE OF INVENTION: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

| APPLN. TYPE | SMALL ENTITY | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | NO | $1770 | $0 | $0 | $1770 | 02/04/2013 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| LY, NGHI H | 2642 | 455-566000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Slater & Matsil, L.L.P.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Ericsson Inc.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Research Triangle Park, NC

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 50-1065 ~~(enclose an extra copy of this form).~~

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Steven H. Slater/ Date 20NOV2012
Typed or printed name Steven H. Slater Registration No. 35,361

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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TCL EXHIBIT 1007
Page 12 of 1144

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 11078916 |
| **Filing Date:** | 11-Mar-2005 |
| **Title of Invention:** | RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Attorney Docket Number:** | ERI-888RI |

Filed as Large Entity

## Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| Utility Appl issue fee | 1501 | 1 | 1770 | 1770 |
| Publ. Fee- early, voluntary, or normal | 1504 | 1 | 300 | 300 |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Extension-of-Time:** | | | | |
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **2070** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 14277587 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Customer Number:** | 25962 |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 20-NOV-2012 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 14:47:25 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Issue Fee Payment (PTO-85B) | ERI_888RI_IF.pdf | 256066<br>5ba8dd9dce7a8f4a314f1fb49d42cf0343314eb4 | no | 1 |

| | |
|---|---|
| **Warnings:** | |
| **Information:** | |

| | | | | | |
|---|---|---|---|---|---|
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 32257<br>5625700c44f92098637f3ea8ee4b7a56f070ed87 | no | 2 |

| | |
|---|---|
| **Warnings:** | |
| **Information:** | |
| **Total Files Size (in bytes):** | 288323 |

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**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

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17950 PRESTON RD, SUITE 1000
DALLAS, TX 75252-5793

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(Depositor's name)
(Signature)
(Date)

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

TITLE OF INVENTION: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

| APPLN. TYPE | SMALL ENTITY | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | NO | $1770 | $0 | $0 | $1770 | 02/04/2013 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| LY, NGHI H | 2642 | 455-566000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Slater & Matsil, L.L.P.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Ericsson Inc.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Research Triangle Park, NC

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☐ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies

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☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 50-1065 ~~(enclose an extra copy of this form).~~

5. **Change in Entity Status** (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature Steven N. Slater Date 20NOV2012
Typed or printed name Steven H. Slater Registration No. 35,361

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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TCL EXHIBIT 1007
Page 17 of 1144

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 11078916 |
| **Filing Date:** | 11-Mar-2005 |
| **Title of Invention:** | RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Attorney Docket Number:** | ERI-888RI |

Filed as Large Entity

## Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| Utility Appl issue fee | 1501 | 1 | 1770 | 1770 |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **1770** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 14277655 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Customer Number:** | 25962 |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 20-NOV-2012 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 14:50:19 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | $1770 |
| RAM confirmation Number | 1496 |
| Deposit Account | 501065 |
| Authorized User | |

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## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Issue Fee Payment (PTO-85B) | ERI_888RI_IF.pdf | 256066<br>5ba8dd9dce7a8f4a314f1fb49d42cf0343314eb4 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 30383<br>d0f2c382e6bedf5b7c07fa101cf7e5c261beb7fb | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 286449 | | |

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**New International Application Filed with the USPTO as a Receiving Office**
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(Depositor's name)
(Signature)
(Date)

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

TITLE OF INVENTION: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

| APPLN. TYPE | SMALL ENTITY | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | NO | $1770 | $0 | $0 | $1770 | 02/04/2013 |

11/21/2012 INTEFSW 00001496 11078916
01 FC:1501 1770.00 DA

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| LY, NGHI H | 2642 | 455-566000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Slater & Matsil, L.L.P.
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3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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(A) NAME OF ASSIGNEE: Ericsson Inc.
(B) RESIDENCE: (CITY and STATE OR COUNTRY): Research Triangle Park, NC

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5. Change in Entity Status (from status indicated above)
☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.
☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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Authorized Signature Steven H. Slater Date 20NOV2012

Typed or printed name Steven H. Slater Registration No. 35,361

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TCL EXHIBIT 1007
Page 22 of 1144

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicant: | Hayes Jr., et al. | Docket No.: | ERI-888RI |
| Serial No.: | 11/078,916 | Art Unit: | 2617 |
| Filed: | March 11, 2005 | Examiner: | Nghi H. Ly |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**AMENDMENT UNDER 37 C.F.R. § 1.312**

Dear Sir:

This amendment is in response to the Notice of Allowance mailed November 2, 2012.


TCL EXHIBIT 1007
Page 23 of 1144

**In the Claims:**

1. (Previously Presented) A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at said front surface, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.

2. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.



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3. (Original) A radiotelephone according to claim 1, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.

4. (Original) A radiotelephone according to claim 3, wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer.

5. (Original) A radiotelephone according to claim 4, wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer.

6. (Original) A radiotelephone according to claim 4, wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

7. (Original) A radiotelephone according to claim 4, wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

8. (Original) A radiotelephone according to claim 7, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.



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9. (Previously Presented) A radiotelephone according to claim 7, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

10. (Original) A radiotelephone according to claim 7, wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object.

11. (Original) A radiotelephone according to claim 10, wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer and to initiate the action associated with the identified graphical object responsive to detection of the momentary contact.

12. (Original) A radiotelephone according to claim 11, wherein the controller is operative to initiate the action in response to detection of a plurality of momentary contacts occurring within a predetermined time interval.

13. (Previously Presented) A radiotelephone according to claim 1, wherein the contact-sensitive transducer further comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.


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Page 26 of 1144

14. (Original) A radiotelephone according to claim 13, wherein the contact-sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

15. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

16. (Previously Presented) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed on said front surface, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, selectively responsive to the output signal and operatively associated with the display, which is configured to scroll displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode


TCL EXHIBIT 1007
Page 27 of 1144

wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.

17. (Original) An apparatus according to claim 16, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

18. (Original) An apparatus according to claim 16, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

19. (Original) An apparatus according to claim 18, wherein the controller is operative to selectively display a graphical object on the display responsive to the output signal of the contact-sensitive transducer.

20. (Original) An apparatus according to claim 19, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

21. (Original) An apparatus according to claim 19, wherein the controller is operative to display a plurality of graphical objects on the display, and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

22. (Original) An apparatus according to claim 19, wherein the controller is operative, responsive to the contact-sensitive transducer, to determine a position of contact along the axis of


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the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

23. (Original) An apparatus according to claim 22, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

24. (Original) An apparatus according to claim 22, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

25. (Original) An apparatus according to claim 24, wherein the controller is operative, responsive to the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer.

26. (Original) An apparatus according to claim 25, wherein the controller is operative, responsive to the output signal of contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and to scroll displayed rows along the axis of the display based on the detected moving contact.

27. (Previously Presented) An apparatus according to claim 19, wherein the contact-sensitive transducer further comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.


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Page 29 of 1144

28. (Original) An apparatus according to claim 27, wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

29. (Original) An apparatus according to claim 22, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

30. (Quin Amended) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.


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31. (Original) An apparatus according to claim 30, further comprising a radiotelephone communications transceiver supported by the housing, and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal.

32. (Original) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at side surface of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface.

33. (Previously Presented) In an apparatus including a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, a display that displays an image at the front surface, and a controller that controls the display, a method of providing user input comprising the steps of:

holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm;

providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at said front surface of the housing, the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer; and

providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to a user input.


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34. (Original) A method according to claim 33, wherein the step of providing comprises the step of contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm.

35. (Original) A method according to claim 33, wherein the apparatus is a radiotelephone that further includes a radiotelephone communications transceiver, wherein the controller is operative to control the radiotelephone communications transceiver, and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

36. (Original) A method according to claim 33, wherein the step of controlling comprises the step of selectively displaying an image or the display according to the output signal of the contact-sensitive transducer.

37. (Previously Presented) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

38. (Previously Presented) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.


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39. (Previously Presented) An apparatus according to claim 38, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

40. (Previously Presented) An apparatus according to claim 39, wherein the contact-sensitive transducer is an elongate strip.

41. (Previously Presented) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises one of a resistive transducer a capacitive transducer and a semiconductive transducer.

42. (Previously Presented) An apparatus according to claim 30, which also includes additional user input interface devices for the apparatus on the front surface of the housing.

43. (Previously Presented) An apparatus according to claim 42 wherein the additional interface devices are contact-sensitive.

44. (Previously Presented) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer.

45. (Previously Presented) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer.

46-47. (Cancelled)


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48. (Previously Presented) An apparatus according to claim 43, wherein an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer.

49-50. (Cancelled)

51. (Previously Presented) An apparatus according to claim 30 further comprising:

a second contact-sensitive transducer, supported by the housing, which produces a second output signal that characterizes contact of an object along the contact-sensitive surface of the second contact-sensitive transducer; and

a controller, responsive to the second output signal for controlling a function of the apparatus.

52. (Previously Presented) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of momentary contact with said second contact-sensitive transducer.

53. (Previously Presented) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of a predetermined number of momentary contacts with said second contact-sensitive transducer within a predetermined time interval.

54. (Previously Presented) An apparatus according to claim 30, wherein said controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of said display based on the output signal from said transducer.


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55. (Previously Presented) An apparatus according to claim 54, wherein the direction of scroll is transverse to the direction that said rows extend across the display.

56. (Previously Presented) An apparatus according to claim 54, wherein said rows consist of alphanumeric characters comprising menu selections.

57. (Previously Presented) An apparatus according to claim 54, wherein said controller identifies successive ones of the rows displayed along the axis of said display by highlighting successive said rows.

58. (Previously Presented) An apparatus according to claim 30 further comprising a power supply disposed inside said housing.

59. (Previously Presented) An apparatus according to claim 58, wherein said power supply comprises a battery.

60. (Previously Presented) An apparatus according to claim 59 further comprising a circuit which controls power transfer from the power supply too another circuit based on the output signal of the contact-sensitive transducer.

61. (Previously Presented) An apparatus according to claim 30 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.


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62. (Previously Presented) An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.

63. (Previously Presented) An apparatus according to claim 62, wherein the displayed rows of menu selectable items comprise a plurality of items in a list.


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64. (Previously Presented) An apparatus according to claim 62 further comprising a power supply disposed inside said housing.

65. (Previously Presented) An apparatus according to claim 64, wherein said power supply comprises a battery.

66. (Previously Presented) An apparatus according to claim 65 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

67. (Previously Presented) An apparatus according to claim 62 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

68. (Amended) An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by a front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the ~~displace~~ display which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the


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controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to user input.

69. (Previously Presented) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

70. (Previously Presented) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

71. (Previously Presented) An apparatus according to claim 70, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

72. (Previously Presented) An apparatus according to claim 71, wherein the contact-sensitive transducer is an elongate strip.

73. (Previously Presented) An apparatus according to claim 68, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.


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## REMARKS

Claims 30 and 68 are amended herein to correct typographical errors noted upon review. No new subject matter has been added by this amendment and the change does not alter the finding of patentability. Accordingly, Applicant respectfully requests that this amendment be considered and entered in the application and that the application move forward into issuance as soon as possible after the issue fee has been paid.

Respectfully submitted,

16 NOV 2012
Date

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Attorney for Applicants
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# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 14251672 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Customer Number:** | 25962 |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 16-NOV-2012 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 15:43:17 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

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| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | | ERI_888RI_312_Amendment.pdf | 617180<br>73a6a887e22ef3acf9441dcf504974ba0f647c49 | yes | 17 |

| | Multipart Description/PDF files in .zip description | | |
|---|---|---|---|
| | **Document Description** | **Start** | **End** |
| | Amendment after Notice of Allowance (Rule 312) | 1 | 1 |
| | Claims | 2 | 16 |
| | Applicant Arguments/Remarks Made in an Amendment | 17 | 17 |
| **Warnings:** | | | |
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**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

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**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

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# NOTICE OF ALLOWANCE AND FEE(S) DUE

25962 7590 11/02/2012

SLATER & MATSIL, L.L.P.
17950 PRESTON RD, SUITE 1000
DALLAS, TX 75252-5793

| EXAMINER |
|---|
| LY, NGHI H |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2642 | |

DATE MAILED: 11/02/2012

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

TITLE OF INVENTION: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

| APPLN. TYPE | SMALL ENTITY | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | NO | $1770 | $0 | $0 | $1770 | 02/04/2013 |

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.**

**THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.**

**HOW TO REPLY TO THIS NOTICE:**

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B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

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**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**



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Page 42 of 1144

# PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail** **Mail Stop ISSUE FEE**
**Commissioner for Patents**
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CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

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**Certificate of Mailing or Transmission**

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| (Depositor's name) |
| (Signature) |
| (Date) |

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

TITLE OF INVENTION: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

| APPLN. TYPE | SMALL ENTITY | ISSUE FEE DUE | PUBLICATION FEE DUE | PREV. PAID ISSUE FEE | TOTAL FEE(S) DUE | DATE DUE |
|---|---|---|---|---|---|---|
| nonprovisional | NO | $1770 | $0 | $0 | $1770 | 02/04/2013 |

| EXAMINER | ART UNIT | CLASS-SUBCLASS |
|---|---|---|
| LY, NGHI H | 2642 | 455-566000 |

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

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1 _____

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3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

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❑ A check is enclosed.

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❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

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| EXAMINER | |
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| LY, NGHI H | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2642 | |

DATE MAILED: 11/02/2012

## Determination of Patent Term Extension or Adjustment under 35 U.S.C. 154 (b)

A reissue patent is for "the unexpired part of the term of the original patent." See 35 U.S.C. 251. Accordingly, the above-identified reissue application is not eligible for Patent Term Extension or Adjustment under 35 U.S.C. 154(b).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

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**The Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

| Notice of Allowability | Application No. | Applicant(s) | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Examiner | Art Unit | |
| | NGHI H. LY | 2617 | |

***-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--***

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *Applicant's Appeal Brief (dated 07/16/2012)*.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are *1-45,48 and 51-73*.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

**Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).**

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/NGHI H LY/
Primary Examiner, Art Unit 2617



TCL EXHIBIT 1007
Page 46 of 1144

## DETAILED ACTION

### *REASONS FOR ALLOWANCE*

1. Claims 1-45, 48 and 51-73 are allowed.

The following is an examiner's statement of reasons for allowance:

Claims 1-45, 48 and 51-73 are allowable over the prior art of record for the reasons as stated in Applicant's argument (dated 07/16/2012).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Conclusion*

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGHI H. LY whose telephone number is (571)272-7911. The examiner can normally be reached on 9:30am-8:00pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rafael Perez-Gutierrez can be reached on (571) 272-7915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nghi H. Ly
/NGHI H LY/
Primary Examiner, Art Unit 2617

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | NGHI H. LY | 2617 |

| SEARCHED | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| 455 | 566,550.1,575.1 | 9/5/2012 | nly |
| 379 | 428.01 | 9/5/2012 | nly |
| 345 | 173 | 9/5/2012 | nly |

| SEARCH NOTES | | |
|---|---|---|
| Search Notes | Date | Examiner |
| See search history. | 9/5/2012 | nly |
| Consulted with Rafael Perez-Gutierrez | 8/29/2012 | nly |

| INTERFERENCE SEARCH | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| 455 | 566,550.1,575.1 | 9/5/2012 | nly |
| 379 | 428.01 | 9/5/2012 | nly |
| 345 | 173 | 9/5/2012 | nly |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | NGHI H LY | 2617 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 09/05/2012 | | | | | | | | |
| | 1 | = | | | | | | | | |
| | 2 | = | | | | | | | | |
| | 3 | = | | | | | | | | |
| | 4 | = | | | | | | | | |
| | 5 | = | | | | | | | | |
| | 6 | = | | | | | | | | |
| | 7 | = | | | | | | | | |
| | 8 | = | | | | | | | | |
| | 9 | = | | | | | | | | |
| | 10 | = | | | | | | | | |
| | 11 | = | | | | | | | | |
| | 12 | = | | | | | | | | |
| | 13 | = | | | | | | | | |
| | 14 | = | | | | | | | | |
| | 15 | = | | | | | | | | |
| | 16 | = | | | | | | | | |
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| | 18 | = | | | | | | | | |
| | 19 | = | | | | | | | | |
| | 20 | = | | | | | | | | |
| | 21 | = | | | | | | | | |
| | 22 | = | | | | | | | | |
| | 23 | = | | | | | | | | |
| | 24 | = | | | | | | | | |
| | 25 | = | | | | | | | | |
| | 26 | = | | | | | | | | |
| | 27 | = | | | | | | | | |
| | 28 | = | | | | | | | | |
| | 29 | = | | | | | | | | |
| | 30 | = | | | | | | | | |
| | 31 | = | | | | | | | | |
| | 32 | = | | | | | | | | |
| | 33 | = | | | | | | | | |
| | 34 | = | | | | | | | | |
| | 35 | = | | | | | | | | |
| | 36 | = | | | | | | | | |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | **Examiner** | **Art Unit** |
| | NGHI H LY | 2617 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 09/05/2012 | | | | | | | | |
| 37 | 37 | = | | | | | | | | |
| 38 | 38 | = | | | | | | | | |
| 39 | 39 | = | | | | | | | | |
| 40 | 40 | = | | | | | | | | |
| 41 | 41 | = | | | | | | | | |
| 42 | 42 | = | | | | | | | | |
| 43 | 43 | = | | | | | | | | |
| 45 | 44 | = | | | | | | | | |
| 46 | 45 | = | | | | | | | | |
| | 46 | - | | | | | | | | |
| | 47 | - | | | | | | | | |
| 44 | 48 | = | | | | | | | | |
| | 49 | - | | | | | | | | |
| | 50 | - | | | | | | | | |
| 47 | 51 | = | | | | | | | | |
| 48 | 52 | = | | | | | | | | |
| 49 | 53 | = | | | | | | | | |
| 50 | 54 | = | | | | | | | | |
| 51 | 55 | = | | | | | | | | |
| 52 | 56 | = | | | | | | | | |
| 53 | 57 | = | | | | | | | | |
| 54 | 58 | = | | | | | | | | |
| 55 | 59 | = | | | | | | | | |
| 56 | 60 | = | | | | | | | | |
| 57 | 61 | = | | | | | | | | |
| 58 | 62 | = | | | | | | | | |
| 59 | 63 | = | | | | | | | | |
| 60 | 64 | = | | | | | | | | |
| 61 | 65 | = | | | | | | | | |
| 62 | 66 | = | | | | | | | | |
| 63 | 67 | = | | | | | | | | |
| 64 | 68 | = | | | | | | | | |
| 65 | 69 | = | | | | | | | | |
| 66 | 70 | = | | | | | | | | |
| 67 | 71 | = | | | | | | | | |
| 68 | 72 | = | | | | | | | | |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | **Examiner** | **Art Unit** |
| | NGHI H LY | 2617 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 09/05/2012 | | | | | | | | |
| 69 | 73 | = | | | | | | | | |

# Issue Classification

| Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|
| 11078916 | HAYES ET AL. |
| **Examiner** | **Art Unit** |
| NGHI H LY | 2617 |

| ORIGINAL | | INTERNATIONAL CLASSIFICATION | |
|---|---|---|---|
| CLASS | SUBCLASS | CLAIMED | NON-CLAIMED |
| 455 | 566 | H 0 4 B 1 / 38 (2006.01) | |

**CROSS REFERENCE(S)**

| CLASS | SUBCLASS (ONE SUBCLASS PER BLOCK) | | | | |
|---|---|---|---|---|---|
| 455 | 550.1 | 575.1 | | | |
| 379 | 428.01 | | | | |
| 345 | 173 | | | | |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original | Final | Original |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | 17 | | 33 | | 49 | 61 | 65 | | | | | | |
| | 2 | | 18 | | 34 | | 50 | 62 | 66 | | | | | | |
| | 3 | | 19 | | 35 | 47 | 51 | 63 | 67 | | | | | | |
| | 4 | | 20 | | 36 | 48 | 52 | 64 | 68 | | | | | | |
| | 5 | | 21 | 37 | 37 | 49 | 53 | 65 | 69 | | | | | | |
| | 6 | | 22 | 38 | 38 | 50 | 54 | 66 | 70 | | | | | | |
| | 7 | | 23 | 39 | 39 | 51 | 55 | 67 | 71 | | | | | | |
| | 8 | | 24 | 40 | 40 | 52 | 56 | 68 | 72 | | | | | | |
| | 9 | | 25 | 41 | 41 | 53 | 57 | 69 | 73 | | | | | | |
| | 10 | | 26 | 42 | 42 | 54 | 58 | | | | | | | | |
| | 11 | | 27 | 43 | 43 | 55 | 59 | | | | | | | | |
| | 12 | | 28 | 45 | 44 | 56 | 60 | | | | | | | | |
| | 13 | | 29 | 46 | 45 | 57 | 61 | | | | | | | | |
| | 14 | | 30 | | 46 | 58 | 62 | | | | | | | | |
| | 15 | | 31 | | 47 | 59 | 63 | | | | | | | | |
| | 16 | | 32 | 44 | 48 | 60 | 64 | | | | | | | | |

| | | | |
|---|---|---|---|
| NONE | | **Total Claims Allowed:** | |
| (Assistant Examiner) | (Date) | 69 | |
| /NGHI H LY/<br>Primary Examiner.Art Unit 2617 | 09/05/2012 | O.G. Print Claim(s) | O.G. Print Figure |
| (Primary Examiner) | (Date) | 37 | 2 |

**EAST Search History**

**EAST Search History (Prior Art)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 0 | (455/566.ccls. 455/550.1.ccls. 455/575.1.ccls. 379/428.01.ccls. 345/173.ccls.) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact$3 pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/10/16 02:16 |
| L3 | 13 | (455/566.ccls. 455/550.1.ccls. 455/575.1.ccls. 379/428.01.ccls. 345/173.ccls.) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3) same (respons$6 unresponsiv$6)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/10/16 02:17 |
| S1 | 359 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) ((touch$4 (contact pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:32 |
| S2 | 115 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact$3 pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:34 |

| | | | | | | |
|---|---|---|---|---|---|---|
| S4 | 1 | (John near3 Hayes Curtis near3 Thornton) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and ((touch$4 (contact pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:37 |
| S5 | 0 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact$3 pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:38 |
| S6 | 3 | (John near3 Hayes Curtis near3 Thornton) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:40 |
| S7 | 194 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:40 |
| S8 | 7 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:43 |
| S9 | 0 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; | OR | ON | 2012/09/05 20:47 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3) same respons$6) and @ad<"19971230" | DERWENT; IBM_TDB | | | |
| S10 | 0 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3) same (respons$6 unresponsiv$6)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:48 |
| S11 | 37 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3) same (respons$6 unresponsiv$6)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:48 |
| S13 | 3 | (455/566.ccls. 455/550.1.ccls. 455/575.1.ccls. 379/428.01.ccls.) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3) same (respons$6 unresponsiv$6)) | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 20:59 |
| S14 | 0 | (455/566.ccls. 455/550.1.ccls. 455/575.1.ccls. 379/428.01.ccls.) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact$3 pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/05 21:01 |
| S30 | 3 | (John near3 Joseph near3 Hayes Curtis near3 Wayne near3 Thornton) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2012/09/06 16:25 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3)) | | | | |

**EAST Search History (Interference)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L2 | 0 | (455/566.ccls. 455/550.1.ccls. 455/575.1.ccls. 379/428.01.ccls. 345/173.ccls.) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact$3 pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | US-PGPUB; USPAT; UPAD | OR | ON | 2012/10/16 02:16 |
| L4 | 13 | (455/566.ccls. 455/550.1.ccls. 455/575.1.ccls. 379/428.01.ccls. 345/173.ccls.) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3) same (respons$6 unresponsiv$6)) | US-PGPUB; USPAT; UPAD | OR | ON | 2012/10/16 02:17 |
| S15 | 337 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) ((touch$4 (contact pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 20:32 |
| S16 | 113 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact$3 pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 20:34 |
| S19 | 0 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact$3 pressur$4) adj sensitiv$4) same | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 20:38 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | (row line) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | | | | |
| S20 | 3 | (John near3 Hayes Curtis near3 Thornton) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3)) | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 20:40 |
| S21 | 194 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3)) | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 20:40 |
| S22 | 7 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 20:43 |
| S23 | 0 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3) same (respons$6 unresponsiv$6)) and @ad<"19971230" | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 20:48 |
| S24 | 37 | (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3) same (respons$6 unresponsiv$6)) | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 20:48 |
| S27 | 0 | (455/566.ccls. 455/550.1.ccls. 455/575.1.ccls. 379/428.01.ccls.) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact$3 pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (first adj (mode state)) | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 21:01 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | near12 (input$4 enter$4 activat$4 press$3)) and ((touch$4 (contact$3 pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and @ad<"19971230" | | | | |
| S29 | 1 | (John near3 Hayes Curtis near3 Thornton) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) near30 (first adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) and ((touch$4 (contact pressur$4) adj sensitiv$4) near30 (second adj (mode state)) near12 (input$4 enter$4 activat$4 press$3)) | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/05 22:16 |
| S31 | 3 | (John near3 Joseph near3 Hayes Curtis near3 Wayne near3 Thornton) and (wireless radio mobile mobilephone mobiletelephone portable handset handheld cellular cellphone cell adj phone) and (display$4 screen$4 lcd) and (touch$4 (contact pressur$4) adj sensitiv$4) same (row line) and ((touch$4 (contact pressur$4) adj sensitiv$4) same (first adj (mode state)) same (second adj (mode state)) same (input$4 enter$4 activat$4 press$3)) | US-PGPUB; USPAT; UPAD | OR | ON | 2012/09/06 16:25 |

**10/16/2012 3:45:44 AM**
**C:\Users\nly\Documents\EAST\Workspaces\11078916.wsp**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicants: | Hayes Jr., et al. | Docket No.: | ERI-888RI |
| Serial No.: | 11/078,916 | Art Unit: | 2617 |
| Filed: | March 11, 2005 | Examiner: | Ly, Nghi H. |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Mail Stop Reissue
Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**SUPPLEMENTAL DECLARATION AND POWER OF ATTORNEY FOR APPLICATION FOR REISSUE OF U.S. PATENT NO. 6,278,888 B1**

Dear Sir:

I hereby declare that:

(1) The last known residence, mailing address and the citizenship of the inventors are stated below.

(2) I am authorized to act on behalf of the assignee, Ericsson, Inc. and the title of my position with said assignee is Assistant Secretary.

(3) The entire title to the patent identified below is vested in said assignee.

(4) The first named inventor is John Joseph Hayes Jr.; residence address – 2408 Canonbie Lane, Wake Forest, North Carolina 27587; citizenship – United States of America.

(5) The second named inventor is Curtis Wayne Thornton; residence address – 103 Indigo Drive, Cary, North Carolina 27513; citizenship – United States of America.

(6) The Patent No. is 6,278,888.

(7) The Date of Patent Issue is August 21, 2001.

(8) I believe said inventors to be the original and first inventors of the subject matter which is described and claimed in U.S. Patent No. 6,278,888, for which a reissue patent is sought on the invention entitled: Radiotelephones having Contact-Sensitive User Interfaces and Methods of Operating same, the specification of which was filed on March 11, 2005.



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(9) I have reviewed and understand the contents of the above-identified specification, including the claims, as amended through the date of execution of this declaration.

(10) I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

(11) I verily believe the original patent to be wholly or partly inoperative or invalid by reason of the patentee claiming more or less than he had the right to claim in the patent.

(12) At least one error upon which reissue is based is described as follows:

Claim 30 of the patent is believed to be wholly or partially invalid in that it claims more than patentee is entitled to.

(13) All errors corrected in this reissue application including errors corrected up to the date of this supplemental Declaration arose without any deceptive intention on the part of the applicant.

(14) Assignee hereby offers to surrender U.S. Patent No. 6,278,888 upon allowance of the subject reissue application.

(15) I hereby appoint the following individuals as my representatives with full power of substitution and revocation to prosecute a Reissue application upon U.S. Patent No. 6,278,888 and to transact all business in the United States Patent and Trademark Office connected therewith:

The Practitioners at Customer Number 25962.

(16) Direct all communications about the application to:

Steven H. Slater
Slater & Matsil, L.L.P.
17950 Preston Rd., Suite 1000
Dallas, TX 75252
Tel.: 972-732-1001
Fax: 972-732-9218

(17) Pursuant to requirements of 37 C.F.R. §1.68, I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 10-8-12

By: _____
John Han, Assistant Secretary



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PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

## STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Hayes Jr., et al.

Application No./Patent No.: 11/078,916 Filed/Issue Date: March 11, 2005

Titled:
Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same

Ericsson Inc. , a Corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 008951, Frame 0747, or for which a copy therefore is attached.

**OR**

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____
The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature — 10-8-12 Date

John Han — Printed or Typed Name

Assistant Secretary — Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 13940404 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Customer Number:** | 25962 |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 09-OCT-2012 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 15:02:37 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | | ERI_888RI_Supp_DEC_373b_Statement_Filed.pdf | 209758<br>df8ff14d5411bb4db0d34827d22c0fb7abf79b62 | yes | 4 |

| | Multipart Description/PDF files in .zip description | | |
|---|---|---|---|
| | **Document Description** | **Start** | **End** |
| | Supp reissue dec filed in accord with MPEP 1414.01. | 1 | 3 |
| | Assignee showing of ownership per 37 CFR 3.73. | 4 | 4 |
| **Warnings:** | | | |
| **Information:** | | | |
| | **Total Files Size (in bytes):** | 209758 | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicants: | Hayes et al. | Docket No.: | ERI-888RI |
| Serial No.: | 11/078,916 | Art Unit: | 2617 |
| Filed: | March 11, 2005 | Examiner: | Nghi H. Ly |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## APPEAL BRIEF

Dear Sir:

This Appeal Brief is respectfully submitted in connection with the above-identified application in response to the final rejection of all pending claims mailed January 18, 2012. A Notice of Appeal was filed on March 15, 2012. This Appeal Brief is being filed along with a Petition for a two month extension of time in which to answer.


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## REAL PARTY OF INTEREST (37 C.F.R. 41.37(c)(1)(i))

The present application is assigned to Ericsson Inc., the real party in interest. The assignment was recorded December 30, 1997, and appears at reel/frame 008951/0747.

## RELATED APPEALS AND INTERFERENCES (37 C.F.R. 41.37(c)(1)(ii))

The present application has been the subject of two previous appeals.

On June 15, 2007, Appellant filed a first Notice of Appeal arising from the Office Action dated March 13, 2007, a final rejection of all then pending claims over U.S. Patent No. 6,424,830 to O'Hagan et al. ("O'Hagan"), either alone or in combination with other references . The first Notice of Appeal was accompanied by a Pre-Appeal Brief Request for Conference. In response, in a Panel Decision dated August 6, 2007, Examiner was instructed to re-open prosecution.

On January 9, 2009, Appellant filed a second Notice of Appeal arising from the Office Action dated September 1, 2008, a final rejection of all then pending claims over the combination of O'Hagan and U.S. Patent No. 5,889,236 to Gillespie et al. ("Gillespie")[1]. That final rejection was, effectively, affirmed in a Board Decision dated October 13, 2010.[2]

## STATUS OF CLAIMS (37 C.F.R. 41.37(c)(1)(iii))

Claims 1-45, 48, and 51-73 are pending and stand finally rejected. The final rejection of each of the claims 1-45, 48, and 51-73 is being appealed.

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[1] Two of the then pending claims were rejected over the combination of O'Hagan, Gillespie and U.S Patent No. 4,566,001 to Moore et al. ("Moore").

[2] The Board affirmed the rejection of the then-pending claims on the basis of the prior art, and affirmed the rejection of the then pending claims as based upon a defective oath or declaration, but ruled Examiner had erred in rejecting the claims as being improperly broadened in a reissue application made and sworn by the assignee rather than the inventor.



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## STATUS OF AMENDMENTS (37 C.F.R. 41.37(c)(1)(iv))

There are no un-entered amendments.

## SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. 41.37(c)(1)(v))

With reference to illustrative embodiments by way of example and not by way of limitation, independent claim 1 relates to a radiotelephone (Fig. 1, 100) comprising a housing (Fig. 1, 11 0) having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, configured to be held in a user's hand such that the rear surface confronts the user's palm (Fig. 1; col. 2, lines 15 - 17; col. 4, lines 64 ~ 67). Claim 1 further relates to a radiotelephone communications transceiver (Fig. 2, 230) supported by the housing (Fig. 2; col. 5, lines 19- 30) and a display (Fig. 1, 1 02), supported by the housing (Fig. 1, 11 0), that displays an image at the front surface of the housing (Fig. 1; col. 5, lines 1-7). A contact-sensitive transducer (Fig. 1, 150) is supported by the housing (Fig. 1, 11 0) and has a contact-sensitive surface disposed at at least one of the first and second side surfaces (Fig. 2, 150; Fig. 3, 150a and 150b). The contact-sensitive surface (Fig. 2, 150a) produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 2; col. 5, lines 19- 22).

Claim 1 further relates to a controller (Fig. 2, 220), responsive to the output signal and operatively associated with the display (Fig. 2, 120) and the radiotelephone communications transceiver (Fig. 2, 230), which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based


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upon the output signal of the contact-sensitive transducer (Fig. 2; Figs. 7A and 7B; col. 8, lines 29- 53).

Furthermore, the controller (Fig. 2, 220) has a first mode wherein the controller is responsive to contact with the contact-sensitive_transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer (Col. 3, lines 27-31). The second mode is entered in response to an input from a use (Col. 3, lines 27-35).

With reference to illustrative embodiments by way of example and not by way of limitation, independent claim 16 relates to an apparatus (Fig. 1, 100) comprising a housing (Fig. 1, 110) having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (Fig. 1; col. 2, lines 15 - 17; col. 4, lines 64 - 67). Claim 16 further relates to a display (Fig. 1, 1 02) supported by the housing (Fig. 1, 11 0) that displays an image at the front surface of the housing (Fig. 1; col. 5, lines 1 - 7). A contact-sensitive transducer (Fig. 1, 150) is supported by the housing (Fig. 1, 11 0) and has a contact-sensitive surface disposed at at least one of the first and second side surfaces (Fig. 2, 150; Fig. 3, 150a and 150b), which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 2; col. 5, lines 19- 22). Claim 16 further relates to a controller (Fig.2, 220) responsive to the output signal and operatively associated with the display (Fig. 2, 120), which is configured to scroll displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (Fig. 2; Figs 7 A and 7B; col. 8, lines 29- 53). Independent claim 30, with reference to illustrative embodiments by way of example and not by limitation, relates to an apparatus (Fig.


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1, 1 00) comprising a housing (Fig. 1, 11 0), a display supported by the housing, that displays an image at a front surface of the housing (Fig. 1, 120; col. 5, lines 1 -7, and a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 1, 150; Fig. 2, 150; Fig. 3, 150a and 150b; col. 5, lines 19- 22).

The apparatus also includes a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (Fig. 2, 220; Figs. 7A and 7B; col. 8, lines 29- 53). The controller has a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer (Col. 3, lines 27-31). The second mode is entered in response to an input from a user (Col. 3, lines 27-35).

By way of illustration and not limitation, independent claim 30 relates to an apparatus (Fig. 1, 100) comprising a housing (Fig. 1, 110) having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand that the rear surface confronts the user's palm (Fig. 1; col. 2, lines 15 - 17; col. 4, lines 64 - 67). The apparatus further includes a display (Fig. 1, 1 02), supported by the housing, that displays an image at a front surface of the housing (Fig. 1; col. 5, lines 1 ~ 7). A contact-sensitive transducer (Fig. 1, 150), supported by the housing, produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer(Fig. 2; col. 5, lines 19- 22). The apparatus further includes a controller (Fig.2, 220), responsive to the output signal and


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operatively associated with the display (Fig. 2, 120), which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (Fig. 2; Figs 7 A and 7B; col. 8, lines 29- 53). The controller has a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer (Col. 3, lines 27-31). The second mode is entered in response to an input from a user (Col. 3, lines 27-35).

By way of illustration and not limitation, independent claim 33 relates to a method of providing user input with an apparatus (Fig. 1, 100) including a housing (Fig. 1, 120) having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface (Fig. 1, col. 2, lines 15- 17; col. 4, lines 64 67). The apparatus also includes a display that displays an image at the front surface (Fig.1, 102; col. 5, lines 1 - 7) and a controller that controls the display (Fig. 2, 220). The method of independent claim 33 includes holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (Fig. 1; col. 2, lines 12- 17; col. 4, lines 64- 67) and providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at at least one of the first and second side surfaces of the housing (Fig. 2, 150; Fig. 3, 150a and 150b), the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer (col. 5, lines 19- 22; Figs. 7A and 7B; col. 8, lines 29- 53).

The method further includes providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second


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mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to a user input (Fig. 2, 220; Col. 3, lines 27-35).

By way of illustration with reference to the described embodiments, claim 62 relates to an apparatus (Fig. 1, 1 00) for providing user input to a hand-held electronic device (Fig. 2) ·comprising a housing for containing the electronics for performing the intended user functions of the device (Fig. 1, 1 00), said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm ((Fig. 1; col. 2, lines 15 -17; col. 4, lines 64- 67). The apparatus further includes a display located on the front surface of the housing for displaying user-interface information for the electronic device, the said information including an image of rows of menu selectable items (Fig. 1, 1 02; Figs. 2, 3, 7 A- 7C; col. 5, lines 1 -7) and a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 2, 150; col. 5, lines 19- 22).

A controller, responsive to the output signal and operatively associated with the display, scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device (Fig. 2, 220; Figs. 7A and 7B; col. 8, lines 29- 53). The controller has a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the


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contact-sensitive transducer, the second mode being entered in response to an input from a user (Col. 3, lines 27-35).

Finally, independent claim 68 relates to an apparatus comprising a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (Fig. 1, 110; col. 2, lines 15- 17; col. 4, lines 64- 67), a display (Fig. 1, 1 02) supported by the housing, that displays an image at a front surface of the housing (Fig. 1; col. 5, lines 1 - 7), a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 2, 150; col. 5, lines 19- 22), and a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (Fig. 2, Figs. 7A and 7B; col. 8, lines 29- 53). The controller has a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to user input (Col. 3, lines 27-35).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL (37 C.F.R. 41.37(c)(1)(vi))

1. Whether claims 1-45, 48, and 51-73 are being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee.
2. Whether claims 30-32, 37-45, 48, and 51-61 are obvious over the combination of O'Hagan[3], Gillespie[4], and Jeong[5]; claims 1-13, 15-27, 29, 33-36, and 62-73 are

[3] U.S. Patent No. 6,424,830 to O'Hagan et al. (henceforth "O'Hagan").
[4] U.S. Patent No. 5,889,236 to Gillespie et al. (henceforth "Gillespie").

obvious over O'Hagan, Gillespie, Jeong, and Reber[6], and claims 14 and 28 are obvious over O'Hagan, Gillespie, Jeong, Reber, and Moore[7].

ARGUMENT (37 C.F.R. 41.37(c)(1)(vii))

***Claims 1-45, 48, and 51-73 are not being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee, and hence are proper under 35 U.S.C. 251.***

Examiner has rejected claims 1-45, 48, and 51-73 under 35 U.S.C. 251 as being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee (Office Action dated January 18, 2012 at p. 2). As addressed below, this ground of rejection was previously reversed by the Board.

Each of claim 1-45, 48, and 51-73 was finally rejected on the same basis (i.e., as being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee) in an Office Action dated September 1, 2008, which final rejection was appealed. In order to avoid needless repetition, Appellant hereby incorporates as if fully set forth herein Appellant's previous response to the rejection of these claims on this basis, by reference to Appellant's previous Appeal Brief, filed July 17, 2009, at pages 13-16.

In the Board decision dated October 13, 2010, the Board held:

> We agree with Appellants, however, that the present application is a narrowing reissue application, particularly in light of (1) the narrowing amendments made to the independent claims (FF 7); (2) independent claims 62 and 68 added via reissue which recited features that generally correspond to those in originally-issued claim 30, but which also recite additional features which are not in originally-issued claim 30 as Appellants indicated (Reply Br. 14-16; FF13); and (3) the features of

[5] U.S. Patent No. 5,621,437 to Jeong (henceforth "Jeong").
[6] U.S. Patent No. 6,002,946 to Reber et al. (henceforth "Reber").
[7] U.S. Patent No. 4,566,001 to Moore et al. (henceforth "Moore").

> dependent claims 27-61, 63-67, and 69-73 (added via reissue), which only further narrow the scope of their respective independent claims 30, 62, and 68 (FF 12).
>
> We therefore find no claim in the present reissue application that is broader than the patented claims, for they do not contain within their scope any conceivable product or process that would not infringe the patented claims.

*Decision on Appeal dated October 13, 2010 at p. 11.*

Since the Board decision of 2010, independent claims 1, 16, 30, 33, 62, and 68 have been amended only to include further narrowing limitations. For instance, each independent apparatus claim has been amended since the previous Board decision to include the limitation "the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to user input." Method claim 33 has analogously been narrowed to include the limitation "providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to a user input."

Because the Board has previously found that the present reissue application is not a broadening reissue, and because the claims have only been further narrowed since the Board decision, the rejection of claims 1-45, 48, and 51-73 under 35 U.S.C. 251 as being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee is improper and should be reversed.


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***Claims 30-32, 37-45, 48, and 51-61 are patentably distinct over the combination of O'Hagan, Gillespie, and Jeong; claims 1-13, 15-27, 29, 33-36, and 62-73 are patentably distinct over O'Hagan, Gillespie, Jeong, and Reber, and claims 14 and 28 are patentably distinct over of O'Hagan, Gillespie, Jeong, Reber, and Moore.***

Claims 1-45, 48, and 51-73

Each of claims 1-32, 37-45, 48, and 51-73 recites, either directly or by dependency the claim limitations of "a contact-sensitive transducer" and "a controller . . . having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user." Each of these claims stands or falls together.

The recited claim element will be explained with reference to illustrative embodiments illustrated in Figure 1 and Figure 11, illustrated below. Reference to the illustrated embodiments is for example only and in no way limits the scope of the claim element.


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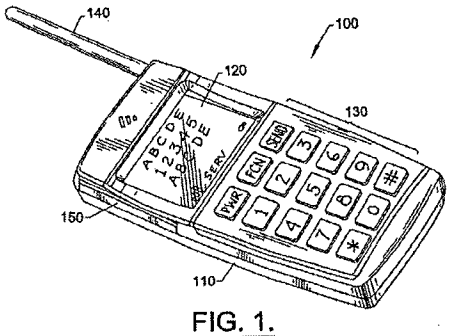



FIG. 1.

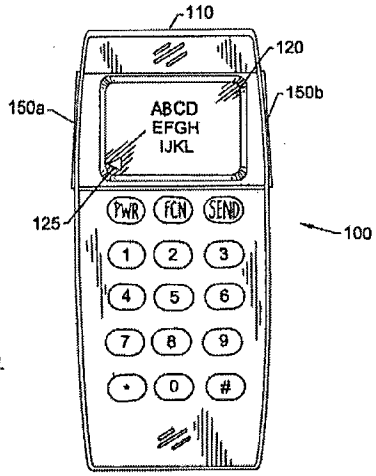



FIG. 3.

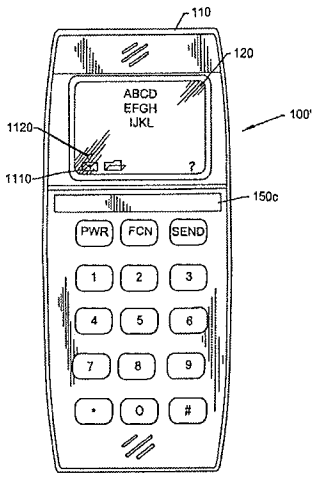



FIG. 11.

*Figures 1, 3, and 11 of Appellant's Specification*

Figure 1 illustrates an exemplary apparatus 100 having a contact-sensitive transducer 150 along a side surface of the housing. Figure 3 illustrates an exemplary apparatus 100 having a contact-sensitive transducer 150a along a first side surface of the housing and a second contact-sensitive transducer 150b along a second side surface of the housing. Figure 11 illustrates an arrangement wherein a contact-sensitive transducer 150c is arranged on a front surface of the housing. Regardless of the configuration, contact-sensitive transducer 150/150a/150b/150c produces an output signal that characterizes contact of an object, such as a user's finger or the like, along the contact-sensitive surface. (see, e.g., Col. 5, lines 19-35). A controller, such as exemplary controller 220 of Figure 2, receives output signals from the contact-sensitive transducer and, e.g., causes rows of information displayed on display 120 (see Figure 1 and/or Figure 11 reproduced herein, or Figure 3) to appear to "scroll" in response to the user's input (see, e.g., Figures 7A-7C; Col. 8, line 29 – 67).

Returning again to Figures 1, 3 and/or Figure 11, it is self-evident that contact-sensitive transducer 150/150a/150b/150c is strategically placed on the housing in order to allow for a user


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to easily make moving contact (such as by "swiping") with transducer surface in order to manipulate the display (see, e.g., Figures 7A-7C; Col. 8, line 29 – 67). As a result of such placement, contact-sensitive transducer 150/150a/150b/150c is self-evidently vulnerable to inadvertent contact with the surface, which could cause unintentional and undesirable output signals being sent to controller 220. In order that such inadvertent contact not cause controller 220 to affect undesirable changes to the display (or potentially other undesirable actions), controller 220 has two modes. In a first mode, controller 220 is responsive to contact with the contact-sensitive transducer (Col. 3, lines 27-31). In the second mode, controller 220 is not responsive to contact-sensitive transducer (Id.). An advantageous feature is that the controller may be placed in the second mode "in response to an input from a user" (Col. 3, lines 31-35).

Returning now to the specific claim language, each of claims 1-32, 37-45, 48, and 51-73 recites, either directly or by dependency the claim limitations of "a contact-sensitive transducer" and "a controller . . . having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user." The prior art references, whether alone or combination, fails to teach or suggest these claim elements.

Examiner has conceded that "the combination of O'Hagan and Gillespie et al fails to expressly disclose the" above recited claim element (Office Action dated January 18, 2012 at p. 5). Examiner asserts, however, that Jeong provides this claim limitation when combined with O'Hagan and Gillespie (Office Action dated January 18, 2012 at p. 5). Appellant respectfully traverses Examiner's assertion.


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Jeong teaches a touch panel 20 and a control circuit 10 (see, e.g., Jeong Figure 2). Jeong further teaches that touch panel 20 has a "present mode" and a "suspend mode" (Jeong at Col. 1, lines 7-19). Solely for the sake of argument, Appellant will accept herein[8] Examiner's apparent assertion that Jeong's teaching of a touch panel with a present mode and a suspend mode is analogous to Appellant's claim elements of a controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer. Nonetheless, Jeong fails to teach or even remotely suggest that "the second mode being entered in response to an input from a user," as also required by the claims. In fact, Jeong's teaching is the very antithesis of this claim limitation.

Far from teaching that a user input causes the controller to enter a second mode, Jeong teaches instead that the "present mode is changed to a suspend mode after the lapse of a predetermined time period from the moment that no data is applied to a touch panel in order to turn off supply power to the touch panel" (Jeong at Col. 2, lines 20-31, emphasis added). In other words, Jeong clearly requires the absence of user input (accepting as true Examiner's characterization that the user touching the touch device constitutes a user input[9]). By stark contrast Appellant's claims recite entering into the second mode "in response to an input from a user." Simply put, and contrary to Examiner's interpretation that "'no data [applied] to a touch panel' reads on applicant's 'an input from the user' as claimed," Jeong's disclosure of (a display)

[8] Appellant makes this assumption solely for the sake of argument and in order to demonstrate that Examiner's assertion and conclusion are nonetheless flawed. Appellant takes no position regarding whether such an assumption is supported by the reference and Appellant expressly reserves the right to challenge this assumption in the future, should the need arise.

[9] See Office Action dated January 18, 2012 at p. 6.



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entering a suspend mode in the absence of user input fails to teach or even remotely suggest (a controller) entering a second mode in response to user input.

Examiner's attempt to gloss over the difference between entering into a second mode "in response to an input from a user" and entering into a second mode in the absence of user input is improper. Not only does Jeong not teach entering into a second mode in response to user input, one skilled in the art would not be motivated to modify Jeong in the manner in which Examiner has characterized Jeong. By conflating Jeong's disclosure with Appellant's claimed invention, Examiner has appeared to implicitly modify the teaching of Jeong. Such modification, however, would change the principle of operation of Jeong and require a substantial reconstruction and redesign of the elements taught by Jeong. A rejection on this type of basis is improper. See MPEP at 2143.01, citing *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). As was the case in *In re Ratti,* changing Jeong from requiring the absence of user input to requiring a user input would require "a change in the basic principle under which" Jeong operates. *In re Ratti* informs us that such a rejection is improper and cannot stand.

Recall that by requiring a user input to enter into a second (non-responsive) mode, Appellant's claimed invention can prevent undesirable commands arising from inadvertent contact with the contact-sensitive transducer, as discussed above. The operation of Jeong is completely contrary to this feature, however. Jeong remains in the first (responsive) mode as long as Jeong continues to receive input to the touch pad (Jeong teaches that when the touch pad is contacted, a signal is generated "so that timer 118 does not generate the control signal CS1, so that the suspend signal generator 119 does not generate the suspend signal SPS" at Col. 5, lines 25-46, emphasis added). Nothing in Jeong teaches or remotely suggests that Jeong distinguishes between an intentional contact (which will prevent the device from entering into a suspend


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mode) and an inadvertent contact (which will also prevent the device from entering into suspect mode). Hence, because Jeong requires the absence of contact in order to enter the suspend (non-responsive) mode, Jeong's system will remain responsive to contact with the touch pad – even when such contact is inadvertent. In fact, such inadvertent contact continually prevents Jeong from entering into a non-responsive mode. Such a teaching by Jeong is contrary to Appellant's claimed invention of entering into a non-responsive mode in response to user input.

For at least these reasons Jeong fails to teach or suggest "a controller . . . having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user." Furthermore, the above reasons establish that Examiner's assertion that Jeong "reads on applicant's 'an input from the user' as claimed" is completely contrary to the express teaching of Jeong and to any implication one skilled in the art would derive from Jeong.

Examiner has nowhere identified and Appellant is unaware of any teaching or suggestion in Reber and/or Moore, whether alone or in combination with O'Hagan, Gillespie, and Jeong, that overcomes this deficiency in Jeong. For at least these reasons, claims 1-32, 37-45, 48, and 51-73 are patentably distinct over the cited references.

Claims 33-36

Each of claims 33-36 recites, either directly or by dependence, "providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact


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with the contact-sensitive transducer, the second mode being entered in response to a user input." These claims stand or fall together.

Examiner has acknowledged that "the combination of O'Hagan and Gillespie et al fails to expressly disclose providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to a user input" (Office Action dated January 18, 2012 at p. 19). Examiner asserts, however, that Jeong provides this claim limitation when combined with O'Hagan and Gillespie (Office Action dated January 18, 2012 at pp. 19-20). Appellant respectfully traverses Examiner's assertion.

Examiner has failed to identify any teaching whatsoever in Jeong of "providing user input to the controller to select . . . a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer" (emphasis added). As addressed above with regard to claims 1-32, 37-45, 48, and 51-73 (the "Apparatus Claims"), Jeong teaches – at best – that a suspend mode is entered into in the absence of user input. For the sake of brevity, Appellant will not reiterate each basis for distinguishing over Jeong that was provided above with regard to the Apparatus Claims. Appellant incorporates by reference, as if fully set forth herein, each basis provided above with regard to the Apparatus Claims. Those bases are sufficient to establish that Jeong fails to teach or remotely suggest entering into a second mode "in response to a user input" as required by claims 33-36.

In addition, claims 33-36 also recite "providing a user input to select" a first mode and a second mode. Even under its broadest interpretation, Jeong provides no teaching or suggestion of a user input to "select" a first mode and/or a second mode. As addressed above, Jeong's


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theory of operation excludes using user input to enter a second mode. As such, Jeong excludes selecting a first and/or second mode based upon user input, for at least the reason that Jeong requires the absence of user input in order to enter into a second mode. Examiner has nowhere identified and Appellant is unaware of any teaching or suggestion in Reber and/or Moore, whether alone or in combination with O'Hagan, Gillespie, and Jeong, that overcomes these deficiencies in Jeong. For at least these reasons, claims 32-36 are patentably distinct over the cited references.

## CONCLUSION

As has been established in a previous appeal decision, the present reissue application is not a broadening reissue application and hence the pending claims are properly supported by an application made and sworn to by the assignee and not the patentee. Hence, the rejection under 35 U.S.C. 251 should be reversed. Each of claims 1-45, 48, and 51-73 recites claim elements that patentably distinguish over the cited prior art references. Hence, the rejection of claims 1-45, 48, and 51-73 under 35 U.S.C. 103 should be reversed.

Respectfully submitted,

2012 July 16
Date

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## CLAIMS APPENDIX

1. A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at said front surface, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.

2. A radiotelephone according to claim 1, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.


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3. A radiotelephone according to claim 1, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.

4. A radiotelephone according to claim 3, wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer.

5. A radiotelephone according to claim 4, wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer.

6. A radiotelephone according to claim 4, wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

7. A radiotelephone according to claim 4, wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

8. A radiotelephone according to claim 7, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.


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9. A radiotelephone according to claim 7, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

10. A radiotelephone according to claim 7, wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object.

11. A radiotelephone according to claim 10, wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer and to initiate the action associated with the identified graphical object responsive to detection of the momentary contact.

12. A radiotelephone according to claim 11, wherein the controller is operative to initiate the action in response to detection of a plurality of momentary contacts occurring within a predetermined time interval.

13. A radiotelephone according to claim 1, wherein the contact-sensitive transducer further comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.


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14. A radiotelephone according to claim 13, wherein the contact-sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

15. A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

16. An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed on said front surface, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, selectively responsive to the output signal and operatively associated with the display, which is configured to scroll displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.


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17. An apparatus according to claim 16, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

18. An apparatus according to claim 16, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

19. An apparatus according to claim 18, wherein the controller is operative to selectively display a graphical object on the display responsive to the output signal of the contact-sensitive transducer.

20. An apparatus according to claim 19, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

21. An apparatus according to claim 19, wherein the controller is operative to display a plurality of graphical objects on the display, and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

22. An apparatus according to claim 19, wherein the controller is operative, responsive to the contact-sensitive transducer, to determine a position of contact along the axis of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.


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23. An apparatus according to claim 22, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

24. An apparatus according to claim 22, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

25. An apparatus according to claim 24, wherein the controller is operative, responsive to the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer.

26. An apparatus according to claim 25, wherein the controller is operative, responsive to the output signal of contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and to scroll displayed rows along the axis of the display based on the detected moving contact.

27. An apparatus according to claim 19, wherein the contact-sensitive transducer further comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.

28. An apparatus according to claim 27, wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.


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29. An apparatus according to claim 22, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

30. An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.

31. An apparatus according to claim 30, further comprising a radiotelephone communications transceiver supported by the housing, and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal.


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32. An apparatus according to claim 30, wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at side surface of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface.

33. In an apparatus including a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, a display that displays an image at the front surface, and a controller that controls the display, a method of providing user input comprising the steps of:

holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm;

providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at said front surface of the housing, the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer; and

providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to a user input.

34. A method according to claim 33, wherein the step of providing comprises the step of contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm.


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35. A method according to claim 33, wherein the apparatus is a radiotelephone that further includes a radiotelephone communications transceiver, wherein the controller is operative to control the radiotelephone communications transceiver, and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

36. A method according to claim 33, wherein the step of controlling comprises the step of selectively displaying an image or the display according to the output signal of the contact-sensitive transducer.

37. An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

38. An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

39. An apparatus according to claim 38, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

40. An apparatus according to claim 39, wherein the contact-sensitive transducer is an elongate strip.


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41. An apparatus according to claim 30, wherein the contact-sensitive transducer comprises one of a resistive transducer a capacitive transducer and a semiconductive transducer.

42. An apparatus according to claim 30, which also includes additional user input interface devices for the apparatus on the front surface of the housing.

43. An apparatus according to claim 42 wherein the additional interface devices are contact-sensitive.

44. An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer.

45. An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer.

46-47. (Cancelled)

48. An apparatus according to claim 43, wherein an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer.

49-50. (Cancelled)


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51. An apparatus according to claim 30 further comprising:

a second contact-sensitive transducer, supported by the housing, which produces a second output signal that characterizes contact of an object along the contact-sensitive surface of the second contact-sensitive transducer; and

a controller, responsive to the second output signal for controlling a function of the apparatus.

52. An apparatus according to claim 51, wherein the second output signal is produced in response to detection of momentary contact with said second contact-sensitive transducer.

53. An apparatus according to claim 51, wherein the second output signal is produced in response to detection of a predetermined number of momentary contacts with said second contact-sensitive transducer within a predetermined time interval.

54. An apparatus according to claim 30, wherein said controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of said display based on the output signal from said transducer.

55. An apparatus according to claim 54, wherein the direction of scroll is transverse to the direction that said rows extend across the display.

56. An apparatus according to claim 54, wherein said rows consist of alphanumeric characters comprising menu selections.


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57. An apparatus according to claim 54, wherein said controller identifies successive ones of the rows displayed along the axis of said display by highlighting successive said rows.

58. An apparatus according to claim 30 further comprising a power supply disposed inside said housing.

59. An apparatus according to claim 58, wherein said power supply comprises a battery.

60. An apparatus according to claim 59 further comprising a circuit which controls power transfer from the power supply too another circuit based on the output signal of the contact-sensitive transducer.

61. An apparatus according to claim 30 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.


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Page 95 of 1144

62. An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.

63. An apparatus according to claim 62, wherein the displayed rows of menu selectable items comprise a plurality of items in a list.


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Page 96 of 1144

64. An apparatus according to claim 62 further comprising a power supply disposed inside said housing.

65. An apparatus according to claim 64, wherein said power supply comprises a battery.

66. An apparatus according to claim 65 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

67. An apparatus according to claim 62 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

68. An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by a front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the


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Page 97 of 1144

controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to user input.

69. An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

70. An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

71. An apparatus according to claim 70, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

72. An apparatus according to claim 71, wherein the contact-sensitive transducer is an elongate strip.

73. An apparatus according to claim 68, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.


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EVIDENCE APPENDIX

None.


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Page 99 of 1144

## RELATED PROCEEDINGS APPENDIX

None.


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Page 100 of 1144

PTO/SB/22 (09-11)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARMENT OF COMMERCE
Under the paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

| **PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)** | Docket Number (Optional) ERI-888RI |
|---|---|
| Application Number 11/078,916 | Filed March 11, 2005 |
| For Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | |
| Art Unit 2617 | Examiner Nghi H. Ly |

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

| | Fee | Small Entity Fee | |
|---|---|---|---|
| ☐ One month (37 CFR 1.17(a)(1)) | $150 | $75 | $ |
| ☑ Two months (37 CFR 1.17(a)(2)) | $560 | $280 | $ 560.00 |
| ☐ Three months (37 CFR 1.17(a)(3)) | $1270 | $635 | $ |
| ☐ Four months (37 CFR 1.17(a)(4)) | $1980 | $990 | $ |
| ☐ Five months (37 CFR 1.17(a)(5)) | $2690 | $1345 | $ |

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-1065.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed (Form PTO/SB/96).

☑ attorney or agent of record. Registration Number 35,361

☐ attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

| /Steven H. Slater/ | 16 July 2012 |
|---|---|
| Signature | Date |
| Steven H. Slater | 972-732-1001 |
| Typed or printed name | Telephone Number |

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 11078916 |
| **Filing Date:** | 11-Mar-2005 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Attorney Docket Number:** | ERI-888RI |

Filed as Large Entity

## Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| Filing a brief in support of an appeal | 1402 | 1 | 620 | 620 |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| Extension - 2 months with $0 paid | 1252 | 1 | 560 | 560 |
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **1180** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 13261993 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Customer Number:** | 25962 |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 16-JUL-2012 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 16:28:14 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | $1180 |
| RAM confirmation Number | 3492 |
| Deposit Account | 501065 |
| Authorized User | |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | | ERI_888RI_Appeal_Brief.pdf | 1436952<br>2ed4f4abb1c129b2fa396b54dac904ce078850d5 | yes | 36 |

| | Multipart Description/PDF files in .zip description | | |
|---|---|---|---|
| | Document Description | Start | End |
| | Appeal Brief Filed | 1 | 35 |
| | Extension of Time | 36 | 36 |

**Warnings:**

**Information:**

| | | | | | |
|---|---|---|---|---|---|
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 31811<br>2b25f373084d48ebaa723dfbf14f48aa6d9c3224 | no | 2 |

**Warnings:**

**Information:**

| Total Files Size (in bytes): | 1468763 |
|---|---|

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PTO/SB/31 (07-09)
Approved for use through 07/31/2012. OMB 06551-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Docket Number (Optional)
ERI-888RI

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]
On_____

Signature_____

Typed or printed name_____

In re Application of
Hayes, Jr. et al.

| Application Number | Filed |
|---|---|
| 11/078,916 | 3/11/2005 |

For Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same

| Art Unit | Examiner |
|---|---|
| 2617 | Nghi H. Ly |

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 41.20(b)(1)) $ 620.00

☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $ _____

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 50-1065.

☐ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

☒ attorney or agent of record.
Registration number 35,361

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34. _____

Signature

Steven H. Slater
Typed or printed name

972-732-1001
Telephone number

15 March 2012
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 41.31. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 11078916 |
| **Filing Date:** | 11-Mar-2005 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Attorney Docket Number:** | ERI-888RI |

Filed as Large Entity

## Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| Notice of appeal | 1401 | 1 | 620 | 620 |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **620** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 12316492 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Customer Number:** | 25962 |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 15-MAR-2012 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 16:58:56 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | $620 |
| RAM confirmation Number | 3996 |
| Deposit Account | 501065 |
| Authorized User | |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Notice of Appeal Filed | ERI_888RI_Notice_of_Appeal.pdf | 79036<br>986eb0abbd2f81ce4916f948ba93366eea94d87e | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Fee Worksheet (SB06) | fee-info.pdf | 30137<br>60391f4c09a963e241979e7279a729b5ddf2831b | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 109173 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

25962 7590 01/18/2012

SLATER & MATSIL, L.L.P.
17950 PRESTON RD, SUITE 1000
DALLAS, TX 75252-5793

| EXAMINER | |
|---|---|
| LY, NGHI H | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2617 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 01/18/2012 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@slater-matsil.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Examiner | Art Unit | |
| | NGHI LY | 2617 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 October 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

5)☒ Claim(s) *1-45,48 and 51-73* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-45,48 and 51-73* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Reissue Applications*

### *Oath/Declaration*

1. A. The reissue oath/declaration filed with this application is defective (see 37 CFR 1.175 and MPEP § 1414) because of the following: amendments (see amendment filed March 22, 2002) have been made to the claims since the filing of the Original reissue oath/declaration. A supplemental oath/declaration is required.

B. The reissue oath/declaration filed with this application is defective because it fails to identify at least one error which is relied upon to support the reissue application. See 37 CFR 1.175(a)(1) and MPEP § 1414.

C. In accordance with 37 CFR 1.175(b)(1), a supplemental reissue oath/declaration under 37 CFR 1.175(b)(1) must be received before this reissue application can be allowed.

D. Claims 1-45, 48 and 51-73 are rejected as being based upon a defective reissue oath under 35 U.S.C. 251. See 37 CFR 1.175.

The nature of the defect(s) in the Oath or Declaration is set forth in the discussion above in this Office action.

E. Claims 1-45, 48 and 51-73 are rejected under 35 U.S.C. 251 as being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee. A claim is broader in scope than the original claims if it contains within its scope any conceivable product or process which would have infringed the original

patent. A claim is broadened if it is broader in any one respect even though it may be narrower in other respects.

F. It appears that on the Oath or Declaration filed 3/11/05 box A, An assignment from the inventors box was inadvertently left blank. Appropriate correction is required.

G. Applicant is referred to 37 CFR 1.173 for the proper format and manner of making amendments in a reissue application.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-13, 15-27, 29, 33-36 and 62-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236) and further in view of Jeong (US 5,621,437) and Reber et al (US 6,002,946).

Regarding claim 1, O'Hagan discloses a radiotelephone (see Figs. 2-3), comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface (see Fig. 2), the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-2), a radio telephone communications transceiver (66), supported by the housing (see Figs. 2-3), a display (28) supported by the housing (see Figs. 2-3), that displays an image at a front surface of the housing (see Figs. 7-8), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver (see processor being connected to display 28 and transceiver 66, Fig. 4), which controls at least **one** of the display and the radiotelephone communications transceiver which scrolls displayed rows along an axis or the display based upon the output signal (which reads on “In response to the operator rotating the three-way switch 46 clockwise or counterclockwise, the processor 60 causes a cursor 120 on the display to scroll up or down in relation to the list of possible "recipients"” as disclosed in column 9 lines 44-46). O'Hagan further discloses a thumb wheel (46, 48), supported by the

housing and having a surface disposed (see 46, 48 on the side Figs. 7-8), which produces an output signal in response to moving contact of an object along the surface of the wheel (which reads on “Rotation in a clockwise direction produces a first output and rotation in a counterclockwise direction produces a second output. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a transaxial direction to produce a third output” as disclosed in col. 5, lines 54-58, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

The combination of O'Hagan and Gillespie et al fails to expressly disclose the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from the user.

In an analogous field of endeavor, Jeong discloses the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer (see fig.2 and column 3, lines 9-23, see "*DS1*", also see Abstract and column 2, lines 32-51, see "*the switch for turning on/off supply power to the touch panel in response to a first control signal from the control circuit*". In this case, the control circuit 10 has two modes: In the **first mode**, controlling a system operation in response to the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "on". In the **second mode**, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "off", and the touch panel is "off" because "*a present mode is changed to a suspend mode after the lapse of a predetermined time period from the moment that **no data is applied to a touch panel**, to turn **off** supply power to the touch panel and stop a system operation*" see column 1, lines 11-15 and column 2, lines 25-28. In this case, Jeong's "***no data is applied to a touch panel***" reads on applicant's "an input from the user" as claimed).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Jeong with the combination of O'Hagan and Gillespie et al terminal so that power consumption can be minimized and a battery can be lengthened (see Jeong, column 1, lines 15-17).

The combination of O'Hagan and Gillespie et al fails to expressly disclose a contact-sensitive surface disposed at the front surface.

In an analogous field of endeavor, Reber discloses a contact-sensitive surface disposed at the front surface (see fig.4, fig.5 and fig.6, a contact-sensitive surface 10, also see column 2, lines 34-43).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Reber with the combination of O'Hagan and Gillespie et al terminal in order to provide a handheld device having a data reader (see Reber, column 1, lines 24-28).

Regarding claim 2, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or thumb of the holding hand (see O'Hagan, Fig. 2).

Regarding claim 3, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to selectively display an image according to the output signal of the transducer (see O'Hagan, col. 9, lines 53-67, Fig. 8). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 4, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer (see O'Hagan, col. 9, lines 43-48).

Regarding claim 5, the combination of O'Hagan and Gillespie et al. and Reber further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the transducer (see Fig. 8). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 6, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the transducer (see col. 9, lines 46-52). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 7, the combination of O'Hagan, Gillespie et al. and Reber further discloses selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object (see O' Hagan, col. 9, lines 43-52). In a similar field of endeavor, Gillespie et al disclose the interface electronics to allow the pointing device to communicate directly with a host microprocessor, and a "finger pointer" embodiment, a position sensing system includes a position sensing transducer comprising a touch-sensitive surface disposed on a substrate, such as a printed circuit board, including a matrix of conductive lines (see column 5, lines 21-27 and column 5 lines 45-50), which reads on the claimed "wherein the controller (186) is operative to

determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer".

Regarding claim 8, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the transducer (see O'Hagan, col. 9, lines 48-52 and col. 12 lines 34-36). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 9, the combination of O'Hagan and Gillespie et al. and Reber further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the transducer (see col. 9, lines 48-52). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 10, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical wherein the controller is further operative, to initiate the action associated with the identified graphical object (see O'Hagan, feature of using the thumbwheel to select a

recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 11, the combination of O'Hagan, Gillespie et al. and Reber further discloses a gesture unit (see Gillespie, column 30, lines 20-28), which reads on the claimed "the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer".

Regarding claim 12, the combination of O'Hagan, Gillespie et al. and Reber further discloses a gesture unit and parameters (see Gillespie, column 30, lines 29-34), which reads on the claimed "detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval".

Regarding claim 13, the combination of O'Hagan, Gillespie et al. and Reber further discloses a scroll bar (see Gillespie, figure 16 and column 32, lines 30-45), which reads on the claimed "elongate contact-sensitive strip".

Regarding claim 15, the combination of O'Hagan, Gillespie et al. and Reber further discloses a capacitive sensing system (see Gillespie, figure 1) which reads on the claimed limitation a capacitive transducer (or see Reber, column 2, lines 34-43).

Regarding claims 16 and 62, O'Hagan discloses an apparatus and a method in an apparatus for providing user input to a hand-held electronic device, comprising: a housing having a front surface, a rear surface and first and second side surfaces

adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see O'Hagan, Figs. 1-4), a display (28) supported by the housing, that displays an image at a front surface of the housing (see O'Hagan, Figs. 7-8), and a controller (O'Hagan, processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal (O'Hagan, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). O'Hagan further discloses a thumb wheel (O'Hagan, 46, 48), supported by the housing and having a surface disposed (see O'Hagan, 46, 48 on the side Figs. 7-8), which produces an output signal that characterizes contact of an object along the surface of the wheel (see O'Hagan, col. 5, lines 46-61, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). However, O'Hagan fails to expressly disclose the use of a contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

The combination of O'Hagan and Gillespie et al fails to expressly disclose the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from the user.

In an analogous field of endeavor, Jeong discloses the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer (see fig.2 and column 3, lines 9-23, see "*DS1*", also see Abstract and column 2, lines 32-51, see "*the switch for turning on/off supply power to the touch panel in response to a first control signal from the control circuit*". In this case, the control circuit 10 has two modes: In the **first mode**, controlling a system operation in response to the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "on". In the **second mode**, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "off", and the touch panel is "off" because "*a present mode is changed to a suspend mode after the lapse of a predetermined time period from the moment that **no data is applied to a touch panel**, to turn **off** supply*

*power to the touch panel and stop a system operation*" see column 1, lines 11-15 and column 2, lines 25-28. In this case, Jeong's "***no data is applied to a touch panel***" reads on applicant's "an input from the user" as claimed).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Jeong with the combination of O'Hagan and Gillespie et al terminal so that power consumption can be minimized and a battery can be lengthened (see Jeong, column 1, lines 15-17).

The combination of O'Hagan, Gillespie et al and Jeong fails to expressly disclose a contact-sensitive surface disposed at the front surface.

In an analogous field of endeavor, Reber discloses a contact-sensitive surface disposed at the front surface (see fig.4, fig.5 and fig.6, a contact-sensitive surface 10, also see column 2, lines 34-43).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Reber with the combination of O'Hagan, Gillespie et al and Jeong terminal in order to provide a handheld device having a data reader (see Reber, column 1, lines 24-28).

Regarding claim 17, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses the contact-sensitive surface (see Gillespie, column 5, lines 47-48), when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand (see O'Hagan, Fig. 2).

Regarding claim 18, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to selectively display an

image according to the output signal of the transducer (see O'Hagan, col. 9, lines 53-67, Fig. 8). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 19, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer (see O'Hagan, col. 9, lines 43-48).

Regarding claim 20, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the transducer (see Fig. 8). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 21, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the transducer (see col. 9, lines 46-52). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 22, the combination of O'Hagan, Gillespie et al., Jeong and Reber further disclose selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object (see O' Hagan, col. 9, lines 43-52). In a similar field of endeavor, Gillespie et al disclose the interface electronics to allow the pointing device to communicate directly with a host microprocessor, and a "finger pointer" embodiment, a position sensing system includes a position sensing transducer comprising a touch-sensitive surface disposed on a substrate, such as a printed circuit board, including a matrix of conductive lines (see column 5, lines 21-27 and column 5 lines 45-50), which reads on the claimed "wherein the controller (186) is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer".

Regarding claim 23, the combination of O'Hagan, Gillespie et al., Jeong and Reber further disclose wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the transducer (see O'Hagan, col. 9, lines 48-52 and col. 12 lines 34-36). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 24, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the transducer (see col. 9, lines 48-52). In a similar field of endeavor, Gillespie et al

disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claims 25 and 26, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein to scroll displayed rows along an axis of the display responsive to the output signal (O'Hagan, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 27, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses Figs. 2-3 illustrates the (O'Hagan, thumbwheel 48) disposed at least one of the first and second side surfaces of the housing. In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed "elongate contact-sensitive strip".

Regarding claims 29 and 73, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a capacitive sensing system (see Gillespie, figure 1) which reads on the claimed limitation a capacitive transducer (or see Reber, column 2, lines 34-43).

Regarding claim 63 the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses in Figs. 7-8 of O'Hagan wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

Regarding claims 64 and 65, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a power supply disposed inside the housing wherein the power supply comprises a battery (O'Hagan, terminal also includes a power source 72 which is a rechargeable supply, see O'Hagan col. 7, lines 54-56).

Regarding claim 66, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the transducer (O'Hagan, power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see O'Hagan col. 7, lines 56-59). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 67, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a mode of operation wherein the controller is unresponsive to contact with the transducer (feature of transitioning between different states as illustrated in O'Hagan Fig. 6). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claims 33 and 68, O'Hagan discloses in an apparatus including a housing having a front surface (see Figs. 2-3), a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface (see Figs. 2-3), a display that displays an image at the front surface (see Figs. 7-8), and a controller that controls the display (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), a method of providing user input comprising the steps of: holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (which reads on “In response to the operator rotating the three-way switch 46 clockwise or counterclockwise, the processor 60 causes a cursor 120 on the display to scroll up or down in relation to the list of possible "recipients"” as disclosed in column 9 lines 44-46), providing user input to the controller (O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least **one** of the first and second side surfaces, see 46, 48 on the side Figs. 7-8), operable to produce an output signal in response to moving contact of an object along the surface of the wheel (which reads on “Rotation in a clockwise direction produces a first output and rotation in a counterclockwise direction produces a second output. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a transaxial direction to produce a third output” as disclosed in col. 5, lines 54-58, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the

display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

The combination of O'Hagan and Gillespie et al fails to expressly disclose providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to a user input.

In an analogous field of endeavor, Jeong discloses providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer (see fig.2 and column 3, lines 9-23, see "*DS1*", also see Abstract and column 2, lines 32-51, see "*the switch for turning on/off supply power to the touch panel in response to a first control signal from the control circuit*". In this case, the control circuit 10 has two modes: In the **first mode**, controlling a system operation in response to the detect signal DS1 from the touch panel 20 when the supply power to

the touch panel is “on”. In the **second mode**, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is “off”, and the touch panel is “off” because “*a present mode is changed to a suspend mode after the lapse of a predetermined time period from the moment that* ***no data is applied to a touch panel****, to turn* ***off*** *supply power to the touch panel and stop a system operation*” see column 1, lines 11-15 and column 2, lines 25-28. In this case, Jeong's “***no data is applied to a touch panel***” reads on applicant’s “an input from the user” as claimed).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Jeong with the combination of O'Hagan and Gillespie et al terminal so that power consumption can be minimized and a battery can be lengthened (see Jeong, column 1, lines 15-17).

The combination of O'Hagan, Gillespie et al and Jeong fails to expressly disclose a contact-sensitive surface disposed at the front surface.

In an analogous field of endeavor, Reber discloses a contact-sensitive surface disposed at the front surface (see fig.4, fig.5 and fig.6, a contact-sensitive surface 10, also see column 2, lines 34-43).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Reber with the combination of O'Hagan, Gillespie et al and Jeong terminal in order to provide a handheld device having a data reader (see Reber, column 1, lines 24-28).

Regarding claim 34, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the step of providing comprises a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (see O'Hagan, Fig. 3). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 35, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the apparatus is a radio telephone that further includes a radio telephone communications transceiver (O'Hagan, 66, Fig. 2), wherein the controller is operative to control the radio telephone communications transceiver (O'Hagan, processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact sensitive transducer (see O'Hagan, col. 5, lines 61-67, col. 9, lines 37-60).

Regarding claim 36, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the step of controlling comprises the step of selectively displaying an image on the display according to the output of the contact-sensitive transducer (see O'Hagan, Figs. 7 and 8).

Regarding claim 69, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the surface of the transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see O'Hagan, Fig. 3). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 70, the combination of O'Hagan and Gillespie et al., Jeong and Reber further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see O'Hagan, Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 71, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the transducer is disposed on the. front surface of the housing (O'Hagan, display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 72, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see Gillespie et al, column 5, lines 1-22), which reads on the claimed "the contact sensitive transducer is an elongate strip".

4. Claims 30-32, 37-45, 48 and 51-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236) and further in view of Jeong (US 5,621,437).

Regarding claim 30, O'Hagan discloses an apparatus (see Figs. 2-3), comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface (see Figs. 2-3), the housing configured to be held in a user's hand that the rear surface confronts the user's palm, a display (28), supported by the housing (see Figs. 2-3), that displays an image at a front surface of the housing (see Figs. 7-8), a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer, and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display (see processor being connected to display 28

and transceiver 66, Fig. 4), which scrolls displayed rows along an axis of the display based on the output signal (which reads on “In response to the operator rotating the three-way switch 46 clockwise or counterclockwise, the processor 60 causes a cursor 120 on the display to scroll up or down in relation to the list of possible "recipients"” as disclosed in column 9 lines 44-46). O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least **one** of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal in response to moving contact of an object along the surface of the wheel (which reads on “Rotation in a clockwise direction produces a first output and rotation in a counterclockwise direction produces a second output. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a transaxial direction to produce a third output” as disclosed in col. 5, lines 54-58, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient

and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

The combination of O'Hagan and Gillespie et al fails to expressly disclose the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from the user.

In an analogous field of endeavor, Jeong discloses the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer (see fig.2 and column 3, lines 9-23, see "*DS1*", also see Abstract and column 2, lines 32-51, see "*the switch for turning on/off supply power to the touch panel in response to a first control signal from the control circuit*". In this case, the control circuit 10 has two modes: In the **first mode**, controlling a system operation in response to the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "on". In the **second mode**, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "off", and the touch panel is "off" because "*a present mode is changed to a suspend mode after the lapse of a predetermined time period from the moment that **no data is applied to a touch panel**, to turn **off** supply power to the touch panel and stop a system operation*" see column 1, lines 11-15 and column 2, lines 25-28. In this case, Jeong's "***no data is applied to a touch panel***" reads on applicant's "an input from the user" as claimed).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Jeong with the combination of O'Hagan and Gillespie et al terminal so that power consumption can be minimized and a battery can be lengthened (see Jeong, column 1, lines 15-17).

Regarding claim 31, the combination of O'Hagan, Gillespie et al. and Jeong further discloses a radiotelephone communications transceiver Supported by the housing and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal (O'Hagan, feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claim 32, the combination of O'Hagan, Gillespie et al. and Jeong further discloses the disposed at the side of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface (see O'Hagan, Fig. 2, showing side with thumb wheel being disposed on a side adjacent the front surface and inclined away from the front surface). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-8), which reads on the claimed "contact-sensitive transducer".

Regarding claim 37, the combination of O'Hagan, Gillespie et al. and Jeong further teach wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding

hand (see O'Hagan, Figs. 2-3 with the thumb wheel 48 on the side). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 38, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 39, the combination of O'Hagan, Gillespie et al. and Jeong further discloses a front surface of the housing (display may function as a touch panel display to allow input of information in addition to or in place of the keypad, see col. 5, lines 12-14). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 40, O'Hagan and Jeong discloses a thumb wheel disposed at least one of the first side surface and the second side surface (see O'Hagan,

thumbwhee148, Figs. 2-3). In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed "elongate contact-sensitive strip".

Regarding claim 41, the combination of O'Hagan, Gillespie et al. and Jeong further discloses a capacitive sensing system (see Gillespie, figure 1) which reads on the claimed limitation a capacitive transducer.

Regarding claims 42-43, the combination of O'Hagan, Gillespie et al. and Jeong further discloses an additional user input interface devices for the apparatus on the front surface of the housing wherein the additional interface devices are contact-sensitive (O'Hagan, display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3).

Regarding claims 44 and 45, the combination of O'Hagan, Gillespie et al. and Jeong further discloses as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see Gillespie et al, column 5, lines 36-58), which reads on the claimed "the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer," and "the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer".

Regarding claim 48, the combination of O'Hagan, Gillespie and Jeong further discloses as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see Gillespie et al, column 5, lines 36-58), which reads

on the claimed "an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer".

Regarding claims 51-53, the combination of O'Hagan, Gillespie and Jeong further discloses inherently a second contact-sensitive transducer, supported by the housing which produces a second output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive surface of the second transducer (O'Hagan, inherent feature of keypad 26 on surface, O'Hagan Fig. 2-3), a controller for providing controlling functions of the apparatus including an output signal in response to detection of momentary contact or predetermined number of momentary contacts with the contact-sensitive transducer (O'Hagan, processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see O'Hagan col. 6, lines 24-35). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claims 54-55, the combination of O'Hagan, Gillespie and Jeong further discloses wherein the controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of the display based on the output signal from the transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display (operator may rotate the thumb wheel clockwise or counter-

clockwise in order to scroll up or down through lines on the display, see O'Hagan col. 5, lines 51-62).

Regarding claims 56 and 57, the combination of O'Hagan, Gillespie and Jeong further teach wherein the rows consist of alphanumeric characteristic comprising menu selections wherein the controller identifies successive ones of the rows displayed along the axis of the display by highlighting successive rows (see O'Hagan Figs 7-8).

Regarding claims 58 and 59, the combination of O'Hagan, Gillespie et al and Jeong further disclose a power supply disposed inside the housing wherein the power supply comprises a battery (O'Hagan, terminal also includes a power source 72 which is a rechargeable supply, see O'Hagan col. 7, lines 54-56).

Regarding claim 60, the combination of O'Hagan, Gillespie et al and Jeong further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the transducer (O'Hagan, power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see O'Hagan col. 7, lines 56-59). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 61, the combination of O'Hagan, Gillespie et al and Jeong further discloses a mode of operation wherein the controller is unresponsive to contact with the transducer (feature of transitioning between different states as illustrated in O'Hagan Fig. 6). In a similar field of endeavor, Gillespie et al disclose a pressure

sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

5. Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236) and further in view of Jeong (US 5,621,437) and Reber et al (US 6,002,946), and further in view of Moore et al. (US 4,566,001).

Regarding claims 14 and 28, the combination of O'Hagan, Gillespie et al, Jeong and Reber fails to teach wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface of the housing.

In an analogous field of endeavor, Moore discloses a touch strip input for a display in which the touch strips are mounted along the horizontal and vertical edges of the display terminal (see col. 1, lines 50-56).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Moore with the combination of O'Hagan, Gillespie et al, Jeong and Reber terminal for the benefit of having the contact overlays or strips in optional edges of the terminal for ease and convenience of use.

***Response to Arguments***

6. Applicant's arguments filed 10/21/2011 have been fully considered but they are not persuasive.

On pages 17 and 18 of applicant's remarks, applicant argues that Jeong fails to teach the second mode being entered in response to an input from the user.

In response, Jeong indeed teaches the second mode being entered in response to an input from the user (see fig.2 and column 3, lines 9-23, see "*DS1*", also see Abstract and column 2, lines 32-51, see "*the switch for turning on/off supply power to the touch panel in response to a first control signal from the control circuit*". In this case, the control circuit 10 has two modes: In the **first mode**, controlling a system operation in response to the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "on". In the **second mode**, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "off", and the touch panel is "off" because "*a present mode is changed to a suspend mode after the lapse of a predetermined time period from the moment that* ***no data is applied to a touch panel****, to turn* ***off*** *supply power to the touch panel and stop a system operation*" see column 1, lines 11-15 and column 2, lines 25-28. In this case, Jeong's "***no data is applied to a touch panel***" reads on applicant's "an input from the user" as claimed).

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGHI H. LY whose telephone number is (571)272-7911. The examiner can normally be reached on 9:30am-8:00pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost can be reached on (571) 272-7023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nghi H. Ly
/Nghi H. Ly/
Primary Examiner, Art Unit 2617

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

| SEARCHED | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| 455 | 566, 550.1, 90.3, 95, 575.1 | 1/7/2012 | nly |
| 379 | 433.1, 433.3,428 | 1/7/2012 | nly |

| SEARCH NOTES | | |
|---|---|---|
| Search Notes | Date | Examiner |
| | | SS |

| INTERFERENCE SEARCH | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| | | | |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | **Examiner** | **Art Unit** |
| | SHEILA B SMITH | 2617 |

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|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 01/07/2012 | | | | | | | | |
| | 1 | ✓ | | | | | | | | |
| | 2 | ✓ | | | | | | | | |
| | 3 | ✓ | | | | | | | | |
| | 4 | ✓ | | | | | | | | |
| | 5 | ✓ | | | | | | | | |
| | 6 | ✓ | | | | | | | | |
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| | 8 | ✓ | | | | | | | | |
| | 9 | ✓ | | | | | | | | |
| | 10 | ✓ | | | | | | | | |
| | 11 | ✓ | | | | | | | | |
| | 12 | ✓ | | | | | | | | |
| | 13 | ✓ | | | | | | | | |
| | 14 | ✓ | | | | | | | | |
| | 15 | ✓ | | | | | | | | |
| | 16 | ✓ | | | | | | | | |
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| | 26 | ✓ | | | | | | | | |
| | 27 | ✓ | | | | | | | | |
| | 28 | ✓ | | | | | | | | |
| | 29 | ✓ | | | | | | | | |
| | 30 | ✓ | | | | | | | | |
| | 31 | ✓ | | | | | | | | |
| | 32 | ✓ | | | | | | | | |
| | 33 | ✓ | | | | | | | | |
| | 34 | ✓ | | | | | | | | |
| | 35 | ✓ | | | | | | | | |
| | 36 | ✓ | | | | | | | | |



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| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 01/07/2012 | | | | | | | | |
| | 37 | ✓ | | | | | | | | |
| | 38 | ✓ | | | | | | | | |
| | 39 | ✓ | | | | | | | | |
| | 40 | ✓ | | | | | | | | |
| | 41 | ✓ | | | | | | | | |
| | 42 | ✓ | | | | | | | | |
| | 43 | ✓ | | | | | | | | |
| | 44 | ✓ | | | | | | | | |
| | 45 | ✓ | | | | | | | | |
| | 46 | - | | | | | | | | |
| | 47 | - | | | | | | | | |
| | 48 | ✓ | | | | | | | | |
| | 49 | - | | | | | | | | |
| | 50 | - | | | | | | | | |
| | 51 | ✓ | | | | | | | | |
| | 52 | ✓ | | | | | | | | |
| | 53 | ✓ | | | | | | | | |
| | 54 | ✓ | | | | | | | | |
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| | 56 | ✓ | | | | | | | | |
| | 57 | ✓ | | | | | | | | |
| | 58 | ✓ | | | | | | | | |
| | 59 | ✓ | | | | | | | | |
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| | 61 | ✓ | | | | | | | | |
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| | 63 | ✓ | | | | | | | | |
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| | 66 | ✓ | | | | | | | | |
| | 67 | ✓ | | | | | | | | |
| | 68 | ✓ | | | | | | | | |
| | 69 | ✓ | | | | | | | | |
| | 70 | ✓ | | | | | | | | |
| | 71 | ✓ | | | | | | | | |
| | 72 | ✓ | | | | | | | | |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | **Examiner** | **Art Unit** |
| | SHEILA B SMITH | 2617 |

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|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 01/07/2012 | | | | | | | | |
| | 73 | ✓ | | | | | | | | |

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicants: | Hayes Jr., et al. | Docket No. | ERI-888RI |
| Serial No. | 11/078,916 | Art Unit: | 2617 |
| Filed: | March 11, 2005 | Examiner: | Ly, Nghi H. |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## AMENDMENT

Dear Sir:

The following amendments and remarks are presented in response to the Examiner's Office Action mailed August 18, 2011 (the "Office Action"). Please amend the above-referenced application as follows.



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**In the Claims:**

1. (Quad Amended) A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at said front surface [at least one of the first and second side surfaces], which produces an output signal [that characterizes] in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon [according to] the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.



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2. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

3. (Original) A radiotelephone according to claim 1, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.

4. (Original) A radiotelephone according to claim 3, wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer.

5. (Original) A radiotelephone according to claim 4, wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer.

6. (Original) A radiotelephone according to claim 4, wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

7. (Original) A radiotelephone according to claim 4, wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.


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8. (Original) A radiotelephone according to claim 7, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

9. (Previously Presented) A radiotelephone according to claim 7, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

10. (Original) A radiotelephone according to claim 7, wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object.

11. (Original) A radiotelephone according to claim 10, wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer and to initiate the action associated with the identified graphical object responsive to detection of the momentary contact.

12. (Original) A radiotelephone according to claim 11, wherein the controller is operative to initiate the action in response to detection of a plurality of momentary contacts occurring within a predetermined time interval.



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13. (Amended) A radiotelephone according to claim 1, wherein the contact-sensitive transducer further comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.

14. (Original) A radiotelephone according to claim 13, wherein the contact-sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

15. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

16. (Quad Amended) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed on said front surface [at at least one of the first and second side surfaces], which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, selectively responsive to the output signal and operatively associated with



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the display, which is configured to scroll displayed rows along an axis of [control] the display based on [according to] the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.

17. (Original) An apparatus according to claim 16, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

18. (Original) An apparatus according to claim 16, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

19. (Original) An apparatus according to claim 18, wherein the controller is operative to selectively display a graphical object on the display responsive to the output signal of the contact-sensitive transducer.

20. (Original) An apparatus according to claim 19, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

21. (Original) An apparatus according to claim 19, wherein the controller is operative to display a plurality of graphical objects on the display, and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.



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22. (Original) An apparatus according to claim 19, wherein the controller is operative, responsive to the contact-sensitive transducer, to determine a position of contact along the axis of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

23. (Original) An apparatus according to claim 22, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

24. (Original) An apparatus according to claim 22, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

25. (Original) An apparatus according to claim 24, wherein the controller is operative, responsive to the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer.

26. (Original) An apparatus according to claim 25, wherein the controller is operative, responsive to the output signal of contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and to scroll displayed rows along the axis of the display based on the detected moving contact.

27. (Amended) An apparatus according to claim 19, wherein the contact-sensitive transducer <u>further</u> comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.



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28. (Original) An apparatus according to claim 27, wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

29. (Original) An apparatus according to claim 22, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

30. (Quad Amended) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving [that characterizes] contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.



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31. (Original) An apparatus according to claim 30, further comprising a radiotelephone communications transceiver supported by the housing, and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal.

32. (Original) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at side surface of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface.

33. (Twice Amended) In an apparatus including a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, a display that displays an image at the front surface, and a controller that controls the display, a method of providing user input comprising the steps of:

holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm; [and]

providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at <u>said front surface</u> [at least one of the first and second side surfaces] of the housing, the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer; <u>and</u>

<u>providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to a user input</u>.



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34. (Original) A method according to claim 33, wherein the step of providing comprises the step of contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm.

35. (Original) A method according to claim 33, wherein the apparatus is a radiotelephone that further includes a radiotelephone communications transceiver, wherein the controller is operative to control the radiotelephone communications transceiver, and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

36. (Original) A method according to claim 33, wherein the step of controlling comprises the step of selectively displaying an image or the display according to the output signal of the contact-sensitive transducer.

37. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

38. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.



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39. (New) An apparatus according to claim 38, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

40. (New) An apparatus according to claim 39, wherein the contact-sensitive transducer is an elongate strip.

41. (New) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises one of a resistive transducer a capacitive transducer and a semiconductive transducer.

42. (New) An apparatus according to claim 30, which also includes additional user input interface devices for the apparatus on the front surface of the housing.

43. (New) An apparatus according to claim 42 wherein the additional interface devices are contact-sensitive.

44. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer.

45. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer.

46-47. (Cancelled)



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48. (New) An apparatus according to claim 43, wherein an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer.

49-50. (Cancelled)

51. (New) An apparatus according to claim 30 further comprising:

a second contact-sensitive transducer, supported by the housing, which produces a second output signal that characterizes contact of an object along the contact-sensitive surface of the second contact-sensitive transducer; and

a controller, responsive to the second output signal for controlling a function of the apparatus.

52. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of momentary contact with said second contact-sensitive transducer.

53. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of a predetermined number of momentary contacts with said second contact-sensitive transducer within a predetermined time interval.

54. (New) An apparatus according to claim 30, wherein said controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of said display based on the output signal from said transducer.



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55. (New) An apparatus according to claim 54, wherein the direction of scroll is transverse to the direction that said rows extend across the display.

56. (New) An apparatus according to claim 54, wherein said rows consist of alphanumeric characters comprising menu selections.

57. (New) An apparatus according to claim 54, wherein said controller identifies successive ones of the rows displayed along the axis of said display by highlighting successive said rows.

58. (New) An apparatus according to claim 30 further comprising a power supply disposed inside said housing.

59. (New) An apparatus according to claim 58, wherein said power supply comprises a battery.

60. (New) An apparatus according to claim 59 further comprising a circuit which controls power transfer from the power supply too another circuit based on the output signal of the contact-sensitive transducer.

61. (New) An apparatus according to claim 30 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.



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62. (New) An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.

63. (New) An apparatus according to claim 62, wherein the displayed rows of menu selectable items comprise a plurality of items in a list.



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64. (New) An apparatus according to claim 62 further comprising a power supply disposed inside said housing.

65. (New) An apparatus according to claim 64, wherein said power supply comprises a battery.

66. (New) An apparatus according to claim 65 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

67. (New) An apparatus according to claim 62 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

68. (New) An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by a front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is



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responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to user input.

69. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

70. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

71. (New) An apparatus according to claim 70, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

72. (New) An apparatus according to claim 71, wherein the contact-sensitive transducer is an elongate strip.

73. (New) An apparatus according to claim 68, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.



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## REMARKS

Claims 1-45, 48, and 51-73 are pending in the present application. Claims 46, 47, 49, and 50 were previously cancelled. Claims 1, 16, and 62 have been amended herein. Applicants respectfully request reconsideration of the claims in view of the following remarks.

The reissue oath/declaration has been rejected as being defective. In order to expedite prosecution on the merits and in order to avoid the necessity of filing multiple supplemental declarations each time the claims are amended, Applicants respectfully request that the rejection of the declaration and the rejection of the claims arising therefrom be held in abeyance until an indication of allowable subject matter. At that time, Applicants will be in a position to provide a fully responsive supplemental declaration.

Each pending independent claim now recites a controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, and further recites "the second mode being entered in response to an input from a user."

Examiner has asserted that U.S. Patent No. 5,621,437 to Jeong ("Jeong") teaches this claim limitation. Applicants respectfully respond that Jeong fails to teach or suggest that selection between the first mode and second mode is "in response to an input from a user" as recited by claim 30. In fact, Jeong teaches that power to the touch panel is turned off when a timer counts down (Jeong at Col. 7, lines 1-28). In the presence of user input, Jeong's controller will not enter into the second mode (Id). Hence, Jeong fails to teach or even suggest a controller having a second mode unresponsive to contact with the contact-sensitive transducer, "the second mode being entered in response to an input from a user."



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In the Office Action, Examiner has stated, regarding Jeong, "in the second mode, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is 'off'." Applicants respectfully respond that this disclosure by Jeong in no way teaches the claim element that the second mode be entered "in response to an input from a user." In fact, at best Jeong teaches the that the second mode is entered into in the absence of input from a user (which argument is not technically accurate either, because Jeong clearly teaches the second mode is entered into in response to a clock counting down at Col. 2, lines 24-27; Col. 4, lines 17-29; Col. 7, lines 1-28). To the extent that Examiner is asserting that a reference that discloses entering a suspend mode on the basis of a clock counting down is equivalent to or obviates a claim limitation of entering a second mode in response to an input from a user, Applicants respectfully submit that this is simply incorrect and unsupported by the reference.

Because Jeong fails to teach or even suggest a controller that enters a second mode in response to an input from a user, the rejection of the pending claims is improper and should be withdrawn. For at least these reasons, and in addition to the reasons previously asserted in prior responses, all pending claims are patentable over the cited references by virtue of their recitation (directly or by dependency) of the combination of claim limitations, including that "the second mode being entered in response to an input from a user."



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Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Steven H. Slater, Applicants' Attorney, at 972-732-1001, so that such issues may be resolved as expeditiously as possible. The Commissioner is hereby authorized to charge any fees that are due, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

21 Oct 11
Date

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## APPENDIX A

| Claims | Status | Support in Patent |
|---|---|---|
| 1. | Pending; amended herein | As issued and Figure 2, and Col. 3, lines 27 – 35. |
| 2-8. | Pending | Unamended. |
| 9. | Pending | Figure 1 and issued claim 9. |
| 10-12. | Pending | Unamended. |
| 13. | Pending | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 16 (col. 11, line 54 – col. 12, line7). Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 14-15. | Pending | Unamended. |
| 16. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 16 (col. 11, line 54 – col. 12, line7). Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 17-26. | Pending | Unamended. |
| 27. | Pending | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 16 (col. 11, line 54 – col. 12, line7). Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 28-29. | Pending | Unamended. |
| 30. | Pending | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 31-32. | Pending | Unamended. |
| 33. | Pending | As issued and Figure 2, and Col. 3, lines 27 – 35. |
| 34-36. | Pending | Unamended. |
| 37. | Pending | Figs. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37; and lines 55-57). |
| 38. | Pending | Figs. 1, 2, 7B, 7C and 11. Claims 1 and 2 (col. 10, lines 35-37; and lines 55-57). Col. 10, lines 2-7. |
| 39. | Pending | Fig. 11, item 150C Col. 9, line 65-Col. 10, line 7. |
| 40. | Pending | Fig. 11, item 150C Col. 9, line 65-Col. 10, line 7. |



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| Claims | Status | Support in Patent |
|---|---|---|
| 41. | Pending | Col. 5, lines 29-34. Claim 15. |
| 42. | Pending | Fig. 1, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 1, lines 1-2. Fig. 11, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 5, lines 1-2. |
| 43. | Pending | Fig. 1, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 1, lines 1-2. Fig. 11, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 5, lines 1-2. Figs. 3, 4. Col. 5, lines 36-39, 48-49. |
| 44. | Pending | Col. 5, lines 19-22. Col. 3, lines 20-26. Claim 26. |
| 45. | Pending | Col. 5, lines 19-22. Col. 8, lines 36-40. |
| 46. | Canceled | |
| 47. | Canceled | |
| 48. | Pending | Fig. 11. Col. 10, lines 13-21. |
| 49. | Canceled | |
| 50. | Canceled | |
| 51. | Pending | Col. 11. Col. 10, lines 13-21. Col. 5, lines 19-22. Fig. 2, item 220. Col. 5, lines 22-24. |
| 52. | Pending | Col. 9, lines 21-50. Col. 8, lines 54-59. |
| 53. | Pending | Col. 9, lines 21-50. Col. 8, lines 54-59. |
| 54. | Pending | Col. 8, lines 43-53. |
| 55. | Pending | Fig. 7A-7C. Col. 8, lines 29-53. |
| 56. | Pending | Figs. 7A-7C. Col. 5, lines 25-26. |
| 57. | Pending | Col. 8, lines 48-50. |
| 58. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 59. | Pending | Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 60. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 61. | Pending | Col. 5, lines 42-45. Col. 3, lines 27-35. |
| 62. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35; Col. 3, lines 27 – 35. |
| 63. | Pending | Col. 5, lines 18-35. Col. 8, lines 29-53. |
| 64. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 65. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 66. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |

| Claims | Status | Support in Patent |
|---|---|---|
| 67. | Pending | Col. 5, lines 42-45. Col. 3, lines 27-35. |
| 68. | Pending | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35; Col. 3, lines 27 – 35. |
| 69. | Pending | Figs. 1 and 11. Claim 1 and 2 (col. 10, lines 35-37 and lines 55-57). |
| 70. | Pending | Figs. 1, 2, 7A, 7B, 7C, and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 10, lines 2-7. |
| 71. | Pending | Fig. 11. Col. 9, line 65- Col. 10, line 2. |
| 72. | Pending | Fig. 11. Col. 9, line 65 – Col. 10, line 2. |
| 73. | Pending | Col. 5, lines 29-34. Claim 15. |


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# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 11241507 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Customer Number:** | 25962 |
| **Filer:** | Steven Howard Slater/Wendy Saxby |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 21-OCT-2011 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 16:28:55 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | no |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | | ERI_888RI_Amendment_Filed.pdf | 876923<br>e03f7f822767e971bb5ef81d370ea7fcabc8ca26 | yes | 22 |

| | Multipart Description/PDF files in .zip description | | |
|---|---|---|---|
| | **Document Description** | **Start** | **End** |
| | Amendment/Req. Reconsideration-After Non-Final Reject | 1 | 1 |
| | Claims | 2 | 16 |
| | Applicant Arguments/Remarks Made in an Amendment | 17 | 22 |
| **Warnings:** | | | |
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| | **Total Files Size (in bytes):** | 876923 | |

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**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

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**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PTO/SB/06 (07-06)
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# PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

| Application or Docket Number | Filing Date | ☐ To be Mailed |
|---|---|---|
| 11/078,916 | 03/11/2005 | |

## APPLICATION AS FILED – PART I

| FOR | (Column 1) NUMBER FILED | (Column 2) NUMBER EXTRA | SMALL ENTITY ☐ RATE ($) | SMALL ENTITY ☐ FEE ($) | OR | OTHER THAN SMALL ENTITY RATE ($) | OTHER THAN SMALL ENTITY FEE ($) |
|---|---|---|---|---|---|---|---|
| ☐ BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | | | N/A | |
| ☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m)) | N/A | N/A | N/A | | | N/A | |
| ☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | | | N/A | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | minus 20 = | * | X $ = | | OR | X $ = | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | minus 3 = | * | X $ = | | | X $ = | |
| ☐ APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | | | | |
| ☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | | | TOTAL | |

## APPLICATION AS AMENDED – PART II

| AMENDMENT 10/21/2011 | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | SMALL ENTITY RATE ($) | SMALL ENTITY ADDITIONAL FEE ($) | OR | OTHER THAN SMALL ENTITY RATE ($) | OTHER THAN SMALL ENTITY ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|---|---|
| Total (37 CFR 1.16(i)) | * 69 | Minus | ** 73 | = 0 | X $ = | | OR | X $60= | 0 |
| Independent (37 CFR 1.16(h)) | * 6 | Minus | ***6 | = 0 | X $ = | | OR | X $250= | 0 |
| ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | 0 |

| AMENDMENT | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE ($) | ADDITIONAL FEE ($) | | RATE ($) | ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|---|---|
| Total (37 CFR 1.16(i)) | * | Minus | ** | = | X $ = | | OR | X $ = | |
| Independent (37 CFR 1.16(h)) | * | Minus | *** | = | X $ = | | OR | X $ = | |
| ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | |

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DAVINA G. BUTLER/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

25962 7590 08/18/2011

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| EXAMINER | |
|---|---|
| LY, NGHI H | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2617 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 08/18/2011 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@slater-matsil.com

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 11/078,916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | NGHI LY | 2617 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *29 June 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-45,48 and 51-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45,48 and 51-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

| Attachment(s) | |
|---|---|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ . |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) ☐ Notice of Informal Patent Application |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____. | 6) ☐ Other: _____. |

## DETAILED ACTION

### *Reissue Applications*

### *Oath/Declaration*

1. A. The reissue oath/declaration filed with this application is defective (see 37 CFR 1.175 and MPEP § 1414) because of the following: amendments (see amendment filed March 22, 2002) have been made to the claims since the filing of the Original reissue oath/declaration. A supplemental oath/declaration is required.

B. The reissue oath/declaration filed with this application is defective because it fails to identify at least one error which is relied upon to support the reissue application. See 37 CFR 1.175(a)(1) and MPEP § 1414.

C. In accordance with 37 CFR 1.175(b)(1), a supplemental reissue oath/declaration under 37 CFR 1.175(b)(1) must be received before this reissue application can be allowed.

D. Claims 1-73 are rejected as being based upon a defective reissue oath under 35 U.S.C. 251. See 37 CFR 1.175.

The nature of the defect(s) in the Oath or Declaration is set forth in the discussion above in this Office action.

E. Claims 1-73 are rejected under 35 U.S.C. 251 as being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee. A claim is broader in scope than the original claims if it contains within its scope any conceivable product or process which would have infringed the original patent. A claim

is broadened if it is broader in any one respect even though it may be narrower in other respects.

F. It appears that on the Oath or Declaration filed 3/11/05 box A, An assignment from the inventors box was inadvertently left blank. Appropriate correction is required.

G. Applicant is referred to 37 CFR 1.173 for the proper format and manner of making amendments in a reissue application.

***Oath/Declaration***

2. It appears that on the Oath or Declaration filed 3/11/05 box A, an assignment from the inventors box was inadvertently left blank.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236) and further in view of Reber et al (US 6,002,946).

Regarding claim 1, O'Hagan discloses a radiotelephone (see Figs. 2-3), comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface (see Fig. 2), the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-2), a radio telephone communications transceiver (66), supported by the housing (see Figs. 2-3), a display (28) supported by the housing (see Figs. 2-3), that displays an image at a front surface of the housing (see Figs. 7-8), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver (see processor being connected to display 28 and transceiver 66, Fig. 4), which controls at least **one** of the display and the radiotelephone communications transceiver which scrolls displayed rows along an axis or the display based upon the

output signal (which reads on “In response to the operator rotating the three-way switch 46 clockwise or counterclockwise, the processor 60 causes a cursor 120 on the display to scroll up or down in relation to the list of possible "recipients"” as disclosed in column 9 lines 44-46). O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed (see 46, 48 on the side Figs. 7-8), which produces an output signal in response to moving contact of an object along the surface of the wheel (which reads on “Rotation in a clockwise direction produces a first output and rotation in a counterclockwise direction produces a second output. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a transaxial direction to produce a third output” as disclosed in col. 5, lines 54-58, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

The combination of O'Hagan and Gillespie et al fails to expressly disclose a contact-sensitive surface disposed at the front surface.

In an analogous field of endeavor, Reber discloses a contact-sensitive surface disposed at the front surface (see fig.4, fig.5 and fig.6, a contact-sensitive surface 10, also see column 2, lines 34-43).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Reber with the combination of O'Hagan and Gillespie et al terminal in order to provide a handheld device having a data reader (see Reber, column 1, lines 24-28).

Regarding claim 2, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or thumb of the holding hand (see O'Hagan, Fig. 2).

Regarding claim 3, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to selectively display an image according to the output signal of the transducer (see O'Hagan, col. 9, lines 53-67, Fig. 8). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 4, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to selectively display a graphical object on

the display according to the output signal of the contact-sensitive transducer (see O'Hagan, col. 9, lines 43-48).

Regarding claim 5, the combination of O'Hagan and Gillespie et al. and Reber further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the transducer (see Fig. 8). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 6, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the transducer (see col. 9, lines 46-52). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 7, the combination of O'Hagan, Gillespie et al. and Reber further discloses selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object (see O' Hagan, col. 9, lines 43-52). In a similar field of endeavor, Gillespie et al disclose the interface electronics to allow the pointing device to communicate directly with a host microprocessor, and a "finger pointer" embodiment, a position sensing system includes a position sensing transducer comprising a touch-sensitive surface disposed on a substrate, such as a printed circuit

board, including a matrix of conductive lines (see column 5, lines 21-27 and column 5 lines 45-50), which reads on the claimed "wherein the controller (186) is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer".

Regarding claim 8, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the transducer (see O'Hagan, col. 9, lines 48-52 and col. 12 lines 34-36). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 9, the combination of O'Hagan and Gillespie et al. and Reber further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the transducer (see col. 9, lines 48-52). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 10, the combination of O'Hagan, Gillespie et al. and Reber further discloses wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical

wherein the controller is further operative, to initiate the action associated with the identified graphical object (see O'Hagan, feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 11, the combination of O'Hagan, Gillespie et al. and Reber further discloses a gesture unit (see Gillespie, column 30, lines 20-28), which reads on the claimed "the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer".

Regarding claim 12, the combination of O'Hagan, Gillespie et al. and Reber further discloses a gesture unit and parameters (see Gillespie, column 30, lines 29-34), which reads on the claimed "detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval".

Regarding claim 13, the combination of O'Hagan, Gillespie et al. and Reber further discloses a scroll bar (see Gillespie, figure 16 and column 32, lines 30-45), which reads on the claimed "elongate contact-sensitive strip".

Regarding claim 15, the combination of O'Hagan, Gillespie et al. and Reber further discloses a capacitive sensing system (see Gillespie, figure 1) which reads on the claimed limitation a capacitive transducer (or see Reber, column 2, lines 34-43).

5. Claims 16-27, 29, 33-36 and 62-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236) and further in view of Jeong (US 5,621,437) and Reber et al (US 6,002,946).

Regarding claims 16 and 62, O'Hagan discloses an apparatus and a method in an apparatus for providing user input to a hand-held electronic device, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see O'Hagan, Figs. 1-4), a display (28) supported by the housing, that displays an image at a front surface of the housing (see O'Hagan, Figs. 7-8), and a controller (O'Hagan, processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal (O'Hagan, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). O'Hagan further discloses a thumb wheel (O'Hagan, 46, 48), supported by the housing and having a surface disposed (see O'Hagan, 46, 48 on the side Figs. 7-8), which produces an output signal that characterizes contact of an object along the surface of the wheel (see O'Hagan, col. 5, lines 46-61, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the

display, see col. 5, lines 46-62). However, O'Hagan fails to expressly disclose the use of a contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

The combination of O'Hagan and Gillespie et al fails to expressly disclose the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer.

In an analogous field of endeavor, Jeong discloses the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer (see fig.2 and column 3, lines 9-23, see "*DS1*", also see Abstract and column 2, lines 32-51, see "*the switch for turning on/off supply power to the touch panel in response to a first control signal from the control circuit*". In this case, the control circuit 10 has two modes: In the first mode, controlling a system operation in response to the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "on") and a second mode wherein the controller is unresponsive to contact with

the contact-sensitive transducer (in the second mode, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is “off”), the second mode being entered in response to an input from the user (in the second mode, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is “off”).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Jeong with the combination of O'Hagan and Gillespie et al terminal so that power consumption can be minimized and a battery can be lengthened (see Jeong, column 1, lines 15-17).

The combination of O'Hagan, Gillespie et al and Jeong fails to expressly disclose a contact-sensitive surface disposed at the front surface.

In an analogous field of endeavor, Reber discloses a contact-sensitive surface disposed at the front surface (see fig.4, fig.5 and fig.6, a contact-sensitive surface 10, also see column 2, lines 34-43).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Reber with the combination of O'Hagan, Gillespie et al and Jeong terminal in order to provide a handheld device having a data reader (see Reber, column 1, lines 24-28).

Regarding claim 17, the combination of O’Hagan, Gillespie et al., Jeong and Reber further discloses the contact-sensitive surface (see Gillespie, column 5, lines 47-

48), when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand (see O'Hagan, Fig. 2).

Regarding claim 18, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to selectively display an image according to the output signal of the transducer (see O'Hagan, col. 9, lines 53-67, Fig. 8). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 19, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer (see O'Hagan, col. 9, lines 43-48).

Regarding claim 20, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the transducer (see Fig. 8). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 21, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the transducer (see col. 9, lines 46-52). In a

similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 22, the combination of O'Hagan, Gillespie et al., Jeong and Reber further disclose selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object (see O' Hagan, col. 9, lines 43-52). In a similar field of endeavor, Gillespie et al disclose the interface electronics to allow the pointing device to communicate directly with a host microprocessor, and a "finger pointer" embodiment, a position sensing system includes a position sensing transducer comprising a touch-sensitive surface disposed on a substrate, such as a printed circuit board, including a matrix of conductive lines (see column 5, lines 21-27 and column 5 lines 45-50), which reads on the claimed "wherein the controller (186) is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer".

Regarding claim 23, the combination of O'Hagan, Gillespie et al., Jeong and Reber further disclose wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the transducer (see O'Hagan, col. 9, lines 48-52 and col. 12 lines 34-36). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 24, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the transducer (see col. 9, lines 48-52). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claims 25 and 26, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein to scroll displayed rows along an axis of the display responsive to the output signal (O'Hagan, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 27, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses Figs. 2-3 illustrates the (O'Hagan, thumbwheel 48) disposed at least one of the first and second side surfaces of the housing. In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed "elongate contact-sensitive strip".

Regarding claims 29 and 73, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a capacitive sensing system (see Gillespie, figure 1) which

reads on the claimed limitation a capacitive transducer (or see Reber, column 2, lines 34-43).

Regarding claim 63 the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses in Figs. 7-8 of O'Hagan wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

Regarding claims 64 and 65, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a power supply disposed inside the housing wherein the power supply comprises a battery (O'Hagan, terminal also includes a power source 72 which is a rechargeable supply, see O'Hagan col. 7, lines 54-56).

Regarding claim 66, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the transducer (O'Hagan, power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see O'Hagan col. 7, lines 56-59). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 67, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a mode of operation wherein the controller is unresponsive to contact with the transducer (feature of transitioning between different states as illustrated in O'Hagan Fig. 6). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position

sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claims 33 and 68, O'Hagan discloses in an apparatus including a housing having a front surface (see Figs. 2-3), a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface (see Figs. 2-3), a display that displays an image at the front surface (see Figs. 7-8), and a controller that controls the display (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), a method of providing user input comprising the steps of: holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (which reads on “In response to the operator rotating the three-way switch 46 clockwise or counterclockwise, the processor 60 causes a cursor 120 on the display to scroll up or down in relation to the list of possible "recipients"” as disclosed in column 9 lines 44-46), providing user input to the controller (O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least **one** of the first and second side surfaces, see 46, 48 on the side Figs. 7-8), operable to produce an output signal in response to moving contact of an object along the surface of the wheel (which reads on “Rotation in a clockwise direction produces a first output and rotation in a counterclockwise direction produces a second output. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a transaxial direction to produce a

third output" as disclosed in col. 5, lines 54-58, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

The combination of O'Hagan and Gillespie et al fails to expressly disclose providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to a user input.

In an analogous field of endeavor, Jeong discloses providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer (see fig.2 and column 3, lines 9-23, see "*DS1*", also see Abstract and column 2, lines 32-51, see "*the switch for turning on/off supply power to the touch panel in response to a first control signal from the control circuit*". In this case,

the control circuit 10 has two modes: In the first mode, controlling a system operation in response to the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is “on”) and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer (in the second mode, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is “off”), the second mode being entered in response to a user input (in the second mode, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is “off”).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Jeong with the combination of O'Hagan and Gillespie et al terminal so that power consumption can be minimized and a battery can be lengthened (see Jeong, column 1, lines 15-17).

The combination of O'Hagan, Gillespie et al and Jeong fails to expressly disclose a contact-sensitive surface disposed at the front surface.

In an analogous field of endeavor, Reber discloses a contact-sensitive surface disposed at the front surface (see fig.4, fig.5 and fig.6, a contact-sensitive surface 10, also see column 2, lines 34-43).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Reber with the combination of O'Hagan, Gillespie et al and Jeong terminal in order to provide a handheld device having a data reader (see Reber, column 1, lines 24-28).

Regarding claim 34, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the step of providing comprises a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (see O'Hagan, Fig. 3). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 35, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the apparatus is a radio telephone that further includes a radio telephone communications transceiver (O'Hagan, 66, Fig. 2), wherein the controller is operative to control the radio telephone communications transceiver (O'Hagan, processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact sensitive transducer (see O'Hagan, col. 5, lines 61-67, col. 9, lines 37-60).

Regarding claim 36, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the step of controlling comprises the step of selectively displaying an image on the display according to the output of the contact-sensitive transducer (see O'Hagan, Figs. 7 and 8).

Regarding claim 69, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the surface of the transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see O'Hagan, Fig. 3). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 70, the combination of O'Hagan and Gillespie et al., Jeong and Reber further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see O'Hagan, Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 71, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses wherein the transducer is disposed on the. front surface of the housing (O'Hagan, display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 72, the combination of O'Hagan, Gillespie et al., Jeong and Reber further discloses a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see Gillespie et al, column 5, lines 1-22), which reads on the claimed "the contact sensitive transducer is an elongate strip".

6. Claims 30-32, 37-45, 48 and 51-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236) and further in view of Jeong (US 5,621,437).

Regarding claim 30, O'Hagan discloses an apparatus (see Figs. 2-3), comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface (see Figs. 2-3), the housing configured to be held in a user's hand that the rear surface confronts the user's palm, a display (28), supported by the housing (see Figs. 2-3), that displays an image at a front surface of the housing (see Figs. 7-8), a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer, and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display (see processor being connected to display 28

and transceiver 66, Fig. 4), which scrolls displayed rows along an axis of the display based on the output signal (which reads on “In response to the operator rotating the three-way switch 46 clockwise or counterclockwise, the processor 60 causes a cursor 120 on the display to scroll up or down in relation to the list of possible "recipients"” as disclosed in column 9 lines 44-46). O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least **one** of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal in response to moving contact of an object along the surface of the wheel (which reads on “Rotation in a clockwise direction produces a first output and rotation in a counterclockwise direction produces a second output. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a transaxial direction to produce a third output” as disclosed in col. 5, lines 54-58, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient

and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

The combination of O'Hagan and Gillespie et al fails to expressly disclose the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from the user.

In an analogous field of endeavor, Jeong discloses the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer (see fig.2 and column 3, lines 9-23, see "*DS1*", also see Abstract and column 2, lines 32-51, see "*the switch for turning on/off supply power to the touch panel in response to a first control signal from the control circuit*". In this case, the control circuit 10 has two modes: In the first mode, controlling a system operation in response to the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "on") and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer (in the second mode, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "off"), the second mode being entered in response to an input from the user (in the second mode, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "off").

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Jeong with the combination of O'Hagan and Gillespie et al terminal so that power consumption can be minimized and a battery can be lengthened (see Jeong, column 1, lines 15-17).

Regarding claim 31, the combination of O'Hagan, Gillespie et al. and Jeong further discloses a radiotelephone communications transceiver Supported by the housing and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal (O'Hagan, feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claim 32, the combination of O'Hagan, Gillespie et al. and Jeong further discloses the disposed at the side of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface (see O'Hagan, Fig. 2, showing side with thumb wheel being disposed on a side adjacent the front surface and inclined away from the front surface). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-8), which reads on the claimed "contact-sensitive transducer".

Regarding claim 37, the combination of O'Hagan, Gillespie et al. and Jeong further teach wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding

hand (see O'Hagan, Figs. 2-3 with the thumb wheel 48 on the side). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 38, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 39, the combination of O'Hagan, Gillespie et al. and Jeong further discloses a front surface of the housing (display may function as a touch panel display to allow input of information in addition to or in place of the keypad, see col. 5, lines 12-14). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 40, O'Hagan and Jeong discloses a thumb wheel disposed at least one of the first side surface and the second side surface (see O'Hagan,

thumbwhee148, Figs. 2-3). In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed "elongate contact-sensitive strip".

Regarding claim 41, the combination of O'Hagan, Gillespie et al. and Jeong further discloses a capacitive sensing system (see Gillespie, figure 1) which reads on the claimed limitation a capacitive transducer.

Regarding claims 42-43, the combination of O'Hagan, Gillespie et al. and Jeong further discloses an additional user input interface devices for the apparatus on the front surface of the housing wherein the additional interface devices are contact-sensitive (O'Hagan, display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3).

Regarding claims 44 and 45, the combination of O'Hagan, Gillespie et al. and Jeong further discloses as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see Gillespie et al, column 5, lines 36-58), which reads on the claimed "the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer," and "the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer".

Regarding claims 48, the combination of O'Hagan, Gillespie and Jeong further discloses as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see Gillespie et al, column 5, lines 36-58), which reads

on the claimed "an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer".

Regarding claims 51-53, the combination of O'Hagan, Gillespie and Jeong further discloses inherently a second contact-sensitive transducer, supported by the housing which produces a second output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive surface of the second transducer (O'Hagan, inherent feature of keypad 26 on surface, O'Hagan Fig. 2-3), a controller for providing controlling functions of the apparatus including an output signal in response to detection of momentary contact or predetermined number of momentary contacts with the contact-sensitive transducer (O'Hagan, processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see O'Hagan col. 6, lines 24-35). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claims 54-55, the combination of O'Hagan, Gillespie and Jeong further discloses wherein the controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of the display based on the output signal from the transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display (operator may rotate the thumb wheel clockwise or counter-

clockwise in order to scroll up or down through lines on the display, see O'Hagan col. 5, lines 51-62).

Regarding claims 56 and 57, the combination of O'Hagan, Gillespie and Jeong further teach wherein the rows consist of alphanumeric characteristic comprising menu selections wherein the controller identifies successive ones of the rows displayed along the axis of the display by highlighting successive rows (see O'Hagan Figs 7-8).

Regarding claims 58 and 59, the combination of O'Hagan, Gillespie et al and Jeong further disclose a power supply disposed inside the housing wherein the power supply comprises a battery (O'Hagan, terminal also includes a power source 72 which is a rechargeable supply, see O'Hagan col. 7, lines 54-56).

Regarding claim 60, the combination of O'Hagan, Gillespie et al and Jeong further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the transducer (O'Hagan, power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see O'Hagan col. 7, lines 56-59). In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

Regarding claim 61, the combination of O'Hagan, Gillespie et al and Jeong further discloses a mode of operation wherein the controller is unresponsive to contact with the transducer (feature of transitioning between different states as illustrated in O'Hagan Fig. 6). In a similar field of endeavor, Gillespie et al disclose a pressure

sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236) and further in view of Reber et al (US 6,002,946) and Moore et al. (US 4,566,001).

Regarding claim 14, the combination of O'Hagan, Gillespie et al and Reber fails to teach wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface of the housing.

In an analogous field of endeavor, Moore discloses a touch strip input for a display in which the touch strips are mounted along the horizontal and vertical edges of the display terminal (see col. 1, lines 50-56).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Moore with the combination of O'Hagan, Gillespie et al and Reber terminal for the benefit of having the contact overlays or strips in optional edges of the terminal for ease and convenience of use.

8. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236) and further in view of

Jeong (US 5,621,437) and Reber et al (US 6,002,946) and further in view of Moore et al. (US 4,566,001).

Regarding claim 28, the combination of O'Hagan, Gillespie et al, Jeong and Reber fails to teach wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface of the housing.

In an analogous field of endeavor, Moore discloses a touch strip input for a display in which the touch strips are mounted along the horizontal and vertical edges of the display terminal (see col. 1, lines 50-56).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Moore with the combination of O'Hagan, Gillespie et al, Jeong and Reber terminal for the benefit of having the contact overlays or strips in optional edges of the terminal for ease and convenience of use.

***Response to Arguments***

9. a. Applicant's arguments with respect to claims 1-45, 48 and 51-73 have been considered but are moot in view of the new ground(s) of rejection.

b. Applicant's arguments filed 06/29/2011 have been fully considered but they are not persuasive.

Regarding claims 30-32, 37-45, 48 and 51-61, the combination of O'Hagan et al, Gillespie et al and Jeong indeed teaches 30-32, 37-45, 48 and 51-61. In addition,

applicant's attention is directed to the teaching of O'Hagan et al, Gillespie et al and Jeong in claims 30-32, 37-45, 48 and 51-61 above.

***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGHI H. LY whose telephone number is (571)272-7911. The examiner can normally be reached on 9:30am-8:00pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost can be reached on (571) 272-7023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nghi H. Ly

/Nghi H. Ly/
Primary Examiner, Art Unit 2617

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | **Examiner** | **Art Unit** |
| | SHEILA B SMITH | 2617 |

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|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
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| Final | Original | 08/13/2011 | | | | | | | | |
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| | 33 | ✓ | | | | | | | | |
| | 34 | ✓ | | | | | | | | |
| | 35 | ✓ | | | | | | | | |
| | 36 | ✓ | | | | | | | | |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 08/13/2011 | | | | | | | | |
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| | 68 | ✓ | | | | | | | | |
| | 69 | ✓ | | | | | | | | |
| | 70 | ✓ | | | | | | | | |
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| | 72 | ✓ | | | | | | | | |

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|---|---|---|
| | 11078916 | HAYES ET AL. |
| | **Examiner** | **Art Unit** |
| | SHEILA B SMITH | 2617 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 08/13/2011 | | | | | | | | |
| | 73 | ✓ | | | | | | | | |

| Notice of References Cited | Application/Control No. 11/078,916 | Applicant(s)/Patent Under Reexamination HAYES ET AL. | |
|---|---|---|---|
| | Examiner NGHI LY | Art Unit 2617 | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Name | Classification |
|---|---|---|---|---|---|
| * | A | US-6,002,946 | 12-1999 | Reber et al. | 455/557 |
| | B | US- | | | |
| | C | US- | | | |
| | D | US- | | | |
| | E | US- | | | |
| | F | US- | | | |
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**FOREIGN PATENT DOCUMENTS**

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Country | Name | Classification |
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| | N | | | | | |
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**NON-PATENT DOCUMENTS**

| * | | Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) |
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

| SEARCHED | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| 455 | 566, 550.1, 90.3, 95, 575.1 | 8/13/2011 | nly |
| 379 | 433.1, 433.3,428 | 8/13/2011 | nly |

| SEARCH NOTES | | |
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| Search Notes | Date | Examiner |
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| INTERFERENCE SEARCH | | | |
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| Class | Subclass | Date | Examiner |
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**EAST Search History**

**EAST Search History (Prior Art)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L10 | 50 | (((touch$4 contact$4) near3 (screen sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4) adj5 front) near7 (housing surface body) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:00 |
| L12 | 761 | (mobile wireless radio cellular cellphone handheld portable pda palm) and (((touch$4 contact$4) near3 (screen sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near7 (housing surface body) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:03 |
| L13 | 182 | (mobile wireless radio cellular cellphone handheld portable pda palm).ab. and (((touch$4 contact$4) near3 (screen sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near7 (housing surface body) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:03 |
| L14 | 111 | (mobile wireless radio cellular cellphone handheld portable pda palm).ab. and (((touch$4 contact$4) near3 (sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near7 (housing surface body) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:04 |
| L29 | 75 | (mobile wireless radio cellular cellphone handheld portable pda palm).ti. and (((touch$4 contact$4) near3 (sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near7 (housing surface body) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:30 |
| L30 | 76 | (mobile wireless radio cellular cellphone handheld portable pda) same (((touch$4 contact$4) near3 (sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near7 (housing surface body) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:37 |
| L31 | 667 | (mobile wireless radio cellular cellphone handheld portable pda) same (((touch$4 contact$4) near3 (sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:38 |
| L32 | 522 | (mobile wireless radio cellular cellphone | US-PGPUB; | OR | OFF | 2011/08/13 |

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|---|---|---|---|---|---|---|
| | | handheld portable pda) same (((touch$4 contact$4) adj (sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4)) and @ad<"19971230" | USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | | | 21:38 |
| L33 | 62 | (mobile wireless radio cellular cellphone handheld portable pda) same ((((touch$4 contact$4) adj (sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near5 (surface region$3 area strip$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:40 |
| L34 | 106 | (mobile wireless radio cellular cellphone handheld portable pda) same ((((touch$4 contact$4) adj (sensitiv$4 pad) touchpad (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near5 (surface region$3 area strip$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:42 |
| L35 | 141 | (mobile wireless radio cellular cellphone handheld portable pda).ab. and ((((touch$4 contact$4) adj (sensitiv$4 pad) touchpad (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near5 (surface region$3 area strip$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 21:53 |
| L37 | 615 | (mobile wireless radio cellular cellphone handheld portable pda) and ((((touch$4 contact$4) adj (sensitiv$4 pad) touchpad (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near5 (surface region$3 area strip$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 22:00 |
| L38 | 378 | (mobile wireless radio cellular cellphone handheld portable pda) and ((((touch$4 contact$4) adj (sensitiv$4) touchpad touch adj pad (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near5 (surface region$3 area strip$3)) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 22:01 |
| S3 | 1491 | ((touch$4 contact$4) near3 sensitiv$4) near12 front | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 18:23 |
| S4 | 968 | ((touch$4 contact$4) near3 sensitiv$4) near5 front | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 18:23 |
| S5 | 157 | ((touch$4 contact$4) near3 sensitiv$4) near5 front and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; | OR | OFF | 2011/08/13 18:23 |

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| | | | IBM_TDB | | | |
| S6 | 88 | (((touch$4 contact$4) near3 sensitiv$4) adj5 front) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 18:24 |
| S7 | 20 | (((touch$4 contact$4) near3 sensitiv$4) adj5 front) near12 (housing surface body) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 18:26 |
| S12 | 59 | (((touch$4 contact$4) near3 (screen sensitiv$4)) adj5 front) near12 (housing surface body) and @ad<"19971230" | US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2011/08/13 18:41 |

**EAST Search History (Interference)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L11 | 38 | (((touch$4 contact$4) near3 (screen sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4) adj5 front) near7 (housing surface body) and @ad<"19971230" | US-PGPUB; USPAT; UPAD | OR | OFF | 2011/08/13 21:00 |
| L43 | 51 | (mobile wireless radio cellular cellphone handheld portable pda) same ((((touch$4 contact$4) adj (sensitiv$4) (resist$4 capacit$4 semiconduct$4) adj transduc$4)) near5 (surface region$3 area strip$3)) and @ad<"19971230" | US-PGPUB; USPAT; UPAD | OR | OFF | 2011/08/13 22:47 |

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicants: | Hayes Jr., et al. | Docket No.: | ERI-888RI |
| Serial No.: | 11/078,916 | Art Unit: | 2617 |
| Filed: | March 11, 2005 | Examiner: | Ly, Nghi H. |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## AMENDMENT

Dear Sir:

The following amendments and remarks are presented in response to the Examiner's Office Action mailed March 30, 2011 (the "Office Action"). Please amend the above-referenced application as follows.



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**In the Claims:**

1. (Thrice Amended) A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at said front surface [at least one of the first and second side surfaces], which produces an output signal [that characterizes] in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon [according to] the output signal of the contact-sensitive transducer.

2. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.



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3. (Original) A radiotelephone according to claim 1, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.

4. (Original) A radiotelephone according to claim 3, wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer.

5. (Original) A radiotelephone according to claim 4, wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer.

6. (Original) A radiotelephone according to claim 4, wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

7. (Original) A radiotelephone according to claim 4, wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

8. (Original) A radiotelephone according to claim 7, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.



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9. (Previously Presented) A radiotelephone according to claim 7, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

10. (Original) A radiotelephone according to claim 7, wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object.

11. (Original) A radiotelephone according to claim 10, wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer and to initiate the action associated with the identified graphical object responsive to detection of the momentary contact.

12. (Original) A radiotelephone according to claim 11, wherein the controller is operative to initiate the action in response to detection of a plurality of momentary contacts occurring within a predetermined time interval.

13. (Amended) A radiotelephone according to claim 1, wherein the contact-sensitive transducer further comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.



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14. (Original) A radiotelephone according to claim 13, wherein the contact-sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

15. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

16. (Thrice Amended) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed on said front surface [at at least one of the first and second side surfaces], which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, selectively responsive to the output signal and operatively associated with the display, which is configured to scroll displayed rows along an axis of [control] the display based on [according to] the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive



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transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer.

17. (Original) An apparatus according to claim 16, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

18. (Original) An apparatus according to claim 16, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

19. (Original) An apparatus according to claim 18, wherein the controller is operative to selectively display a graphical object on the display responsive to the output signal of the contact-sensitive transducer.

20. (Original) An apparatus according to claim 19, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

21. (Original) An apparatus according to claim 19, wherein the controller is operative to display a plurality of graphical objects on the display, and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

22. (Original) An apparatus according to claim 19, wherein the controller is operative, responsive to the contact-sensitive transducer, to determine a position of contact along the axis of

the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

23. (Original) An apparatus according to claim 22, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

24. (Original) An apparatus according to claim 22, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

25. (Original) An apparatus according to claim 24, wherein the controller is operative, responsive to the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer.

26. (Original) An apparatus according to claim 25, wherein the controller is operative, responsive to the output signal of contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and to scroll displayed rows along the axis of the display based on the detected moving contact.

27. (Amended) An apparatus according to claim 19, wherein the contact-sensitive transducer <u>further</u> comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.



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28. (Original) An apparatus according to claim 27, wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

29. (Original) An apparatus according to claim 22, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

30. (Quad Amended) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving [that characterizes] contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user.



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31. (Original) An apparatus according to claim 30, further comprising a radiotelephone communications transceiver supported by the housing, and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal.

32. (Original) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at side surface of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface.

33. (Twice Amended) In an apparatus including a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, a display that displays an image at the front surface, and a controller that controls the display, a method of providing user input comprising the steps of:

holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm; [and]

providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at <u>said front surface</u> [at least one of the first and second side surfaces] of the housing, the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer<u>; and</u>

<u>providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to a user input</u>.



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34. (Original) A method according to claim 33, wherein the step of providing comprises the step of contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm.

35. (Original) A method according to claim 33, wherein the apparatus is a radiotelephone that further includes a radiotelephone communications transceiver, wherein the controller is operative to control the radiotelephone communications transceiver, and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

36. (Original) A method according to claim 33, wherein the step of controlling comprises the step of selectively displaying an image or the display according to the output signal of the contact-sensitive transducer.

37. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

38. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.



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39. (New) An apparatus according to claim 38, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

40. (New) An apparatus according to claim 39, wherein the contact-sensitive transducer is an elongate strip.

41. (New) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises one of a resistive transducer a capacitive transducer and a semiconductive transducer.

42. (New) An apparatus according to claim 30, which also includes additional user input interface devices for the apparatus on the front surface of the housing.

43. (New) An apparatus according to claim 42 wherein the additional interface devices are contact-sensitive.

44. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer.

45. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer.

46-47. (Cancelled)



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48. (New) An apparatus according to claim 43, wherein an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer.

49-50. (Cancelled)

51. (New) An apparatus according to claim 30 further comprising:

a second contact-sensitive transducer, supported by the housing, which produces a second output signal that characterizes contact of an object along the contact-sensitive surface of the second contact-sensitive transducer; and

a controller, responsive to the second output signal for controlling a function of the apparatus.

52. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of momentary contact with said second contact-sensitive transducer.

53. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of a predetermined number of momentary contacts with said second contact-sensitive transducer within a predetermined time interval.

54. (New) An apparatus according to claim 30, wherein said controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of said display based on the output signal from said transducer.



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55. (New) An apparatus according to claim 54, wherein the direction of scroll is transverse to the direction that said rows extend across the display.

56. (New) An apparatus according to claim 54, wherein said rows consist of alphanumeric characters comprising menu selections.

57. (New) An apparatus according to claim 54, wherein said controller identifies successive ones of the rows displayed along the axis of said display by highlighting successive said rows.

58. (New) An apparatus according to claim 30 further comprising a power supply disposed inside said housing.

59. (New) An apparatus according to claim 58, wherein said power supply comprises a battery.

60. (New) An apparatus according to claim 59 further comprising a circuit which controls power transfer from the power supply too another circuit based on the output signal of the contact-sensitive transducer.

61. (New) An apparatus according to claim 30 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

62. (New) An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer.

63. (New) An apparatus according to claim 62, wherein the displayed rows of menu selectable items comprise a plurality of items in a list.



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64. (New) An apparatus according to claim 62 further comprising a power supply disposed inside said housing.

65. (New) An apparatus according to claim 64, wherein said power supply comprises a battery.

66. (New) An apparatus according to claim 65 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

67. (New) An apparatus according to claim 62 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

68. (New) An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by a front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is


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responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to user input.

69. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

70. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

71. (New) An apparatus according to claim 70, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

72. (New) An apparatus according to claim 71, wherein the contact-sensitive transducer is an elongate strip.

73. (New) An apparatus according to claim 68, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.



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## REMARKS

Claims 1-45, 48, and 51-73 are pending in the present application. Claims 46, 47, 49, and 50 were previously cancelled. Claims 1, 13, 16, 27, 30, 33, 62, and 68 have been amended herein. For Examiner's convenience, Appendix B hereto provides a marked version of claims 62 and 68 showing the amendment relative to the last amendment to these claims. No new matter has been added. Applicants respectfully request reconsideration of the claims in view of the following remarks.

Claims 1, 16, 30, 33, 62, and 68 have been objected to due to informalities. Specifically, the claims recited "wherein the controller wherein the controller." These informalities have been corrected herein.

The reissue oath/declaration has been rejected as being defective. In order to expedite prosecution on the merits and in order to avoid the necessity of filing multiple supplemental declarations each time the claims are amended, Applicants respectfully request that the rejection of the declaration and the rejection of the claims arising therefrom be held in abeyance until an indication of allowable subject matter. At that time, Applicants will be in a position to provide a fully responsive supplemental declaration.

Claims 1-13, 15-27, 29-45, 48, and 51-73 have been rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over U.S. Patent No. 6,424,830 (hereinafter "O'Hagan"), in view of U.S. Patent No. 5,889,236 (hereinafter "Gillespie") and U.S. Patent No. 5,621,437 (hereinafter "Jeong").

Claim 1 has been amended to recite a "contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at said front surface" of the housing (emphasis added). By way of example and not by limitation, support for this amendment can be



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found, *e.g,* at Figure 11. O'Hagan teaches away from this limitation, as O'Hagan discloses a thumb wheel 48 located on a side surface of the housing (see O'Hagan's Figures 2 and 3). One skilled in the art would recognize the need to provide the thumb wheel on the side surface of the housing in order to allow for easy manipulation of same by a user. Assuming, as Examiner has proposed, that thumb wheel 48 of O'Hagan was replaced with the pressure sensitive scrollbar of Gillespie, the resulting combination would be a pressure sensitive scrollbar located on a side surface of the housing. Examiner has cited to Col. 34, lines 41-43 of Gillespie for the teaching of "a very convenient and easy-to-use cursor position solution that replaces [a mouse or trackball]." Hence, the combination of O'Hagan and Gillespie (assuming solely for the sake of argument such combination was proper) would simply result in a pressure sensitive scrollbar (Gillespie) on a side surface of the housing (Gillespie).

Nothing in the combination of O'Hagan and Gillespie teaches or even suggests moving the location of the pressure sensitive scrollbar to a different housing surface. In fact, one skilled in the art would recognize that O'Hagan teaches away from such a location, as addressed above. Gillespie's teaching regarding portable computers is inapposite to handheld devices. The only teaching of providing a pressure sensitive scrollbar on a front surface of a handheld housing (which would be an ergonomically impractical approach under the teaching of O'Hagan) to replace a thumb wheel type device as taught by O'Hagan is provided by Applicants' own specification. This is not a mere matter of design choice, as the location and placement of the user input device (such as O'Hagan's thumb wheel) is a significant feature of the operation of handheld devices. Hence, neither O'Hagan nor Gillespie, alone or in combination, teaches or suggests the claim limitation of a "contact-sensitive transducer, supported by the housing and



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having a contact-sensitive surface disposed at said front surface" of the housing, as required by claim 1.

For at least the above reasons, claim 1 is patentably distinct over the prior art references and is in condition for allowance. Claims 2-15, which depend from claim 1 directly or indirectly, are also allowable by virtue of their respective dependence from claim 1 as well as their respective further defining claim limitations.

Claim 16 has been amended to recite "a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed on said front surface" [of the housing]. For reasons analogous to those provided with respect to claim 1, neither O'Hagan nor Gillespie, either alone or in combination, teaches or suggests this claim limitation. For at least the above reasons, claim 16 is patentably distinct over the prior art references and is in condition for allowance. Claims 17-29, which depend from claim 16 directly or indirectly, are also allowable by virtue of their respective dependence from claim 16 as well as their respective further defining claim limitations.

Claim 30 has been amended to recite a controller "having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to an input from a user" (emphasis added). By way of example and not limitation, support for this amendment can be found, *e.g,* at Col. 3, lines 32-35. Examiner has conceded that neither O'Hagan nor Gillespie teach a controller having a first mode and a second mode as claimed, but Examiner has asserted that Jeong teaches a controller having a first mode responsive to contact with a contact-sensitive transducer and a second mode not responsive to contract with a contact-sensitive transducer.



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Applicants respectfully respond that Jeong fails to teach or suggest that selection between the first mode and second mode is "in response to an input from a user" as recited by claim 30. In fact, Jeong teaches that power to the touch panel is turned off when a timer counts down (Jeong at Col. 7, lines 1-28). In the presence of user input, Jeong's controller will not enter into the second mode (Id). Hence, Jeong fails to teach or even suggest a controller having a second mode unresponsive to contact with the contact-sensitive transducer, "the second mode being entered in response to an input from a user."

For at least these reasons, claim 30 is patentable over the cited references. Claims 31, 32, 37-45, 48, and 51-53 which depend from claim 30 are also allowable by virtue of their respective dependence from claim 30 as well as their respective further defining claim limitations.

Claim 33 has been amended to a method including "providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at said front surface of the housing," and further "providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer" (emphasis added).

For reasons analogous to those provided above with respect to claim 1, none of the cited references, alone or in proper combination, teach or suggest a contact-sensitive surface on the front surface of the housing. As further addressed above with regard to claim 1, one skilled in the art would have no motivation to modify the references to provide for such a placement, as this is contrary to the teaching of, at least, O'Hagan.



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Furthermore, none of the references teach "providing user input to the controller to select . . . a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer." As addressed above with regard to claim 30, Jeong merely discloses turning off power to the touch pad when a counter times out. Jeong's approach does not anticipate or even suggest the claim limitation of "providing user input" to place a controller into a mode wherein it is unresponsive to contact with the contact-sensitive transducer. In fact, in the presence of user input, Jeong's device will not enter into the asserted second mode. *See* Jeong at Col. 7, lines 1-28.

For at least these reasons, claim 33 (and by dependence as well as for their further defining limitations, claims 34-36) is patentably distinct over the prior art references and is in condition for allowance.

Claim 62 recites "a contact-sensitive transducer, supported by the front surface of the housing." In the Office Action, Examiner has asserted that O'Hagan teaches "a thumb wheel (O'Hagan 46, 48) supported by the housing and having a surface disposed at least one of the first and second side surfaces (see O'Hagan, 46, 48 on the side Figs. 7-8)" (Office Action at p. 15, emphasis in original). Examiner further asserted "It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel." (Id.) The result of Examiner's combination, however, would be a position sensing transducer on the side surface of the housing. This combination does not meet the express limitation of claim 62, however, that the contact sensitive transducer be "supported by the front surface of the housing." Analogous to the reasons provided above with regard to claim 1, it would not have been obvious



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to yet further modify O'Hagan and Gillespie to move the position sensing transducer to a front surface because this would have been contrary to the teaching of O'Hagan regarding the operation of O'Hagan's device (where the user can easily manipulate the input device, the thumb wheel, when the device is held in the palm of the hand). The only teaching or suggestion to provide for a contact-sensitive transducer supported on the front surface of the housing is that provided by Applicants' specification.

For at least these reasons, claim 62 is patentably distinct over the references, whether alone or in proper combination. Claims 63-67, which depend from claim 62, are also allowable by virtue of their respective dependence from claim 62 as well as their respective further defining claim limitations.

Claim 68 has been amended to recite "a contact-sensitive transducer, supported by a front surface of the housing" and to further recite "a controller . . . [having] a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to user input." Analogous to the reasons provided above with respect to claim 1, none of the references teaches or suggests a contact-sensitive transducer supported by the "front surface" of the housing.

Further, and for reasons analogous to those provided above with respect to claim 30, nothing in the cited references teaches or suggests a controller having a second mode unresponsive to contact with the contact-sensitive transducer that is "entered in response to user input." As addressed above, Jeong teaches a contrary approach.



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For at least these reasons, claim 68 is patentably distinct over the cited references. Claims 69-73, which depend from claim 68 are likewise patentable by virtue of their respective dependence from claim 68 as well as their respective further defining limitations.

Claims 14 and 28 have been rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over O'Hagan in view of Gillespie and Jeong as applied to claims 13 and 27 above, and further in view of U.S. Patent No. 4,566,001 (hereinafter "Moore"). Moore was cited for its disclosure of a display terminal having touch strips extending along adjacent horizontal and vertical edges. Applicants respectfully traverse this rejection on the basis that Moore fails to even recognize the special requirements of a handheld device, such as the ergonomics and need for operational control of the input devices (such as the thumb wheels of O'Hagan) and hence one of ordinary skill in the art would have no motivation to apply the teaching of Moore to O'Hagan, Jeong, and/or Gillespie.

Furthermore, even assuming Moore was combined with O'Hagan, Jeong, and Gillespie, Moore does not overcome the deficiencies of those three references addressed above. As such, claims 14 and 28 are patentably distinct over this combination of references.



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Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Steven H. Slater, Applicants' Attorney, at 972-732-1001, so that such issues may be resolved as expeditiously as possible. The Commissioner is hereby authorized to charge any fees that are due, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

29JUN2011
Date

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## APPENDIX A

| Claims | Status | Support in Patent |
|---|---|---|
| 1. | Pending; amended herein | As issued and Figure 2, and Col. 3, lines 27 – 35. |
| 2-8. | Pending | Unamended. |
| 9. | Pending | Figure 1 and issued claim 9. |
| 10-12. | Pending | Unamended. |
| 13. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 16 (col. 11, line 54 – col. 12, line7). Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 14-15. | Pending | Unamended. |
| 16. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 16 (col. 11, line 54 – col. 12, line7). Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 17-26. | Pending | Unamended. |
| 27. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 16 (col. 11, line 54 – col. 12, line7). Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 28-29. | Pending | Unamended. |
| 30. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 31-32. | Pending | Unamended. |
| 33. | Pending; amended herein | As issued and Figure 2, and Col. 3, lines 27 – 35. |
| 34-36. | Pending | Unamended. |
| 37. | Pending | Figs. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37; and lines 55-57). |
| 38. | Pending | Figs. 1, 2, 7B, 7C and 11. Claims 1 and 2 (col. 10, lines 35-37; and lines 55-57). Col. 10, lines 2-7. |
| 39. | Pending | Fig. 11, item 150C Col. 9, line 65-Col. 10, line 7. |

| Claims | Status | Support in Patent |
|---|---|---|
| 40. | Pending | Fig. 11, item 150C Col. 9, line 65-Col. 10, line 7. |
| 41. | Pending | Col. 5, lines 29-34. Claim 15. |
| 42. | Pending | Fig. 1, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 1, lines 1-2. Fig. 11, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 5, lines 1-2. |
| 43. | Pending | Fig. 1, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 1, lines 1-2. Fig. 11, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 5, lines 1-2. Figs. 3, 4. Col. 5, lines 36-39, 48-49. |
| 44. | Pending | Col. 5, lines 19-22. Col. 3, lines 20-26. Claim 26. |
| 45. | Pending | Col. 5, lines 19-22. Col. 8, lines 36-40. |
| 46. | Canceled | |
| 47. | Canceled | |
| 48. | Pending | Fig. 11. Col. 10, lines 13-21. |
| 49. | Canceled | |
| 50. | Canceled | |
| 51. | Pending | Col. 11. Col. 10, lines 13-21. Col. 5, lines 19-22. Fig. 2, item 220. Col. 5, lines 22-24. |
| 52. | Pending | Col. 9, lines 21-50. Col. 8, lines 54-59. |
| 53. | Pending | Col. 9, lines 21-50. Col. 8, lines 54-59. |
| 54. | Pending | Col. 8, lines 43-53. |
| 55. | Pending | Fig. 7A-7C. Col. 8, lines 29-53. |
| 56. | Pending | Figs. 7A-7C. Col. 5, lines 25-26. |
| 57. | Pending | Col. 8, lines 48-50. |
| 58. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 59. | Pending | Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 60. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 61. | Pending | Col. 5, lines 42-45. Col. 3, lines 27-35. |
| 62. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. |
| 63. | Pending | Col. 5, lines 18-35. Col. 8, lines 29-53. |
| 64. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 65. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 66. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44- |

| Claims | Status | Support in Patent |
|---|---|---|
| | | 67. Col. 7, lines 24-63. |
| 67. | Pending | Col. 5, lines 42-45. Col. 3, lines 27-35. |
| 68. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. |
| 69. | Pending | Figs. 1 and 11. Claim 1 and 2 (col. 10, lines 35-37 and lines 55-57). |
| 70. | Pending | Figs. 1, 2, 7A, 7B, 7C, and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 10, lines 2-7. |
| 71. | Pending | Fig. 11. Col. 9, line 65- Col. 10, line 2. |
| 72. | Pending | Fig. 11. Col. 9, line 65 – Col. 10, line 2. |
| 73. | Pending | Col. 5, lines 29-34. Claim 15. |

## APPENDIX B

62. (New) An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller ~~wherein the controller~~ is unresponsive to contact with the contact-sensitive transducer.



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68. (New) An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by a front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller ~~wherein the controller~~ is unresponsive to contact with the contact-sensitive transducer, the second mode being entered in response to user input.



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| Application Number | 11/078,916 |
| Filing Date | 3/11/2005 |
| First Named Inventor | Hayes, Jr. |
| Art Unit | 2617 |
| Examiner Name | Nghi H. Ly |
| Attorney Docket Number | ERI-888RI |

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[ ] Registered practitioner named in the application transmittal letter in an application without an executed oath or declaration. See 37 CFR 1.33(a)(1). Registration Number _____

| | | | |
|---|---|---|---|
| Signature | /Steven H. Slater/ | | |
| Typed or Printed Name | Steven H. Slater | | |
| Date | June 29, 2011 | Telephone | 972-732-1001 |

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

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| **EFS ID:** | 10420238 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Correspondence Address:** | Steven H Slater<br>Slater & Matsil LLP<br>17950 Preston Road<br>Suite 1000<br>Dallas TX 75252<br>US 972-732-1001<br>- |
| **Filer:** | Steven Howard Slater/Kristin Hayes |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 29-JUN-2011 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 18:30:13 |
| **Application Type:** | Utility under 35 USC 111(a) |

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## File Listing:

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|---|---|---|---|---|---|
| 1 | | ERI-888RI_Amendment.pdf | 96401<br>afbf60be0e9b26d1a6755456612b75b1fec17cee | yes | 29 |

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| 11/078,916 | 03/11/2005 | |

## APPLICATION AS FILED – PART I

| FOR | (Column 1) NUMBER FILED | (Column 2) NUMBER EXTRA | SMALL ENTITY ☐ RATE ($) | SMALL ENTITY ☐ FEE ($) | OR | OTHER THAN SMALL ENTITY RATE ($) | OTHER THAN SMALL ENTITY FEE ($) |
|---|---|---|---|---|---|---|---|
| ☐ BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | | | N/A | |
| ☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m)) | N/A | N/A | N/A | | | N/A | |
| ☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | | | N/A | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | minus 20 = | * | X $ = | | OR | X $ = | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | minus 3 = | * | X $ = | | | X $ = | |
| ☐ APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | | | | |
| ☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | | | TOTAL | |

## APPLICATION AS AMENDED – PART II

| AMENDMENT | 06/29/2011 | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | SMALL ENTITY RATE ($) | SMALL ENTITY ADDITIONAL FEE ($) | OR | OTHER THAN SMALL ENTITY RATE ($) | OTHER THAN SMALL ENTITY ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total (37 CFR 1.16(i)) | * 69 | Minus | ** 73 | = 0 | X $ = | | OR | X $52= | 0 |
| | Independent (37 CFR 1.16(h)) | * 6 | Minus | ***6 | = 0 | X $ = | | OR | X $220= | 0 |
| | ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| | ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | 0 |

| AMENDMENT | | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE ($) | ADDITIONAL FEE ($) | | RATE ($) | ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Total (37 CFR 1.16(i)) | * | Minus | ** | = | X $ = | | OR | X $ = | |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = | X $ = | | OR | X $ = | |
| | ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| | ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | |

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/EAON SMALLWOOD/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 03/30/2011

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| EXAMINER | |
|---|---|
| LY, NGHI H | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2617 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 03/30/2011 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Examiner | Art Unit | |
| | NGHI H. LY | 2617 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *13 December 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-45,48 and 51-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45,48 and 51-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Reissue Applications*

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 12/13/2010 has been entered.

### *Claim Objections*

2. Claims 1, 16, 30, 33, 62 and 68 are objected to because of the following informalities: The newly added in claims 1, 16, 30, 33, 62 and 68 recite “wherein the controller wherein the controller”.

Appropriate correction is required.

### *Oath/Declaration*

3. A. The reissue oath/declaration filed with this application is defective (see 37 CFR 1.175 and MPEP § 1414) because of the following: amendments (see amendment

filed March 22, 2002) have been made to the claims since the filing of the Original reissue oath/declaration. A supplemental oath/declaration is required.

B. The reissue oath/declaration filed with this application is defective because it fails to identify at least one error which is relied upon to support the reissue application. See 37 CFR 1.175(a)(1) and MPEP § 1414.

C. In accordance with 37 CFR 1.175(b)(1), a supplemental reissue oath/declaration under 37 CFR 1.175(b)(1) must be received before this reissue application can be allowed.

D. Claims 1-73 are rejected as being based upon a defective reissue oath under 35 U.S.C. 251. See 37 CFR 1.175.

The nature of the defect(s) in the Oath or Declaration is set forth in the discussion above in this Office action.

E. Claims 1-73 are rejected under 35 U.S.C. 251 as being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee. A claim is broader in scope than the original claims if it contains within its scope any conceivable product or process which would have infringed the original patent. A claim is broadened if it is broader in any one respect even though it may be narrower in other respects.

F. It appears that on the Oath or Declaration filed 3/11/05 box A, An assignment from the inventors box was inadvertently left blank. Appropriate correction is required.

G. Applicant is referred to 37 CFR 1.173 for the proper format and manner of making amendments in a reissue application.

### *Oath/Declaration*

4. It appears that on the Oath or Declaration filed 3/11/05 box A, an assignment from the inventors box was inadvertently left blank.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-13, 15-27, 29-45, 48 and 51-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236) and further in view of Jeong (US 5,621,437).

Regarding claim 1, O'Hagan discloses a radiotelephone (see Figs. 2-3), comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface (see Fig. 2), the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-2), a radio telephone communications transceiver (66), supported by the housing (see Figs. 2-3), a display (28) supported by the housing (see Figs. 2-3), that displays an image at a front surface of the housing (see Figs. 7-8), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver (see processor being connected to display 28 and transceiver 66, Fig. 4), which controls at least **one** of the display and the radiotelephone communications transceiver which scrolls displayed rows along an axis or the display based upon the output signal (which reads on “In response to the operator rotating the three-way switch 46 clockwise or counterclockwise, the processor 60 causes a cursor 120 on the display to scroll up or down in relation to the list of possible "recipients"” as disclosed in column 9 lines 44-46). O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least **one** of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal in response to moving contact of an object along the surface of the wheel (which reads on

"Rotation in a clockwise direction produces a first output and rotation in a counterclockwise direction produces a second output. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a transaxial direction to produce a third output" as disclosed in col. 5, lines 54-58, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

The combination of O'Hagan and Gillespie et al fails to expressly disclose the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer.

In an analogous field of endeavor, Jeong discloses the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer (see fig.2 and column 3, lines 9-23, see "*DS1*", also see Abstract and

column 2, lines 32-51, see "*the switch for turning on/off supply power to the touch panel in response to a first control signal from the control circuit*". In this case, the control circuit 10 has two modes: In the first mode, controlling a system operation in response to the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "on") and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer (in the second mode, the control circuit 10 NOT controlling a system operation in response to NOT receive the detect signal DS1 from the touch panel 20 when the supply power to the touch panel is "off").

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Jeong with the combination of O'Hagan and Gillespie et al terminal so that power consumption can be minimized and a battery can be lengthened (see Jeong, column 1, lines 15-17).

Regarding claims 2 and 17, O'Hagan, Gillespie et al. and Jeong further discloses wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or thumb of the holding hand (see O'Hagan, Fig. 2).

Regarding claims 3 and 18, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the controller is operative to selectively display an image according to the output signal of the transducer (see O'Hagan, col. 9, lines 53-67, Fig. 8). However, O'Hagan and Jeong fail to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 4 and 19, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer (see O'Hagan, col. 9, lines 43-48).

Regarding claims 5 and 20, the combination of O'Hagan and Gillespie et al. and Jeong further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the transducer (see Fig. 8). However, O'Hagan and Jeong fail to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above

position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 6 and 21, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the transducer (see col. 9, lines 46-52). However, O'Hagan and Jeong fail to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 7 and 22, O'Hagan and Jeong disclose selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object (see O' Hagan, col. 9, lines 43-52). O'Hagan and Jeong fail to expressly disclose wherein the controller is operative to determine a position of contact

of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose the interface electronics to allow the pointing device to communicate directly with a host microprocessor, and a "finger pointer" embodiment, a position sensing system includes a position sensing transducer comprising a touch-sensitive surface disposed on a substrate, such as a printed circuit board, including a matrix of conductive lines (see column 5, lines 21-27 and column 5 lines 45-50), which reads on the claimed "wherein the controller (186) is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include a position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 8 and 23, O'Hagan and Jeong disclose wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the transducer (see O'Hagan, col. 9, lines 48-52 and col. 12 lines 34-36). However, O'Hagan and Jeong fail to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 9 and 24, the combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the transducer (see col. 9, lines 48-52). However, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 10, O'Hagan discloses wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical wherein the controller is further operative, to initiate the action associated with the identified graphical object (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67). However, O'Hagan fails to expressly disclose the use of a contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 11, O'Hagan and Jeong fail to expressly disclose wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a gesture unit (see column 30, lines 20-28), which reads on the claimed "the controller is operative, responsive to

the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the gesture unit in order to properly position the cursor.

Regarding claim 12, O'Hagan and Jeong fail to expressly disclose detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval.

In a similar field of endeavor, Gillespie et al disclose a gesture unit and parameters (see column 30, lines 29-34), which reads on the claimed "detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above gesture unit and parameters in order to properly position the cursor.

Regarding claim 13, O'Hagan and Jeong discloses a thumb wheel disposed at least one of the first side surface and the second side surface (see O'Hagan, thumbwhee148, Figs. 2-3). O'Hagan and Jeong fail to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed "elongate contact-sensitive strip". It would have been obvious to a person of ordinary skill in the art at the time of

the invention to modify O'Hagan and Jeong with Gillespie et al to include the above scroll bar in order to properly position the cursor.

Regarding claims 15, 29, 41 and 73, O'Hagan and Jeong fail to explicitly disclose wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductor transducer.

In a similar field of endeavor, Gillespie et al disclose a capacitive sensing system (see figure 1) which reads on the claimed limitation a capacitive transducer.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above capacitive sensing system in order to provide an accurately determine the position of a finger as suggested by Gillespie et al (see column 8, lines 40-45).

Regarding claims 16, 30, 33, 62 and 68, O'Hagan and Jeong discloses an apparatus and a method in an apparatus for providing user input to a hand-held electronic device, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see O'Hagan, Figs. 1-4), a display (28) supported by the housing, that displays an image at a front surface of the housing (see O'Hagan, Figs. 7-8), and a controller (O'Hagan, processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and

operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal (O'Hagan, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). O'Hagan and Jeong further discloses a thumb wheel (O'Hagan, 46, 48), supported by the housing and having a surface disposed at least one of the first and second side surfaces (see O'Hagan, 46, 48 on the side Figs. 7-8), which produces an output signal that characterizes contact of an object along the surface of the wheel (see O'Hagan, col. 5, lines 46-61, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). However, O'Hagan and Jeong fail to expressly disclose the use of a contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 25 and 26, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein to scroll displayed rows along an axis of the display responsive to the output signal (O'Hagan, operator may rotate the thumb wheel

clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). However, O'Hagan and Jeong fail to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 27, the combination of O'Hagan and Gillespie et al. and Jeong further discloses Figs. 2-3 illustrates the (O'Hagan, thumbwheel 48) disposed at least one of the first and second side surfaces of the housing. However, O'Hagan and Jeong fail to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed "elongate contact-sensitive strip". It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above scroll bar in order to properly position the cursor.

Regarding claim 31, the combination of O'Hagan, Gillespie et al. and Jeong further discloses a radiotelephone communications transceiver Supported by the

housing and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal (O'Hagan, feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claim 32, the combination of O'Hagan, Gillespie et al. and Jeong further discloses the disposed at the side of the housing, the side surface disposed adjacent the front surface and inclined away form the front surface (see O'Hagan, Fig. 2, showing side with thumb wheel being disposed on a side adjacent the front surface and inclined away from the front surface). However, O'Hagan and Jeong fail to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-8), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 34, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the step of providing comprises a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface

confronts the user's palm and the display projects away from the user's palm (see O'Hagan, Fig. 3). However, O'Hagan and Jeong fail to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 35, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the apparatus is a radio telephone that further includes a radio telephone communications transceiver (O'Hagan, 66, Fig. 2), wherein the controller is operative to control the radio telephone communications transceiver (O'Hagan, processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact sensitive transducer (see O'Hagan, col. 5, lines 61-67, col. 9, lines 37-60).

Regarding claim 36, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the step of controlling comprises the step of selectively displaying an image on the display according to the output of the contact-sensitive transducer (see O'Hagan, Figs. 7 and 8).

Regarding claims 37 and 69, the combination of O'Hagan, Gillespie et al. and Jeong further teach wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see O'Hagan, Figs. 2-3 with the thumb wheel 48 on the side). However, O'Hagan and Jeong fail to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 38, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which

illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand). However, O'Hagan and Jeong fail to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 39, the combination of O'Hagan, Gillespie et al. and Jeong further discloses a front surface of the housing (display may function as a touch panel display to allow input of information in addition to or in place of the keypad, see col. 5, lines 12-14). However, O'Hagan and Jeong fail to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above

position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 40, O'Hagan and Jeong discloses a thumb wheel disposed at least one of the first side surface and the second side surface (see O'Hagan, thumbwhee148, Figs. 2-3). O'Hagan and Jeong fail to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed "elongate contact-sensitive strip".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above scroll bar in order to properly position the cursor.

Regarding claims 42-43, the combination of O'Hagan, Gillespie et al. and Joeng further discloses an additional user input interface devices for the apparatus on the front surface of the housing wherein the additional interface devices are contact-sensitive (O'Hagan, display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3).

Regarding claims 44 and 45, O'Hagan and Jeong fail to disclose the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see column 5, lines 36-58), which reads on the claimed "the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer," and "the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above sliding output in order to allow a user to easily recover from touching an unintended button as suggested by Gillespie et al (see column 5, lines 36-58).

Regarding claims 48, O'Hagan and Jeong fail to disclose the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see column 5, lines 36-58), which reads on the claimed "an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above

sliding output in order to allow a user to easily recover from touching an unintended button as suggested by Gillespie et al (see column 5, lines 36-58).

Regarding claims 51-53, the combination of O'Hagan, Gillespie and Jeong further discloses inherently a second contact-sensitive transducer, supported by the housing which produces a second output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive surface of the second transducer (O'Hagan, inherent feature of keypad 26 on surface, O'Hagan Fig. 2-3), a controller for providing controlling functions of the apparatus including an output signal in response to detection of momentary contact or predetermined number of momentary contacts with the contact-sensitive transducer (O'Hagan, processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see O'Hagan col. 6, lines 24-35). However, O'Hagan and Jeong fail to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 54-55, the combination of O'Hagan, Gillespie and Jeong further discloses wherein the controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of the display based on the output signal from the transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see O'Hagan col. 5, lines 51-62).

Regarding claims 56 and 57, the combination of O'Hagan, Gillespie and Jeong further teach wherein the rows consist of alphanumeric characteristic comprising menu selections wherein the controller identifies successive ones of the rows displayed along the axis of the display by highlighting successive rows (see O'Hagan Figs 7-8).

Regarding claims 58, 59, 64 and 65, the combination of O'Hagan, Gillespie et al and Jeong further disclose a power supply disposed inside the housing wherein the power supply comprises a battery (O'Hagan, terminal also includes a power source 72 which is a rechargeable supply, see O'Hagan col. 7, lines 54-56).

Regarding claims 60 and 66, the combination of O'Hagan, Gillespie et al and Jeong further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the transducer (O'Hagan, power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see O'Hagan col. 7, lines 56-59). However, O'Hagan and Jeong fail to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 61 and 67, the combination of O'Hagan, Gillespie et al and Jeong further discloses a mode of operation wherein the controller is unresponsive to contact with the transducer (feature of transitioning between different states as illustrated in O'Hagan Fig. 6). However, O'Hagan and Jeong fail to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 63 the combination of O'Hagan, Gillespie et al and Jeong disclose in Figs. 7-8 of O'Hagan wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

Regarding claim 69, the combination of O'Hagan, Gillespie et al. and Jeong further discloses wherein the surface of the transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see O'Hagan, Fig. 3). However, O'Hagan and Jeong fail to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 70, the combination of O'Hagan and Gillespie et al. and Jeong further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see O'Hagan, Figs. 2-3, which illustrates the terminal 14 having

a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 71, the combination of O'Hagan and Gillespie et al. and Jeong further discloses wherein the transducer is disposed on the. front surface of the housing (O'Hagan, display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3). However, O'Hagan and Jeong fail to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed "contact-sensitive transducer".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 72, O'Hagan and Jeong fail to disclose wherein the transducer is an elongate strip. In a similar field of endeavor, Gillespie et al disclose a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see column 5, lines 1-22), which reads on the claimed "the contact sensitive transducer is an elongate strip".

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan and Jeong with Gillespie et al to include the above touch-sensitive overlay instead of the thumb wheel in order to provide an improved pan function as suggested by Gillespie et al (see column 2, lines 25-59).

7. Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al in view of Gillespie et al and in view of Jeong (US 5,621,437) as applied to claims 13 and 27 above, and further in view of Moore et al. (US 4,566,001).

Regarding claims 14 and 28, the combination of O'Hagan, Gillespie et al and Jeong fails to teach wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface of the housing.

In an analogous field of endeavor, Moore discloses a touch strip input for a display in which the touch strips are mounted along the horizontal and vertical edges of the display terminal (see col. 1, lines 50-56).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Moore with the combination of O'Hagan, Gillespie et al and Jeong terminal for the benefit of having the contact overlays or strips in optional edges of the terminal for ease and convenience of use.

***Response to Arguments***

8. Applicant's arguments with respect to claims 1-45, 48 and 51-73 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NGHI H. LY whose telephone number is (571)272-7911. The examiner can normally be reached on 9:30am-8:00pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost can be reached on (571) 272-7023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nghi H. Ly

/Nghi H. Ly/
Primary Examiner, Art Unit 2617

| Notice of References Cited | Application/Control No. 11/078,916 | Applicant(s)/Patent Under Reexamination HAYES ET AL. | |
|---|---|---|---|
| | Examiner NGHI H. LY | Art Unit 2617 | Page 1 of 1 |

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| | B | US- | | | |
| | C | US- | | | |
| | D | US- | | | |
| | E | US- | | | |
| | F | US- | | | |
| | G | US- | | | |
| | H | US- | | | |
| | I | US- | | | |
| | J | US- | | | |
| | K | US- | | | |
| | L | US- | | | |
| | M | US- | | | |

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| | X | |

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

| SEARCHED | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| 455 | 566, 550.1, 90.3, 95, 575.1 | 4/28/08 | nly |
| 379 | 433.1, 433.3,428 | 4/28/08 | nly |

| SEARCH NOTES | | |
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| Search Notes | Date | Examiner |
| | | SS |

| INTERFERENCE SEARCH | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
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| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

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| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
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| Final | Original | 03/28/2011 | | | | | | | | |
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| | 36 | ✓ | | | | | | | | |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

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| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 03/28/2011 | | | | | | | | |
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| | 38 | ✓ | | | | | | | | |
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| | 70 | ✓ | | | | | | | | |
| | 71 | ✓ | | | | | | | | |
| | 72 | ✓ | | | | | | | | |

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

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| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 03/28/2011 | | | | | | | | |
| | 73 | ✓ | | | | | | | | |

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

*(Use as many sheets as necessary)*

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| Complete if Known | |
|---|---|
| Application Number | 11/078,916 |
| Filing Date | 03-11-2005 |
| First Named Inventor | Hayes, Jr. et al. |
| Art Unit | 2617 |
| Examiner Name | Sheila B. Smith |
| Attorney Docket Number | ERI-888RI |

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| | B2 | JP-8-125724 | 05-17-1996 | IBM et al. | | ✓ |
| | B3 | | | | | |
| | B4 | | | | | |
| | B5 | | | | | |

| Examiner Signature | /Nghi Ly/ | Date Considered | 03/27/2011 |
|---|---|---|---|

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This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.L./

## EAST Search History

## EAST Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 127 | (deactivat$6 de-activat$6 off$2 unrespons$6 respons$7 repond $4) near9 (controlling controller cpu processor) near9 ((touch$3) adj1 (sens$3 sensiti $6)) | USPAT | OR | ON | 2011/03/28 05:32 |
| L2 | 0 | (deactivat$6 de-activat$6 off$2 unrespons$6 respons$7 repond $4) near9 (controlling controller cpu processor) near9 ((touch$3) adj1 (sens$3 sensiti$6) near5 transduc$4) | USPAT | OR | ON | 2011/03/28 05:43 |
| L3 | 0 | (deactivat$6 de-activat$6 off$2 unrespons$6 respons$7 repond $4) near9 (controlling controller cpu processor) near9 ((touch$3) near5 (sens$3 sensiti$6) near5 transduc$4) | USPAT | OR | ON | 2011/03/28 05:44 |



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|---|---|---|---|---|---|---|
| L5 | 0 | (activat$4 deactivat$6 de-activat$6 off$2 unrespons$6 respons$7 repond $4) near9 (controlling controller cpu processor) near9 ((touch$3) near5 (sens$3 sensiti$6) near5 transduc$4) | USPAT | OR | ON | 2011/03/28 05:44 |
| L6 | 2 | (activat$4 deactivat$6 de-activat$6 off$2 unrespons$6 respons$7 repond $4) near22 (controlling controller cpu processor) near22 ((touch$3) near5 (sens$3 sensiti$6) near5 transduc$4) | USPAT | OR | ON | 2011/03/28 05:45 |
| L7 | 635 | (activat$4 deactivat$6 de-activat$6 off$2 unrespons$6 respons$7 repond $4) near22 (controlling controller cpu processor) near22 ((touch$3) near3 (sens$3 sensiti $6)) | USPAT | OR | ON | 2011/03/28 05:46 |



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| | | | | | | |
|---|---|---|---|---|---|---|
| L8 | 148 | ((activat$4 deactivat$6 de-activat$6 off$2 unrespons$6 respons$7 repond $4) near3 (controlling controller cpu processor)) near22 ((touch$3) near3 (sens$3 sensiti$6)) | USPAT | OR | ON | 2011/03/28 05:46 |
| L9 | 44 | ((deactivat$6 de-activat$6 off$2 unrespons$6 effect $4 uneffect$4) near3 (controlling controller cpu processor)) near22 ((touch$3) near3 (sens$3 sensiti$6)) | USPAT | OR | ON | 2011/03/28 05:58 |
| L10 | 27 | (switch$4 near12 (deactivat$6 de-activat$6 off$2 unrespons$6 effect $4 uneffect$4) near5 (controlling controller cpu processor)) near22 ((touch$3) near3 (sens$3 sensiti$6)) | USPAT | OR | ON | 2011/03/28 06:05 |
| L11 | 44 | (switch$4 near22 (deactivat$6 de-activat$6 off$2 unrespons$6 effect $4 uneffect$4) near22 (controlling controller cpu processor)) near22 ((touch$3) near3 (sens$3 sensiti$6)) | USPAT | OR | ON | 2011/03/28 06:09 |



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| | | | | | | |
|---|---|---|---|---|---|---|
| S4 | 916 | ((touch$3 contact) adj sensiti$6) near3 transducer | USPAT | OR | ON | 2011/03/28 03:25 |
| S11 | 169 | (turn$3 switch$3) near9 off near12 ((touch$3 contact $3 sens$3 sensiti $6) near5 transducer) | USPAT | OR | ON | 2011/03/28 03:31 |
| S12 | 100 | (turn$3 switch$3) near9 off near5 ((touch$3 contact $3 sens$3 sensiti $6) near5 transducer) | USPAT | OR | ON | 2011/03/28 03:33 |
| S13 | 0 | (turn$3 switch$3) near9 off near5 ((touch$3 contact $3) near3 (sens$3 sensiti$6) near3 transducer) | USPAT | OR | ON | 2011/03/28 03:35 |
| S14 | 0 | (turn$3 switch$3) near9 (off) near5 ((touch$3 contact $3) near3 (sens$3 sensiti$6) near3 transducer) | USPAT | OR | ON | 2011/03/28 03:35 |
| S16 | 0 | (turn$3 switch$3) near9 (deactivat$6 off) near5 ((touch $3 contact$3) near3 (sens$3 sensiti$6) near3 transducer) | USPAT | OR | ON | 2011/03/28 03:37 |
| S17 | 0 | (turn$3 switch$3) near9 (deactivat$6 de-activat$6 off $2) near5 ((touch $3 contact$3) near3 (sens$3 sensiti$6) near3 transducer) | USPAT | OR | ON | 2011/03/28 03:38 |

| | | | | | | |
|---|---|---|---|---|---|---|
| S18 | 0 | (turn$3 switch$3) near9 (deactivat$6 de-activat$6 off $2) near5 ((touch $3 contact$3) near5 (sens$3 sensiti$6) near5 transducer) | USPAT | OR | ON | 2011/03/28 03:38 |
| S19 | 103 | (turn$3 switch$3) near9 (deactivat$6 de-activat$6 off $2) near5 ((touch $3 contact$3 sens $3 sensiti$6) near5 transducer) | USPAT | OR | ON | 2011/03/28 03:38 |
| S20 | 519 | (turn$3 switch$3) near9 (deactivat$6 de-activat$6 off $2) near5 ((touch $3 contact$3) near3 (sens$3 sensiti$6)) | USPAT | OR | ON | 2011/03/28 03:41 |
| S21 | 391 | (turn$3 switch$3) near9 (deactivat$6 de-activat$6 off $2) near5 ((touch $3 contact$3) adj3 (sens$3 sensiti$6)) | USPAT | OR | ON | 2011/03/28 03:42 |
| S22 | 241 | (turn$3 switch$3) near9 (deactivat$6 de-activat$6 off $2) near5 ((touch $3 contact$3) adj1 (sens$3 sensiti$6)) | USPAT | OR | ON | 2011/03/28 03:43 |
| S23 | 153 | (turn$3 switch$3) near9 (deactivat$6 de-activat$6 off $2) near5 ((touch $3) adj1 (sens$3 sensiti$6)) | USPAT | OR | ON | 2011/03/28 03:44 |

| | | | | | | |
|---|---|---|---|---|---|---|
| S24 | 16 | (deactivat$6 de-activat$6 off$2) near5 (controlling controller cpu processor) near9 ((touch$3) adj1 (sens$3 sensiti $6)) | USPAT | OR | ON | 2011/03/28 03:56 |
| S25 | 22 | (deactivat$6 de-activat$6 off$2) near9 (controlling controller cpu processor) near9 ((touch$3) adj1 (sens$3 sensiti $6)) | USPAT | OR | ON | 2011/03/28 03:59 |

**EAST Search History (Interference)**

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L13 | 47 | (deactivat$6 de-activat$6 off$2) near5 (controlling controller cpu processor) near9 ((touch $3) adj1 (sens $3 sensiti$6)) | US-PGPUB; USPAT; UPAD | OR | ON | 2011/03/28 07:45 |

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PTO/SB/08a (01-08)
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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

*(Use as many sheets as necessary)*

Sheet 1 of 1

| *Complete if Known* | |
|---|---|
| Application Number | 11/078,916 |
| Filing Date | 03-11-2005 |
| First Named Inventor | Hayes, Jr. et al. |
| Art Unit | 2617 |
| Examiner Name | Sheila B. Smith |
| Attorney Docket Number | ERI-888RI |

## U.S. PATENT DOCUMENTS

| Examiner Initials* | Cite No.[1] | Document Number<br>Number - Kind Code[2] *(if known)* | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
|---|---|---|---|---|---|
| | A1 | US-5,491,597 | 02-13-1996 | Bennin et al. | |
| | A2 | US-5,543,590 | 08-06-1996 | Gillespie et al. | |
| | A3 | US-5,999,827 | 12-07-1999 | Sudo et al. | |
| | A4 | US-6,173,194 B1 | 01-09-2001 | Vanttila | |
| | A5 | US- | | | |
| | A6 | US- | | | |
| | A7 | US- | | | |
| | A8 | US- | | | |
| | A9 | US- | | | |
| | A10 | US- | | | |
| | A11 | US- | | | |
| | A12 | US- | | | |
| | A13 | US- | | | |
| | A14 | US- | | | |
| | A15 | US- | | | |
| | A16 | US- | | | |
| | A17 | US- | | | |

## FOREIGN PATENT DOCUMENTS

| Examiner Initials* | Cite No.[1] | Foreign Patent Document<br>Country Code[3] - Number[4] - Kind Code[5] *(if known)* | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear | T[6] |
|---|---|---|---|---|---|---|
| | B1 | JP-08-030378 | 02-22-1996 | Hewlett Packard Co. | | ✓ |
| | B2 | JP-8-125724 | 05-17-1996 | IBM et al. | | ✓ |
| | B3 | | | | | |
| | B4 | | | | | |
| | B5 | | | | | |

| Examiner Signature | | Date Considered | |
|---|---|---|---|

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# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-030378

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G06F 3/03

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(22)Date of filing : 06.07.1995

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(72)Inventor : CHRISTOPHER M BUNSEN

(30)Priority

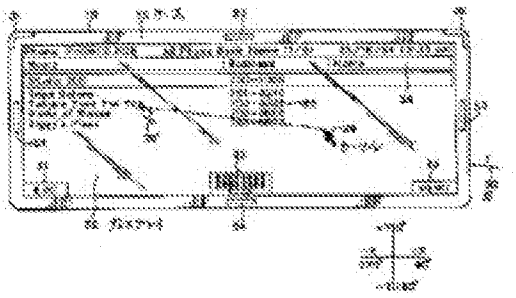
Priority number : 94 271406 Priority date : 06.07.1994 Priority country : US

## (54) PRESSURE-SENSITIVE ELECTRONIC DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To eliminate the need for an inputting equipment such as a key or a mouse, and to miniaturize a device by transmitting a signal for changing display information to a display by a processor, in response to the detection of pressure on a case by a pressure sensor.

SOLUTION: In an electronic device 10 being a portable or wrist mounting type computer called a personal digital assistant(PDA), a display 20 is integrated into a case 15, and soft key information 21-23 and data 24 and 25 being one part of the PDA, such as header information or telephone directory, are displayed. Then, when a text input is necessary, a larger keyboard is displayed on the display, and each key can be selected by, for example, moving a cursor 29 to a keyboard icon 22 and clicking a selection switch 31. Also, pressure sensors 51-54 detect pressures in X and Y directions of the case 15, and the processor changes the information 21-29 displayed on the display 20, in response to this pressure detection.



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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

## DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]Especially this invention relates to a pressure-sensitive electronic device about the field of an electronic circuit.
[0002]
[Background of the Invention]The electronic device which can perform various functions conventionally was very large-sized. The size of such equipment was mainly prescribed by the size of the circuit required in order to perform the function of equipment. The time when the vacuum tube constituted a lot of electronic circuits which perform these functions is a table top type (TV, stereo receiver) as the size of these pieces of equipment is small.
It was the size which occupies the room and the whole building in many cases (computer).
In such equipment, since equipment itself was very large-sized, the space for the keyboard with which a user can control equipment, or the apparatus of everythings, such as a key and a switch, was not a problem.
[0003]However, technology developed and the miniaturization of the circuit required in order to perform the function of an electronic device progressed rapidly. The transistor appeared instead of the vacuum tube. The integrated circuit appeared instead of the transistor. Today's VLSI (very large-scale integration) circuit has the capability to accumulate no less than 1 million transistors on a single chip. Equipment itself has been miniaturized with the miniaturization of the circuit for electronic devices. The electronic device which occupied the whole room once can also be literally stored in a user's palm and wrist now.
[0004]Although the miniaturization of the electronic device under progress was actually a revolution of technical progress, it was necessarily satisfactory. One of such the problems is that the space for the keyboard with which a user enables it to control equipment, or the apparatus of everythings, such as a key and a switch, is a decisive factor which specifies the

size of an electronic device now in many cases. If the space for control of the equipment by a user is reducible to the minimum, it is smaller and all the equipment from a computer to a clock will be able to be made efficient.

[0005]

[Summary of Invention]The pressure-sensitive electronic device has a display, a case, a processor, and a pressure sensor like one or much more **** sensibility resistance. A pressure sensor's detection of the pressure added to the case will change the information displayed on a display. The pressure in one or much more dimensions (X, Y, and/or Z) on a case is detected by a pressure sensor. Most generally, although the information which changes on a display is change of the cursor position on a display, it is possible also by the change to various operational modes, and/or writing. The position changes corresponding to the direction and size of a pressure as which cursor was detected in the case. A pressure can be used also in order to perform operation corresponding to the cursor position on a display. In order to control a motion of the cursor on a display, and to perform operation or to switch various operational modes of equipment, the input devices (MASUU, a trackball, etc.) of a key or others are unnecessary.

[0006]

[Working example]Drawing 1 is a top view of the electronic device 10 of the embodiment of this invention. The equipment 10 has the display 20 incorporated in the case 15. In an embodiment, the equipment 10 is a computer of portable [ which is generally called a personal digital assistant (PDA) ] or a wrist wearing type. The information 21 thru/or 29 is displayed on the display 20. The information 21 thru/or 23 is a soft key displayed on a part for the lower part of the display 20. The information 24 and 25 is header information and data like a telephone directory which is usually a part of PDA. The cursor 29 can move about on the display 20 so that it may explain in full detail behind. The selecting switches 31 and 32 perform operation like the button on a mouse or a trackball based on the information displayed on the display corresponding to the cursor position on a display. The selecting switches 31 and 32 are not indispensable so that it may mention later.

[0007]Please note that there is no mechanical keyboard connected with the equipment 10. When text input is required, the user can select the icon 22 of a keyboard. (Moving the cursor 29, for example on the keyboard icon 22, and clicking the selecting switch 31 twice) When the keyboard icon 22 is selected, a larger keyboard is displayed on the display 20 and can choose each key.

[0008]In the desirable embodiment, although the equipment 10 is a thing of the proper size and form of 100LX type palm top PC which applicant of this application is manufacturing, the display 20 is arranged on the upper surface of a circuit board, and the keyboard is deleted. Although the size of the equipment 10 may be arbitrary, probably, it will be clear to a person

skilled in the art that it is preferred that it is the size which can be carried by a user's hand or can be applied to a user's wrist or a belt.

[0009]Since these sensors are having the field of view obstructed by the case 15, by drawing 1, the dotted line has shown the relative position of the pressure sensors 51 thru/or 54. The pressure sensors 51 thru/or 54 are some pressure sensors 50 (drawing 3), and are behind explained in full detail about the operation. Probably, its thing good at least will be clear to a person skilled in the art, even if there is more number of a sensor, although four sensors which have turned to the right-angled direction to the sensor by which each adjoins are illustrated. In an embodiment, although a pressure sensor is feeling resistance of **** made from Interlink Electronics, for example, a pressure is convertible for an electronic signal, the parts of others like a strain gage may be sufficient. The term of "power" and a "pressure" shall be interexchangeably used by the description of the following of this Description.

[0010]If a pressure is impressed to the case 15 by a user's hand or the pressure source of others like the power 90 shown in drawing 1, the information 21 thru/or 29 displayed on the display 20 will change. The pressure of the direction of the both sides of X and Y of the case 15 is detected by the pressure sensors 51 thru/or 54. it was shown in drawing 1 -- as -- change of the information on a display -- the cursor 29 on the display 20 -- the position of 29' -- the time -- arranging -- having -- things -- it is . The position of the cursor 29 is changed corresponding to the pressure detected in the direction of X and Y of the case 15. In the example shown in drawing 1, in order that a user may move the cursor 29, the power 90 is applied to the case 15, and as a result, the user can perform operation about one item of a telephone directory called "Twinkle Toes Top Tap". Any of the acquisition of the dial of the selected telephone number and the detailed information see and concerning edit of an item and an item, etc. may be sufficient as the operation performed. Operation can be performed, the selecting switch 31 and/or various operations of 32, or when only specific time only stops the cursor 29 in the position of cursor 29'. In addition, another embodiment which added one or much more pressure sensors which detect the pressure in a Z direction instead of is also possible so that it may explain in detail by the back. [ the selecting switches 31 and 32 ] In order to control a motion of the cursor on a display by any embodiment, the input devices (a mouse, a trackball, etc.) of a key or others are unnecessary.

[0011]Drawing 2 is a sectional side elevation of the electronic device 10 of the embodiment of this invention. The case 15 contains the upper part 15a, the flank (one or more many) 15b, and the pars basilaris ossis occipitalis 15c. In this embodiment, the pars basilaris ossis occipitalis 15c consists of spreading material which has the coefficient of friction that the equipment 10 does not move, or other materials, when it puts on the surface of the congener of a table or others. Attach equipment to the field which others fixed, or the field (for example, watchband which a user hangs on a wrist) fixed relatively, or, When the method of offsetting the external

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force applied to the case 15 like [ in the case of carrying out the clip stop of the cradle of a paging device to a user's belt, or only having equipment in it in a user's palm ] is adopted, it is not necessary to use the pars basilaris ossis occipitalis 15c as a different material from another portion of the case 15.

[0012]Drawing 3 is a block diagram of the electronic device 10 of the embodiment of this invention. The battery 80 is connected with the display 20, the selection circuitry 30, the processor 40, the pressure sensor 50, and the I/O driver 60 in the other circuits 70. As mentioned above, the pressure sensor 50 includes four **** sensibility resistance 51 thru/or 54. The pressure sensor 50 also contains the fixed resistance 55 thru/or 58 further for pull-up. The pull-up resistors 55 thru/or 58 constitute the voltage divider circuit with the **** sensibility resistance 51 thru/or 54. The signal sent to the I/0 driver 60 on the entrance cable 61 thru/or 64 is proportional to the power applied to the **** sensibility resistance 51 thru/or 54. When the **** sensibility resistance 51 thru/or 54 is the direction shown in drawing 1, the signal on the entrance cable 64 is proportional to the power applied to the case 15 in the direction of +Y which is an angle of 0 degree. Similarly, the signal on the entrance cable 61 is proportional to the power applied in the direction of +X which is an angle of 90 degrees, the signal on the entrance cable 62 is proportional to the power applied in the direction of -Y which is an angle of 180 degrees, and the signal on the entrance cable 63 is proportional to the power applied in the direction of -X which is an angle of 270 degrees. For example, the signal on the entrance cable 63 shows the component of a force of the direction of -X of the power 90 with the power 90 shown in drawing 1, and the signal on the entrance cable 64 shows the component of a force of the direction of Y of the power 90 with it. Although two pairs of **** sensibility resistance (the resistance 51 and 53 and "X" "Y" resistance 52 and 54 of a couple of a couple) were used in this embodiment, If the "negative pressure" (for example, power applied to the resistance 51 and 52 with the power 90 of drawing 1) to resistance can be measured by impressing the power of the specified quantity to the resistance 51 and 52 beforehand, it will be clear to a person skilled in the art resistance's 53 and 54 to become unnecessary. In a desirable embodiment, since the direction of the power concerning the case 15 can be uniquely judged with the signal generated from the **** sensibility resistance which measures a positive pressure, the signal generated from the **** sensibility resistance of some kind which measures negative pressure, and which "is a couple" is only disregarded (even if it exists).

[0013]With combination of a signal on the entrance cable 61 thru/or 64, the I/O driver 60 can judge quantity of the direction and power uniquely, no matter what X-Y power may be impressed to the case 15. It will be understood by person skilled in the art that the I/O driver 60 is the same in many driver circuits and many which are used by an input device of a conventional type like a mouse which receives position data from equipment similar to a X-Y roller or this, or a trackball. This position data, and (constituted from the switches 31 and 32 by

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embodiment) data from the selection circuitry 30, It is transmitted to the processor 40 through the line 45 using a specific clock protocol like a RS-232 clock protocol (clocked-protocol) which the processor 40 can understand by the I/O driver 60. The processor 40 answers a signal sent to the processor 40 via the line 45, as shown in drawing 1, it moves a position of the cursor 29 to 29', and it makes information included on the display 20 change. The circuit 70 is a circuit of the special purpose of others, such as a modem, a paging device, and a sound card, which may be provided in order to perform some of functions of the equipment 10.

[0014]Drawing 4 thru/or drawing 6 show the electronic device of another embodiment of this invention. Drawing 4 is illustrating the equipment 100. The equipment 100 as well as the equipment 10 has the display 20 and the **** sensibility resistance 51 and 52. The hollows 101 and 102 are borne so that a user's thumb and the index finger may enter. Power is applied to the equipment 100 by the thumb and the index finger of the user who put on the hollows 101 and 102. Necessity [ **** sensibility resistance / two pieces ] since power is beforehand impressed to the **** sensibility resistance 51 and 52 in this embodiment so that the both sides of a positive pressure and negative pressure can be detected. In this embodiment, the equipment 100 is an alphanumeric character paging device with which appearance (not being a function) resembles the Advisor pager made from Motorola Corporation closely a little.

[0015]Drawing 5 is illustrating the equipment 200. For example, by depressing the display 20 in the index finger or the palm, the equipment 200 is pressed and power is applied to the equipment 200. It differs in the equipment 10 and 100, and the equipment 200 does not have the cursor 29, therefore it is necessary to detect no pressure of the directions of a multi-dimension side. Instead, the **** sensibility resistance 59 detects the power of the Z direction added to the upper surface of the equipment 200, and it is used in order to switch two or more operational modes of the equipment 200. In this embodiment, the equipment 200 is a clocking which functions as a stopwatch, a user's monitoring pulse, etc. and a multifunctional clock which can do other work, or an exercise monitor. A user only applies a pressure to the upper surface of the equipment 200 in various modes (for example, a pressure is applied two or more times for the merits and demerits of the duration time of application of pressure, and a short period of time), and can switch various operational modes, such as renewal of time. Please care about that there is not a key, a knob, a dial, a switch, or what kind of push button in the equipment 200, either. Only the pressure applied to the upper surface of equipment controls operation of the equipment 200.

[0016]By adding the **** sensibility resistance 59 to these pieces of equipment, the equipment 10 or 100 is correctable so that a pressure of a Z direction can also be detected. Capability and a function of the equipment 10 and 100 are strengthened by pressure detection capability in three dimensions. For example, by detection of a pressure in a Z direction, a function of the selection circuitry 30 (drawing 3) can be achieved, and the switches 31 and 32 can be

removed from the equipment 10. Or a switch of equipment can also only be cut by detection of a pressure in a Z direction, and the cursor 29 can also be moved a three-dimensional object displayed on the display 20, and within and without [ overlapping ] a window.

[0017]Drawing 6 is illustrating the equipment 300. Although size of the illustrated equipment 300 is the same as that of the equipment 200, a PDA function of more large-sized equipment like the equipment 10 can be performed. That is, although the usual PDA function which was similar to the equipment 300 with PDA based on pen operation like AppleNewton of "writing" in equipment can be performed, in this operation, a pen or other write-in apparatus are not used. A user moves the cursor 329 like a case where a pencil is moved on a paper, when writing operation is performed and a user writes a letter etc. by applying a pressure to the case 315 of the equipment 300 instead of a pen. The equipment 300 is not only electronic substitution of a paper, but actually substitutes the pencil itself. When the cursor 329 provides a user with feedback of a position, it is useful, but it does not need to be displayed to a user. The **** sensibility resistance 59 detects a pressure of a Z direction in the same mode as the above-mentioned case, and it can use it in order to control the equipment 300 by scrolling of a down/rise, selection of an item from a menu, etc.

[0018]Below, the examples of the mode of enforcement of this invention are enumerated.

[0019][Embodiment 1] A case, the information-display display incorporated in said case, and the processor which was accommodated in said case and connected to said display, It is combined with said case and said processor in operation, form the pressure sensor which detects the pressure added to said case, and it answers that said pressure sensor detected the pressure to said case, An electronic device with which said processor sends the signal which makes the information which said display displays change to said display.

[0020][Embodiment 2] An electronic device given in the embodiment 1, wherein said pressure sensor detects the pressure of the direction of Y of said case.

[0021][Embodiment 3] An electronic device given in the embodiment 2, wherein a change of said information displayed on said display is made by changing the position of the cursor on said display corresponding to the pressure detected in the direction of Y of said case.

[0022][Embodiment 4] An electronic device given in the embodiment 1, wherein said pressure sensor detects the pressure of the direction of X of said case.

[0023][Embodiment 5] An electronic device given in the embodiment 2, wherein a change of said information displayed on said display is made by changing the position of the cursor on said display corresponding to the pressure detected in the direction of X of said case.

[0024][Embodiment 6] An electronic device given in the embodiment 2, wherein said pressure sensor detects the pressure of the direction of X of said case.

[0025][Embodiment 7] An electronic device given in the embodiment 6, wherein a change of said information displayed on said display is made by changing the position of the cursor on

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said display corresponding to the pressure detected on the both sides of the direction of X of said case, and the direction of Y.

[0026][Embodiment 8] An electronic device given in the embodiment 7, wherein said pressure sensor has two or more **** sensibility resistance which detects a pressure on the both sides of the direction of X of said case, and the direction of Y, out of which it came and which it turned to, and has been arranged in said case.

[0027][Embodiment 9] An electronic device given in the embodiment 1 characterized by the operational mode of said electronic device switching among two or more operational modes by said change of said information displayed on said display.

[0028][Embodiment 10] An electronic device given in the embodiment 1, wherein said pressure sensor detects the pressure of the Z direction of said case.

[0029][Embodiment 11] An electronic device given in the embodiment 10 characterized by the operational mode of said electronic device switching among two or more operational modes by said change of said information displayed on said display.

[0030][Embodiment 12] An electronic device given in the embodiment 6, wherein said pressure sensor detects the pressure of the Z direction of said case.

[0031][Embodiment 13] An electronic device given in the embodiment 12, wherein change of said information displayed on said display is changing the position of the cursor on said display corresponding to the pressure detected by said direction of X of said case, said direction of Y, and said Z direction.

[0032][Embodiment 14] An electronic device given in the embodiment 8 having further a selection circuitry which performs operation corresponding to the position of said cursor on said display based on the information displayed on said display.

[0033][Embodiment 15] An electronic device given in the embodiment 6, wherein a change of said information on said display is made by writing in said equipment corresponding to the pressure detected on the both sides of said direction of X of said case, and said direction of Y.

[0034][Embodiment 16] An electronic device given in the embodiment 1, wherein said electronic device is a portable computer.

[0035][Embodiment 17] An electronic device given in the embodiment 1, wherein said electronic device is a paging device.

[0036][Embodiment 18] An electronic device given in the embodiment 1, wherein said electronic device is a clock.

[0037][Embodiment 19] In the method of changing the information displayed on the display of the electronic device which has the pressure sensor connected with the case, the processor, and said case and a processor in operation, A method said pressure sensor's having answered the step which detects the pressure added to said case, and said pressure detected on said case, and providing the step which changes the information displayed on said display.

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[0038][Embodiment 20] A method given in the embodiment 19, wherein said detection step detects the pressure of the direction of Y of said case.
[0039][Embodiment 21] A method given in the embodiment 20, wherein said change step is a step which changes the position of the cursor on said display corresponding to said pressure detected by Y of said case.
[0040][Embodiment 22] A method given in the embodiment 20, wherein said detection step detects the pressure of the direction of X of said case.
[0041][Embodiment 23] A method given in the embodiment 22, wherein said detection step is performed by changing the position of the cursor on said display corresponding to the pressure detected on the both sides of said direction of X of said case, and said direction of Y.
[0042][Embodiment 24] A method given in the embodiment 23 providing the step which performs operation corresponding to the position of said cursor on said display based on the information displayed on said display.
[0043][Embodiment 25] A method given in the embodiment 22, wherein said change step is a step written in said equipment corresponding to the pressure detected on the both sides of said direction of X of said case, and said direction of Y.
[0044][Embodiment 26] A method given in the embodiment 22, wherein said change step detects the pressure of the Z direction of said case.
[0045][Embodiment 27] A method given in the embodiment 26, wherein said change step is a step which changes the position of the cursor on said display corresponding to the pressure detected by said direction of X of said case, said direction of Y, and said Z direction.

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## EXAMPLE

[Working example]Drawing 1 is a top view of the electronic device 10 of the embodiment of this invention. The equipment 10 has the display 20 incorporated in the case 15. In an embodiment, the equipment 10 is a computer of portable [ which is generally called a personal digital assistant (PDA) ] or a wrist wearing type. The information 21 thru/or 29 is displayed on the display 20. The information 21 thru/or 23 is a soft key displayed on a part for the lower part of the display 20. The information 24 and 25 is header information and data like a telephone directory which is usually a part of PDA. The cursor 29 can move about on the display 20 so that it may explain in full detail behind. The selecting switches 31 and 32 perform operation like the button on a mouse or a trackball based on the information displayed on the display corresponding to the cursor position on a display. The selecting switches 31 and 32 are not indispensable so that it may mention later.
[0007]Please note that there is no mechanical keyboard connected with the equipment 10. When text input is required, the user can select the icon 22 of a keyboard. (Moving the cursor 29, for example on the keyboard icon 22, and clicking the selecting switch 31 twice) When the keyboard icon 22 is selected, a larger keyboard is displayed on the display 20 and can choose each key.
[0008]In the desirable embodiment, although the equipment 10 is a thing of the proper size and form of 100LX type palm top PC which applicant of this application is manufacturing, the display 20 is arranged on the upper surface of a circuit board, and the keyboard is deleted. Although the size of the equipment 10 may be arbitrary, probably, it will be clear to a person skilled in the art that it is preferred that it is the size which can be carried by a user's hand or can be applied to a user's wrist or a belt.
[0009]Since these sensors are having the field of view obstructed by the case 15, by drawing 1, the dotted line has shown the relative position of the pressure sensors 51 thru/or 54. The pressure sensors 51 thru/or 54 are some pressure sensors 50 (drawing 3), and are behind

explained in full detail about the operation. Probably, its thing good at least will be clear to a person skilled in the art, even if there is more number of a sensor, although four sensors which have turned to the right-angled direction to the sensor by which each adjoins are illustrated. In an embodiment, although a pressure sensor is feeling resistance of **** made from Interlink Electronics, for example, a pressure is convertible for an electronic signal, the parts of others like a strain gage may be sufficient. The term of "power" and a "pressure" shall be interexchangeably used by the description of the following of this Description.

[0010]If a pressure is impressed to the case 15 by a user's hand or the pressure source of others like the power 90 shown in drawing 1, the information 21 thru/or 29 displayed on the display 20 will change. The pressure of the direction of the both sides of X and Y of the case 15 is detected by the pressure sensors 51 thru/or 54. it was shown in drawing 1 -- as -- change of the information on a display -- the cursor 29 on the display 20 -- the position of 29' -- the time -- arranging -- having -- things -- it is . The position of the cursor 29 is changed corresponding to the pressure detected in the direction of X and Y of the case 15. In the example shown in drawing 1, in order that a user may move the cursor 29, the power 90 is applied to the case 15, and as a result, the user can perform operation about one item of a telephone directory called "Twinkle Toes Top Tap". Any of the acquisition of the dial of the selected telephone number and the detailed information see and concerning edit of an item and an item, etc. may be sufficient as the operation performed. Operation can be performed, the selecting switch 31 and/or various operations of 32, or when only specific time only stops the cursor 29 in the position of cursor 29'. In addition, another embodiment which added one or much more pressure sensors which detect the pressure in a Z direction instead of is also possible so that it may explain in detail by the back. [ the selecting switches 31 and 32 ] In order to control a motion of the cursor on a display by any embodiment, the input devices (a mouse, a trackball, etc.) of a key or others are unnecessary.

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## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The top view of the electronic device of the embodiment of this invention.
[Drawing 2]The sectional side elevation of the electronic device of the embodiment of this invention.
[Drawing 3]The block diagram of the electronic device of the embodiment of this invention.
[Drawing 4]The top view of the electronic device of another embodiment of this invention.
[Drawing 5]The top view of the electronic device of another embodiment of this invention.
[Drawing 6]The top view of the electronic device of another embodiment of this invention.
[Explanations of letters or numerals]
10: Electronic device
15: Case
20: Display
21, 22, 23, 24, 25: Information
29: Cursor
31, 32: Switch
51, 52, 53, 54: Power susceptibility resistance
90: Power

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## CLAIMS

[Claim(s)]
[Claim 1]A case, an information-display display incorporated in said case, and a processor which was accommodated in said case and connected to said display, It is combined with said case and said processor in operation, form a pressure sensor which detects a pressure added to said case, and it answers that said pressure sensor detected a pressure to said case, An electronic device with which said processor sends a signal which makes information which said display displays change to said display.

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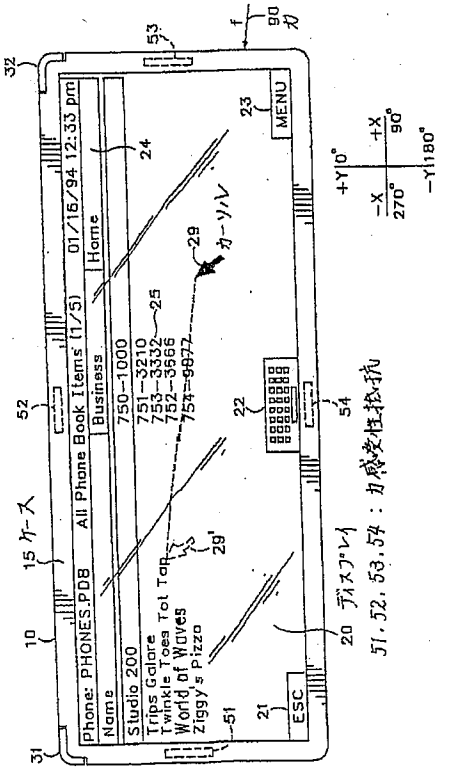
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(54)【発明の名称】　感圧性電子装置

(57)【要約】

【目的】超小型の電子機器から、入力用のキーやスイッチ類をできるだけ取り除くことによって、このような機器をより小さくする。

【構成】ケース１５に力センサ５１～５４を設け、ケースに力をかけることによって、カーソル２９の移動などの指示を与える。その他、力の与えかたによって、例えばマウスのボタンのクリックに相当する指示を与えるようにできる。






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【特許請求の範囲】
【請求項１】ケースと、
前記ケース内に組込んだ情報表示ディスプレィと、
前記ケース内に収容され、前記ディスプレィに接続されたプロセッサと、
前記ケース及び前記プロセッサと作動的に結合され、前記ケースに加わった圧力を検知する圧力センサとを設け、
前記圧力センサが前記ケースへの圧力を検知したことに応答して、前記ディスプレィが表示する情報を変更させる信号を前記プロセッサが前記ディスプレィに送る電子装置。
【発明の詳細な説明】
【０００１】
【発明の分野】本発明は電子回路の分野に関し、特に感圧性電子装置に関する。
【０００２】
【発明の背景】従来、多様な機能を実行できる電子装置は極めて大型であった。このような装置のサイズは主として、装置の機能を実行するために必要な回路のサイズによって規定された。真空管がこれらの機能を実行する大量の電子回路を構成した時代は、これらの装置のサイズは小さくとも卓上型（ＴＶ、ステレオ受信機）であり、部屋や建物全体を占めるようなサイズであることも多かった（コンピュータ）。このような装置では、装置自体が極めて大型であったので、ユーザが装置を制御できるキーボードやキー、スイッチ等の諸々の機器のためのスペースは問題ではなかった。
【０００３】しかし、テクノロジーが発展して、電子装置の機能を実行するために必要な回路の小型化は急激に進展した。真空管に代わってトランジスタが登場した。トランジスタに代わって集積回路が登場した。今日のＶＬＳＩ（超大規模集積）回路は単一チップ上に１００万個ものトランジスタを集積する能力を有している。電子装置用の回路の小型化とともに、装置自体も小型化してきた。かつては部屋全体を占めた電子装置も、現在では文字どおりユーザの手のひらや手首におさめることができる。
【０００４】進展中の電子装置の小型化は実際技術進展の革命であったが、問題がない訳ではなかった。そのような問題点の１つは、ユーザが装置を制御できるようにするキーボードやキー、スイッチ等の諸々の機器のためのスペースが、現在では電子装置のサイズを規定する決定的な要因となっている場合が多いことである。ユーザによる装置の制御のためのスペースを最小限に縮小できれば、コンピュータから時計までの全ての装置をより小型で、効率よくすることができるであろう。
【０００５】
【発明の概要】感圧性電子装置は、ディスプレィと、ケースと、プロセッサと、１つまたはもっと多くの力受感性抵抗のような圧力センサを有している。圧力センサがケースに加わった圧力を検知すると、ディスプレィに表示される情報が変更される。ケース上の１つまたはもっと多くの次元（Ｘ，Ｙ及び／またはＺ）での圧力が圧力センサによって検知される。最も一般的には、ディスプレィ上で変化する情報はディスプレィ上のカーソル位置の変化であるが、多様な動作モードへの切換え、及び／または書込みによっても可能である。カーソルはケースで検知された圧力の方向と大きさに対応してその位置が変化する。更に、ディスプレィ上のカーソル位置に対応する動作を実行するためにも圧力を利用できる。ディスプレィ上のカーソルの動きを制御し、動作を実行し、または装置の種々の動作モードを切換えるために、キーまたはその他の入力機器（マスウ、トラックボール等）は必要ない。
【０００６】
【実施例】図１は本発明の実施例の電子装置１０の平面図である。装置１０はケース１５内に組込まれたディスプレィ２０を有している。実施例では、装置１０は一般にパーソナル・ディジタル・アシスタント（ＰＤＡ）と呼ばれる携帯型、または手首装着式のコンピュータである。情報２１ないし２９がディスプレィ２０上に表示される。情報２１ないし２３はディスプレィ２０の下部分に表示されるソフト・キーである。情報２４及び２５はヘッダ情報及び、電話帳のような通常はＰＤＡの一部であるデータである。カーソル２９は、後に詳述するようにディスプレィ２０上を動きまわることができる。マウスまたはトラックボール上のボタンと同様に、選択スイッチ３１と３２が、ディスプレィ上のカーソル位置に対応して、ディスプレィ上に表示された情報に基づいて動作を実行する。後述するように、選択スイッチ３１と３２は必須ではない。
【０００７】装置１０と連結された機械式キーボードがないことに注目されたい。テキスト入力が必要な場合は、ユーザはキーボードのアイコン２２を選択できる。（例えばキーボード・アイコン２２上にカーソル２９を動かし、選択スイッチ３１を２度クリックして）キーボード・アイコン２２を選択した場合は、より大きいキーボードがディスプレィ２０上に表示され、個々のキーを選択できるようになる。
【０００８】好ましい実施例では、装置１０は本願出願人が製造している１００ＬＸ型パームトップＰＣの適宜のサイズと形状のものであるが、ディスプレィ２０は回路板の上面に配され、キーボードは削除されている。装置１０のサイズは任意でよいが、ユーザの手で携帯できるか、ユーザの手首、またはベルトに掛けることができるサイズであることが好ましいことが当業者には明らかであろう。
【０００９】圧力センサ５１ないし５４の相対位置は、これらのセンサがケース１５によって視界を阻まれてい


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るため、図１では点線で示してある。圧力センサ５１ないし５４は圧力センサ５０（図３）の一部であり、その動作については後に詳述する。それぞれが隣接するセンサに対して直角の方向を向いている４個のセンサを図示しているが、センサの個数はもっと多くても少なくてもよいことが当業者には明らかであろう。実施例では、圧力センサは例えばInterlink Electronics製の力受感抵抗であるが、圧力を電子信号に変換できる例えば歪みゲージのようなその他の部品でもよい。“力”及び“圧力”という用語は、この明細書の以下の記載では互換的に用いるものとする。

【００１０】ユーザの手、または図１に示した力９０のようなその他の圧力源によってケース１５に圧力が印加されると、ディスプレイ２０上に表示された情報２１ないし２９が変化する。ケース１５のＸとＹの双方の方向の圧力が圧力センサ５１ないし５４によって検知される。図１に示したように、ディスプレイ上での情報の変化は、ディスプレイ２０上のカーソル２９が２９’の位置に際配置されることである。カーソル２９の位置は、ケース１５のＸとＹの方向で検知された圧力に対応して変更される。図１に示した例では、ユーザはカーソル２９を動かすためにケース１５に力９０を加え、その結果、ユーザは"Twinkle Toes Top Tap"という電話帳の一項目についての動作を実行できる。実行される動作は、選択した電話番号のダイアル、見項目の編集、項目に関する詳細情報の取得などのうちのどれでもよい。動作は選択スイッチ３１及び／または３２の種々の操作によって、または単にカーソル２９を特定時間だけカーソル２９’の位置に留めておくことによって、実行できる。加えて、後により詳細に説明するように、選択スイッチ３１及び３２の代わりに、Ｚ方向での圧力を検知する１つまたはもっと多くの圧力センサを追加した別の実施例も可能である。いずれの実施例でも、ディスプレイ上のカーソルの動きを制御するためにキーまたはその他の入力機器（マウス、トラックボール等）は必要ない。

【００１１】図２は、本発明の実施例の電子装置１０の側断面図である。ケース１５は上部１５ａと、（１つまたはもっと多くの）側部１５ｂと、底部１５ｃを含んでいる。この実施例では、底部１５ｃは、テーブルまたはその他の同類の表面に置いた時に、装置１０が動かないような摩擦係数を有するゴム引材料、またはその他の材料からなっている。装置をその他の固定した面、または相対的に固定した面（例えばユーザが手首に掛ける時計バンド）に取付けたり、ユーザのベルトにページング装置のクレードルをクリップ止めしたり、単にユーザの手のひらで装置を持ったりする場合のように、ケース１５に加えられる外力を相殺する方法を採用した場合は、底部１５ｃをケース１５の別の部分と異なる材料にする必要はない。

【００１２】図３は本発明の実施例の電子装置１０のブロック図である。バッテリ８０が、ディスプレイ２０と、選択回路３０と、プロセッサ４０と、圧力センサ５０と、Ｉ／Ｏドライバ６０と、その他の回路７０に接続されている。前述したように、圧力センサ５０は４個の力受感性抵抗５１ないし５４を含んでいる。圧力センサ５０は更に、プルアップ用の固定抵抗５５ないし５８も含んでいる。プルアップ抵抗５５ないし５８は力受感性抵抗５１ないし５４とともに分圧器回路を構成している。入力線６１ないし６４上でＩ／Ｏドライバ６０に送られる信号は、力受感性抵抗５１ないし５４に加えられた力と比例する。力受感性抵抗５１ないし５４が図１に示した向きである場合は、入力線６４上の信号は、角度０°である＋Ｙ方向でケース１５に加えられた力に比例する。同様に、入力線６１上の信号は角度９０°である＋Ｘ方向に加えられた力と比例し、入力線６２上の信号は角度１８０°であるーＹ方向に加えられた力と比例し、入力線６３上の信号は角度２７０°であるーＸ方向に加えられた力と比例する。例えば、図１に示した力９０によって、入力線６３上の信号は力９０のーＸ方向の分力を示し、入力線６４上の信号は力９０のＹ方向の分力を示す。この実施例では二対の力受感性抵抗（一対の“Ｘ”抵抗５１、５３、及び一対の“Ｙ”抵抗５２、５４）を使用したが、抵抗５１と５２に所定量の力を予め印加しておくことにより、抵抗に対する“負圧”（例えば、図１の力９０によって抵抗５１及び５２にかかる力）を測定できれば、抵抗５３と５４は不要になることが当業者には明らかであろう。好ましい実施例では、ケース１５にかかる力の方向を正圧を測定する力受感性抵抗から発生される信号によって一意的に判定できるので、負圧を測定する“一対の”何らかの力受感性抵抗から発生される信号は（もし存在したとしても）単に無視されるだけである。

【００１３】入力線６１ないし６４上の信号の組合わせによって、Ｉ／Ｏドライバ６０はケース１５にいかなるＸーＹ力が印加されてもその方向及び力の量を一意的に判定できる。Ｉ／Ｏドライバ６０は、ＸーＹローラまたはこれに類似する装置から位置データを受けるマウスやトラックボールのような従来型の入力素子で用いられているドライバ回路と多くの面で同様であることが当業者には理解されよう。この位置データ、並びに（実施例ではスイッチ３１と３２から構成された）選択回路３０からのデータは、プロセッサ４０が理解できるＲＳ－２３２クロック・プロトコル（clocked-protocol）のような特定のクロック・プロトコルを利用して、Ｉ／Ｏドライバ６０によって線４５を経てプロセッサ４０に伝送される。プロセッサ４０は線４５を介してプロセッサ４０に送られた信号に応答して、図１に示したようにカーソル２９の位置を２９’に移動させて、ディスプレイ２０上に含まれる情報を変更せしめる。回路７０は、装置１０の機能の幾つかを実行するために設けてもよいモデム、



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ページング装置、サウンド・カード等のその他の特別な目的の回路である。

【００１４】図４ないし図６は本発明の別の実施例の電子装置を示している。図４は装置１００を図示している。装置１０と同様に、装置１００は、ディスプレイ２０と、力受感性抵抗５１及び５２を有している。窪み１０１及び１０２はユーザの親指と人指し指が入るよう担っている。窪み１０１と１０２に置いたユーザの親指と人指し指によって装置１００に力が加えられる。この実施例では、正圧と負圧の双方を検知できるように力受感性抵抗５１と５２に予め力を印加してあるので、力受感性抵抗は２個しか必要ない。この実施例では、装置１００は（機能ではなく）外見がMotorola Corporation製のAdvisorページャとやや似通っている英数字ページング装置である。

【００１５】図５は装置２００を図示している。例えば人指し指または手のひらでディスプレイ２０を押下げることによって、装置２００を押圧して力が装置２００に加えられる。装置１０及び１００とは異なり、装置２００はカーソル２９を有しておらず、従って多次元面での全ての方向の圧力を検知する必要はない。その代わりに、力受感性抵抗５９は装置２００の上面に加えられたＺ方向の力を検知し、装置２００の複数の動作モードを切換えるために利用される。この実施例では、装置２００はストップウォッチ、ユーザの脈拍モニタ等として機能するような、刻時、及びその他の作業を実行可能な多機能時計またはエクササイズ・モニタである。ユーザは装置２００の上面に種々の態様（例えば加圧の継続時間の長短、短期間で圧力を複数回加える等）で圧力を加えるだけで、時刻の更新等の種々の動作モードを切換えることができる。装置２００にはキー、つまみ、ダイアル、スイッチ、またはいかなる種類の押しボタンもないことに留意されたい。装置２００の動作を制御するのは装置の上面に加えられる圧力だけである。

【００１６】装置１０または１００は、これらの装置に力受感性抵抗５９を付加することによってＺ方向の圧力も検知できるように修正可能である。三次元での圧力検知能力によって、装置１０及び１００の能力と機能が強化される。例えば、Ｚ方向での圧力の検知によって、選択回路３０（図３）の機能を果たすことができ、スイッチ３１と３２を装置１０から除去することができる。あるいは、Ｚ方向での圧力の検知によって単に装置のスイッチを切ることもできるし、また、カーソル２９をディスプレイ２０上に表示された三次元のオブジェクトや重なったウインドゥの内外に移動させることもできる。

【００１７】図６は装置３００を図示している。図示された装置３００のサイズは装置２００と同一であるが、装置１０のようなより大型の装置のＰＤＡ機能を実行することができる。すなわち、装置３００には、Apple Newtonのようなペン操作を基本とするＰＤＡと類似した、装置への“書込み”という通常のＰＤＡ機能を実行することができるが、この操作ではペンあるいはその他の書込み機器を使用しない。ユーザはペンの代わりに、装置３００のケース３１５に圧力を加えることによって書込み動作を行って、ユーザが手紙等を書く時に用紙上で鉛筆を動かす場合と同様に、カーソル３２９を移動させる。実際に、装置３００は用紙の電子的な代用であるばかりではなく、鉛筆自体をも代用する。カーソル３２９はユーザに位置のフィードバックを提供する上で有用ではあるが、ユーザに対して表示される必要はない。力受感性抵抗５９は前述の場合と同様の態様でＺ方向の圧力を検知し、ダウン／アップのスクロール、メニューからの項目の選択等によって装置３００を制御するために利用できる。

【００１８】以下に、本発明の実施の態様の例を列挙する。

【００１９】〔実施態様１〕ケースと、前記ケース内に組込んだ情報表示ディスプレイと、前記ケース内に収容され、前記ディスプレイに接続されたプロセッサと、前記ケース及び前記プロセッサと作動的に結合され、前記ケースに加わった圧力を検知する圧力センサとを設け、前記圧力センサが前記ケースへの圧力を検知したことに応答して、前記ディスプレイが表示する情報を変更させる信号を前記プロセッサが前記ディスプレイに送る電子装置。

【００２０】〔実施態様２〕前記圧力センサが前記ケースのＹ方向の圧力を検知することを特徴とする実施態様１に記載の電子装置。

【００２１】〔実施態様３〕前記ディスプレイに表示される前記情報の変更は、前記ケースのＹ方向で検知された圧力に対応して、前記ディスプレイ上のカーソルの位置を変更することによって行われることを特徴とする実施態様２に記載の電子装置。

【００２２】〔実施態様４〕前記圧力センサが前記ケースのＸ方向の圧力を検知することを特徴とする実施態様１に記載の電子装置。

【００２３】〔実施態様５〕前記ディスプレイに表示される前記情報の変更は、前記ケースのＸ方向で検知された圧力に対応して、前記ディスプレイ上のカーソルの位置を変更することによって行われることを特徴とする実施態様２に記載の電子装置。

【００２４】〔実施態様６〕前記圧力センサが前記ケースのＸ方向の圧力を検知することを特徴とする実施態様２に記載の電子装置。

【００２５】〔実施態様７〕前記ディスプレイに表示される前記情報の変更は、前記ケースのＸ方向とＹ方向の双方で検知された圧力に対応して、前記ディスプレイ上のカーソルの位置を変更することによって行われることを特徴とする実施態様６に記載の電子装置。

【００２６】〔実施態様８〕前記圧力センサは、前記ケ



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ースのＸ方向とＹ方向の双方で圧力を検知するような向きで前記ケースに配置した複数個の力受感性抵抗を有することを特徴とする実施態様７に記載の電子装置。

【００２７】〔実施態様９〕前記ディスプレィ上に表示される前記情報の前記変更によって、前記電子装置の動作モードが複数の動作モード間で切換わることを特徴とする実施態様１に記載の電子装置。

【００２８】〔実施態様１０〕前記圧力センサが前記ケースのＺ方向の圧力を検知することを特徴とする実施態様１に記載の電子装置。

【００２９】〔実施態様１１〕前記ディスプレィ上に表示される前記情報の前記変更によって、前記電子装置の動作モードが複数の動作モード間で切換わることを特徴とする実施態様１０に記載の電子装置。

【００３０】〔実施態様１２〕前記圧力センサが前記ケースのＺ方向の圧力を検知することを特徴とする実施態様６に記載の電子装置。

【００３１】〔実施態様１３〕前記ディスプレィに表示される前記情報の変更が、前記ケースの前記Ｘ方向、前記Ｙ方向、及び前記Ｚ方向で検知された圧力に対応して、前記ディスプレィ上のカーソルの位置を変更することであることを特徴とする実施態様１２に記載の電子装置。

【００３２】〔実施態様１４〕前記ディスプレィ上の前記カーソルの位置に対応する動作を前記ディスプレィ上に表示された情報に基づいて実行する選択回路を更に備えたことを特徴とする実施態様８に記載の電子装置。

【００３３】〔実施態様１５〕前記ディスプレィ上の前記情報の変更が、前記ケースの前記Ｘ方向と前記Ｙ方向の双方で検知された圧力に対応して前記装置に書込むことによって行われることを特徴とする実施態様６に記載の電子装置。

【００３４】〔実施態様１６〕前記電子装置が携帯用コンピュータであることを特徴とする実施態様１に記載の電子装置。

【００３５】〔実施態様１７〕前記電子装置がページング装置であることを特徴とする実施態様１に記載の電子装置。

【００３６】〔実施態様１８〕前記電子装置が時計であることを特徴とする実施態様１に記載の電子装置。

【００３７】〔実施態様１９〕ケースと、プロセッサと、前記ケース及びプロセッサと作動的に連結された圧力センサとを有する電子装置のディスプレィ上に表示される情報を変更する方法において、前記圧力センサが前記ケースに加わった圧力を検知するステップと、前記ケース上で検知された前記圧力に応答して、前記ディスプレィに表示される情報を変更するステップ、とを設けたことを特徴とする方法。

【００３８】〔実施態様２０〕前記検知ステップが、前記ケースのＹ方向の圧力を検知することを特徴とする実施態様１９に記載の方法。

【００３９】〔実施態様２１〕前記変更ステップが、前記ケースのＹで検知された前記圧力に対応して前記ディスプレィ上のカーソルの位置を変更するステップであることを特徴とする実施態様２０に記載の方法。

【００４０】〔実施態様２２〕前記検知ステップが、前記ケースのＸ方向の圧力を検知することを特徴とする実施態様２０に記載の方法。

【００４１】〔実施態様２３〕前記検知ステップが、前記ケースの前記Ｘ方向と前記Ｙ方向の双方で検知された圧力に対応して前記ディスプレィ上のカーソルの位置を変更することによって行われることを特徴とする実施態様２２に記載の方法。

【００４２】〔実施態様２４〕前記ディスプレィ上の前記カーソルの位置に対応する動作を前記ディスプレィ上に表示された情報に基づいて実行するステップを設けたことを特徴とする実施態様２３に記載の方法。

【００４３】〔実施態様２５〕前記変更ステップが、前記ケースの前記Ｘ方向と前記Ｙ方向の双方で検知された圧力に対応して前記装置に書込むステップであることを特徴とする実施態様２２に記載の方法。

【００４４】〔実施態様２６〕前記変更ステップが、前記ケースのＺ方向の圧力を検知することを特徴とする実施態様２２に記載の方法。

【００４５】〔実施態様２７〕前記変更ステップが、前記ケースの前記Ｘ方向、前記Ｙ方向、及び前記Ｚ方向で検知された圧力に対応して前記ディスプレィ上のカーソルの位置を変更するステップであることを特徴とする実施態様２６に記載の方法。

【図面の簡単な説明】

【図１】本発明の実施例の電子装置の平面図。

【図２】本発明の実施例の電子装置の側断面図。

【図３】本発明の実施例の電子装置のブロック図。

【図４】本発明の別の実施例の電子装置の平面図。

【図５】本発明の別の実施例の電子装置の平面図。

【図６】本発明の別の実施例の電子装置の平面図。

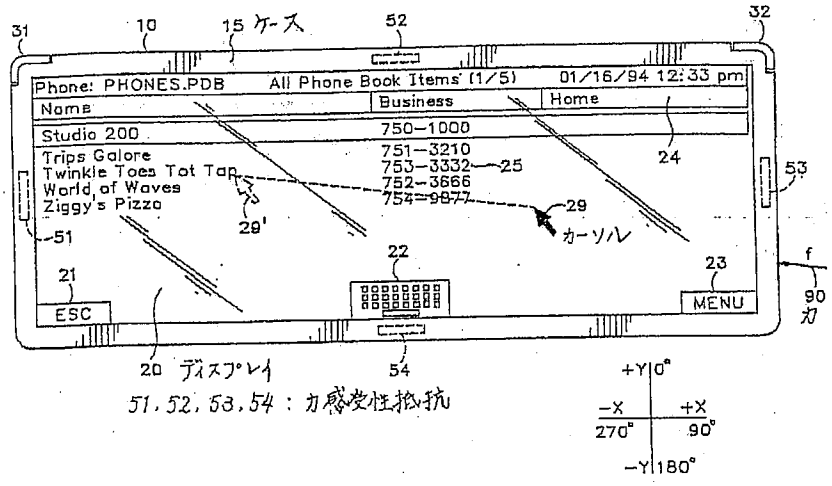
【符号の説明】

１０：電子装置
１５：ケース
２０：ディスプレィ
２１、２２、２３、２４、２５：情報
２９：カーソル
３１、３２：スイッチ
５１、５２、５３、５４：力感受性抵抗
９０：力

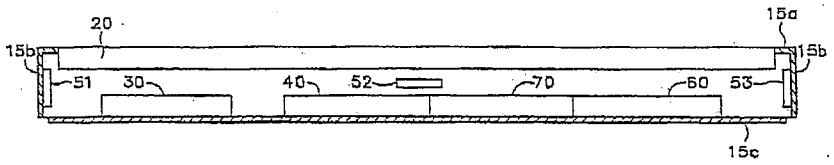


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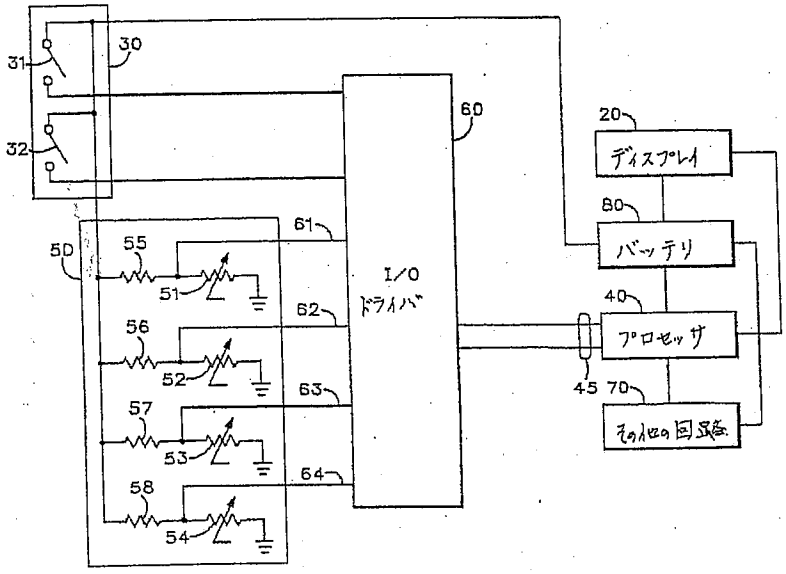
【図１】



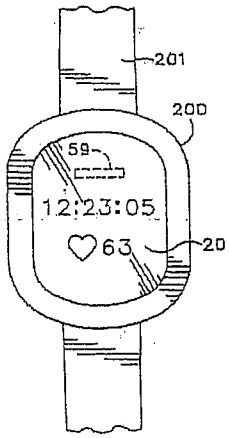

【図２】



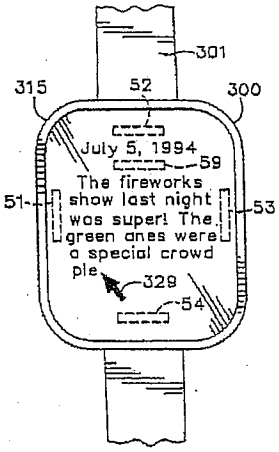

【図３】




【図５】



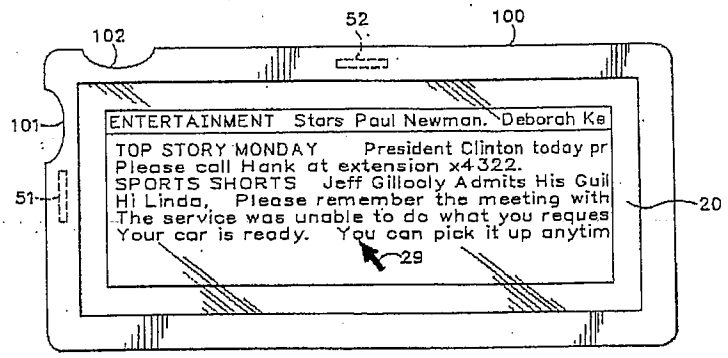

【図６】






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【図４】






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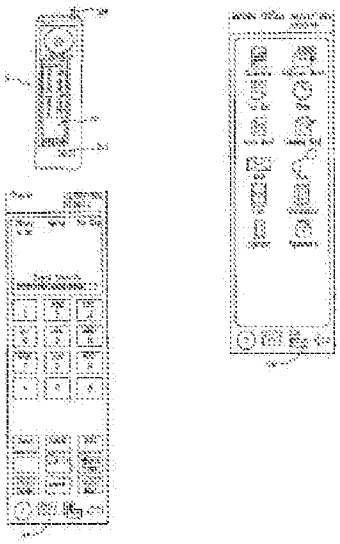
# EQUIPMENT AND METHOD FOR MARKING TEXT ON DISPLAY SCREEN OF PERSONAL COMMUNICATION EQUIPMENT

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**Applicant(s):** IBM +
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**- European:** G06F15/02D; G06F3/048A3; G06F3/048A3G; H04M1/2745G; H04M1/725F1; H04M1/725F1M; H04M1/725F4
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Abstract of **JP 8125724 (A)**

PROBLEM TO BE SOLVED: To efficiently retrieve specified data to be displayed by permitting a user to start a mark mode on the contact overlay film of a display device and marking a desired number of text. SOLUTION: The user can use a device 2 as a cellular telephone set by permitting the user to depress a telephone icon 26 at the lower part of a screen in the display device 10. The mark mode is started on the contact overlay film and the desired number or text is marked. Then, data can be retrieved. When the user touches an icon 28 at the lower part, a shift office screen is displayed. In a different application example which can be used in the data processing system of the device 2, the device 2 has the calendar, the note, the filer and the address book of the device itself. A facsimile operation is possible by the icon of the name of 'male'.; For making the device realize various communications, various communication links are synthesized to the device 2 apart from the cellular telephone set, and specified data is retrieved.



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3.In the drawings, any words are not translated.

## TECHNICAL FIELD

[Industrial Application]This invention relates to the personal data-processing communications system which has a touch detection display screen in details more about a data processing system.

[Translation done.]

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## DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]This invention relates to the personal data-processing communications system which has a touch detection display screen in details more about a data processing system.
[0002]
[Description of the Prior Art]This invention, It is related to the related application entitled "Field programming Apparatus and Methodfor Updating Programs in a Personal Communications Device" transferred to these people. The indication of said application is united on these Descriptions by reference.
[0003]The personal communication apparatus SIMON announced from IBM Corporation in 1994 includes many functions which make personal communications easy as indicated by the aforementioned application. As shown in drawing 1 and drawing 2, the appearance of the SIMON personal communication apparatus 2 resembles the cellular phone, and is actually a cellular phone. It is also an electronic pager. Transmission and reception of a facsimile and transmission and reception of an E-mail are possible further again. In the system 2, all of computer Note Pad, an address book, and a calendar are provided.
[0004]As shown in a figure, the system 2 The loudspeaker 4, the on-off switch 6, the volume control switches 8a and 8b, It has the touch detection screen 10, the PCMCIA card accommodation slot 12, the PCMCIA card discharge switch 14, the battery pack 16, the input and output connectors 18, and the microphone 20. The system 2 is provided also with the stylus 22 which can be used in order to have a dialog with the touch detection screen 10. However, please also care about that a user can use his finger instead of the stylus 22. In order to make it operate as cellular equipment, the antenna 24 can be extended from the main part of the equipment 2.

[0005]Since data is memorized in SIMON equipment (for example, inside of an address book) and a kind with various equipment itself of a fax message and an E-mail message can be received, in order for this system to become useful, it becomes indispensable that a user can search data easily. That is right especially when a telephone number is referred to from a display screen. Therefore, it is necessary for a user to be able to use the suitable information from the data memorized the message which received, or before from a display screen, pulling it out directly efficiently.

[0006]

[Problem to be solved by the invention]The purpose of this invention is to provide a user with the efficient method of marking a desired text on a touch detection screen.

[0007]Another purpose of this invention is to provide a user with the capability to take out the displayed information, in order to use it by one of much applications.

[0008]Another purpose of this invention is to provide a user with the capability to mark a text from the data memorized in the message which received, and the front.

[0009]

[Means for solving problem]In order that this invention can search the specific data displayed efficiently, the user can mark the number or text wished to have by starting Mark Mohd on the contact overlay film of a display device. In order to start Mark Mohd, the user has to touch a screen so that cursor may come immediately under a point of contact. As a result, cursor comes to answer the contact on a display screen. If a user touches a screen and makes a finger (stylus) slide at this time, cursor follows movement of the point of contact to slide. In order to mark a text (a character, a number, and a space are included), the user needs to direct the head of a text to mark. the user after placing cursor at the head of a request text -- a short period of time (this invention for example, about 0.5 - 1.0 second) -- the same position will continue being touched. If the period expires, a system will change from cursor slide operation Mohd to cursor mark Mohd. Next, it is shown that equipment sounded the beep sound and went into Mark Mohd.

[0010]The text in which the finger moved on it is marked after Mark Mohd's start, and the character count is memorized. If a user reaches in the end of the text which desires a mark, the point of contact will be made from a display device. At this time, the 1st beep sound shows a user that the beep sound of the 2nd different tone came out of equipment, and the marked text was received (namely, Mark Mohd's end). Next, the menu of the operation expressed by a function key or the icon appears on a display device. The marked text is displayed on a pop-up window almost simultaneous, and the user can check that the request text has been marked correctly. The application which a user pushes arbitrary function keys or icons, and uses the marked text can be started after the check of the marked text. The application by which activation was carried out is call application, and when the marked text is a telephone number,

the telephone number is called via the communication interface built into equipment.
[0011]
[Working example]If drawing 3 is referred to, the display device 10 of the personal communication apparatus of this invention can be chosen so that a user may have a telephone screen which enables it to use the equipment 2 as a cellular phone, when a user pushes the telephone icon 26 of a bottom of screen. . More detailed consideration of the touch detection display device was transferred to the same applicant as both this inventions, and applied on November 1, 1993. "Personal Communicator Having Improved Contrast Control For A Liquid Crystal,Touch Sensitive Display". And "Personal Communicator Having Improved Zoom and Pan Functions for Editing Information on Touch Sensitive Display". It is indicated to the U.S. patent application to entitle. The indication of these applications is united on these Descriptions by reference, respectively.
[0012]If the icon 28 of the lower part of a screen is touched, the move office screen shown in drawing 4 will be displayed. As shown in a figure, there is different application of some which can use the data processing system of the equipment 2. For example, the equipment 2 has the calendar, the memo pad and filer, and address book of equipment itself. Facsimile operation is possible by the icon of the name [ icon / of the name "e-mail" / operation / E-mail ] again "fax."
[0013]Various communication links are unified by the equipment 2 besides the radio link provided by a cellular phone so that communication with various equipment can be performed. The communication link of such various form is indicated to the related application referred to above.
[0014]More detailed consideration of the joint communication interface subsystem incorporated in the equipment 2, Related application "Integrated FAX Send/Receive on Cellular and PSTN" (IBMDocketNo.BC9-94-099), "Consistent User Interface for Cellular and PSTNEnvironments" (BC9-94-097), And all are indicated in part to "Modem Ring Indicate Signal From Either PSTN or Cellular System" (BC89-94-101). Said all applications are transferred to the same applicant as this invention, and unite these indications to this indication by reference, respectively.
[0015]Drawing 5 is the block diagram which the equipment 2 of this invention simplified. Only the component relevant to this invention is shown (more detailed explanation of various parts of the equipment 2 has appeared in the related application referred to first).
As shown in a figure, the processing unit 32 is connected to the system bus 30 of the system of this invention. The memory of the type with which a large number, such as RAM34, EPROM36, and the additional memory 38, differ is also connected to the system bus 30. The thing of the form of the PCMCIA (international personal computer memory card association) standard card inserted in the accommodation slot 12 of the equipment 2 may be sufficient as the memory 38. Refer to drawing 1. The memory 38 may contain excessive RAM or ROM for

memorizing the additional data used by a system. EPROM36 has memorized some of the applications which made reference all over the move office screen of drawing 4 into it, and were referred to as an icon. RAM34 is an operation memory for CPU32.

[0016]The touch detection screen controller 40 with which the function is influenced is also connected to the system bus 30 by the counter 42, and it is controlled by CPU32. A system clock may be actually sufficient as the counter 42. The tone generator 44 is controlled by the contact screen controller 40. The screen contact overlay 46 (referred to by said application of application on November 1, 1993) which detects a pressed point of contact, i.e., contact performed on the display device 10, is connected to the contact screen controller 40. It is connected to the bus 30 and LCD display device 10 which the contact overlay 46 piled up is also controlled by CPU32.

[0017]The cellular PSTN integrated interface 50 is connected to the system bus 30. This interface includes a cellular link which was illustrated by the antenna 52, serial port of a conventional type, the conventional telephone jack, and data / modem for fax messages for examination of this invention. A still more detailed examination of the various features of a communication subsystem of the equipment 2 is indicated to related application referred to first.

[0018]It discusses about drawing 6 in which an illustration E-mail message received by a system in operation of a system of this invention is shown. As illustrated, Screen 6A of drawing 6 displays a main menu showing "e-mail" icon shown in a move office screen of drawing 4. This screen should be taken out from system memory EPROM36, and please care about providing a user with an option which displays three sorts of different messages, i.e., an "incoming message", a "transmitting preparation-completion message", and a "storage message." Screen 6B shows three E-mail messages which the equipment 2 received. In order to search Screen 6B from Screen 6A, a user pressed the function key of a name of an "incoming message."

[0019]A user pushes the block which shows the outline of the message to see a specific message. For example, a user's push of the block with a title called "Joe Smith" will display the message about Joe Smith like Screen 6C, for example. As illustrated, Screen 6C is divided into the two fields 62, i.e., a text area, and the functional area 64. A text including a number, a character, and a space is displayed on the field 62, and some function keys and icons are displayed on the field 64. Therefore, the display of the equipment 2 returns from Screen 6C to Screen 6B by touching a backward arrow icon. By the same technique, if a telephone icon is pushed, the telephone screen shown in drawing 3 will appear. Similarly, when a move office icon (it indicated that an envelope was in front of letter paper) is pushed, the move office screen shown in drawing 4 appears. Reference is possible when a question mark is pushed. The function key and arrow key which were illustrated are considered to be explanation

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needlessness.

[0020]Since the equipment 2 is for communication, it will be useful if a specific portion of information displayed on a text area can be marked. It is especially important for a memo to which other kinds which are in an E-mail and a "memo pad" were written that this text can be marked. It is desirable that a specific text can be inputted without the necessity of writing down on space, from a message. When a user wanted to telephone a telephone number displayed on a screen before this invention, the user needed to write down the number first. The user has to return to a telephone screen after that. The user was able to telephone the number for the first time after that. This was inefficient.

[0021]In this invention, the user can mark a text on a screen directly on another applications instead of copying a desired text. A method of this invention is discussed in relation to drawing 7 thru/or drawing 9.

[0022]As shown in drawing 7, the telephone number of Joe Smith and Bob Jones which is persons detailed to financial reporting is appended to the lower end of the conference note of a meeting of the staff of Joe Smith. When a user wants to acquire the information on the addition about this staff meeting, of course, it is going to telephone Joe Smith or Bob Jones. A user assumes that it is going to telephone Joe Smith. The user can carry this out easily in a text to mark and this example on a screen first by doubling the cursor 66 with the position of the head of the telephone number of Joe Smith. A system is in cursor slide mode at this time, and since it is programmed to follow at the point of contact on a screen, a user performs this by touching a screen and moving a finger (or stylus) to the number of the beginning of the telephone number of Joe Smith. As shown in drawing 7, the cursor 66 is located just under "5" of the beginning of the telephone number of JoeSmith. At this time, a system is still cursor slide mode.

That is, cursor answers a motion of a user's finger and continues following it.

[0023]Since a user wants to mark a telephone number in order to use it later, it is necessary to start "Mark Mohd" of a system. A user performs this by holding a finger in the position in which only prescribed period of a screen is the same. In this embodiment of this invention, this period is considered to be about 0.5 - 1.0 second. In this system, this time is provided by the counter 42 (or system clock) of drawing 5. That is, the counter 42 functions as a timer which is under direct control of the contact screen controller 40, and the contact screen controller 40 receives an input that a user is in contact with a screen from the sensor overlay 46.

[0024]If judged with only time which needs a user's finger for the same position of a screen having been held, the screen controller 40 will carry out activation of the tone generator 44, a beep sound will be sounded, and a user will be told about a system having gone into Mark Mohd.

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[0025]If Mark Mohd's beep sound is heard, the user can move a finger on a screen and can mark a desired text. In order to continue Mark Mohd, please understand that a user has to continue contacting a screen after starting Mark Mohd. And as shown in drawing 8, a user moved the cursor 66 to number "4" of the last of a telephone number of Joe Smith. it is alike and takes, and a point of contact moved in an it top, or a text which the cursor 66 moves along with a desired text and in which the cursor 66 crossed an it top shows by the frame 68 of a dotted line -- as -- highlighting -- or it is highlighted and emphasized.
[0026]Mark Mohd is continued as long as a user maintains a finger on a screen. Therefore, the marked text can attain to ranges arbitrary from one character to the text area 62 whole. Mark Mohd will be ended if a user lifts a finger from a screen. Mark Mohd's end is shown by when the tone generator 44 generates the 2nd different beep sound from a beep sound which tells Mark Mohd's start.
[0027]As shown in drawing 9, a marked text is displayed on the pop-up window 70 in the end of Mark Mohd. A pop up screen provides a user with check that a suitable text was marked. Some function keys appear on [ other than the pop up screen 70 ] a screen. Various function keys provide an option which can be chosen about a marked text, respectively. For example, when a user judges that a right text was marked as a telephone number of Joe Smith, it can direct to telephone the number to a system by next pressing the "dial" function key 72. When a user's mind changes, mark release of the text can also be carried out by touching the function key 74. A marked text can also be canceled by pushing a backward arrow icon. Therefore, in this invention, the user can telephone something without the necessity of writing nothing down, directly by only marking a desired telephone number and subsequently pressing the "dial" function key.
[0028]A telephone number is marked and also other texts can also be marked in this invention. For example, when Bob Jones wants to count the number of times which appeared in the text, a user marks "Bob Jones" and should just press the "search" function key 76. "Search" function is extensible to other files held to various directories, such as various messages memorized to "e-mail" directory and a "memo pad" directory, and a "address book" directory.
[0029]. Were transferred to the applicant of this invention. "Apparatus and Method Therefor of Intelligently Searching for Information in a Personal Communications Divice"(BC8-94-0282 The text marked does not need to be a telephone number although the related application to entitle is examining the dialing of a telephone number in relation to the mark of a telephone number. If it says simply, in the aforementioned related application, the telephone number of JoeSmith can be directly telephoned by marking a suitable shortening search item, without referring to the telephone number itself. Some applications other than the application which a text is displayed and is marked can also use the marked text. For example, the marked telephone number which is shown in drawing 7 thru/or drawing 9 can be inserted in an address book,

especially the address of Joe Smith. Or if it says in more detail, when a user will consider that it is better to receive a telephone in Joe Smith later, in order to receive a telephone in Joe Smith in the future, the marked text can be routed to the "To Do" directory file.
[0030]Anyway, the marked number is sent to the cellular PSTN joint communication interface 50, in order to telephone a telephone number.
[0031]The operation which marks, ranks second and dials a text is shown in the flow chart of drawing 10. Operation begins from a scanning screen service routine as illustrated. This is one of the routines memorized by EPROM36 of the system.
Even if it is not all that work on equipment, it is used with a great portion of application.
Shortly after going into this routine, scanning screen service will supervise the button (or function key) displayed on the field 64 of the screen, an icon, and the text displayed on the field 62 of the screen. By the button press routine 802, it is judged whether one of a function key or the icons was pushed. With the block 804, it is judged whether a text area like 62 of drawing 6 was pushed. When a text area is pushed, it is the block 806A and cursor moves to the pushed position. Simultaneously, the timer which is the counter 42 or a system clock is set with the block 806B. Then, a judgment is further performed [ whether the text area was pushed and ] by the block 808. When not pushed, it returns to the block 802 and it is judged whether the function key or the icon was pushed.
[0032]When surely a text area is pushed, it is the block 810 and a judgment is performed [ whether it is the new cursor position and ]. In the case of the new cursor position, a processor judges [ that a system continues being in cursor slide mode and ], and a process returns to the blocks 806a and 806b, moves cursor to a new position, and resets a timer. When judged with the cursor position not having moved (i.e., when the user holds the finger in the same position on a screen), it is the block 812 and a judgment is performed [ whether the prescribed period passed by the processor, and ]. When a user does not hold a finger in the same position on a screen, a system will judge again whether a text area continue being contacted with the block 808, and will judge whether the user moved the finger with the block 810.
[0033]When cursor is judged as the predetermined period having passed after having been maintained by the same position, the beep sound which is the block 814 and was generated by the tone generator 44 sounds, and it progresses to Mark Mohd. A system continues scanning a touch detection display device, it is the block 816, and it is judged whether a text area is continue being contacted. When contacted [ continuing ], it is the block 818 and the marked text is marked on the field of the screen from the point that Mark Mohd started to a point of contact, highlighting or by highlighting. It continues until a system detects that a text area is no longer touched (i.e., until this stops that a user pushes a display screen). By release of contact, a user is told about the 2nd beep sound having been provided and Mark Mohd's having ended with the tone generator 44, by the block 820.

[0034]In order for the pointer in which the beginning of the marked text is shown simultaneously and the number of character counts, i.e., the marked text, to use it with another application, it is provided for memory storage, such as RAM34.

[0035]As mentioned above, one of the applications is the call origination application shown in drawing 9. When the marked number is displayed on the pop-up window 70 by the beginning of call origination application, another beep sound which is different from the beep sound outputted with the blocks 814 and 820 with the block 822a is provided by the tone generator 44. With the block 822b, it is considered that the pop-up window 70 is a check. Next, with the block 824, a system checks whether the marked text is the right. A right case touches the key 72 with the block 826, and calls the checked telephone number. When not right, it is the block 828 and the user can do mark release of the marked text by touching the mark release button 74. Then, a system is the block 830 and returns to call scanning screen service.

[0036]As a conclusion, the following matters are indicated about composition of this invention.

[0037](1) In computer systems which have a display screen which answers contact, A stage of being the method of marking information displayed on said display screen about alternative application, detecting contact to the (a) aforementioned screen, and establishing a starting position, (b) A stage where said contact detects that only a prescribed period was maintained in said starting position, and starts Mark Mohd, and after starting (c) aforementioned Mark Mohd, A method including a stage which marks information which it was displayed on said screen and said contact crossed from said starting position, and a stage which ends said Mark Mohd when the (d) aforementioned contact is removed from a screen.

(2) A stage where one of said the applications expresses a telephone number, and said marked information includes a communication interface means in said system including communication application, A method given in the above (1) which sends said marked information to said communication interface means, and is characterized by including further a stage which starts a call to said telephone number.

(3) A method given in the above (1) whose information displayed on said screen is characterized by including a stage where said stage (c) displays said marked information as highlighting or a highlighted text further including a text and an icon.

(4) A method given in the above (3) including further a stage of touching one of said icons on said screen, and initializing application, and a stage of using said marked text with said application.

(5) Including communication application, said marked information expresses a telephone number and one of said the applications includes a communication interface means in said system, A method given in the above (4), wherein said system includes further a stage which enables it to communicate with other communications systems, and a stage of sending said marked information to said communication interface means, and carrying out a communication

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interface to said telephone number.
(6) One of said the applications includes a communication interface means in said system including communication application, A stage where said system enables it to communicate with other communications systems, and a stage which displays said marked information as highlighting, A method given in the above (1) to which said marked information is characterized by including further a stage of checking expressing a desired telephone number, and a stage which sends said marked information to said communication interface means, and starts a call to said telephone number.
(7) A method given in the above (1) including further a stage of generating a tone when said Mark Mohd starts, and a stage of generating the 2nd tone when said Mark Mohd ends.
(8) It is the method of marking the information displayed on the touch detection display screen of computer systems, (a) The stage of establishing the 1st position of the cursor which touches said screen in the 1st position, is displayed on said screen, answers movement of contact on said screen, and moves, (b) When said 1st position continues describing said screen and only predetermined time maintains said cursor in said 1st position, A method including the stage which marks the information on the request which moves from said 1st position, touching the stage which starts Mark Mohd, and the (c) aforementioned screen, makes move said cursor, and is displayed on said screen, and the stage which stops touching the (d) aforementioned screen and ends said Mark Mohd.
(9) A method given in the above (8) including the stage which hears the 1st tone as directions with which said Mark Mohd was started, and the stage judged as having heard the 2nd tone and said Mark Mohd's having ended.
(10) The stage where said information displayed on said screen looks at the information on said request further as a text by which highlighting was carried out on said screen including a text, a function key, and an icon in a stage (c), A method given in the above (8) which touches one of said function key or the icons, and is characterized by including the stage which begins operation of application using said text by which highlighting was carried out.
(11) Said computer systems include a communication interface means further, A method given in the above (8) which checks that information touched and marked on another portion of said screen after said Mark Mohd's end is right, and is characterized by including further a stage where a call to a telephone number which has used said marked information is started.
(12) In a computer type communications system which has the cursor displayed on a touch detection display screen and said screen, (a) A stage where the 1st position as which a head of data corresponding to a telephone number is displayed describes on said screen, (b) A stage which only a prescribed period continues touching said 1st position of said screen, and starts Mark Mohd, (c) Move, touching from said 1st position on said screen to the 2nd position on said screen where an end of said telephone number data is displayed, A method including

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a stage which marks said telephone number data, a stage which ends contact of the (d) aforementioned screen and chooses said telephone number data, and a stage of touching a predetermined region on the (e) aforementioned screen, and making said communications system starting a call to said telephone number.

(13) A method given in the above (12) which builds a communication interface into said system and is characterized by said system including further a stage of enabling it to carry out cellular communication and PSTN communication both.

(14) A method given in the above (12) including further the stage which hears the 1st tone as a check by which said Mark Mohd was started, and the stage which hears the 2nd tone in the end of gradual (d).

(15) A method given in the above (12) to which the predetermined region on said screen is characterized by said stage's (e's)'s touching one of said function key showing calling operation, or the icons further, and including the stage of making said communications system starting said call to said telephone number, including a function key and an icon.

(16) When said contact to a touch detection display screen, a means to answer contact of the 1st position on said screen, and said 1st position on said screen exceeds a prescribed period, When it is a means to start Mark Mohd, and a means to mark the data which it was displayed on said screen and said contact moved after said Mark Mohd's start exceeding it from said 1st position and said contact is removed from said screen, Computer systems containing the means which said data is marked and said Mark Mohd ends.

(17) Computer systems given in the above (16) by which a communication interface means and a means to send said marked data to said communication interface means, and to carry out communication to the telephone number corresponding to said marked data being included further.

(18) Computer systems given in the above (16) containing a means to generate the 1st tone at least when said Mark Mohd starts, and to generate the 2nd tone when said Mark Mohd ends.

(19) Computer systems given in the above (16), wherein said Mark Mohd start means contains the means in comparison with the period when said contact was maintained by said 1st position in said predetermined period.

(20) Computer systems given in the above (16), wherein said display screen displays said marked data as highlighting or a highlighted text further.

(21) The touch detection display screen as which a text is displayed on it at least, A means to answer contact of said screen, a means to start Mark Mohd when only a prescribed period touches a certain position on said screen continuously, and after said Mark Mohd starts, The computer communication system which is a means to mark the text in which it was displayed on said screen and contact was performed without discontinuation on it, and contains the means which said Mark Mohd ends when continuous contact of said screen finishes.

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[Translation done.]

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is a perspective view of the personal communication apparatus of this invention.
[Drawing 2]It is a top view of the equipment of drawing 1.
[Drawing 3]It is an enlarged drawing of one available display screen of the equipment of drawing 1.
[Drawing 4]It is another illustration display screen of the equipment of drawing 1.
[Drawing 5]It is the block diagram which various components of the equipment of drawing 2 important for this invention simplified.
[Drawing 6]It is a schematic view by various display screens showing the illustration embodiment of this invention.
[Drawing 7]It is a figure showing the process of marking the text of the request on a display screen.
[Drawing 8]It is a figure showing the process of marking the text of the request on a display screen.
[Drawing 9]It is a figure showing the process of marking the text of the request on a display screen.
[Drawing 10]It is a flow chart which shows various processing stages of the method of this invention.
[Explanations of letters or numerals]
2 Equipment
4 Loudspeaker
6 On-off switch
8 Volume control switch
10 Touch detection screen
12 PCMCIA card accommodation slot

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14 PCMCIA card discharge switch
16 Battery pack
18 Input and output connectors
20 Microphone
22 Stylus
24 Antenna
62 Text area
64 Functional area
66 Cursor
70 Pop-up window
72 "Dial" function key

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[Translation done.]

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## CLAIMS

[Claim(s)]
[Claim 1]Computer systems which have a display screen which answers contact, comprising:
A stage of being how to mark information displayed on said display screen about alternative application, detecting contact to the (a) aforementioned screen and establishing a starting position.
(b) A stage where said contact detects that only a prescribed period was maintained in said starting position, and starts Mark Mohd.
(c) A stage which marks information which it was displayed on said screen and said contact crossed from said starting position after starting said Mark Mohd.
(d) A stage which ends said Mark Mohd when said contact is removed from a screen.

[Claim 2]A stage where one of said the applications expresses a telephone number, and said marked information includes a communication interface means in said system including communication application, A method according to claim 1 which sends said marked information to said communication interface means, and is characterized by including further a stage which starts a call to said telephone number.
[Claim 3]A method according to claim 1 that information displayed on said screen is characterized by said stage (c) including a stage which displays said marked information as highlighting or a highlighted text further including a text and an icon.
[Claim 4]A method of including further a stage of touching one of said icons on said screen, and initializing application, and a stage of using said marked text with said application according to claim 3.
[Claim 5]Including communication application, said marked information expresses a telephone number and one of said the applications includes a communication interface means in said system, A method according to claim 4, wherein said system includes further a stage which

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enables it to communicate with other communications systems, and a stage of sending said marked information to said communication interface means, and carrying out a communication interface to said telephone number.

[Claim 6]One of said the applications includes a communication interface means in said system including communication application, A stage where said system enables it to communicate with other communications systems, and a stage which displays said marked information as highlighting, A method according to claim 1 that said marked information is characterized by including further a stage of checking expressing a desired telephone number, and a stage which sends said marked information to said communication interface means, and starts a call to said telephone number.

[Claim 7]A method of including further a stage of generating a tone when said Mark Mohd starts, and a stage of generating the 2nd tone when said Mark Mohd ends according to claim 1.

[Claim 8]A method of marking information displayed on a touch detection display screen of computer systems, comprising:

(a) A stage of establishing the 1st position of cursor which touches said screen in the 1st position, is displayed on said screen, answers movement of contact on said screen, and moves.

(b) A stage which starts Mark Mohd when said 1st position continues describing said screen and only predetermined time maintains said cursor in said 1st position.

(c) A stage which marks information on a request which moves from said 1st position, touching said screen, makes move said cursor, and is displayed on said screen.

(d) A stage which stops touching said screen and ends said Mark Mohd.

[Claim 9]A method comprising according to claim 8:

A stage which hears the 1st tone as directions with which said Mark Mohd was started.

A stage judged as having heard the 2nd tone and said Mark Mohd's having ended.

[Claim 10]A method comprising according to claim 8:

A stage where said information displayed on said screen looks at information on said request further as a text by which highlighting was carried out on said screen including a text, a function key, and an icon in a stage (c).

A stage which touches one of said function key or the icons, and begins operation of application using said text by which highlighting was carried out.

[Claim 11]Said computer systems include a communication interface means further, A method according to claim 8 which checks that information touched and marked on another portion of

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said screen after said Mark Mohd's end is right, and is characterized by including further a stage where a call to a telephone number which has used said marked information is started.
[Claim 12]A computer type communications system which has the cursor displayed on a touch detection display screen characterized by comprising the following, and said screen.
(a) A stage where the 1st position as which a head of data corresponding to a telephone number is displayed describes on said screen.
(b) A stage which only a prescribed period continues touching said 1st position of said screen, and starts Mark Mohd.
(c) A stage which moves touching from said 1st position on said screen to the 2nd position on said screen where an end of said telephone number data is displayed, and marks said telephone number data.
(d) A stage which ends contact of said screen and chooses said telephone number data.
(e) A stage of touching a predetermined region on said screen and making said communications system starting a call to said telephone number.

[Claim 13]A method according to claim 12 which builds a communication interface into said system and is characterized by said system including further a stage of enabling it to carry out cellular communication and PSTN communication both.
[Claim 14]A method of including further a stage which hears the 1st tone as a check by which said Mark Mohd was started, and a stage which hears the 2nd tone in the end of gradual (d) according to claim 12.
[Claim 15]A method according to claim 12 that said stage (e) touches one of said function key showing calling operation, or the icons further including a function key and an icon, and a predetermined region on said screen is characterized by including a stage of making said communications system starting said call to said telephone number.
[Claim 16]When said contact to a touch detection display screen, a means to answer contact of the 1st position on said screen, and said 1st position on said screen exceeds a prescribed period, When it is a means to start Mark Mohd, and a means to mark data which it was displayed on said screen and said contact moved after said Mark Mohd's start exceeding it from said 1st position and said contact is removed from said screen, Computer systems containing a means which said data is marked and said Mark Mohd ends.
[Claim 17]The computer systems according to claim 16 by which a communication interface means and a means to send said marked data to said communication interface means, and to carry out communication to a telephone number corresponding to said marked data being included further.
[Claim 18]The computer systems according to claim 16 containing a means to generate the 1st tone at least when said Mark Mohd starts, and to generate the 2nd tone when said Mark Mohd

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ends.

[Claim 19]The computer systems according to claim 16, wherein said Mark Mohd start means contains a means in comparison with a period when said contact was maintained by said 1st position in said predetermined period.

[Claim 20]The computer systems according to claim 16 with which said display screen is further characterized by displaying said marked data as highlighting or a highlighted text.

[Claim 21]A computer communication system comprising:

A touch detection display screen as which a text is displayed on it at least.

A means to answer contact of said screen.

A means to start Mark Mohd when only a prescribed period touches a certain position on said screen continuously.

A means which said Mark Mohd ends when it is a means to mark a text in which it was displayed on said screen and contact was performed without discontinuation on it and continuous contact of said screen finishes, after said Mark Mohd started.

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[Translation done.]

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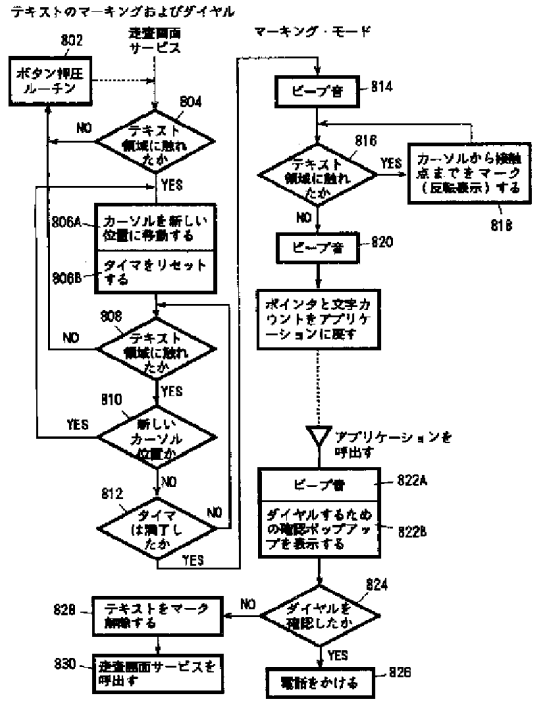
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(54)【発明の名称】　パーソナル通信装置の表示画面上でテキストをマークする装置および方法

(57)【要約】

【目的】　パーソナル・データ処理通信システムのタッチ検知表示画面上で所望のテキストをマークする効果的な方法を提供する。

【構成】　ある期間だけ同じ文字の上に位置が保持されたことをシステムが検出すると、システムはビープ音を鳴らして操作モードの変更があったことを示す。このマーキング・モードの開始後にユーザが接触画面から接触点を取り除くまでに接触点が通過したテキストがマークされる。マーキング・モードの終了および画面上での操作メニューの表示をユーザに知らせるために第２のビープ音が鳴る。操作メニューは、ユーザが確認できるように、マークされたテキストを再度表示する。ユーザは、マークされたテキストを使って電話をうける発呼アプリケーションを含むいくつかのアプリケーションで使用できる。




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【特許請求の範囲】
【請求項１】接触に応答する表示画面を有するコンピュータ・システムにおいて、選択的アプリケーションに関して前記表示画面に表示された情報をマークする方法であって、（ａ）前記画面への接触を検知して開始位置を確立する段階と、（ｂ）前記接触が前記開始位置に所定期間だけ維持されたことを検知してマーク・モードを開始する段階と、（ｃ）前記マーク・モードを開始した後で、前記画面に表示され前記接触が前記開始位置から横切った情報をマークする段階と、（ｄ）前記接触が画面から除去されたときに、前記マーク・モードを終了する段階とを含む方法。
【請求項２】前記アプリケーションの１つが通信アプリケーションを含み、前記マークされた情報が電話番号を表し、
前記システムに通信インターフェース手段を組み込む段階と、
前記マークされた情報を前記通信インターフェース手段に送って、前記電話番号に対する呼を開始する段階とをさらに含むことを特徴とする、請求項１に記載の方法。
【請求項３】前記画面上に表示された情報がテキストおよびアイコンを含み、
前記段階（ｃ）がさらに、前記マークされた情報を、強調表示または反転表示されたテキストとして表示する段階を含むことを特徴とする、請求項１に記載の方法。
【請求項４】前記画面上の前記アイコンのうちの１つに触れてアプリケーションを初期設定する段階と、
前記マークされたテキストを前記アプリケーションで利用する段階とをさらに含むことを特徴とする、請求項３に記載の方法。
【請求項５】前記アプリケーションの１つが通信アプリケーションを含み、前記マークされた情報が電話番号を表し、
前記システムに通信インターフェース手段を組み込んで、前記システムが他の通信システムと通信できるようにする段階と、
前記マークされた情報を前記通信インターフェース手段に送って、前記電話番号への通信接続を実施する段階とをさらに含むことを特徴とする、請求項４に記載の方法。
【請求項６】前記アプリケーションの１つが通信アプリケーションを含み、
前記システムに通信インターフェース手段を組み込んで、前記システムが他の通信システムと通信できるようにする段階と、
前記マークされた情報を強調表示として表示する段階と、
前記マークされた情報が所望の電話番号を表すことを確認する段階と、
前記マークされた情報を前記通信インターフェース手段に送って、前記電話番号への呼を開始する段階とをさらに含むことを特徴とする、請求項１に記載の方法。
【請求項７】前記マーク・モードが開始したときにトーンを発生する段階と、
前記マーク・モードが終了したときに第２のトーンを発生する段階と、
をさらに含むことを特徴とする、請求項１に記載の方法。
【請求項８】コンピュータ・システムのタッチ検知表示画面上に表示された情報をマークする方法であって、
（ａ）第１の位置で前記画面に触れて、前記画面に表示され前記画面上の接触の移動に応答して移動するカーソルの第１の位置を確立する段階と、（ｂ）前記第１の位置で前記画面に触れ続けて、前記カーソルを前記第１の位置に所定時間だけ維持することによって、マーク・モードを開始する段階と、（ｃ）前記画面に触れながら前記第１の位置から移動して、前記カーソルを移動させ、前記画面に表示されている所望の情報をマークする段階と、（ｄ）前記画面に触れるのを止めて前記マーク・モードを終了する段階とを含む方法。
【請求項９】前記マーク・モードが開始された指示として第１のトーンを聞く段階と、
第２のトーンを聞いて前記マーク・モードが終了したと判定する段階とを含むことを特徴とする、請求項８に記載の方法。
【請求項１０】前記画面に表示された前記情報がテキスト、機能キーおよびアイコンを含み、段階（ｃ）がさらに、
前記所望の情報を、前記画面上で強調表示されたテキストとして見る段階と、
前記機能キーまたはアイコンの１つに触れて、前記強調表示されたテキストを使用してアプリケーションの動作を始める段階とを含むことを特徴とする、請求項８に記載の方法。
【請求項１１】前記コンピュータ・システムがさらに通信インターフェース手段を含み、前記マーク・モードの終了後に、
前記画面の別の部分に触れて、マークされた情報が正しいことを確認し、前記マークされた情報を使ってある電話番号への呼が開始されるようにする段階とをさらに含むことを特徴とする、請求項８に記載の方法。
【請求項１２】タッチ検知表示画面および前記画面に表示されたカーソルを有するコンピュータ式通信システムにおいて、（ａ）電話番号に対応するデータの先頭が表示される第１の位置で前記画面上に触れる段階と、
（ｂ）前記画面の前記第１の位置に所定期間だけ触れ続けて、マーク・モードを開始する段階と、（ｃ）前記画面上の前記第１の位置から、前記電話番号データの末尾が表示される前記画面上の第２の位置まで触れながら移動して、前記電話番号データをマークする段階と、

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（ｄ）前記画面の接触を終了して、前記電話番号データを選択する段階と、（ｅ）前記画面上の所定領域に触れて、前記通信システムに前記電話番号への呼を開始させる段階とを含む方法。
【請求項１３】前記システムに通信インターフェースを組み込んで、前記システムがセルラ通信とＰＳＴＮ通信を両方とも実施できるようにする段階とをさらに含むことを特徴とする、請求項１２に記載の方法。
【請求項１４】前記マーク・モードが開始された確認として第１のトーンを聞く段階と、
段階（ｄ）の終りに第２のトーンを聞く段階とをさらに含むことを特徴とする、請求項１２に記載の方法。
【請求項１５】前記画面上の所定領域が機能キーおよびアイコンを含み、前記段階（ｅ）がさらに、
発呼動作を表す前記機能キーまたはアイコンの１つに触れて、前記通信システムに前記電話番号への前記呼を開始させる段階とを含むことを特徴とする、請求項１２に記載の方法。
【請求項１６】タッチ検知表示画面と、
前記画面上の第１の位置の接触に応答する手段と、
前記画面上の前記第１の位置への前記接触が所定期間を越えたとき、マーク・モードを開始する手段と、
前記マーク・モードの開始後に、前記画面上に表示され前記接触が前記第１の位置からそれを越えて移動したデータをマークする手段であって、前記接触が前記画面から取り除かれたとき、前記データがマークされ、前記マーク・モードが終了する手段とを含むコンピュータ・システム。
【請求項１７】通信インターフェース手段と、
前記マークされたデータを前記通信インターフェース手段に送って、前記マークされたデータに対応する電話番号への通信を実施する手段とをさらに含むことを特徴とする、請求項１６に記載のコンピュータ・システム。
【請求項１８】少なくとも、前記マーク・モードが開始したときに第１のトーンを生成し、前記マーク・モードが終了したときに第２のトーンを生成する手段を含むことを特徴とする、請求項１６に記載のコンピュータ・システム。
【請求項１９】前記マーク・モード開始手段が、
前記所定の期間を、前記接触が前記第１の位置に維持された期間と比較する手段を含むことを特徴とする、請求項１６に記載のコンピュータ・システム。
【請求項２０】前記表示画面がさらに、前記マークされたデータを強調表示または反転表示されたテキストとして表示することを特徴とする、請求項１６に記載のコンピュータ・システム。
【請求項２１】少なくともテキストがその上に表示されるタッチ検知表示画面と、
前記画面の接触に応答する手段と、
前記画面上のある位置に所定期間だけ連続的に触れたときにマーク・モードを開始する手段と、
前記マーク・モードが開始した後で、前記画面上に表示され中断なしにその上で接触が行われたテキストをマークする手段であって、前記画面の連続的な接触が終わったときに前記マーク・モードが終了する手段とを含むコンピュータ通信システム。
【発明の詳細な説明】
【０００１】
【産業上の利用分野】本発明は、データ処理システムに関し、より詳細にはタッチ検知表示画面を有するパーソナル・データ処理通信システムに関する。
【０００２】
【従来の技術】本発明は、本出願人に譲渡された"Field programming Apparatus and Methodfor Updating Programs in a Personal Communications Device"と題する関連出願に関係する。前記出願の開示を、参照により本明細書に合体する。
【０００３】前記の出願に開示されているように、１９９４年にＩＢＭコーポレイションから発表されたパーソナル通信装置ＳＩＭＯＮは、パーソナル通信を容易にする多くの機能を含んでいる。図１と図２に示したように、ＳＩＭＯＮパーソナル通信装置２の外観はセルラ電話に似ており、また実際にセルラ電話である。さらに、電子ページャでもある。さらにまた、ファクシミリの送受信ならびに電子メールの送受信が可能である。さらに、システム２中には、コンピュータ・ノート・パッド、住所録およびカレンダがすべて提供される。
【０００４】図に示すように、システム２は、スピーカ４、オン・オフ・スイッチ６、音量調整スイッチ８ａおよび８ｂ、タッチ検知画面１０、ＰＣＭＣＩＡカード収容スロット１２、ＰＣＭＣＩＡカード放出スイッチ１４、バッテリ・パック１６、入出力コネクタ１８およびマイクロホン２０を有する。また、システム２は、タッチ検知画面１０と対話するために使用できるスタイラス２２も備える。ただし、スタイラス２２の代わりに、ユーザが自分の指を使うこともできることに留意されたい。セルラ装置として動作させるために、装置２の本体からアンテナ２４を延ばすことができる。
【０００５】データがＳＩＭＯＮ装置内（たとえば、住所録内）に記憶され、装置自体が様々な種類のファックス・メッセージおよび電子メール・メッセージを受け取ることができるので、このシステムが有用となるためには、データをユーザが簡単に検索できることが必須になる。電話番号が表示画面から参照される場合には特にそうである。したがって、ユーザが、受信したメッセージまたは以前に記憶されたデータからの適切な情報を、表示画面から直接効率的に引き出して使用できることが必要となっている。
【０００６】
【発明が解決しようとする課題】本発明の目的は、タッ

チ検知画面上で所望のテキストをマークする効率的な方法をユーザに提供することである。
【０００７】本発明のもう１つの目的は、多数のアプリケーションのうちの１つで使用するために、表示された情報を取り出す能力をユーザに提供することである。
【０００８】本発明のもう１つの目的は、受信したメッセージおよび前に記憶されたデータからテキストをマークする能力をユーザに提供することである。
【０００９】
【課題を解決するための手段】本発明は表示される特定のデータを効率的に検索できるようにするために、ユーザは、表示装置の接触オーバレイ膜上でマーク・モードを開始することにより希望する数字またはテキストをマークすることができる。マーク・モードを開始するには、ユーザはカーソルが接触点のすぐ下にくるように画面に触れなければならない。その結果、カーソルが表示画面上での接触に応答するようになる。このときユーザが画面に触れ、指（スタイラス）をスライドさせると、カーソルはスライドする接触点の移動に追従する。テキスト（文字、番号およびスペースを含む）をマークするには、ユーザは、マークしたいテキストの先頭を指示する必要がある。カーソルを所望テキストの先頭に置いた後、ユーザは短期間（本発明ではたとえば約０．５～１．０秒）同じ位置に触れ続けることになる。その期間が終ると、システムはカーソル・スライド動作モードからカーソル・マーク・モードに変わる。次に、装置はビープ音を鳴らしてマーク・モードに入ったことを示す。
【００１０】マーク・モードの開始後、指がその上を動いたテキストがマークされ、その文字カウントが記憶される。ユーザがマークを望むテキストの終りに達すると、その接触点を表示装置からはなす。このとき、第１のビープ音とは異なる第２のトーンのビープ音が装置から出て、マークしたテキストが受け入れられたこと（すなわち、マーク・モードの終了）をユーザに示す。次に、機能キーまたはアイコンによって表される動作のメニューが表示装置上に現れる。ほぼ同時に、マークされたテキストがポップアップ・ウィンドウに表示され、ユーザは所望テキストが正しくマークされたことを確認することができる。マークされたテキストの確認後、ユーザは任意の機能キーまたはアイコンを押して、マークされたテキストを利用するアプリケーションを開始することができる。活動化されたアプリケーションが呼アプリケーションであり、マークされたテキストが電話番号のとき、装置に組み込まれた通信インターフェースを介してその電話番号が呼び出される。
【００１１】
【実施例】図３を参照すると、本発明のパーソナル通信装置の表示装置１０は、画面下部の電話アイコン２６をユーザが押すことによって、ユーザが装置２をセルラ電話として使用できるようにする、電話画面を有するように選択できる。タッチ検知表示装置のより詳しい考察は、共に本発明と同じ出願人に譲渡され１９９３年１１月１日に出願された、"Personal Communicator Having Improved Contrast Control For A Liquid Crystal,Touch Sensitive Display"および"Personal Communicator Having Improved Zoom and Pan Functions for Editing Information on Touch Sensitive Display"と題する米国特許出願に記載されている。これらの出願の開示をそれぞれ参照により本明細書に合体する。
【００１２】画面の下部のアイコン２８に触れると、図４に示した移動オフィス画面が表示される。図から分かるように、装置２のデータ処理システムが使用できるいくつかの異なるアプリケーションがある。たとえば、装置２は、装置自体のカレンダとメモ帳ならびにファイラと住所録を有する。さらに、「メール」という名称のアイコンにより電子メール操作が、また「ファックス」という名称のアイコンによりファクシミリ操作が可能である。
【００１３】装置が様々な通信を行えるように、セルラ電話によって提供される無線リンクの他にも様々な通信リンクが装置２に統合されている。これらの様々な型式の通信リンクは、上記で参照した関連出願に記載されている。
【００１４】装置２内に組み込まれた統合通信インターフェース・サブシステムのより詳細な考察は、関連出願"Integrated FAX Send/Receive on Cellular and PSTN"(IBMDocket No.BC9-94-099)、"Consistent User Interface for Cellular and PSTNEnvironments"(BC9-94-097)、および"Modem Ring Indicate Signal From Either PSTN or Cellular System"(BC89-94-101)に一部または全部が記載されている。前記出願はすべて本発明と同じ出願人に譲渡され、これらの開示をそれぞれ参照により本開示に合体する。
【００１５】図５は、本発明の装置２の簡略化したブロック図であり、本発明に関連する構成要素だけを示す（装置２の様々な部品のより詳しい説明は、最初に参照した関連出願に出ている）。図のように、本発明のシステムのシステム・バス３０には処理装置３２が接続されている。また、ＲＡＭ３４、ＥＰＲＯＭ３６、追加メモリ３８などの多数の異なるタイプのメモリも、システム・バス３０に接続されている。メモリ３８は、装置２の収容スロット１２に差し込まれたＰＣＭＣＩＡ（国際パーソナル・コンピュータ・メモリ・カード協会）標準カードの形のものでもよい。図１を参照のこと。メモリ３８は、システムで使用される追加データを記憶するための余分のＲＡＭまたはＲＯＭを含むこともある。ＥＰＲＯＭ３６はその中に、図４の移動オフィス画面中で言及しアイコンとして参照したアプリケーションのうちのいくつかを記憶している。ＲＡＭ３４は、ＣＰＵ３２用の作業メモリである。

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【００１６】システム・バス３０には、カウンタ４２によってその機能が左右されるタッチ検知画面制御装置４０も接続され、ＣＰＵ３２によって制御される。カウンタ４２は、実際にはシステム・クロックでよい。接触画面制御装置４０によってトーン発生器４４が制御される。さらに、接触画面制御装置４０には、押圧された接点、すなわち表示装置１０上で行われた接触を検知する画面接触オーバレイ４６（１９９３年１１月１日出願の前記出願で参照された）が接続されている。接触オーバレイ４６が重ねられたＬＣＤ表示装置１０も、バス３０に接続されＣＰＵ３２によって制御される。

【００１７】さらに、システム・バス３０には、セルラＰＳＴＮ統合インターフェース５０が接続されている。このインターフェースは、本発明の検討のためにアンテナ５２、従来型のシリアル・ポート、従来の電話ジャックおよびデータ／ファックス通信用モデムによって例示されたようなセルラ・リンクを含む。装置２の通信サブシステムの様々な特徴のさらに詳しい検討は、最初に参照した関連出願に記載されている。

【００１８】本発明のシステムの動作を、システムによって受信された例示的な電子メール・メッセージを示す図６に関して論じる。図示したように、図６の画面６Ａは、図４の移動オフィス画面に示された「メール」アイコンを表すメイン・メニューを表示する。この画面は、システム・メモリＥＰＲＯＭ３６から取り出され、異なる３種のメッセージ、すなわち「受信メッセージ」、「送信準備完了メッセージ」および「保管メッセージ」を表示するオプションをユーザに提供することに留意されたい。画面６Ｂは、装置２が受け取った３つの電子メール・メッセージを示す。画面６Ａから画面６Ｂを検索するために、「受信メッセージ」という名前の機能キーをユーザが押した。

【００１９】ユーザは特定のメッセージを見たいとき、そのメッセージの概要を示すブロックを押す。たとえば、ユーザが"Joe Smith"という見出しのついたブロックを押すと、たとえば画面６ＣのようなJoe Smithに関するメッセージが表示される。図示したように、画面６Ｃは、２つの領域、すなわちテキスト領域６２と機能領域６４に分割される。領域６２には数字、文字およびスペースを含むテキストが表示され、領域６４にはいくつかの機能キーとアイコンが表示される。したがって、後向きの矢印アイコンに触れることにより、装置２の表示が画面６Ｃから画面６Ｂに戻る。同じ手法で、電話アイコンを押すと、図３に示した電話画面が現れる。同様に、移動オフィス・アイコン（便箋の前に封筒があるように示された）を押した場合は、図４に示した移動オフィス画面が現れる。疑問符を押した場合は、照会ができる。図示した機能キーと矢印キーは説明不要と思われる。

【００２０】装置２が通信用のものであるため、テキスト領域に表示された情報の特定の部分をマークできれば有用であろう。このテキストをマークできることは、電子メールおよび「メモ帳」の中にあるような他の種類の書かれたメモには特に重要なものである。さらに、紙面に書き留める必要なしにメッセージから特定のテキストをキー入力できることが望ましい。本発明以前は、ユーザが画面上に表示された電話番号に電話をかけたい場合、ユーザはまずその番号を書き留める必要があった。その後ユーザは、電話画面に戻らなければならない。その後で初めて、ユーザはその番号に電話をかけることができた。これは能率が悪かった。

【００２１】本発明では、ユーザは、所望のテキストをコピーする代わりに、別のアプリケーション用に画面上のテキストを直接マークすることができる。本発明の方法を、図７ないし図９に関連して論じる。

【００２２】図７に示すように、Joe Smithのスタッフの会議の議事録の下端に、Joe Smithと財務報告に詳しい人物であるBob Jonesの電話番号が付記されている。ユーザがこのスタッフ会議に関する追加の情報を得たいときは、もちろんJoe SmithまたはBob Jonesに電話をかけようとする。ユーザがJoe Smithに電話をかけようとしているものと想定する。ユーザはまず、画面上で、マークしたいテキスト、この例ではJoe Smithの電話番号の先頭の位置に、カーソル６６を合わせることによってこれを簡単に実施できる。この時システムはカーソル・スライド・モードにあり、画面上の接触点に追従するようにプログラムされているので、ユーザは画面に触って指（またはスタイラス）をJoe Smithの電話番号の最初の数字に移動することによってこれを行う。図７に示したように、カーソル６６は、JoeSmithの電話番号の最初の"５"の真下に位置する。このとき、システムは、カーソル・スライド・モードのままであり、つまり、カーソルはユーザの指の動きに応答してそれに追従し続ける。

【００２３】ユーザは後で使用するために電話番号をマークしたいので、システムの「マーク・モード」を開始する必要がある。ユーザは指を所定期間だけ画面の同じ位置に保持することによってこれを行う。本発明のこの実施例では、この期間はおよそ０．５～１．０秒と考えられる。本システムでは、この時間は図５のカウンタ４２（またはシステム・クロック）によって提供される。すなわち、カウンタ４２は、接触画面制御装置４０に直属するタイマとして機能し、接触画面制御装置４０はユーザが画面に接触しているという入力をセンサ・オーバレイ４６から受け取る。

【００２４】ユーザの指が画面の同じ位置に必要な時間だけ保持されていたと判定されると、画面制御装置４０はトーン発生器４４を活動化してビープ音を鳴らし、システムがマーク・モードに入ったことをユーザに知らせる。

【００２５】マーク・モードのビープ音を聞くと、ユー

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ザは画面上で指を移動して所望のテキストをマークすることができる。マーク・モードを続けるためには、マーク・モードを開始した後で、ユーザが画面に接触し続けなければならないことを理解されたい。そして、図８に示したように、ユーザはJoe Smithの電話番号の最後の数字”４”までカーソル６６を移動した。カーソル６６が所望のテキストに沿って移動するにつれて、接触点がその上を移動したまたはカーソル６６がその上を横切ったテキストが、点線の枠６８で示すように、強調表示または反転表示されて強調される。

【００２６】マーク・モードは、ユーザが指を画面上に維持する限り継続する。したがって、マークされたテキストは１文字からテキスト領域６２全体まで任意の範囲に及ぶことができる。マーク・モードはユーザが指を画面から離すと終了する。マーク・モードの終了は、マーク・モードの開始を知らせるビープ音とは異なる第２のビープ音をトーン発生器４４が生成することによって示される。

【００２７】マーク・モードの終りに、図９に示すように、マークされたテキストがポップアップ・ウィンドウ７０に表示される。ポップアップ画面は、適切なテキストがマークされたという確認をユーザに提供する。ポップアップ画面７０の他にも、画面上にいくつかの機能キーが現れる。様々な機能キーはそれぞれ、マークされたテキストに関して選ぶことのできるオプションを提供する。たとえば、ユーザが、Joe Smithの電話番号として正しいテキストがマークされたと判断した場合は、次に「ダイヤル」機能キー７２を押すことにより、その番号に電話をかけるようシステムに指示することができる。また、ユーザの気が変わった場合は、機能キー７４に触れることによってそのテキストをマーク解除することもできる。さらに、後ろ向きの矢印アイコンを押すことによって、マークされたテキストを取り消すこともできる。したがって、本発明では、何も書き留める必要なしに、ユーザは、単に所望の電話番号をマークし、次いで「ダイヤル」機能キーを押すことによって、何かに直接電話をかけることができる。

【００２８】電話番号をマークする他に、本発明では他のテキストをマークすることもできる。たとえば、ユーザは、Bob Jonesがテキストに現れた回数を調べたい場合、”Bob Jones”をマークし「探索」機能キー７６を押すだけでよい。「探索」機能は、「メール」ディレクトリに記憶された様々なメッセージ、ならびに「メモ帳」ディレクトリや「住所録」ディレクトリなど様々なディレクトリに保持された他のファイルに拡張することができる。

【００２９】本発明の出願人に譲渡された、”Apparatus and Method Therefor of Intelligently Searching for Information in a Personal Communications Divice”(BC8-94-0282)と題する関連出願では、電話番号のマークに関連して電話番号のダイヤル呼出しを検討しているが、マークされるテキストは電話番号である必要はない。簡単に言うと、前記の関連出願では、適切な短縮探索項目をマークすることによって、電話番号自体を参照することなしにJoe Smithの電話番号に直接電話をかけることができる。さらに、マークされたテキストは、テキストが表示されマークされているアプリケーション以外のいくつかのアプリケーションも使用できる。たとえば、図７ないし図９に示すマークされた電話番号を、住所録、特にJoe Smithの住所に挿入することができる。あるいは、さらに詳しく言うと、ユーザがJoe Smithに後で電話をうける方がよいと思う場合は、Joe Smithに将来電話をうけるために、マークされたテキストを「Ｔｏ　Ｄｏ」ディレクトリ・ファイルに経路指定することができる。

【００３０】いずれにせよ、マークされた番号は、電話番号に電話をかけるためにセルラＰＳＴＮ統合通信インターフェース５０に送られる。

【００３１】テキストをマークし次いでダイヤルする動作を、図１０のフローチャートに示す。図示した通り、動作は走査画面サービス・ルーチンから始まる。これは、システムのＥＰＲＯＭ３６に記憶されたルーチンの１つであり、装置上で稼働する全部でなくとも大部分のアプリケーションで使用される。このルーチンに入るとすぐに、走査画面サービスが、画面の領域６４に表示されたボタン（または機能キー）およびアイコン、ならびに画面の領域６２に表示されたテキストを監視する。ボタン押圧ルーチン８０２で、機能キーまたはアイコンの１つが押されたかどうかが判定される。ブロック８０４で、図６の６２のようなテキスト領域が押されたかどうかが判定される。テキスト領域が押された場合は、ブロック８０６Ａで、押された位置にカーソルが移動する。同時に、ブロック８０６Ｂで、カウンタ４２またはシステム・クロックであるタイマがセットされる。その後、ブロック８０８で、テキスト領域が押されたかどうかさらに判定が行われる。押されていない場合は、ブロック８０２に戻り、機能キーまたはアイコンが押されたかどうかを判定する。

【００３２】テキスト領域が確かに押された場合は、ブロック８１０で、新しいカーソル位置かどうか判定が行われる。新しいカーソル位置の場合は、プロセッサは、システムがカーソル・スライド・モードのままであると判定し、プロセスはブロック８０６ａおよび８０６ｂに戻って、カーソルを新しい位置に移動させタイマをリセットする。カーソル位置が移動しなかったと判定された場合、すなわちユーザが指を画面上の同じ位置に保持していた場合は、ブロック８１２で、プロセッサにより所定期間が経過したかどうか判定が行われる。ユーザが指を画面上の同じ位置に保持しなかった場合、システムは再度、ブロック８０８でテキスト領域が接触され続けた

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かどうかを判定し、ブロック８１０でユーザが指を移動したかどうかを判定することになる。
【００３３】カーソルが同じ位置に維持された状態で所定の期間が経過したと判定された場合は、ブロック８１４で、トーン発生器４４によって生成されたビープ音が鳴ってマーク・モードに進む。システムはタッチ検知表示装置を走査し続けて、ブロック８１６で、テキスト領域が接触され続けているかどうかを判定する。接触され続けている場合は、ブロック８１８で、マーク・モードが始まった点から接触点までの画面の領域が、マークされたテキストを強調表示または反転表示することによってマークされる。これは、テキスト領域が触れられなくなったことをシステムが検知するまで、すなわちユーザが表示画面を押すのを止めるまで続く。接触の解除により、ブロック８２０で、トーン発生器４４によって第２のビープ音が提供され、マーク・モードが終了したことをユーザに知らせる。
【００３４】同時に、マークされたテキストの始まりを示すポインタならびに文字カウント数、すなわちマークされたテキストが、別のアプリケーションで使用するためにＲＡＭ３４などの記憶装置に提供される。
【００３５】前述のように、アプリケーションの１つは、図９に示した発呼アプリケーションである。発呼アプリケーションの始まりによって、マークされた番号がポップアップ・ウィンドウ７０に表示されたときに、ブロック８２２ａで、ブロック８１４および８２０で出力されたビープ音とは異なる別のビープ音がトーン発生器４４によって提供される。ブロック８２２ｂで、ポップアップ・ウィンドウ７０は確認と見なされる。次にブロック８２４で、マークされたテキストが正しいかどうかシステムが確認を行う。正しい場合は、ブロック８２６でキー７２に触れて、確認された電話番号を呼び出す。正しくない場合は、ブロック８２８で、ユーザはマーク解除ボタン７４に触れることによって、マークしたテキストをマーク解除することができる。その後、システムは、ブロック８３０で、呼走査画面サービスに戻る。
【００３６】まとめとして、本発明の構成に関して以下の事項を開示する。
【００３７】（１）接触に応答する表示画面を有するコンピュータ・システムにおいて、選択的アプリケーションに関して前記表示画面に表示された情報をマークする方法であって、（ａ）前記画面への接触を検知して開始位置を確立する段階と、（ｂ）前記接触が前記開始位置に所定期間だけ維持されたことを検知してマーク・モードを開始する段階と、（ｃ）前記マーク・モードを開始した後で、前記画面に表示され前記接触が前記開始位置から横切った情報をマークする段階と、（ｄ）前記接触が画面から除去されたときに、前記マーク・モードを終了する段階とを含む方法。
（２）前記アプリケーションの１つが通信アプリケーションを含み、前記マークされた情報が電話番号を表し、前記システムに通信インターフェース手段を組み込む段階と、前記マークされた情報を前記通信インターフェース手段に送って、前記電話番号に対する呼を開始する段階とをさらに含むことを特徴とする、上記（１）に記載の方法。
（３）前記画面上に表示された情報がテキストおよびアイコンを含み、前記段階（ｃ）がさらに、前記マークされた情報を、強調表示または反転表示されたテキストとして表示する段階を含むことを特徴とする、上記（１）に記載の方法。
（４）前記画面上の前記アイコンのうちの１つに触れてアプリケーションを初期設定する段階と、前記マークされたテキストを前記アプリケーションで利用する段階とをさらに含むことを特徴とする、上記（３）に記載の方法。
（５）前記アプリケーションの１つが通信アプリケーションを含み、前記マークされた情報が電話番号を表し、前記システムに通信インターフェース手段を組み込んで、前記システムが他の通信システムと通信できるようにする段階と、前記マークされた情報を前記通信インターフェース手段に送って、前記電話番号への通信接続を実施する段階とをさらに含むことを特徴とする、上記（４）に記載の方法。
（６）前記アプリケーションの１つが通信アプリケーションを含み、前記システムに通信インターフェース手段を組み込んで、前記システムが他の通信システムと通信できるようにする段階と、前記マークされた情報を強調表示として表示する段階と、前記マークされた情報が所望の電話番号を表すことを確認する段階と、前記マークされた情報を前記通信インターフェース手段に送って、前記電話番号への呼を開始する段階とをさらに含むことを特徴とする、上記（１）に記載の方法。
（７）前記マーク・モードが開始したときにトーンを発生する段階と、前記マーク・モードが終了したときに第２のトーンを発生する段階と、をさらに含むことを特徴とする、上記（１）に記載の方法。
（８）コンピュータ・システムのタッチ検知表示画面上に表示された情報をマークする方法であって、（ａ）第１の位置で前記画面に触れて、前記画面に表示され前記画面上の接触の移動に応答して移動するカーソルの第１の位置を確立する段階と、（ｂ）前記第１の位置で前記画面に触れ続けて、前記カーソルを前記第１の位置に所定時間だけ維持することによって、マーク・モードを開始する段階と、（ｃ）前記画面に触れながら前記第１の位置から移動して、前記カーソルを移動させ、前記画面に表示されている所望の情報をマークする段階と、
（ｄ）前記画面に触れるのを止めて前記マーク・モードを終了する段階とを含む方法。
（９）前記マーク・モードが開始された指示として第１

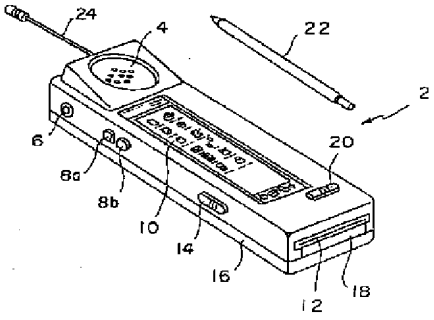
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のトーンを聞く段階と、第２のトーンを聞いて前記マーク・モードが終了したと判定する段階とを含むことを特徴とする、上記（８）に記載の方法。
（１０）前記画面に表示された前記情報がテキスト、機能キーおよびアイコンを含み、段階（ｃ）がさらに、前記所望の情報を、前記画面上で強調表示されたテキストとして見る段階と、前記機能キーまたはアイコンの１つに触れて、前記強調表示されたテキストを使用してアプリケーションの動作を始める段階とを含むことを特徴とする、上記（８）に記載の方法。
（１１）前記コンピュータ・システムがさらに通信インターフェース手段を含み、前記マーク・モードの終了後に、前記画面の別の部分に触れて、マークされた情報が正しいことを確認し、前記マークされた情報を使ってある電話番号への呼が開始されるようにする段階とをさらに含むことを特徴とする、上記（８）に記載の方法。
（１２）タッチ検知表示画面および前記画面に表示されたカーソルを有するコンピュータ式通信システムにおいて、（ａ）電話番号に対応するデータの先頭が表示される第１の位置で前記画面上に触れる段階と、（ｂ）前記画面の前記第１の位置に所定期間だけ触れ続けて、マーク・モードを開始する段階と、（ｃ）前記画面上の前記第１の位置から、前記電話番号データの末尾が表示される前記画面上の第２の位置まで触れながら移動して、前記電話番号データをマークする段階と、（ｄ）前記画面の接触を終了して、前記電話番号データを選択する段階と、（ｅ）前記画面上の所定領域に触れて、前記通信システムに前記電話番号への呼を開始させる段階とを含む方法。
（１３）前記システムに通信インターフェースを組み込んで、前記システムがセルラ通信とＰＳＴＮ通信を両方とも実施できるようにする段階とをさらに含むことを特徴とする、上記（１２）に記載の方法。
（１４）前記マーク・モードが開始された確認として第１のトーンを聞く段階と、段階（ｄ）の終りに第２のトーンを聞く段階とをさらに含むことを特徴とする、上記（１２）に記載の方法。
（１５）前記画面上の所定領域が機能キーおよびアイコンを含み、前記段階（ｅ）がさらに、発呼動作を表す前記機能キーまたはアイコンの１つに触れて、前記通信システムに前記電話番号への前記呼を開始させる段階とを含むことを特徴とする、上記（１２）に記載の方法。
（１６）タッチ検知表示画面と、前記画面上の第１の位置の接触に応答する手段と、前記画面上の前記第１の位置への前記接触が所定期間を越えたとき、マーク・モードを開始する手段と、前記マーク・モードの開始後に、前記画面上に表示され前記接触が前記第１の位置からそれを越えて移動したデータをマークする手段であって、前記接触が前記画面から取り除かれたとき、前記データがマークされ、前記マーク・モードが終了する手段とを含むコンピュータ・システム。
（１７）通信インターフェース手段と、前記マークされたデータを前記通信インターフェース手段に送って、前記マークされたデータに対応する電話番号への通信を実施する手段とをさらに含むことを特徴とする、上記（１６）に記載のコンピュータ・システム。
（１８）少なくとも、前記マーク・モードが開始したときに第１のトーンを生成し、前記マーク・モードが終了したときに第２のトーンを生成する手段を含むことを特徴とする、上記（１６）に記載のコンピュータ・システム。
（１９）前記マーク・モード開始手段が、前記所定の期間を、前記接触が前記第１の位置に維持された期間と比較する手段を含むことを特徴とする、上記（１６）に記載のコンピュータ・システム。
（２０）前記表示画面がさらに、前記マークされたデータを強調表示または反転表示されたテキストとして表示することを特徴とする、上記（１６）に記載のコンピュータ・システム。
（２１）少なくともテキストがその上に表示されるタッチ検知表示画面と、前記画面の接触に応答する手段と、前記画面上のある位置に所定期間だけ連続的に触れたときにマーク・モードを開始する手段と、前記マーク・モードが開始した後で、前記画面上に表示され中断なしにその上で接触が行われたテキストをマークする手段であって、前記画面の連続的な接触が終わったときに前記マーク・モードが終了する手段とを含むコンピュータ通信システム。
【図面の簡単な説明】
【図１】本発明のパーソナル通信装置の斜視図である。
【図２】図１の装置の平面図である。
【図３】図１の装置の１つの利用可能な表示画面の拡大図である。
【図４】図１の装置の別の例示的表示画面である。
【図５】本発明にとって重要な図２の装置の様々な構成要素の簡略化したブロック図である。
【図６】本発明の例示的実施例を示す、様々な表示画面による概略図である。
【図７】表示画面上の所望のテキストをマークするプロセスを示す図である。
【図８】表示画面上の所望のテキストをマークするプロセスを示す図である。
【図９】表示画面上の所望のテキストをマークするプロセスを示す図である。
【図１０】本発明の方法の様々な処理段階を示すフローチャートである。
【符号の説明】
２　装置
４　スピーカ
６　オン・オフ・スイッチ

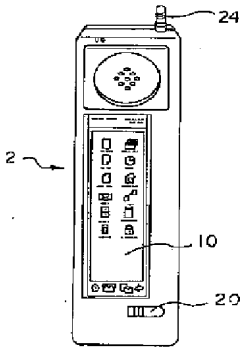
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８　音量調整スイッチ
１０　タッチ検知画面
１２　ＰＣＭＣＩＡカード収容スロット
１４　ＰＣＭＣＩＡカード放出スイッチ
１６　バッテリ・パック
１８　入出力コネクタ
２０　マイクロホン
２２　スタイラス
２４　アンテナ
６２　テキスト領域
６４　機能領域
６６　カーソル
７０　ポップアップ・ウィンドウ
７２　「ダイヤル」機能キー

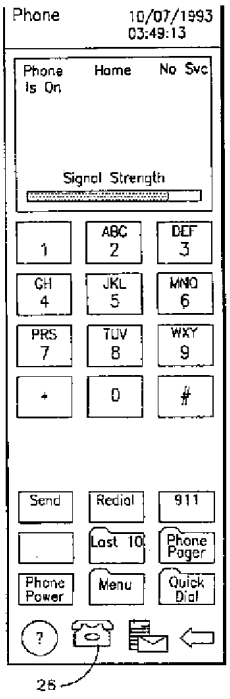
【図１】




【図２】

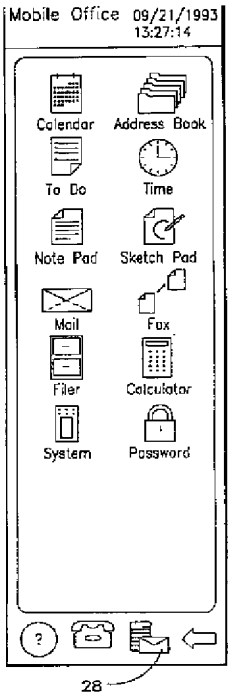



【図３】



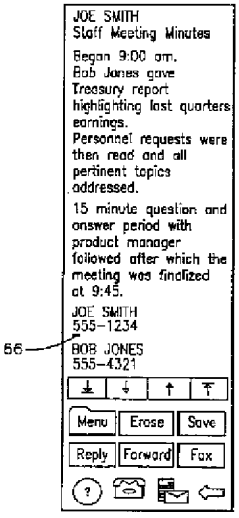

電話画面

【図４】

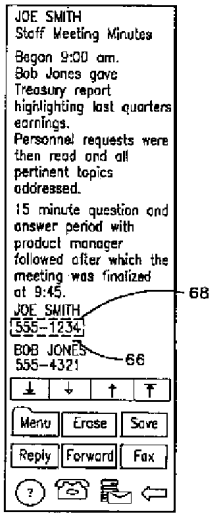



移動オフィス画面

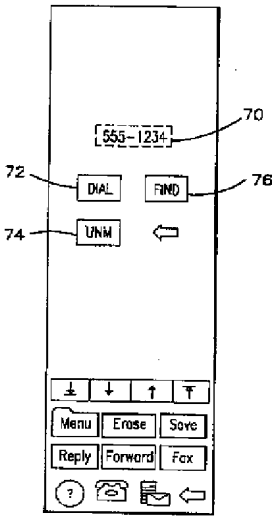
【図７】



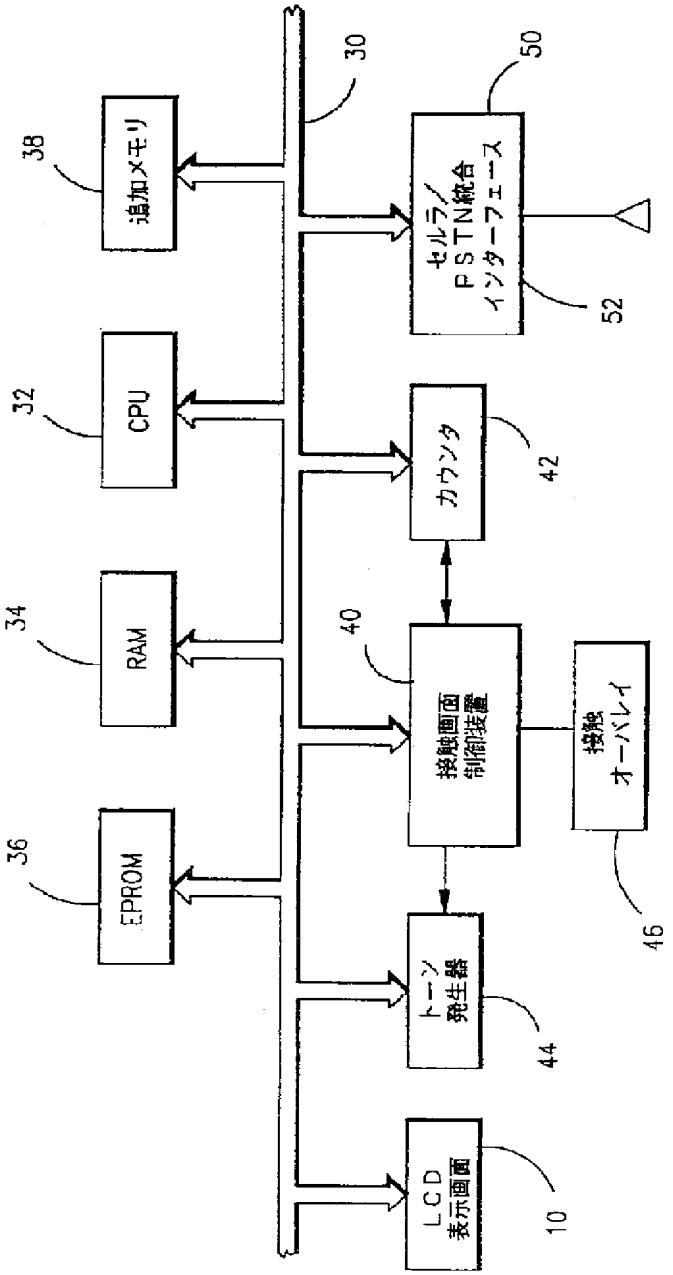

【図８】



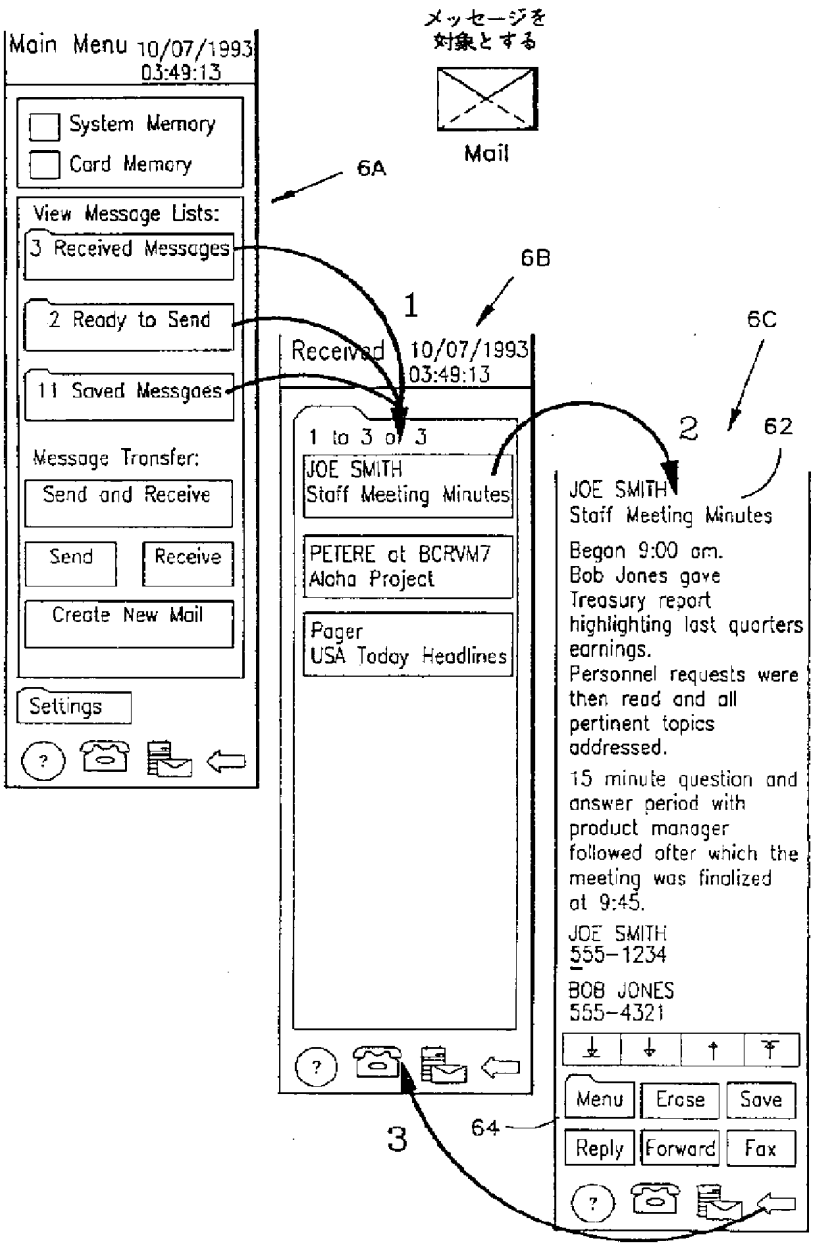

【図９】



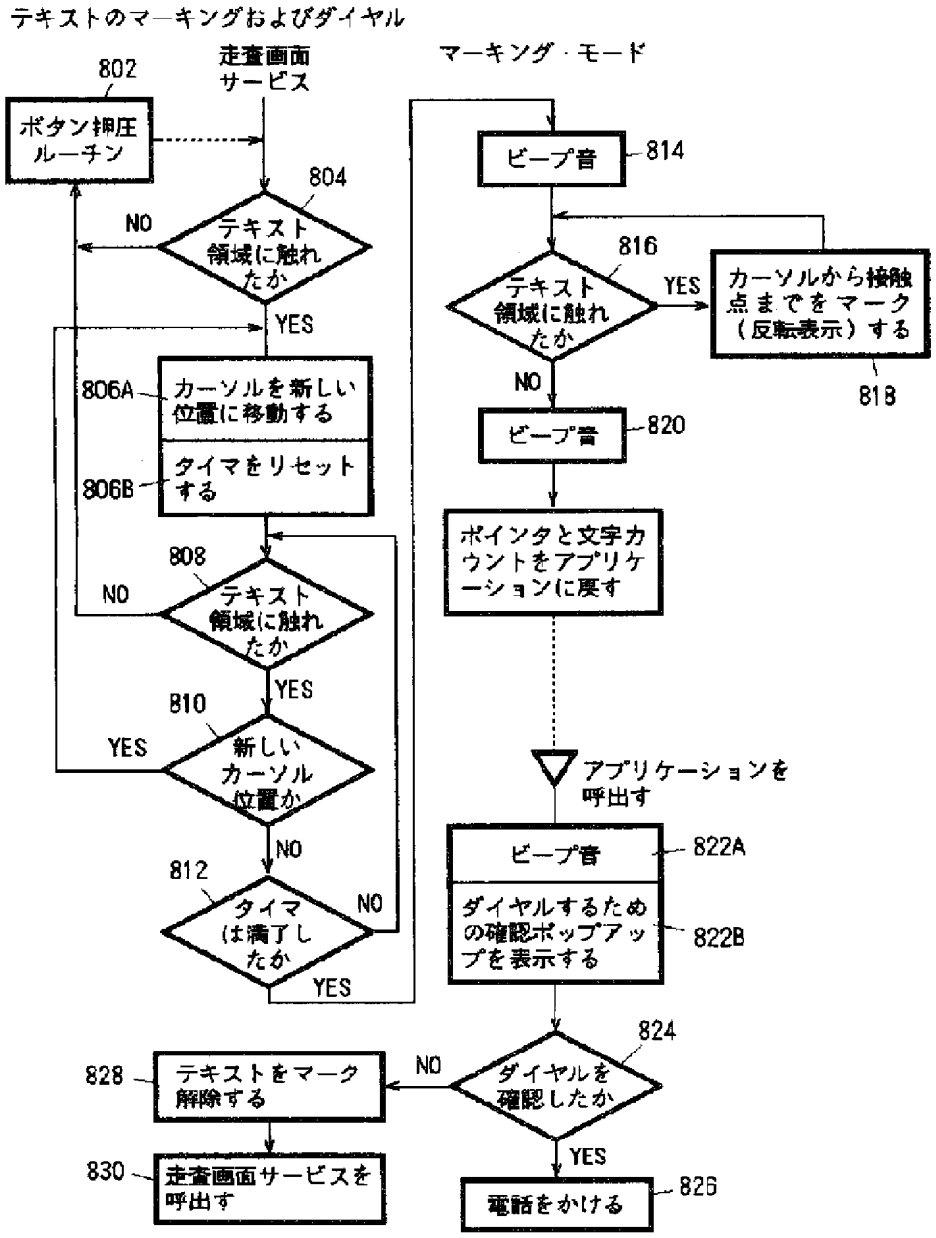
【図５】


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追加メモリ
セルラ／
ＰＳＴＮ統合
インターフェース
52
32
CPU
カウンタ
42
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RAM
40
接触画面
制御装置
接触
オーバレイ
36
EPROM
トーン
発生器
44
46
LCD
表示画面
10

【図６】


メッセージを
対象とする
Mail
Main Menu 10/07/1993
03:49:13
System Memory
Card Memory
View Message Lists:
3 Received Messages
2 Ready to Send
11 Saved Messages
Message Transfer:
Send and Receive
Send
Receive
Create New Mail
Settings
6A
6B
6C
1
2
3
62
64
Received 10/07/1993
03:49:13
1 to 3 of 3
JOE SMITH
Staff Meeting Minutes
PETERE at BCRVM7
Alpha Project
Pager
USA Today Headlines
JOE SMITH
Staff Meeting Minutes
Began 9:00 am.
Bob Jones gave
Treasury report
highlighting last quarters
earnings.
Personnel requests were
then read and all
pertinent topics
addressed.
15 minute question and
answer period with
product manager
followed after which the
meeting was finalized
at 9:45.
JOE SMITH
555-1234
BOB JONES
555-4321
Menu
Erase
Save
Reply
Forward
Fax

【図１０】




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フロントページの続き

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| Ｈ０４Ｎ　1/387 | | | | |

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# Electronic Acknowledgement Receipt

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| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Correspondence Address:** | Steven H Slater<br>Slater & Matsil LLP<br>17950 Preston Road<br>Suite 1000<br>Dallas TX 75252<br>US 972-732-1001<br>- |
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| 1 | | ERI-888RI_IDS_filed_2011-01-12.pdf | 127475<br>aaffbce909316543aed140141f57ca1896123ceb | yes | 2 |

| | Multipart Description/PDF files in .zip description | | |
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| 2 | Foreign Reference | C1-JP8303878.pdf | 3026170<br>86830a5316183fd23bb97a151aee9196665bb942 | no | 20 |
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**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicants: | Hayes, Jr. et al. | Docket No.: | ERI-888RI |
| Serial No.: | 11/078,916 | Art Unit: | 2617 |
| Filed: | March 11, 2005 | Examiner: | Sheila B. Smith |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT**

Dear Sir:

The Applicants wish to bring to the attention of the Patent and Trademark Office the information noted on the enclosed form PTO/SB/08a that may be considered material to the examination of the above-identified application. Copies of the cited U.S. Patents are not being submitted. However, Applicants have included copies of the cited foreign patents.

No fee is due at this time, as this Information Disclosure Statement is being filed pursuant to 37 C.F.R. § 1.97(b)(4), before the mailing of a first Office Action after the filing of a request for continued examination under § 1.114.

In the event a fee is deemed due, please charge any such fees, or credit any overpayment, to Deposit Acct. No. 50-1065 of the below-mentioned firm.

Respectfully submitted,

12 JAN 11
Date

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# Request for Continued Examination (RCE) Transmittal

Address to:
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P.O. Box 1450
Alexandria, VA 22313-1450

| | |
|---|---|
| Application Number | 11/078,916 |
| Filing Date | March 11, 2005 |
| First Named Inventor | Hayes, Jr. et al. |
| Art Unit | 2617 |
| Examiner Name | Nghi H. Ly |
| Attorney Docket Number | ERI-888RI |

**This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.**
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).
   a. [ ] Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.
      i. [ ] Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
      ii. [ ] Other _____
   b. [X] Enclosed
      i. [X] Amendment/Reply
      ii. [ ] Affidavit(s)/Declaration(s)
      iii. [ ] Information Disclosure Statement (IDS)
      iv. [ ] Other _____

2. Miscellaneous
   a. [ ] Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)
   b. [ ] Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
   a. [X] The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 50-1065.
      i. [X] RCE fee required under 37 CFR 1.17(e)
      ii. [ ] Extension of time fee (37 CFR 1.136 and 1.17)
      iii. [ ] Other _____
   b. [ ] Check in the amount of $ _____ enclosed
   c. [ ] Payment by credit card (Form PTO-2038 enclosed)

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

| *SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED* | | | |
|---|---|---|---|
| Signature | /Steven H. Slater/ | Date | Dec. 13, 2010 |
| Name (Print/Type) | Steven H. Slater | Registration No. | 35,361 |

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| In re: Reissue Application Of | | Docket No.: | ERI-888RI |
| U.S. Patent No. 6,278,888 to | | Art Unit: | 2617 |
| Hayes, Jr., et al. | | | |
| Serial No.: | 11/078,916 | Examiner: | Nghi H. Ly |
| Filed: | March 11, 2005 | | |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

## AMENDMENT SUBMITTED WITH RCE

Dear Sir:

The following amendments and remarks are presented with a request for continued examination under 37 CFR 1.114 along with the fee required under 37 CFR 1.17(e). Please amend the above-referenced application as follows. No new matter has been added.


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IN THE CLAIMS:

1. (Twice Amended) A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal [that characterizes] in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon [according to] the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer.

2. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.


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3. (Original) A radiotelephone according to claim 1, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.

4. (Original) A radiotelephone according to claim 3, wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer.

5. (Original) A radiotelephone according to claim 4, wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer.

6. (Original) A radiotelephone according to claim 4, wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

7. (Original) A radiotelephone according to claim 4, wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

8. (Original) A radiotelephone according to claim 7, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.


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9. (Amended) A radiotelephone according to claim 7, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

10. (Original) A radiotelephone according to claim 7, wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object.

11. (Original) A radiotelephone according to claim 10, wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer and to initiate the action associated with the identified graphical object responsive to detection of the momentary contact.

12. (Original) A radiotelephone according to claim 11, wherein the controller is operative to initiate the action in response to detection of a plurality of momentary contacts occurring within a predetermined time interval.

13. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.


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14. (Original) A radiotelephone according to claim 13, wherein the contact-sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

15. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

16. (Twice Amended) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, selectively responsive to the output signal and operatively associated with the display, which is configured to scroll displayed rows along an axis of [control] the display based on [according to] the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive


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transducer and a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer.

17. (Original) An apparatus according to claim 16, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

18. (Original) An apparatus according to claim 16, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

19. (Original) An apparatus according to claim 18, wherein the controller is operative to selectively display a graphical object on the display responsive to the output signal of the contact-sensitive transducer.

20. (Original) An apparatus according to claim 19, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

21. (Original) An apparatus according to claim 19, wherein the controller is operative to display a plurality of graphical objects on the display, and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

22. (Original) An apparatus according to claim 19, wherein the controller is operative, responsive to the contact-sensitive transducer, to determine a position of contact along the axis

of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

23. (Original) An apparatus according to claim 22, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

24. (Original) An apparatus according to claim 22, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

25. (Original) An apparatus according to claim 24, wherein the controller is operative, responsive to the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer.

26. (Original) An apparatus according to claim 25, wherein the controller is operative, responsive to the output signal of contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and to scroll displayed rows along the axis of the display based on the detected moving contact.

27. (Original) An apparatus according to claim 19, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.


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28. (Original) An apparatus according to claim 27, wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

29. (Original) An apparatus according to claim 22, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

30. (Thrice Amended) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving [that characterizes] contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer.


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31. (Original) An apparatus according to claim 30, further comprising a radiotelephone communications transceiver supported by the housing, and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal.

32. (Original) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at side surface of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface.

33. (Amended) In an apparatus including a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, a display that displays an image at the front surface, and a controller that controls the display, a method of providing user input comprising the steps of:

holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm; [and]

providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at at least one of the first and second side surfaces of the housing, the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer; and

providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer.


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34. (Original) A method according to claim 33, wherein the step of providing comprises the step of contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm.

35. (Original) A method according to claim 33, wherein the apparatus is a radiotelephone that further includes a radiotelephone communications transceiver, wherein the controller is operative to control the radiotelephone communications transceiver, and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

36. (Original) A method according to claim 33, wherein the step of controlling comprises the step of selectively displaying an image or the display according to the output signal of the contact-sensitive transducer.

37. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

38. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.


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39. (New) An apparatus according to claim 38, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

40. (New) An apparatus according to claim 39, wherein the contact-sensitive transducer is an elongate strip.

41. (New) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises one of a resistive transducer a capacitive transducer and a semiconductive transducer.

42. (New) An apparatus according to claim 30, which also includes additional user input interface devices for the apparatus on the front surface of the housing.

43. (New) An apparatus according to claim 42 wherein the additional interface devices are contact-sensitive.

44. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer.

45. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer.

46. – 47. (Cancelled)


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48. (New) An apparatus according to claim 43, wherein an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer.

49. - 50. (Cancelled)

51. (New) An apparatus according to claim 30 further comprising:

a second contact-sensitive transducer, supported by the housing, which produces a second output signal that characterizes contact of an object along the contact-sensitive surface of the second contact-sensitive transducer; and

a controller, responsive to the second output signal for controlling a function of the apparatus.

52. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of momentary contact with said second contact-sensitive transducer.

53. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of a predetermined number of momentary contacts with said second contact-sensitive transducer within a predetermined time interval.

54. (New) An apparatus according to claim 30, wherein said controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of said display based on the output signal from said transducer.


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55. (New) An apparatus according to claim 54, wherein the direction of scroll is transverse to the direction that said rows extend across the display.

56. (New) An apparatus according to claim 54, wherein said rows consist of alphanumeric characters comprising menu selections.

57. (New) An apparatus according to claim 54, wherein said controller identifies successive ones of the rows displayed along the axis of said display by highlighting successive said rows.

58. (New) An apparatus according to claim 30 further comprising a power supply disposed inside said housing.

59. (New) An apparatus according to claim 58, wherein said power supply comprises a battery.

60. (New) An apparatus according to claim 59 further comprising a circuit which controls power transfer from the power supply too another circuit based on the output signal of the contact-sensitive transducer.

61. (New) An apparatus according to claim 30 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.


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62. (New) An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer.


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63. (New) An apparatus according to claim 62, wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

64. (New) An apparatus according to claim 62 further comprising a power supply disposed inside said housing.

65. (New) An apparatus according to claim 64, wherein said power supply comprises a battery.

66. (New) An apparatus according to claim 65 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

67. (New) An apparatus according to claim 62 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

68. (New) An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;


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a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer, the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer..

69. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

70. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

71. (New) An apparatus according to claim 70, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

72. (New) An apparatus according to claim 71, wherein the contact-sensitive transducer is an elongate strip.


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73. (New) An apparatus according to claim 68, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.


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## REMARKS

Applicants respectfully request reconsideration of this application in view of the following remarks. All independent claims, 1, 16, 30, 33, 62, and 68 have been amended. Claim 9 has also been amended to correct a minor grammatical error. Claims 46-47 and 49-50 were previously cancelled. No claims have been added or cancelled herein. Accordingly, Claims 1 – 45, 48, and 51 – 73 are currently pending in the application.

Prior to the request for continued examination, claims 1-13, 15-27, 29-45, 48, and 51-73 had been finally rejected as being unpatentable over O'Hagan et al (U.S. Patent No. 6,424,830) in view of Gillespie (U.S. Patent No. 5,889,236) and claims 14 and 28 had been finally rejected as being unpatentable over O'Hagan in view of Gillespie and further in view of Moore. Applicants respectfully submit that the claims, as presently amended, fully and patentably distinguish over the cited references, whether alone or in combination.

Specifically, claim 1 now recites, *e.g.,* as been amended to recite a radiotelephone having, *e.g.,* a contact-sensitive transducer which produces an output signal and a controller responsive to the output signal, "the controller having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer." Support for this amendment can be found, *e.g.*, at Figure 2, and Col. 3, lines 27 – 35.

Neither O'Hagan nor Gillespie teaches a controller, responsive to an output signal from a contact-sensitive transducer, having a first mode wherein the controller is responsive to contact with the transducer and a second mode wherein the controller is unresponsive thereto. Nothing in Moore overcomes this deficiency in O'Hagan and Gillespie. Further, nothing in the


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references or the general skill in the art would suggest modifying the combination to achieve such a result.

For at least the above reasons, claim 1 is patentably distinct over the prior art references and is in condition for allowance. Claims 2-15, which depend from claim 1 directly or indirectly, are also allowable by virtue of their respective dependence from claim 1 as well as their respective further defining claim limitations.

Likewise independent claims 16, 30, 62, and 68 have been amended to recite a controller "having a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer." As addressed above, neither O'Hagan nor Gillespie teaches a controller, responsive to an output signal from a contact-sensitive transducer, having a first mode wherein the controller is responsive to contact with the transducer and a second mode wherein the controller is unresponsive thereto. Nothing in Moore overcomes this deficiency in O'Hagan and Gillespie. Further, nothing in the references or the general skill in the art would suggest modifying the combination to achieve such a result.

For at least the above reasons, claims 16 (and by dependence as well as their further defining limitations, claims 17-29), 30 (and by dependence as well as for their further defining limitations, claims 31-32, 37-48, and 51-61), 62 (and by dependence as well as for their further defining limitations, claims 63-67), and 68 (and by dependence as well as for their further defining limitations, claims 69-73) are patentably distinct over the prior art references and is in condition for allowance.


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Likewise, claim 33 has been amended to recite providing user input to a controller using a contact-sensitive transducer and "providing user input to the controller to select a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller wherein the controller is unresponsive to contact with the contact-sensitive transducer." As addressed above, neither O'Hagan nor Gillespie selecting a first mode where a controller is responsive to contact and a second mode where the controller is unresponsive to contact. Nothing in Moore overcomes this deficiency in O'Hagan and Gillespie. Further, nothing in the references or the general skill in the art would suggest modifying the combination to achieve such a result.

For at least the above reasons, claims 33 (and by dependence as well as their further defining limitations, claims 35-36) is patentably distinct over the prior art references and is in condition for allowance.


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## CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully submit that all claims currently pending in this application are in condition for allowance and therefore earnestly solicit a Notice of Allowance therefor.

Applicants request that the Examiner telephone the undersigned attorney of record at (972) 732-1001 if such would further expedite the prosecution of the present application. No fee is believed due in connection with this filing. However, should one be deemed due the Commissioner is hereby authorized to charge any additional fees, or credit any overpayments, to Deposit Account No. 50-1065.

Respectfully submitted,

December 13, 2010
Date

/Steven H. Slater/
Steven H. Slater
Attorney for Applicant(s)
Reg. No. 35,361

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Dallas, Texas 75252-5793
Tel. 972-732-1001
Fax: 972-732-9218

**APPENDIX A**

| Claims | Status | Support in Patent |
|---|---|---|
| 1. | Pending; amended herein | As issued and Figure 2, and Col. 3, lines 27 – 35. |
| 2-8. | Pending | Unamended. |
| 9. | Pending; amended herein. | Figure 1 and issued claim 9. |
| 10-15. | Pending | Unamended. |
| 16. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 16 (col. 11, line 54 – col. 12, line7). Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 17-29. | Pending. | Unamended. |
| 30. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. Figure 2, and Col. 3, lines 27 – 35 |
| 31. – 32. | Pending | Unamended. |
| 33. | Pending; amended herein. | As issued and Figure 2, and Col. 3, lines 27 – 35. |
| 34-36. | Pending | Unamended. |
| 37. | Pending | Figs. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37; and lines 55-57). |
| 38. | Pending | Figs. 1, 2, 7B, 7C and 11. Claims 1 and 2 (col. 10, lines 35-37; and lines 55-57). Col. 10, lines 2-7. |
| 39. | Pending | Fig. 11, item 150C Col. 9, line 65-Col. 10, line 7. |
| 40. | Pending | Fig. 11, item 150C Col. 9, line 65-Col. 10, line 7. |
| 41. | Pending | Col. 5, lines 29-34. Claim 15. |
| 42. | Pending | Fig. 1, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 1, lines 1-2. Fig. 11, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 5, lines 1-2. |
| 43. | Pending | Fig. 1, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 1, lines 1-2. Fig. 11, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 5, lines 1-2. Figs. 3, 4. Col. 5, lines 36-39, 48-49. |
| 44. | Pending | Col. 5, lines 19-22. Col. 3, lines 20-26. Claim 26. |
| 45. | Pending | Col. 5, lines 19-22. Col. 8, lines 36-40. |
| 46. | Canceled herein | |


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| Claims | Status | Support in Patent |
|---|---|---|
| 47. | Canceled herein | |
| 48. | Pending | Fig. 11. Col. 10, lines 13-21. |
| 49. | Canceled herein | |
| 50. | Canceled herein | |
| 51. | Pending | Col. 11. Col. 10, lines 13-21. Col. 5, lines 19-22. Fig. 2, item 220. Col. 5, lines 22-24. |
| 52. | Pending | Col. 9, lines 21-50. Col. 8, lines 54-59. |
| 53. | Pending | Col. 9, lines 21-50. Col. 8, lines 54-59. |
| 54. | Pending | Col. 8, lines 43-53. |
| 55. | Pending | Fig. 7A-7C. Col. 8, lines 29-53. |
| 56. | Pending | Figs. 7A-7C. Col. 5, lines 25-26. |
| 57. | Pending | Col. 8, lines 48-50. |
| 58. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 59. | Pending | Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 60. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 61. | Pending | Col. 5, lines 42-45. Col. 3, lines 27-35. |
| 62. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. |
| 63. | Pending | Col. 5, lines 18-35. Col. 8, lines 29-53. |
| 64. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 65. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 66. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 67. | Pending | Col. 5, lines 42-45. Col. 3, lines 27-35. |
| 68. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. |
| 69. | Pending | Figs. 1 and 11. Claim 1 and 2 (col. 10, lines 35-37 and lines 55-57). |
| 70. | Pending | Figs. 1, 2, 7A, 7B, 7C, and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 10, lines 2-7. |
| 71. | Pending | Fig. 11. Col. 9, line 65- Col. 10, line 2. |


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| Claims | Status | Support in Patent |
|---|---|---|
| 72. | Pending | Fig. 11. Col. 9, line 65 – Col. 10, line 2. |
| 73. | Pending | Col. 5, lines 29-34. Claim 15. |


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Page 371 of 1144

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 11078916 |
| **Filing Date:** | 11-Mar-2005 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Filer:** | Steven Howard Slater/Della Gonzales |
| **Attorney Docket Number:** | ERI-888RI |

Filed as Large Entity

## Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| Request for continued examination | 1801 | 1 | 810 | 810 |
| | | **Total in USD ($)** | | **810** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 9024598 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Correspondence Address:** | Steven H Slater<br>Slater & Matsil LLP<br>17950 Preston Road<br>Suite 1000<br>Dallas TX 75252<br>US 972-732-1001<br>- |
| **Filer:** | Steven Howard Slater/Della Gonzales |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 13-DEC-2010 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 18:17:11 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | $810 |

| | |
|---|---|
| RAM confirmation Number | 5823 |
| Deposit Account | 501065 |
| Authorized User | |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Request for Continued Examination (RCE) | ERI-888RI-RCE_Transmittal_filed_2010-12-13.pdf | 97248<br>4a122c20715187a07c5707e2afc9fbb043d8ba48 | no | 1 |
| **Warnings:** | | | | | |
| This is not a USPTO supplied RCE SB30 form. | | | | | |
| **Information:** | | | | | |
| 2 | | ERi-0888RI_Amendment_filed_2010-12-13.pdf | 117356<br>41314e4ea8dee5a5ed89da9b15f8789f7e8ad929 | yes | 24 |

| | Multipart Description/PDF files in .zip description | | |
|---|---|---|---|
| | **Document Description** | **Start** | **End** |
| | Request for Continued Examination (RCE) | 1 | 1 |
| | Drawings-only black and white line drawings | 2 | 17 |
| | Applicant Arguments/Remarks Made in an Amendment | 18 | 24 |

| | | | | | |
|---|---|---|---|---|---|
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Fee Worksheet (PTO-875) | fee-info.pdf | 30062<br>7b8bdc2262b37ddf5e3b13ba73b3bd9e28656718 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | | **Total Files Size (in bytes):** | 244666 | |

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**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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# PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

| Application or Docket Number | Filing Date | ☐ To be Mailed |
|---|---|---|
| 11/078,916 | 03/11/2005 | |

## APPLICATION AS FILED – PART I

| FOR | (Column 1) NUMBER FILED | (Column 2) NUMBER EXTRA | SMALL ENTITY ☐ RATE ($) | SMALL ENTITY ☐ FEE ($) | OR | OTHER THAN SMALL ENTITY RATE ($) | OTHER THAN SMALL ENTITY FEE ($) |
|---|---|---|---|---|---|---|---|
| ☐ BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | | | N/A | |
| ☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m)) | N/A | N/A | N/A | | | N/A | |
| ☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | | | N/A | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | minus 20 = | * | X $ = | | OR | X $ = | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | minus 3 = | * | X $ = | | | X $ = | |
| ☐ APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | | | | |
| ☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | | | TOTAL | |

## APPLICATION AS AMENDED – PART II

| AMENDMENT 12/13/2010 | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | SMALL ENTITY RATE ($) | SMALL ENTITY ADDITIONAL FEE ($) | OR | OTHER THAN SMALL ENTITY RATE ($) | OTHER THAN SMALL ENTITY ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|---|---|
| Total (37 CFR 1.16(i)) | * 69 | Minus | ** 69 | = 0 | X $ = | | OR | X $52= | 0 |
| Independent (37 CFR 1.16(h)) | * 6 | Minus | ***6 | = 0 | X $ = | | OR | X $220= | 0 |
| ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | 0 |

| AMENDMENT | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE ($) | ADDITIONAL FEE ($) | | RATE ($) | ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|---|---|
| Total (37 CFR 1.16(i)) | * | Minus | ** | = | X $ = | | OR | X $ = | |
| Independent (37 CFR 1.16(h)) | * | Minus | *** | = | X $ = | | OR | X $ = | |
| ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | |

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DENISE HOPKINS/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 10/13/2010

Steven H Slater
Slater & Matsil LLP
17950 Preston Road
Suite 1000
Dallas, TX 75252

| EXAMINER | |
|---|---|
| LY, NGHI H | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2617 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 10/13/2010 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

---

*Ex parte* JOHN JOSEPH HAYES JR. and CURTIS WAYNE THORNTON

---

Appeal 2010-008061
Application 11/078,916
Patent US 6,278,888 B1
Technology Center 2600

---

Before ALLEN R. MacDONALD, *Vice Chief Administrative Patent Judge*, JOHN A. JEFFERY, and ROBERT E. NAPPI, *Administrative Patent Judges*.

JEFFERY, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

---

[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-45, 48, and 51-73. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

## STATEMENT OF THE CASE

Appellants seek to reissue U.S. Patent 6,278,888 which pertains to a radiotelephone with a contact-sensitive transducer that enables the user to use their finger to scroll displayed information. *See generally* Abstract; Figs. 1-2. Claims 1 and 30 are illustrative:

1. A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon the output signal of the contact-sensitive transducer.

30. An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to



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respective opposite sides of the rear surface, the housing configured to be held in a user's hand that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

The Examiner relies on the following as evidence of unpatentability:

| | | |
|---|---|---|
| Moore | US 4,566,001 | Jan. 21, 1986 |
| Gillespie | US 5,889,236 | Mar. 30, 1999 (filed Nov. 13, 1995) |
| O'Hagan | US 6,424,830 B1 | July 23, 2002 (filed June 2, 1997) |

THE REJECTIONS

1. The Examiner rejected claims 1-45, 48, and 51-73[2] under 35 U.S.C. § 251 as being based on a defective reissue oath. Ans. 4.[3]
2. The Examiner rejected claims 1-45, 48, and 51-73 under 35 U.S.C. § 251 as being improperly broadened in a reissue application made and sworn by the assignee—not the patentee. Ans. 4-5.

[2] Although the Examiner erroneously indicates that claims 1-73 are rejected (Ans. 4), claims 46, 47, 49, and 50 have been cancelled. *See* App. Br. 4 (indicating this claim status); *see also* Ans. 3 (acknowledging this status as correct). We therefore present the correct claim listing for each rejection here for clarity.

[3] Throughout this opinion, we refer to (1) the Appeal Brief filed July 17, 2009; (2) the Examiner's Answer mailed March 4, 2010; and (3) the Reply Brief filed May 3, 2010.



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3. The Examiner rejected claims 1-13, 15-27, 29-45, 48, and 51-73 under 35 U.S.C. § 103(a) as unpatentable over O'Hagan and Gillespie. Ans. 5-28.
4. The Examiner rejected claims 14 and 28 under 35 U.S.C. § 103(a) as unpatentable over O'Hagan, Gillespie, and Moore. Ans. 28-29.

THE DEFECTIVE DECLARATION REJECTION

The Examiner finds Appellants' reissue declaration[4] defective since (1) the claims are said to have been amended after the original reissue declaration was filed thus necessitating a supplemental declaration, and (2) the reissue declaration allegedly fails to identify at least one error relied upon to support the present reissue application. Ans. 4.

Appellants argue that the Examiner's rejection is erroneous since the present reissue application was filed well after the purported amendment date identified by the Examiner. App. Br. 11. Although Appellants acknowledge amending the claims "to more comprehensively claim the invention," Appellants nonetheless maintain that the Examiner has not shown that these amendments correct errors not covered by the Supplemental Declaration filed July 14, 2006—a declaration that is said to specifically identify at least one error relied upon as the basis for reissue. App. Br. 12. The issue before us, then, is as follows:

[4] Although the Examiner refers to both an oath and declaration in connection with this rejection (Ans. 4), we nevertheless use the term "declaration" in this context for clarity and consistency. *See, e.g.,* Decl. filed Mar. 11, 2005.



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## ISSUE

Under § 251, has the Examiner erred in rejecting claims 1-45, 48, and 51-73 by finding that Appellants' reissue declaration is defective?

This issue turns on whether (1) claim amendments made after the original reissue declaration was filed correct errors not covered by the Supplemental Declaration filed July 14, 2006, and (2) the reissue declaration identifies at least one error relied upon to support the present reissue application.

## FINDINGS OF FACT (FF)

1. The present reissue application was filed March 11, 2005, and seeks to reissue U.S. Patent 6,278,888 which issued August 21, 2001 with 36 claims. Decl. In Support of Reissue Appl'n filed Mar. 11, 2005 ("Reissue Decl."), at 1-2 (¶¶ 6-7); '888 Pat., col. 10, l. 29 – col. 14, l. 29 (listing patented claims 1-36).

2. On March 11, 2005, (1) claims 37 to 73 were added (claims 62 and 68 independent), and (2) independent claim 30 was amended, in pertinent part, as follows:

> 30. (Amended) An apparatus, comprising:
> a housing <u>having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm</u> . . . .

Prelim. Amd't filed Mar. 11, 2005, at 2-8 (underlining in original).



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3. Appellants' Reissue Declaration identifies "[a]t least one error upon which reissue is based" as follows: "Claim 30 of the patent is believed to be wholly or partially invalid in that it claims more than patentee is entitled to." Reissue Decl. at 2 (¶ 12).

4. Appellants' Reissue Declaration is signed by "John Han, Assistant Secretary" who indicates that he is authorized to act on behalf of the assignee, Ericsson, Inc., as the assignee's Assistant Secretary. Reissue Decl., at 1, 3 (¶¶ 2, 17).

5. An assignee statement filed March 11, 2005 signed by John Han indicates that Ericsson, Inc. is the assignee of the entire right, title, and interest in Patent No. 6,278,888 B1. Neither boxes "A" nor "B" on the Form PTO/SB/96 is checked, but the form indicates that the assignment was recorded in the United States Patent and Trademark Office at Reel 008951, Frame 0747. Statement Under 37 C.F.R. 3.73(b) filed Mar. 11, 2005.

6. A Supplemental Declaration filed July 20, 2006 signed by John Han identifies "[a]t least one error upon which reissue is based" as follows:

> Claim 30 of the patent is believed to be wholly or partially invalid in that it claims more than patentee is entitled to. Specifically, originally issued claim 30 lacks the limitation of a "housing configured to be held in a user's hand such that the rear surface confronts the user's palm." The absence of this limitation constitutes an error.

Supp. Decl. In Support of Reissue Appl'n, filed July 20, 2006 ("Supp. Decl."), at 2 (¶ 12).

7. On December 21, 2007, Appellants amended claims 1, 16, and 30, in pertinent part, as follows:



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1. (Once amended) A radiotelephone, comprising:

* * *

a contact-sensitive transducer . . . which produces an output signal ~~that characterizes~~ in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller . . . which controls at least one of the display and the radiotelephone communication transceiver and which scrolls displayed rows along an axis of the display based upon ~~according to~~ the output signal of the contact-sensitive transducer.

* * *

16. (Once amended) An apparatus, comprising:

* * *

a contact-sensitive transducer . . . which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller . . . which is configured to scroll displayed rows along an axis of ~~control~~ the display based on ~~according to~~ the output signal of the contact-sensitive transducer.

* * *

30. (Twice amended) An apparatus, comprising:

a housing;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving ~~that~~



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> ~~characterizes~~ contact of an object along the contact-sensitive surface of the contact-sensitive transducer . . . .

Amd't filed Dec. 21, 2007, at 2, 6 (underlining and strike-through in original).

8. On December 21, 2007, Appellants cancelled claims 46, 47, 49, and 50. Amd't filed Dec. 21, 2007, at 9.

9. In the Remarks accompanying the Amendment filed December 21, 2007, Appellants note the following:

> [C]laim 1 recites that (1) the contact-sensitive transducer "produces an output signal in response to moving contact along the contact-sensitive surface of the contact-sensitive transducer;["] and that (2) the controller "scrolls displayed rows . . . of the display based on the output signal" (emphasis added). In other words, the displayed rows are scrolled in response to moving contact along the contact-sensitive transducer.
>
> * * *
>
> [C]laim 16 recites that (1) the contact-sensitive transducer "produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer;" and that (2) the controller configured to "scroll displayed rows along an axis of the display based on the output signal" (emphasis added). These elements are analogous to the elements discussed in detail above with respect to claim 1.
>
> * * *
>
> Claim 30, as amended, recites the combination of a (a) a display, (b) a contact-sensitive transducer "which produces an output signal in response to moving contact of an object along



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> the contact-sensitive transducer;" and (c) a control which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer."

Amd't filed Dec. 21, 2007, at 13, 17 (emphasis in original).

10. Appellants' Appeal Brief reproduces claim 30, in pertinent part, as follows:

> 30. An apparatus, comprising:
>
> a housing;
>
> a display, supported by the housing, that displays an image at a front surface of the housing . . . .

App. Br. 31 (Claims App'x).

11. Appellants' Reply Brief reproduces claim 30, in pertinent part, as follows:

> 30. An apparatus, comprising:
>
> a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;
>
> a display, supported by the housing, that displays an image at a front surface of the housing . . . .

Reply Br. 9 (Corrected Claims App'x).



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12. Claims 37-61 depend directly or indirectly from independent claim 30. Also, (1) claims 63-67, and (2) claims 69-73 depend directly or indirectly from independent claims 62 and 68, respectively. Reply Br. 11-14 (Corrected Claims App'x).

13. Independent claims 30, 62, and 68 are directed to an apparatus with (1) a housing; (2) a display; (3) a contact-sensitive transducer supported by the housing which produces an output signal; and (4) a controller that is responsive to the output signal which scrolls displayed rows along an axis of the display. Claims 62 and 68, however, contain additional limitations that are not present in originally-issued claim 30. *Compare* Reply Br. 14-16 (Claims 62 and 68 reproduced in Corrected Claims App'x) *with* '888 patent, col. 13, ll. 1-33 (claim 30).

## ANALYSIS

We first address whether Appellants' reissue declaration is defective. To that end, we first note that, Appellants' initially-filed and supplemental reissue declarations indicate that the error upon which the reissue was based is that patented claim 30 recites *more* than Appellants are entitled to. FF 3, 6 (emphasis added). In other words, Appellants characterize the present application as a narrowing—not broadening—reissue application.

This point is critical, for were we to accept the Examiner's opposite position in this regard (i.e., that the present application is a broadening reissue) (Ans. 4-5, 29-30), the present reissue application would be statutorily barred as untimely since it was filed well after two years from the patent's issuance. *See* 35 U.S.C. § 251; FF 1.



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We agree with Appellants, however, that the present application is a narrowing reissue application, particularly in light of (1) the narrowing amendments made to the independent claims (FF 7); (2) independent claims 62 and 68 added via reissue which recite features that generally correspond to those in originally-issued claim 30, but which also recite additional features which are not in originally-issued claim 30 as Appellants indicate (Reply Br. 14-16; FF 13); and (3) the features of dependent claims 37-61, 63-67, and 69-73 (added via reissue), which only further narrow the scope of their respective independent claims 30, 62, and 68 (FF 12).

We therefore find no claim in the present reissue application that is broader than the patented claims, for they do not contain within their scope any conceivable product or process that would not infringe the patented claims. *See Tillotson, Ltd. v. Walbro Corp.*, 831 F.2d 1033, 1037 n.2 (Fed. Cir. 1987).[5]

We reach this conclusion notwithstanding the fact that Appellants concede that they "inadvertently omitted" various limitations further limiting the housing from claim 30 in an amendment filed December 21, 2007. Reply Br. 1-2.

To be sure, the version of claim 30 when it was amended on December 21, 2007 omits the limitations regarding various housing details that were added to the claim when the present reissue application was filed on March 11, 2005. *Compare* FF 2 (adding limitations to claim 30 further narrowing the housing limitation when the reissue application was filed)

[5] *See also* MPEP § 1412.03(I) ("A claim would be considered a broadening claim if the patent owner would be able to sue any party for infringement who previously could not have been sued for infringement.").



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*with* FF 7 (listing claim 30 in an amendment filed December 21, 2007, but omitting these previously-added housing limitations). The Examiner's point in this regard (Ans. 29) is well taken.

But as Appellants indicate (Reply Br. 1-2), Appellants did not express their intention to omit these limitations, neither in the remarks accompanying the amendment nor the amendment itself. *See* FF 7, 9. The latter point is telling in this regard, for the listing of claim 30 in that amendment contains no formatting or other indicia that would express Appellants' intention to delete the previously-added housing limitations—formatting that was used to delete other limitations in that claim. *See* FF 7.[6]

Although it is unclear from this record why the previously-added housing limitations were omitted from the December 21, 2007 amendment to claim 30—an omission that was repeated in the Claims Appendix of the Appeal Brief (FF 10)—we nonetheless consider this inconsistency an inadvertent scrivener's error, and therefore harmless based on the record before us. That Appellants provide a corrected version of claim 30 in the Reply Brief's "Corrected Claims Appendix" that includes the previously-omitted housing limitations (FF 11) only reinforces our conclusion that the error was inadvertent and therefore harmless.

Nevertheless, we agree with the Examiner (Ans. 4) that the reissue declaration is defective insofar as it does not account for Appellants' correcting additional defects or errors *after* the Supplemental Declaration was filed on July 14, 2006, namely the amendments to the claims on

[6] *See also* 37 C.F.R. 1.173(d)(1) (noting that matter omitted by reissue must be bracketed); 37 C.F.R. 1.121(c)(2) (noting that deleted claim text must be shown by strike-through).



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December 21, 2007 noted above. *See* FF 7-8 (noting amendments to claims 1, 16, and 30, and cancellation of four claims). *See also* FF 9 (quoting Appellants' reasons why the claims were amended).

Simply put, Appellants did not account for correcting these additional errors after the first Supplemental Declaration via another Supplemental Declaration—a crucial defect on this record.[7] Although the Supplemental Declaration filed July 14, 2006 (1) specifically identifies at least one error to be corrected (FF 6), and (2) accounts for additional errors corrected up to July 14, 2006, it fails to account for errors corrected thereafter, namely the amendments filed December 21, 2007 noted above.

While these errors may relate to the error identified in Appellants' Supplemental Declaration (*id.*), correcting these additional errors nevertheless must be accounted for via an additional Supplemental Declaration. *See* 37 C.F.R. § 1.175(b)(1); *see also* MPEP 1414.01. We reach this conclusion emphasizing that these error corrections reflect substantive amendments to the claims which materially alter their scope,[8]

---

[7] *See* 37 C.F.R. § 1.175(b)(1) ("For any error corrected, which is not covered by the oath or declaration submitted under paragraph (a) of this section, applicant must submit a supplemental oath or declaration stating that every such error arose without any deceptive intention on the part of the applicant."); *see also* MPEP 1414.01, 8th ed., Rev. 7, July 2008 ("If additional defects or errors are corrected in the reissue after the filing of the application and the original reissue oath or declaration, a supplemental oath/declaration must be filed, unless all additional errors corrected are spelling, grammar, typographical, editorial or clerical errors which are not errors under 35 U.S.C. 251 . . . .").

[8] *Accord* App. Br. 12 (acknowledging amending the claims "to more comprehensively claim the invention").



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and therefore go well beyond merely correcting spelling, grammar, typographical, editorial, or clerical errors (which are not errors under § 251). *See* FF 7-9; *see also* MPEP 1414.01.

We are therefore not persuaded that the Examiner erred in rejecting claims 1-45, 48, and 51-73 under 35 U.S.C. § 251 as being based on a defective reissue oath.

THE IMPROPER BROADENING REJECTION

The Examiner finds that the claims on appeal were improperly broadened in a reissue application that was made and sworn to by the assignee—not the patentee. Ans. 4-5, 30. Appellants argue that the Examiner's position is erroneous since the application is not a broadening reissue application. App. Br. 13-16; Reply Br. 2. The issue before us, then, is as follows:

ISSUE

Under § 251, has the Examiner erred in rejecting claims 1-45, 48, and 51-73 by finding that these claims were improperly broadened in a reissue application made and sworn to by the assignee—not the patentee?

ANALYSIS

As noted above, since we find the present application is a narrowing—not broadening—reissue application, we find no error in the present reissue declaration being made and sworn by John Han who, while not an inventor, is nonetheless authorized to act on the assignee's behalf. FF 4-5. This practice is permissible for narrowing reissues. *See* 37 C.F.R.



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§ 1.172 ("[A] reissue oath may be made and sworn to or declaration made by the assignee of the entire interest if the application does not seek to enlarge the scope of the claims of the original patent.").

Although the Examiner is correct that the assignee statement in connection with this reissue application contains a typographical error since the box adjacent the assignment recordation information is blank (Ans. 5; FF 5), we nonetheless treat this error as harmless. Notably, the corresponding recordation information (i.e., the reel and frame numbers) is readily apparent from that document, all but indicating that Appellants intended to select the corresponding option on the form (i.e., option "A"). *See id.*

We are therefore persuaded that the Examiner erred in rejecting claims 1-45, 48, and 51-73 under § 251 by finding that these claims were improperly broadened in a reissue application made and sworn to by the assignee—not the patentee.

THE OBVIOUSNESS REJECTION OVER O'HAGAN AND GILLESPIE

Regarding representative claim 1, the Examiner finds that O'Hagan discloses a radiotelephone with every recited feature except for a contact-sensitive transducer, but cites Gillespie for this feature in concluding the claim would have been obvious. Ans. 5-7, 31. Specifically, the Examiner contends that it would have been obvious to replace O'Hagan's scrolling thumbwheel with a contact-sensitive transducer such as that disclosed by Gillespie. Ans. 7, 31.

Appellants argue that the prior art does not teach or suggest (1) a contact-sensitive transducer that produces an output signal responsive to moving contact along the contact-sensitive transducer, and (2) a controller



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that scrolls displayed rows based on the output signal as claimed. App. Br. 16-18. Although Appellants acknowledge that Gillespie uses a contact-sensitive transducer, Appellants nevertheless contend that Gillespie is silent on how to use this transducer to scroll displayed rows. App. Br. 20. The issue before us, then, is as follows:

ISSUE

(1) Under § 103, has the Examiner erred in rejecting claim 1 by finding that O'Hagan and Gillespie collectively would have taught or suggested (1) a contact-sensitive transducer that produces an output signal responsive to moving contact along the contact-sensitive transducer, and (2) a controller that scrolls displayed rows based on the output signal?

FINDINGS OF FACT

14. We adopt the Examiner's findings regarding O'Hagan (Ans. 6-7, 31) as our own.

15. Gillespie discloses a pressure-sensitive scrollbar feature used for cursor movement for computing devices and other applications. Gillespie's invention is especially useful for enhancing the scrollbar feature in applications for computing devices. Gillespie, Title; col. 1, ll. 17-23.

16. Gillespie notes in the patent's background section that the scrolling feature (i.e., enabling a user to move through a document line by line) is one of the most common controls in applications. This feature is often accessed with an object position detector that is used to move the



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cursor over a scroll arrow. The document is then scrolled at a constant rate by activating the scroll arrow, often with the object position detector (e.g., depressing and holding a mouse button). Gillespie, col. 4, ll. 37-48.

17. Gillespie's position sensing system 6 includes a position-sensing transducer comprising a touch-sensitive surface disposed on a substrate. The system includes a matrix of conductive lines which are capacitively-coupled to the user's finger 8 placed on sensing plane 10. Position and touch-pressure information is derived from detected capacitance changes. Gillespie, col. 5, ll. 35-67; col. 8, ll. 40-56; Fig. 1.

18. The scroll rate is a function of the Z pressure information such that the scroll rate varies in accordance with the pressure information. Gillespie, col. 9, ll. 33-41.

19. In operation, a host computer 400 polls the object position information supplied from the touch pad sensor. When the operating system 404 determines that the cursor is over a scroll arrow and a drag gesture has been implemented, a scroll message is sent, and the scroll rate is modified using the Z pressure information sensed by touchpad sensor 414. The application 406 then links to the scrolling function DLL 410 to scroll the document as a function of the Z pressure information. Gillespie, col. 31, l. 50 – col. 34, l. 49; Figs. 15-17.

20. Gillespie's invention provides a very convenient and easy-to-use cursor position solution that replaces a mouse or trackball. In mouse-type applications, the sensor can be placed in a convenient location (e.g., below the space bar key). In this location, the user's thumb can be used as the



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position pointer on the sensor to control displayed cursor position. The cursor may then be moved without the need for the user's fingers to leave the keyboard. Gillespie, col. 34, ll. 41-51.

## ANALYSIS

### *Claims 1-13 and 15*

We will sustain the Examiner's obviousness rejection of representative claim 1. In short, we see no reason why skilled artisans could not have utilized a contact-sensitive transducer such as that disclosed by Gillespie (FF 15-19) in lieu of O'Hagan's rotatable switch 46 (FF 14) as the Examiner proposes, particularly since both types of input devices enable scrolling displays for their respective devices in accordance with input from those devices. *See* FF 14-19.

Although Appellants contend that Gillespie is silent on how to use the contact-sensitive transducer to scroll displayed rows (App. Br. 20), Gillespie does, in fact, note that line-by-line scrolling is a common control scheme for applications. FF 16. Since Gillespie's system is intended to provide commensurate functionality via a contact-sensitive transducer (i.e., to enable positioning and scrolling with the user's finger in lieu of a hardware input device such as a mouse or trackball) (*see* FF 17-20), skilled artisans would have recognized that the system's ability to scroll displayed rows (i.e., lines) via that functionality. *See* FF 16-20. To the extent that implementing this transducer-based scrolling functionality to scroll displayed rows in O'Hagan would require additional design or engineering considerations, Appellants have provided no persuasive evidence on this record proving that such an adaptation would have been beyond the level of ordinarily skilled artisans.



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Nevertheless, we see no reason why applying this technique to scroll rows in O'Hagan's system (FF 14) is not tantamount to the predictable use of prior art elements according to their established functions. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 417 (2007). We reach this conclusion noting—as did the Examiner (Ans. 31)—that replacing O'Hagan's thumbwheel with Gillespie's contact-sensitive transducer would yield predictable results, namely scrolling displayed rows using a transducer-based input device in lieu of a rotatable wheel. Skilled artisans would have recognized several benefits from such a substitution, namely reducing the number of moving parts (which can wear out and fail over time), as well as the convenience of enabling the user's finger or thumb to be used as the position pointer in lieu of a wheel. *See* FF 20. We therefore find the Examiner's reason to combine the teachings of the cited references supported by articulated reasoning with some rational underpinning to justify the Examiner's obviousness conclusion. That both O'Hagan and Gillespie use cursor-based scroll bars to scroll displayed information (*compare* O'Hagan Figs. 7-8 *with* Gillespie Fig. 16) only bolsters our conclusion that utilizing a contact-sensitive transducer such as that in Gillespie to scroll information in O'Hagan would have been obvious.

We are therefore not persuaded that the Examiner erred in rejecting representative claim 1, and claims 2-13 and 15 which fall therewith.[9]

[9] Although Appellants arguments in connection with the obviousness rejection also refer to Allard (U.S. Pat. 5,615,384) (App. Br. 19-21), we need not address these arguments since the reference was not relied upon in the rejection before us on appeal. Nor is this reference germane to the Examiner's position articulated in the Answer. *See generally* Ans. 5-32.



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*Claims 16-27 and 29-73*

Although Appellants nominally argue (1) claims 16-27 and 29; (2) claims 30-61; (3) claims 62-67; and (4) claims 68-73 separately (App. Br. 21-23), the arguments are commensurate with the arguments made in connection with claim 1. Accordingly, we sustain the Examiner's rejection of claims 16-27 and 29-73 for reasons similar to those indicated in connection with claim 1.

THE OBVIOUSNESS REJECTION OVER O'HAGAN, GILLESPIE, AND MOORE

We likewise sustain the Examiner's rejection of claims 14 and 28 over O'Hagan, Gillespie, and Moore (Ans. 28-29). Although Appellants argue that Moore does not cure the previously-noted deficiencies of independent claims 1 and 16, we are not persuaded by these arguments for the reasons previously discussed. We are therefore not persuaded that the Examiner erred in rejecting claims 14 and 28.

CONCLUSION

Under § 251, the Examiner did not err in rejecting claims 1-45, 48, and 51-73 as being based on a defective reissue oath, but erred in rejecting those claims as being improperly broadened in a reissue application made and sworn by the assignee—not the patentee.

Under § 103, the Examiner did not err in rejecting claims 1-45, 48, and 51-73.



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ORDER

The Examiner's decision rejecting claims 1-45, 48, and 51-73 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

pgc

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Page 399 of 1144

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Appeal No: 2010-008061
Application: 11/078,916
Appellant: John Joseph Hayes et al.

# Board of Patent Appeals and Interferences
# Docketing Notice

Application 11/078,916 was received from the Technology Center at the Board on May 24, 2010 and has been assigned Appeal No: 2010-008061.

In all future communications regarding this appeal, please include both the application number and the appeal number.

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| 11078916 | 3/11/05 | HAYES ET AL. | ERI-888RI |

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**Commissioner for Patents**

The reply brief filed on 05/03/2010 has been noted and made of record.

/Nghi H. Ly/
Primary Examiner, Art Unit 2617

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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| Applicant: | Hayes, Jr., *et al.* | Docket No.: | ERI-888RI |
| Serial No: | 11/078,916 | Art Unit: | 2617 |
| Date Filed: | March 11, 2005 | Examiner: | Sheila B. Smith |
| Title: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**REPLY BRIEF**

Dear Sir:

In reply to Examiner's Answer dated March 4, 2010, Appellant provides the following reply pursuant to 37 CFR 41.41 and would respectfully show the following:

*The Supplemental Declaration in Support of Reissue Application Accurately States an Error to be Corrected*

At page 29 of Examiner's Answer, Examiner asserts that the limitation "housing configured to be held in a user's hand such that the rear surface confronts the user's palm" has been removed from claim 30 as of the latest claims of record filed 12/21/2007. This is incorrect. The official record shows no amendment to claim 30 removing the subject claim limitation. Rather, in an amendment dated 12/21/2007 the subject claim limitation was inadvertently omitted from the listing of claim 30. The official record reveals no deletion of that subject claim limitation by amendment (See 37 CFR § 1.121 "The text of any deleted matter must be shown by strike-through except that double brackets placed before and after the deleted characters may be


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used to show deletion of five or fewer consecutive characters. The text of any deleted subject matter must be shown by being placed within double brackets if strike-through cannot be easily perceived."). Review of that amendment reveals that claim 30 was amended to add an additional claim limitation (as indicated by underlining) but that no claim limitations were intentionally or properly deleted. Hence, claim 30 does include the subject claim limitation and the Supplemental Declaration is proper. Attached to this Reply Brief is a Corrected Claims Appendix reflecting the correct listing of claim 30.

*The Supplemental Declaration is Proper Because the Reissue Claims are Not Broader in Scope than the Originally Issued Claims*

Examiner's Answer at page 30 asserts that claim 62 is broader in scope than the originally issued claims. Appellant briefed this rejection in detail in the Appeal Brief at pages 13 – 16. In response, Examiner has conceded that, "The Examiner does concede that this claim is narrower in scope than claims 1 – 36 of the originally issued claims . . ." (Examiner's Answer at page 30). Because no product or process that does not infringe originally issued claims 1 – 36 could infringe claim 62, this is not a broadening reissue.

*The Claims Are Not Obvious Over the Cited Prior Art*

At page 31, Examiner asserts that the pending reissue claims are obvious over the combination of O'Hagan (U.S. Patent No. 6,424,830) in view of Gillespie (U.S. Patent No. 5,889,236) and argues that that the thumb wheel 48 of O'Hagan "reads on" the claimed contact-sensitive element" (Examiner's Answer page 31). The incorrect assertion that a thumbwheel is a claimed contact-sensitive element was the basis of a previous final rejection of the claims (see Final Office Action dated March 19, 2007, at page 3), which final rejection was overcome and


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withdrawn (see Appellant's first Pre-Appeal Brief Request for Review dated June 15, 2007 at pages 2 – 4, Notice of Panel Decision from Pre-Appeal Brief Review dated August 6, 2007, and Office Action dated September 21, 2007). In fact, Examiner has previously twice conceded that "O'Hagan fails to expressly disclose the use of an contact-sensitive transducer" (see Office Action dated August 6, 2007 at page 3 and Final Office Action dated September 11, 2008 at page 5). Hence, the assertion made in Examiner's Answer is directly contrary to the positions previously taken by the Patent Office.

For the reasons established hereinabove and in Appellant's Appeal Brief, reversal of the final rejection of 1 – 73 is respectfully requested. No fee is believed due in connection with this filing. However, should one be deemed due, the Commissioner is hereby authorized to charge Deposit Account No. 50-1065.

Respectfully submitted,

3 May 2010
Date

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## CORRECTED CLAIMS APPENDIX

1. A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon the output signal of the contact-sensitive transducer.

2. A radiotelephone according to claim 1, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

3. A radiotelephone according to claim 1, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.


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4. A radiotelephone according to claim 3, wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer.

5. A radiotelephone according to claim 4, wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer.

6. A radiotelephone according to claim 4, wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

7. A radiotelephone according to claim 4, wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

8. A radiotelephone according to claim 7, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

9. A radiotelephone according to claim 7, wherein the controller is operative display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

10. A radiotelephone according to claim 7, wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality

of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object.

11. A radiotelephone according to claim 10, wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer and to initiate the action associated with the identified graphical object responsive to detection of the momentary contact.

12. A radiotelephone according to claim 11, wherein the controller is operative to initiate the action in response to detection of a plurality of momentary contacts occurring within a predetermined time interval.

13. A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.

14. A radiotelephone according to claim 13, wherein the contact-sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

15. A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

16. An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces


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adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which is configured to scroll displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

17. An apparatus according to claim 16, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

18. An apparatus according to claim 16, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

19. An apparatus according to claim 18, wherein the controller is operative to selectively display a graphical object on the display responsive to the output signal of the contact-sensitive transducer.

20. An apparatus according to claim 19, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

21. An apparatus according to claim 19, wherein the controller is operative to display a plurality of graphical objects on the display, and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

22. An apparatus according to claim 19, wherein the controller is operative, responsive to the contact-sensitive transducer, to determine a position of contact along the axis of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

23. An apparatus according to claim 22, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

24. An apparatus according to claim 22, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

25. An apparatus according to claim 24, wherein the controller is operative, responsive to the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer.

26. An apparatus according to claim 25, wherein the controller is operative, responsive to the output signal of contact-sensitive transducer, to detect moving contact with the contact-sensitive

transducer along the axis of the contact-sensitive transducer, and to scroll displayed rows along the axis of the display based on the detected moving contact.

27. An apparatus according to claim 19, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.

28. An apparatus according to claim 27, wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

29. An apparatus according to claim 22, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

30. An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display,

which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

31. An apparatus according to claim 30, further comprising a radiotelephone communications transceiver supported by the housing, and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal.

32. An apparatus according to claim 30, wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at side surface of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface.

33. In an apparatus including a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, a display that displays an image at the front surface, and a controller that controls the display, a method of providing user input comprising the steps of:

holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm; and

providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at at least one of the first and second side surfaces of the housing, the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer.

34. A method according to claim 33, wherein the step of providing comprises the step of contacting the contact-sensitive transducer with a thumb or finger of the holding hand while

holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm.

35. A method according to claim 33, wherein the apparatus is a radiotelephone that further includes a radiotelephone communications transceiver, wherein the controller is operative to control the radiotelephone communications transceiver, and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

36. A method according to claim 33, wherein the step of controlling comprises the step of selectively displaying an image or the display according to the output signal of the contact-sensitive transducer.

37. An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

38. An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

39. An apparatus according to claim 38, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

40. An apparatus according to claim 39, wherein the contact-sensitive transducer is an elongate strip.

41. An apparatus according to claim 30, wherein the contact-sensitive transducer comprises one of a resistive transducer a capacitive transducer and a semiconductive transducer.

42. An apparatus according to claim 30, which also includes additional user input interface devices for the apparatus on the front surface of the housing.

43. An apparatus according to claim 42 wherein the additional interface devices are contact-sensitive.

44. An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer.

45. An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer.

48. An apparatus according to claim 43, wherein an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer.

51. An apparatus according to claim 30 further comprising:

a second contact-sensitive transducer, supported by the housing, which produces a second

output signal that characterizes contact of an object along the contact-sensitive surface of the second contact-sensitive transducer; and

a controller, responsive to the second output signal for controlling a function of the apparatus.

52. An apparatus according to claim 51, wherein the second output signal is produced in response to detection of momentary contact with said second contact-sensitive transducer.

53. An apparatus according to claim 51, wherein the second output signal is produced in response to detection of a predetermined number of momentary contacts with said second contact-sensitive transducer within a predetermined time interval.

54. An apparatus according to claim 30, wherein said controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of said display based on the output signal from said transducer.

55. An apparatus according to claim 54, wherein the direction of scroll is transverse to the direction that said rows extend across the display.

56. An apparatus according to claim 54, wherein said rows consist of alphanumeric characters comprising menu selections.

57. An apparatus according to claim 54, wherein said controller identifies successive ones of the rows displayed along the axis of said display by highlighting successive said rows.

58. An apparatus according to claim 30 further comprising a power supply disposed inside said housing.

59. An apparatus according to claim 58, wherein said power supply comprises a battery.

60. An apparatus according to claim 59 further comprising a circuit which controls power transfer from the power supply too another circuit based on the output signal of the contact-sensitive transducer.

61. An apparatus according to claim 30 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

62. An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display,


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which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device.

63. An apparatus according to claim 62, wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

64. An apparatus according to claim 62 further comprising a power upply disposed inside said housing.

65. An apparatus according to claim 64, wherein said power supply comprises a battery.

66. An apparatus according to claim 65 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

67. An apparatus according to claim 62 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

68. An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-

sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

69. An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

70. An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

71. An apparatus according to claim 70, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

72. An apparatus according to claim 71, wherein the contact-sensitive transducer is an elongate strip.

73. An apparatus according to claim 68, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

# Electronic Acknowledgement Receipt

| | |
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| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Correspondence Address:** | Steven H Slater<br>Slater & Matsil LLP<br>17950 Preston Road<br>Suite 1000<br>Dallas TX 75252<br>US 972-732-1001<br>- |
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**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 11/078,916
Filing Date: March 11, 2005
Appellant(s): HAYES ET AL.

Steven H. Slater
Reg. No. 35,361
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 7/17/2009 appealing from the Office action mailed 9/11/2008.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

| | | |
|---|---|---|
| 6,424,830 | O'Hagan et al. | 7-2002 |
| 5,889,236 | Gillespic et al. | 3-1999 |

4,566,001 Moore et al. 1-1986

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

1. The reissue oath/declaration filed with this application is defective (see 37 CFR 1.175 and MPEP § 1414) because of the following: amendments (see amendment filed March 22, 2002) have been made to the claims since the filing of the Original reissue oath/declaration. A supplemental oath/declaration is required.

2. The reissue oath/declaration filed with this application is defective because it fails to identify at least one error which is relied upon to support the reissue application. See 37 CFR 1.175(a)(1) and MPEP § 1414.

3. In accordance with 37 CFR 1.175(b)(1), a supplemental reissue oath/declaration under 37 CFR 1.175(b)(1) must be received before this reissue application can be allowed.

4. Claims 1-73 are rejected as being based upon a defective reissue oath under 35 U.S.C. 251. See 37 CFR 1.175.

The nature of the defect(s) in the Oath or Declaration is set forth in the discussion above in this Office action.

5. Claims 1-73 are rejected under 35 U.S.C. 251 as being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee. A claim is

broader in scope than the original claims if it contains within its scope any conceivable product or process which would have infringed the original patent. A claim is broadened if it is broader in any one respect even though it may be narrower in other respects.

6. It appears that on the Oath or Declaration filed 3/11/05 box A, An assignment from the inventors box was inadvertently left blank. Appropriate correction is required.

7. Appellant is referred to 37 CFR 1.173 for the proper format and manner of making amendments in a reissue application.

***Oath/Declaration***

1. It appears that on the Oath or Declaration filed 3/11/05 box A, An assignment from the inventors box was inadvertently left blank. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-13, 15-27 and 29-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236).

Regarding claim 1, O'Hagan discloses a radiotelephone, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-2), a radio telephone communications transceiver (66), supported by the housing, a display (28) supported by the housing, that displays an image at a front surface of the housing (see Figs. 7-8), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver (see processor being connected to display 28 and transceiver 66, Fig. 4), which controls at least one of the display and the radiotelephone communications transceiver which scrolls displayed rows along an axis or the display based upon the output signal (which reads on “In response to the operator rotating the three-way switch 46 clockwise or counterclockwise, the processor 60 causes a cursor 120 on the display to scroll up or down in relation to the list of possible "recipients"” as disclosed in column 9 lines 44-46). O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least one of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal in response to moving contact of an object along the surface of the wheel (which reads on “Rotation in a clockwise direction produces a first output and rotation in a counterclockwise direction produces a

second output. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a transaxial direction to produce a third output" as disclosed in col. 5, lines 54-58, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 2 and 17, the combination of O'Hagan and Gillespie et al. further discloses wherein the contact- sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or thumb of the holding hand (see • Fig. 2).

Regarding claims 3 and 18, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to selectively display an image according to the output signal of the transducer (see col. 9, lines 53-67, Fig. 8). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 4 and 19, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer (see col. 9, lines 43-48).

Regarding claims 5 and 20, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the transducer (see Fig. 8). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and

easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 6 and 21, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the transducer (see col. 9, lines 46-52). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 7 and 22, O'Hagan discloses selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object (see col. 9, lines 43-52). O'Hagan fails to expressly disclose wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose the interface electronics to allow the pointing device to communicate directly with a host microprocessor, and a "finger pointer" embodiment, a position sensing system includes a position sensing transducer comprising a touch-sensitive surface disposed on a substrate, such as a printed circuit board, including a matrix of conductive lines (see column 5, lines 21-27 and column 5 lines 45-50), which reads on the claimed, "wherein the controller (186) is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include a position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 8 and 23, O'Hagan disclose wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the transducer (see col. 9, lines 48-52 and col. 12 lines 34-36). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and

easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 9 and 24, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the transducer (see col. 9, lines 48-52). however, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 10, O'Hagan discloses wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical wherein the controller is further operative, to initiate the action associated with the identified graphical object (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or

send a voice message, for example, see col. 5, lines 62- 67, also col. 7, lines col. 9, lines 53-67), however, O'Hagan fails to expressly disclose the use of an contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 11, O'Hagan fails to expressly disclose wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a gesture unit (see column 30, lines 20-28), which reads on the claimed, "the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the gesture unit in order to properly position the cursor.

Regarding claim 12, O'Hagan fails to expressly disclose detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval.

In a similar field of endeavor, Gillespie et al disclose a gesture unit and parameters (see column 30, lines 29-34), which reads on the claimed, "detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above gesture unit and parameters in order to properly position the cursor.

Regarding claim 13, O'Hagan discloses a thumb wheel disposed at least one of the first side surface and the second side surface (see thumbwhee148, Figs. 2-3). O'Hagan fails to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed, "elongate contact-sensitive strip." It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above scroll bar in order to properly position the cursor.

Regarding claims 15, 29, 41 and 73, O'Hagan fails to explicitly disclose wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductor transducer.

In a similar field of endeavor, Gillespie et al disclose a capacitive sensing system (see figure 1) which reads on the claimed limitation a capacitive transducer.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above capacitive sensing system in order to provide an accurately determine the position of a finger as suggested by Gillespie et al (see column 8, lines 40-45).

Regarding claims 16, 30, 33, 62 and 68, O'Hagan discloses an apparatus and a method in an apparatus for providing user input to a hand-held electronic device, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-4), a display (28) supported by the housing, that displays an image at a front surface of the housing (see Figs. 7-8), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least one of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal that characterizes contact of an object along the surface of the wheel (see col. 5, lines 46-61, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however,

O'Hagan fails to expressly disclose the use of an contact- sensitive transducer., however, O'Hagan fails to expressly disclose the use of an contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 25-26, The combination of O'Hagan and Gillespie et al. further discloses wherein to scroll displayed rows along an axis of the display responsive to the output signal (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and

easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 27, The combination of O'Hagan and Gillespie et al. further discloses Figs. 2-3 illustrates the (thumbwheel 48) disposed at least one of the first and second side surfaces of the housing. However, O'Hagan fails to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed, "elongate contact-sensitive strip." It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above scroll bar in order to properly position the cursor.

Regarding claim 31, The combination of O'Hagan and Gillespie et al. further discloses a radiotelephone communications transceiver Supported by the housing and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claim 32, The combination of O'Hagan and Gillespie et al. further discloses the disposed at the side of the housing, the side surface disposed adjacent the front surface and inclined away form the front surface (see Fig. 2, showing side with thumb wheel being disposed on a side adjacent the front surface and inclined away from

the front surface). However, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 34, The combination of O'Hagan and Gillespie et al. further discloses wherein the step of providing comprises a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (see Fig. 3). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and

easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 35, The combination of O'Hagan and Gillespie et al. further discloses wherein the apparatus is a radio telephone that further includes a radio telephone communications transceiver (66, Fig. 2), wherein the controller is operative to control the radio telephone communications transceiver (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact sensitive transducer (see col. 5, lines 61-67, col. 9, lines 37-60).

Regarding claim 36, The combination of O'Hagan and Gillespie et al. further discloses wherein the step of controlling comprises the step of selectively displaying an image on the display according to the output of the contact-sensitive transducer (see Figs. 7 and 8).

Regarding claims 37 and 69, The combination of O'Hagan and Gillespie et al. further teach wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see Figs. 2-3 with the thumb wheel 48 on the side). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 38, The combination of O'Hagan and Gillespie et al. further discloses wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand). However, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and

easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 39, The combination of O'Hagan and Gillespie et al. further discloses a front surface of the housing (display may function as a touch panel display to allow input of information in addition to or in place of the keypad, see col. 5, lines 12-14). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 40, O'Hagan discloses a thumb wheel disposed at least one of the first side surface and the second side surface (see thumbwhee148, Figs. 2-3). O'Hagan fails to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed, "elongate contact-sensitive strip."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above scroll bar in order to properly position the cursor.

Regarding claims 42-43, The combination of O'Hagan and Gillespie et al. further discloses an additional user input interface devices for the apparatus on the front surface of the housing wherein the additional interface devices are contact-sensitive (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3).

Regarding claims 44 and 45, O'Hagan fails to disclose the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see column 5, lines 36-58), which reads on the claimed, "the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer," and, "the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above sliding output in order to allow a user to easily recover from touching an unintended button as suggested by Gillespie et al (see column 5, lines 36-58).

Regarding claims 46 and 49, O'Hagan fails to expressly disclose wherein the output signal is produced in response to detection of momentary contact with said contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a button is selected by a touch and release action (see column 5, lines 36-58), which reads on the claimed, "the output signal is produced in response to detection of momentary contact with said contact- sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above button selection in order to allow a user to select different buttons as suggested by Gillespie et al (see column 6, lines 8-17).

Regarding claims 47 and 50, O'Hagan fails to expressly disclose the output signal is produced in response to detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval.

In a similar field of endeavor, Gillespie et al disclose a pan function where a decision is made as to whether or not the touch screen is being touched, then a decision is made as to whether the position has changed, and this process can be repeated (see column 7, lines 16-45), which reads on the claimed, "detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above pan function in

order to provide an improved pan function as suggested by Gillespie et al (see column 2, lines 25-59).

Regarding claims 48, O'Hagan fails to disclose the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see column 5, lines 36-58), which reads on the claimed, "an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above sliding output in order to allow a user to easily recover from touching an unintended button as suggested by Gillespie et al (see column 5, lines 36-58).

Regarding claims 51-53, the combination of O'Hagan and Gillespie further discloses inherently a second contact-sensitive transducer, supported by the housing which produces a second output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive surface of the second transducer (inherent feature of keypad 26 on surface, O'Hagan Fig. 2-3), a controller for providing controlling functions of the apparatus including an output signal in response to detection of momentary contact or predetermined number of momentary contacts with the contact-sensitive transducer (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see

O'Hagan col. 6, lines 24-35). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 54-55, the combination of O'Hagan and Gillespie further discloses wherein the controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of the display based on the output signal from the transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display (operator may rotate the thumb wheel clockwise or counter- clockwise in order to scroll up or down through lines on the display, see O'Hagan col. 5, lines 51-62).

Regarding claims 56 and 57, the combination of O'Hagan and Gillespie further teach wherein the rows consist of alphanumeric characteristic comprising menu selections wherein the controller identifies successive ones of the rows displayed along the axis of the display by highlighting successive rows (see O'Hagan Figs 7-8).

Regarding claims 58, 59, 64 and 65, the combination of O'Hagan and Gillespie et al further disclose a power supply disposed inside the housing wherein the power supply comprises a battery (terminal also includes a power source 72 which is a rechargeable supply, see O'Hagan col. 7, lines 54-56).

Regarding claims 60 and 66, the combination of O'Hagan and Gillespie et al further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the transducer (power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see O'Hagan col. 7, lines 56-59). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 61 and 67, the combination of O'Hagan and Gillespie et al further discloses a mode of operation wherein the controller is unresponsive to contact with the transducer (feature of transitioning between different states as illustrated in

O'Hagan Fig. 6). However, O'Hagan fails to expressly disclose the use of and contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 63 the combination of O'Hagan and Gillespie et al disclose in Figs. 7-8 of O'Hagan wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

Regarding claim 69, The combination of O'Hagan and Gillespie et al. further discloses wherein the surface of the transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see Fig. 3), However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position

sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 70, The combination of O'Hagan and Gillespie et al. further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 71, The combination of O'Hagan and Gillespie et al. further discloses wherein the transducer is disposed on the. front surface of the housing (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and

easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 72, O'Hagan fails to disclose wherein the transducer is an elongate strip. In a similar field of endeavor, Gillespie et al disclose a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see column 5, lines 1-22), which reads on the claimed, "the contact sensitive transducer is an elongate strip." It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above touch-sensitive overlay instead of the thumb wheel in order to provide an improved pan function as suggested by Gillespie et al (see column 2, lines 25-59).

Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al in view of Gillespie et al as applied to claims 13 and 27 above, and further in view of Moore et al. (4,566,001).

Regarding claims 14 and 28, the combination of O'Hagan and Gillespie et al fails to teach wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface of the housing.

In an analogous field of endeavor, Moore discloses a touch strip input for a display in which the touch strips are mounted along the horizontal and vertical edges of the display terminal (see col. 1, lines 50-56).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Moore with the combination of O'Hagan and Gillespie et ars terminal for the benefit of having the contact overlays or strips in optional edges of the terminal for ease and convenience of use.

**(10) Response to Argument**

Appellant's arguments filed 7/17/2009 have been fully considered but they are not persuasive.

At page 12 of the Brief, Appellant argues that the Supplemental Declaration in Support of Reissue Application, filed July 14, 2006 states: At least one error upon which reissue is based is described as follows: Claim 30 of the patent is believed to be wholly or partially invalid an that it claims more than patentee is entitled to. Specifically originally issued claim 30 lacks the limitation of a "housing configured to be held in a user's hand such that the rear surface confronts the user's palm." The absence of this limitation constitutes an error.

The examiner contends that the limitation of a "housing configured to be held in a user's hand such that the rear surface confronts the user's palm," which was present in claims filed 03/11/2005, **has been subsequently removed** from claim 30 as of the latest claims of record filed 12/21/2007. Therefore, appellant has failed to provide a specific error for the filing of this reissue.

At page 13 of the Brief, Appellant argues that when the present reissue application is reviewed in light of the proper standard, it is self-evident that no claims have been broadened. The Examiner cannot concur. The examiner point your attention to claim 62 which discloses "An apparatus for providing user input to a hand-held electronic device, comprising: a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm; a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items; a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact- sensitive surface of the contact-sensitive transducer; and a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device." The Examiner does agree that this claim is narrower in scope than claims 1-36 of the originally issued claims, however, this claim is evident that it would also require broader (more) coverage, i.e. patent protection than the originally filed claims. Therefore, this is a broadened reissue and a broadened reissue requires that it be sworn to by all the patentee and not the assignee.

At page 18 of the Brief, Appellant argues that combination of O'Hagan and Gillespie fails to teach or suggest that a contact-sensitive transducer that produces an output signal in response to moving contact along the contact sensitive surface of the contact-sensitive transducer, and a controller that scrolls displayed rows… of the display based on the output signal. The examiner disagrees, to more clearly point out the Office's position, the examiner would like to draw attention to column 5 lines 50-62 which states "In the exemplary embodiment, the switch 46 includes a thumb wheel 48 (which reads on the contact-sensitive element because it is operated by touching it with ones finger) which may be rotated continuously in either a clockwise or counterclockwise direction…. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a trans axial direction to produce a third output (which reads on "produces an output signal in response to moving contact along the contact sensitive element). An operator may rotate the thumb wheel clockwise or counterclockwise in order to scroll up or down through lines on the display 28 (which reads on a controller that displayed rows.. of the display based on the output signal). Gillespie was only brought in to evidence the use of a contact-sensitive transducer to control scrolling. Therefore it would had been obvious to one of ordinary skill in the art to substitute the thumb wheel of O'Hagan with the contact-sensitive transducer of Gillespie and the outcome of the combination would have yield a predicable result.

At page 23 of the Brief, Appellant argues that nothing is Moore overcomes the deficiencies in the O'Hagan and Gillespie references. The examiner disagrees, Moore clearly discloses the contact-sensitive transducer comprises a first contract sensitive

surface mounted at a first side surface (which reads on "the strip(s) can be mounted at positions offset from the screen. Alternatively touch strips can be mounted on a bezel surrounding the screen") and a second contact sensitive strip mounted at a second side surface of the housing (which reads on "the strip(s) can be mounted at positions offset from the screen. Alternatively touch strips can be mounted on a bezel surrounding the screen" as disclosed in column 1 lines 50-56).

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Sheila B. Smith/

Examiner, Art Unit 2617

Conferees:

/Dwayne D. Bost/
Supervisory Patent Examiner,
Art Unit 2617

/George Eng/
Supervisory Patent Examiner, Art Unit 2617

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Appellant : | Hayes Jr., et al. | Docket No.: | ERI-888RI |
| Serial No.: | 11/078,916 | Art Unit: | 2617 |
| Filed: | March 11, 2005 | Examiner: | Sheila B. Smith |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## APPEAL BRIEF

Dear Sirs:

This Appeal Brief is respectfully submitted in connection with the above-identified application in response to the Office Action dated September 11, 2008, which action was made final. A Notice of Appeal was filed on January 9, 2009 along with a Pre-Appeal Brief Request for Review, which resulted in a Panel Decision to proceed to the Board of Patent Appeals and Interferences.



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REAL PARTY OF INTEREST (37 C.F.R. § 41.37(c)(1)(i))

The present application is assigned to Ericsson Inc., which assignment was recorded December 30, 1997, and appears at reel/frame 008951/0747.


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RELATED APPEALS AND INTERFERENCES (37 C.F.R. § 41.37(c)(1)(ii))

A Notice of Appeal was filed on June 15, 2007, in the current application along with a Pre-Appeal Brief Request for Review related to the final rejection of claims 1-73 over U.S. Patent No. 6,424,830 to O'Hagan, which reference remains one of the primary references used in the currently appealed rejection of claims 1-45, 48, and 51-73. A copy of the Notice of Panel Decision from Pre-Appeal Brief Review, dated August 6, 2007, which ordered that prosecution be reopened, is provided below in the Related Proceedings Appendix.

Appellant is not aware of any other related appeals or interferences.


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STATUS OF CLAIMS (37 C.F.R. § 41.37(c)(1)(iii))

Claims 1-45, 48, and 51-73 stand finally rejected Appellant notes that although the Final Office Action identifies claims 1-73 as rejected, claims 46, 47, 49, and 50 have been previously canceled. No claims have been allowed. Therefore, claims 1-45, 48, and 51-73 are the subject of this appeal and are reproduced in the Claims Appendix.


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STATUS OF AMENDMENTS (37 C.F.R. § 41.37(c)(1)(iv))

No amendments were filed after the final rejection dated September 11, 2008.


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SUMMARY OF CLAIMED SUBJECT MATTER (37 C.F.R. § 41.37(c)(1)(v))

With reference to illustrative embodiments by way of example and not by way of limitation, independent claim 1 relates to a radiotelephone (Fig. 1, 100) comprising a housing (Fig. 1, 110) having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, configured to be held in a user's hand such that the rear surface confronts the user's palm (Fig. 1; col. 2, lines 15 – 17; col. 4, lines 64 – 67). Claim 1 further relates to a radiotelephone communications transceiver (Fig. 2, 230) supported by the housing (Fig. 2; col. 5, lines 19 – 30) and a display (Fig. 1, 102), supported by the housing (Fig. 1, 110), that displays an image at the front surface of the housing (Fig. 1; col. 5, lines 1 – 7). A contact-sensitive transducer (Fig. 1, 150) is supported by the housing (Fig. 1, 110) and has a contact-sensitive surface disposed at at least one of the first and second side surfaces (Fig. 2, 150; Fig. 3, 150a and 150b). The contact-sensitive surface (Fig. 2, 150a) produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 2; col. 5, lines 19 – 22). Claim 1 further relates to a controller (Fig. 2, 220), responsive to the output signal and operatively associated with the display (Fig. 2, 120) and the radiotelephone communications transceiver (Fig. 2, 230), which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon the output signal of the contact-sensitive transducer (Fig. 2; Figs. 7A and 7B; col. 8, lines 29 – 53).


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With reference to illustrative embodiments by way of example and not by way of limitation, independent claim 16 relates to an apparatus (Fig. 1, 100) comprising a housing (Fig. 1, 110) having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (Fig. 1; col. 2, lines 15 – 17; col. 4, lines 64 – 67). Claim 16 further relates to a display (Fig. 1, 102) supported by the housing (Fig. 1, 110) that displays an image at the front surface of the housing (Fig. 1; col. 5, lines 1 – 7). A contact-sensitive transducer (Fig. 1, 150) is supported by the housing (Fig. 1, 110) and has a contact-sensitive surface disposed at at least one of the first and second side surfaces (Fig. 2, 150; Fig. 3, 150a and 150b), which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 2; col. 5, lines 19 – 22). Claim 16 further relates to a controller (Fig.2, 220) responsive to the output signal and operatively associated with the display (Fig. 2, 120), which is configured to scroll displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (Fig. 2; Figs 7A and 7B; col. 8, lines 29 – 53).

Independent claim 30, with reference to illustrative embodiments by way of example and not by limitation, relates to an apparatus (Fig. 1, 100) comprising a housing (Fig. 1, 110), a display supported by the housing, that displays an image at a front surface of the housing (Fig. 1, 120; col. 5, lines 1 – 7, and a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 1, 150; Fig. 2, 150; Fig. 3, 150a and 150b; col. 5, lines 19 – 22). The apparatus also includes a controller, responsive to the output


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signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (Fig. 2, 220; Figs. 7A and 7B; col. 8, lines 29 – 53).

By way of illustration and not limitation, independent claim 33 relates to a method of providing user input with an apparatus (Fig. 1, 100) including a housing (Fig. 1, 120) having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface (Fig. 1, col. 2, lines 15 – 17; col. 4, lines 64 – 67). The apparatus also includes a display that displays an image at the front surface (Fig.1, 102; col. 5, lines 1 – 7) and a controller that controls the display (Fig. 2, 220). The method of independent claim 33 includes holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (Fig. 1; col. 2, lines 12 – 17; col. 4, lines 64 – 67) and providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at at least one of the first and second side surfaces of the housing (Fig. 2, 150; Fig. 3, 150a and 150b), the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer (col. 5, lines 19 – 22; Figs. 7A and 7B; col. 8, lines 29 – 53).

By way of illustration with reference to the described embodiments, claim 62 relates to an apparatus (Fig. 1, 100) for providing user input to a hand-held electronic device (Fig. 2) comprising a housing for containing the electronics for performing the intended user functions of the device (Fig. 1, 100), said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending


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from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm ((Fig. 1; col. 2, lines 15 – 17; col. 4, lines 64 – 67). The apparatus further includes a display located on the front surface of the housing for displaying user-interface information for the electronic device, the said information including an image of rows of menu selectable items (Fig. 1, 102; Figs. 2, 3, 7A – 7C ; col. 5, lines 1 -7) and a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 2, 150; col. 5, lines 19 – 22). A controller, responsive to the output signal and operatively associated with the display, scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device (Fig. 2, 220; Figs. 7A and 7B; col. 8, lines 29 – 53).

Finally, independent claim 68 relates to an apparatus comprising a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (Fig. 1, 110; col. 2, lines 15 – 17; col. 4, lines 64 – 67), a display (Fig. 1, 102) supported by the housing, that displays an image at a front surface of the housing (Fig. 1; col. 5, lines 1 – 7), a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer (Fig. 2, 150; col. 5, lines 19 – 22), and a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (Fig. 2, Figs. 7A and 7B; col. 8, lines 29 – 53).


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GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL (37 C.F.R. § 41.37(c)(1)(vi))

(1) Whether claims 1-45, 48, and 51-73 are properly rejected as being based upon a defective reissue oath because (a) amendments have been made to the claims since the filing of the Original reissue oath / declaration and (b) the reissue oath / declaration fails to identify at least one error which is relied upon to support the reissue application?

(2) Whether claims 1-45, 48, and 51-73 are being improperly broadened in a reissue application made and sworn to by assignee and not the patentee?

(3) Whether claims 1–13, 15-27, and 29-45, 48, and 51-73 are unpatentable under 35 U.S.C. § 103(a) over O'Hagan et al (U.S. Patent No. 6,424,830, henceforth O'Hagan) in view of Gillespie et al (U.S. Patent No. 5,889,236, henceforth Gillespie)?

(4) Whether claims 14 and 28 are unpatentable under 35 U.S.C. § 103(a) over O'Hagan et al (U.S. Patent No. 6,424,830, henceforth O'Hagan) in view of Gillespie et al (U.S. Patent No. 5,889,236, henceforth Gillespie) and further in view of Moore et al (U.S. Patent No. 4,566,001, henceforth Moore)?


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ARGUMENT (37 C.F.R. § 41.37(c)(1)(vii))

Appellant respectfully submits that claims 1-45, 48, and 51-73 are supported by a proper reissue oath / declaration and are fully patentable over the prior art for the following reasons.

(1) The reissue oath/declaration is proper and fully supports claims 1-45, 48, and 51-73

(a) The rejection of claims 1-45, 48, and 51-73 as being based upon a defective reissue oath because amendments have been made to the claims since the filing of the Original reissue oath / declaration is improper and not supported by the record.

In the final office action dated September 11, 2008 (henceforth the "Final Office Action"), Examiner asserted, "The reissue oath/declaration filed with this application is defective (see 37 CFR 1.175 and MPEP § 1414) because of the following: amendments (see amendment filed March 22, 2002) have been made to the claims since the filing of the Original reissue oath / declaration. A supplemental oath/declaration is required" (emphasis added).

Appellant respectfully responds that the present reissue application was filed on March 11, 2005, well after the date of the purported amendment identified by Examiner to support the final rejection of claims 1-45, 48, and 51-73. For this reason alone, the final rejection of claims 1-45, 48, and 51-73 on the basis of 37 CFR 1.175 should be reversed because it is self-evident from the record that Examiner's grounds for this rejection is in error. Appellant respectfully notes that the rejection of claims 1-45, 48, 51-73 as being based upon a defective reissue oath/declaration was first raised in the Final Office Action and hence Appellant has not had the opportunity to previously respond to these grounds of rejection or to request clarification from Examiner.

Furthermore, however, 37 CFR 1.1.75 only requires a supplemental reissue oath/declaration "for any error corrected, which is not covered by the oath or declaration


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submitted under paragraph (a) of [37 CFR 1.175." While Appellant has amended certain claims in order to more comprehensively claim the invention, the record is devoid of any evidence that the amendments were to correct errors not covered by the Supplemental Declaration in Support of Reissue Application submitted on July 14, 2006. Hence, the rejection of claims 1-45, 48, and 51-73 is not properly supported and should be reversed.

(b) The rejection of claims 1-45, 48, and 51-73 as being based upon a defective reissue oath/declaration because the reissue oath / declaration fails to identify at least one error which is relied upon to support the reissue application is improper and not supported by the record.

In the Final Office Action, Examiner asserted that "the reissue oath/declaration filed with the application is defective because it fails to identify at least one error which is relied upon to support the reissue application." Appellant respectfully traverses. The Supplemental Declaration in Support of Reissue Application, filed July 14, 2006 states:

> At least one error upon which reissue is based is described as follows:
>
> Claim 30 of the patent is believed to be wholly or partially invalid an that it claims more than patentee is entitled to. Specifically originally issued claim 30 lacks the limitation of a "housing configured to be held in a user's hand such that the rear surface confronts the user's palm." The absence of this limitation constitutes an error.

Declaration in Support of Reissue Application, paragraph (12).

Because the Declaration "stat[es] at least one error being relied upon as the basis for reissue" as required under 37 CFR 1.175, the final rejection of claims 1-45, 48, and 51-73 as being based upon a defective reissue oath/declaration should be reversed.


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(2) The reissue oath/declaration fully supports claims 1 – 73 because the claims are not being broadened

In the Final Office Action, Examiner asserted that "claims 1-45, 48, and 51-73 are rejected under 35 U.S.C. 251 as being improperly broadened in a reissue application made and sworn by the assignee and not the patentee. A claim is broader in scope than the original claims if it contains within its scope any conceivable product or process which would have infringed the original patent" (Final Office Action, p. 3). Examiner's statement of the law is self-evidently in error. In order for a claim to be broader in scope than the original claim it must contain within its scope a product or process which would not have infringed the original patent (*See* MPEP 1412.03).

When the present reissue application is reviewed in light of the proper standard, it is self-evident that no claims have been broadened. As an initial matter, Examiner has provided no evidence or support or even articulated rationale under which the finally rejected claims are broader than the original claims – and hence the record is devoid of any basis to support the rejection. Because this issue was first raised in a final rejection of all claims, Appellant has not had an opportunity to previously respond to this issue. A response is provided in the following paragraphs.

*Claims 1-36*

The record flatly refutes Examiner's characterization that claims 1-45, 48, and 51-73 are being improperly broadened. In fact, each and every one of the originally issued claims (i.e., originally issued claims 1 – 36) has been amended in this reissue application to add claim limitations. It is thus axiomatic and beyond peradventure that claims 1 – 36 have not been


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improperly broadened. The final rejection of claims 1 – 36 as being broadened and hence based upon a defective reissue oath/declaration must hence be reversed.

*Claims 37-61*

Furthermore, each and every one of claims 37 – 61, which were added by preliminary amendment in the present reissue application, depends from (original and now narrowed) claim 36 and adds yet further limitations to the claim scope. By definition, claims 37 – 61 are narrower in scope than original claim 36 and hence the final rejection of claims 37 – 61 as being broadened and hence based upon a defective reissue oath/declaration must be reversed.

*Claims 62-73*

Finally, neither claims 62 (from which depend claims 63–67) nor 68 (from which depend claims 69–73) are broadening claims. A broadened reissue claim is one that is "greater in scope than each and every claim of the original patent" (MPEP § 1412.03). Examiner has failed to establish even a *prima facie* showing the claims 62–73 are greater in scope than original claims 1–36. In fact, simply by way of example, a cursory comparison of claim 62 with originally issued claim 30 demonstrates that claim 62 contains an analogous claim element to each claim element of claim 30 and adds further limitations to each claim element, as demonstrated by the below table.

| Originally Issued Claim 30 | Narrowing Reissue Claim 62 |
|---|---|
| 30. An apparatus, comprising: | 62. An apparatus for providing user input to a hand-held electronic device, comprising: |
| a housing; | a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a |


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| | |
|---|---|
| | user's hand such that the rear surface confronts the user's palm; |
| a display, supported by the housing, that displays an image at a front surface of the housing; | a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items; |
| a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and | a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and |
| a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer. | a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device. |

Claims 63–67 add still further limitations to claim 62 from which they depend and hence are not broadening claims.

Likewise, claim 68 is self-evidently narrower than, for instance, claim 30, as demonstrated below.

| Originally Issued Claim 30 | Narrowing Reissue Claim 68 |
|---|---|
| 30. An apparatus, comprising: | 68. An apparatus, comprising: |
| a housing; | a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm; |
| a display, supported by the housing, that displays an image at a front surface of the housing; | a display, supported by the housing, that displays an image at a front surface of the housing; |
| a contact-sensitive transducer, supported by the housing, which produces an output signal | a contact-sensitive transducer, supported by the housing, which produces an output signal |


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| | |
|---|---|
| that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and | that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and |
| a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer. | a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer. |

Claims 69–73 add still further limitations to claim 68 from which they depend and hence are not broadening claims.

In summary, the record demonstrates that no currently pending claims is broader in scope than each and every claim of the original patent. Hence, the rejection of claims 1-45, 48, and 51-73 under 35 U.S.C. 251 as being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee is in error and should be reversed.

(3) Claims 1–13, 15- 27, 29-45, 48, and 51-73 are patentably distinct over O'Hagan in view of Gillespie et al

Claims 1-13, 15-27, 29-45, 48, and 51-73 were rejected under 35 U.S.C. § 103(a) as being unpatentable over O'Hagan (6,424,830) in view of Gillespie (5,889,236).

*Claims 1–13 and 15*

Claim 1 recites the combination of: (a) a contact-sensitive transducer, (b) a controller, and (c) a display, and furthermore recites that (1) the contact-sensitive transducer "produces an output signal in response to moving contact along the contact-sensitive surface of the contact-sensitive transducer; and (2) the controller "scrolls displayed rows . . . of the display based on the output signal" (emphasis added). In other words, the displayed rows are scrolled in response to moving contact along the contact-sensitive transducer. By way of example and not


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as limitation, attention is respectfully drawn to Figures 2 and 7 of Appellant's specification, reproduced below. In Figure 2, "moving contact along the contact-sensitive surface" is embodied as a user's finger 210 moving (as shown by the arrows) along the surface of contact-sensitive transducer 150 to generate controls signals 155. In response, controller 220 scrolls displayed rolls 240, in the illustrated case a list of phone numbers, on display 120 (see, e.g., column 5, lines 19-35).

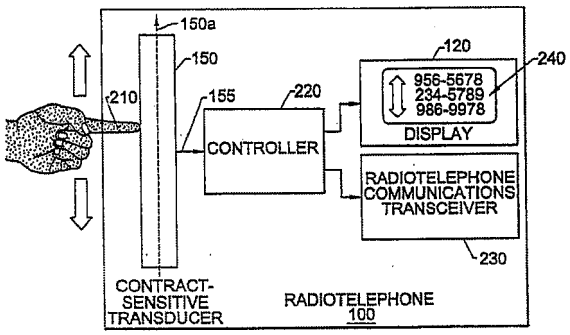



FIG. 2.

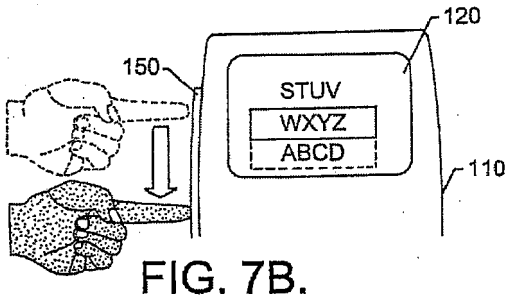



FIG. 7B.

In Figure 7, moving contact along a contact-sensitive transducer 150 is accomplished by swiping a finger along contact-sensitive strip 150 to generate control signals, which cause displayed rows of alphanumeric symbols to scroll along display 120 (see, e.g., column 8 at lines 29-53).


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While the present invention is broader in scope than the illustrated embodiments, the specification provides descriptive embodiments of the claim elements of "moving contact along a contact-sensitive surface" to generate control signals to "scroll displayed rows."

Examiner concedes that O'Hagan does not teach a contact-sensitive transducer, but asserts that Gillespie "discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed, "contact-sensitive transducer" (Final Office Action, p. 5). Assuming for the sake of argument that this is correct, Gillespie still fails to teach or suggest "moving contact along a contact-sensitive surface" to generate control signals to "scroll displayed rows" as required by claim 1. Hence, the combination of O'Hagan and Gillespie fails to teach suggest that a contact-sensitive transducer that "produces an output signal in response to moving contact along the contact-sensitive surface of the contact-sensitive transducer; and a controller that "scrolls displayed rows . . . of the display based on the output signal" as required by claim 1.

In the Final Office Action, Examiner asserts "it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include a position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position as suggested by Gillespie et al" (Final Office Action, p. 5). Assuming for the sake of argument that it was proper to modify O'Hagan with the position sensing transducer of Gillespie, this combination still does not teach that the transducer "produces an output signal in response to moving contact along the contact-sensitive surface of the contact-sensitive transducer," and that the controller "scrolls displayed rows . . . of the display based on the output signal." Since O'Hagan does not disclose a contact-sensitive transducer and Gillespie is silent regarding how to scroll displayed rows, it is simply


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speculation to assume that the contact-sensitive transducer of Gillespie would be used in the manner suggested by Examiner. This is particularly so because a reference previously cited by Examiner demonstrates how one skilled in the art would combine the teaching of O'Hagan and Gillespie, and that such combination would not "produce an output signal in response to moving contact along the contact-sensitive surface" that is used to "scroll displayed rows." Rather, the combination results in a static push-button type of input, such as taught by O'Hagan – even when combined with a contact-sensitive transducer, such as taught by Gillespie. This is demonstrated in the following paragraphs.

U.S. Patent No. 5,615,384 to Allard (which was asserted against all claims in the Office Action dated Sept. 21, 2007, but not in the Final Office Action) discloses a contact-sensitive transducer (much like Gillespie) and teaches how one of ordinary skill in the art would use such a contact-sensitive transducer to scroll displayed rows. Allard, clearly teaches using the contact-sensitive transducer as a point-of-contact push button input (See Allard, Figure 4 and col. 6, lines 18 – 21, "Buttons 134 are for the purpose of scrolling down and up in the list."). In other words, Allard demonstrates that even if the push-button of O'Hagan is replaced with a contact-sensitive transducer, such as in Gillespie, the result is producing an output signal in response to pushing a (virtual) button – and not "in response to moving contact along the contact-sensitive surface" as required by claim 1.

Simply put, there is no need, as Examiner has done, to speculate what the combination of O'Hagan and Gillespie would look like. Allard takes the mechanical point-of-contact push button of O'Hagan and substitutes for it the contact-sensitive transducer of Gillespie – and the result is a point-of-contact push button implemented in a contact-sensitive transducer. What the combination does not provide, however, is a contact-sensitive transducer used to generate


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output signals to "[scroll] displayed rows . . . of the display based on the output signal" which output signal is "produced in response to moving contact along the contact-sensitive surface."

Allard clearly demonstrates how one skilled in the art would (did in fact) combine the mechanical push button taught by O'Hagan with the contact-sensitive transducer taught by Gillespie. It is speculation to suppose that Gillespie (which is at best silent regarding scrolling displayed rolls) would accomplish this function in a different manner – particularly when (1) O'Hagan explicitly teaches a point-of-contact push button input, and (2) Allard (which Examiner previously asserted teaches every element of the claims at issue) shows how one skilled in the art would modify O'Hagan to employ a contact-sensitive transducer and demonstrates that the result would still be a point-of-contact push button input even when a contact-sensitive transducer (such as taught by Gillespie) is employed.

Putting this in perspective – both Allard and Gillespie teach the use of a contact-sensitive transducer. Allard also expressly teaches how one skilled in the art would employ the contact-sensitive transducer to scroll display rows (i.e. by using the contact-sensitive transducer as a point-of-contact push button). As a result, Allard fails to meet the above recited limitation of claim 1. Gillespie, on the other hand, is completely silent on how to use the contact-sensitive transducer to scroll displayed rows. The fact that Gillespie provides even less teaching than Allard should not lead to the bizarre result that Examiner is free to opine (or speculate) what Gillespie would have taught had Gillespie disclosed scrolling displayed rows.

The only suggestion to further modify the combination of O'Hagan and Gillespie in order to provide a device having a contact-sensitive transducer which produces an output signal "in response to moving contact of an object along the contact-sensitive surface" and that "scrolls displayed rows along an axis of the display based upon the output signal of the contact-


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sensitive transducer," as required by claim 1, is provided by Appellant's own specification and nowhere else. Other relevant art (Allard) teaches away from such further modification. Hence, claim 1 is patentably distinct over the prior art.

Claims 2–13, and 15 are also allowable over the prior art by virtue of their respective dependence from claim 1 as well as for their further defining limitations.

*Claims 16–27 and 29*

Claim 16 recites the combination of the following elements: (a) a contact-sensitive transducer, (b) a controller, and (c) a display. Furthermore, claim 16 recites that (1) the contact-sensitive transducer "produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer," and that (2) the controller configured to "scroll displayed rows along an axis of the display based on the output signal" (emphasis added). These elements are analogous to the elements discussed in detail above with respect to claim 1, and, analogously claim 16 is patentably distinct over O'Hagan and Gillespie because these references fail to disclose or suggest the cited claim elements for reasons analogous to those provided above with respect to claim 1. Claims 16-27 and 29 are also patentably distinct over the reference by virtue of their respective dependence from claim 16 as well as their further respective defining limitations.

*Claims 30–61*

Claim 30 recites the combination of a (a) a display, (b) a contact-sensitive transducer "which produces an output signal in response to moving contact of an object along the contact-sensitive transducer," and (c) a controller which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer." As addressed above


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with reference to claim 1, the combination of O'Hagan and Gillespie fails to disclose a device in which the contact-sensitive transducer generates an output signal in response to "moving contact of an object" along the contact-sensitive surface, which output signal "scrolls displayed rows" of the display. O'Hagan teaches the use of a thumb-wheel device, which is contrary to a contact-sensitive transducer; and Gillespie is at best silent regarding scrolled displayed rows; as described above, the combination would fail to meet these claim elements. Claim 30 is hence allowable over the cited references. Claims 31-61 are likewise allowable by virtue of their respective dependence from claim 30 as well as their respective further defining limitations.

*Claims 62–67*

Claim 62 recites the requirement of a contact-sensitive transducer that "produces an output signal that characterizes moving contact of an object along" the contact-sensitive transducer, and the further requirement that a controller "scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer." As has been demonstrated above, neither O'Hagan nor Gillespie, alone or in combination, teach or suggest these claim limitations with reference to claim 1. Hence, claim 62 is patentably distinct over the references as are claims 63-67 by virtue of their respective dependence from claim 62 as well as their respective further defining limitations.

*Claims 68–73*

Claim 68 also requires (a) a display, (b) a contact-sensitive transducer that "produces an output signal that characterizes moving contact of an object along the contact-sensitive transducer," and (c) a controller "which scrolls displayed rows along an axis of the display


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based on the output signal of the contact-sensitive transducer." For reasons analogous to those provided, these claim limitations are patentably distinct over the cited references. O'Hagan provides no teaching of using a contact-sensitive transducer to scroll displayed rows, and Gillespie is at best silent regarding scrolled displayed rows. As other references (Allard) teach, the combination of O'Hagan and Gillespie would not suggest to those skilled in the art the combination of claim elements required by claim 68. Hence, claim 68 is patentably distinct over the references as are claims 69-73 by virtue of their respective dependence from claim 68 as well as their respective further defining limitations.

(4) Claims 14 and 28 are patentably distinct over O'Hagan in view of Gillespie and further in view of Moore

Claim 14 contains all the elements of claim 1 from which it depends. Claim 14 is patentably distinct over the prior art by virtue of its dependence from claim 1 as well as its further defining limitations. Nothing in Moore (which was combined with O'Hagan and Gillespie to reject claim 14) overcomes the above described deficiencies in the O'Hagan and Gillespie references. Hence, claim 14 is also patentably distinct by virtue of its dependence from claim 1 as well as its further respective defining limitations.

Claim 28 contains all the elements of claim 16 from which it depends. Claim 28 is patentably distinct over the prior art by virtue of its dependence from claim 16 as well as its further defining limitations. Nothing in Moore (which was combined with O'Hagan and Gillespie to reject claim 28) overcomes the above described deficiencies in the O'Hagan and Gillespie references. Hence, claim 28 is also patentably distinct by virtue of its dependence from claim 1 as well as its further respective defining limitations.


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Conclusion

The reissue oath/declaration supporting claims 1-45, 48, and 51-78 meets all statutory and regulatory requirements and the final rejection of claims 1-45, 48, and 51-78 as being based upon a deficient oath/declaration should be reversed.

Claims 1-45, 48, 51-73 are patentably distinct over the art of record and the final rejection of claims 1-45, 48, and 51-73 under 35 U.S.C. 103 should be reversed.

The Commissioner is hereby authorized to charge any fees due, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

17 JULY 2009
Date

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## CLAIMS APPENDIX

1. A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon the output signal of the contact-sensitive transducer.

2. A radiotelephone according to claim 1, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.


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3. A radiotelephone according to claim 1, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.

4. A radiotelephone according to claim 3, wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer.

5. A radiotelephone according to claim 4, wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer.

6. A radiotelephone according to claim 4, wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

7. A radiotelephone according to claim 4, wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

8. A radiotelephone according to claim 7, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.


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9. A radiotelephone according to claim 7, wherein the controller is operative display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

10. A radiotelephone according to claim 7, wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object.

11. A radiotelephone according to claim 10, wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer and to initiate the action associated with the identified graphical object responsive to detection of the momentary contact.

12. A radiotelephone according to claim 11, wherein the controller is operative to initiate the action in response to detection of a plurality of momentary contacts occurring within a predetermined time interval.

13. A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.


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14. A radiotelephone according to claim 13, wherein the contact-sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

15. A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

16. An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which is configured to scroll displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.


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17. An apparatus according to claim 16, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

18. An apparatus according to claim 16, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

19. An apparatus according to claim 18, wherein the controller is operative to selectively display a graphical object on the display responsive to the output signal of the contact-sensitive transducer.

20. An apparatus according to claim 19, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

21. An apparatus according to claim 19, wherein the controller is operative to display a plurality of graphical objects on the display, and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

22. An apparatus according to claim 19, wherein the controller is operative, responsive to the contact-sensitive transducer, to determine a position of contact along the axis of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.


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23. An apparatus according to claim 22, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

24. An apparatus according to claim 22, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

25. An apparatus according to claim 24, wherein the controller is operative, responsive to the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer.

26. An apparatus according to claim 25, wherein the controller is operative, responsive to the output signal of contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and to scroll displayed rows along the axis of the display based on the detected moving contact.

27. An apparatus according to claim 19, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.

28. An apparatus according to claim 27, wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.


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29. An apparatus according to claim 22, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

30. An apparatus, comprising:

a housing;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

31. An apparatus according to claim 30, further comprising a radiotelephone communications transceiver supported by the housing, and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal.

32. An apparatus according to claim 30, wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at side surface of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface.

33. In an apparatus including a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear


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surface, a display that displays an image at the front surface, and a controller that controls the display, a method of providing user input comprising the steps of:

holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm; and

providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at at least one of the first and second side surfaces of the housing, the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer.

34. A method according to claim 33, wherein the step of providing comprises the step of contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm.

35. A method according to claim 33, wherein the apparatus is a radiotelephone that further includes a radiotelephone communications transceiver, wherein the controller is operative to control the radiotelephone communications transceiver, and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

36. A method according to claim 33, wherein the step of controlling comprises the step of selectively displaying an image or the display according to the output signal of the contact-sensitive transducer.


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37. An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

38. An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

39. An apparatus according to claim 38, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

40. An apparatus according to claim 39, wherein the contact-sensitive transducer is an elongate strip.

41. An apparatus according to claim 30, wherein the contact-sensitive transducer comprises one of a resistive transducer a capacitive transducer and a semiconductive transducer.

42. An apparatus according to claim 30, which also includes additional user input interface devices for the apparatus on the front surface of the housing.

43. An apparatus according to claim 42 wherein the additional interface devices are contact-sensitive.


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44. An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer.

45. An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer.

48. An apparatus according to claim 43, wherein an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer.

51. An apparatus according to claim 30 further comprising:

a second contact-sensitive transducer, supported by the housing, which produces a second output signal that characterizes contact of an object along the contact-sensitive surface of the second contact-sensitive transducer; and

a controller, responsive to the second output signal for controlling a function of the apparatus.

52. An apparatus according to claim 51, wherein the second output signal is produced in response to detection of momentary contact with said second contact-sensitive transducer.


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53. An apparatus according to claim 51, wherein the second output signal is produced in response to detection of a predetermined number of momentary contacts with said second contact-sensitive transducer within a predetermined time interval.

54. An apparatus according to claim 30, wherein said controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of said display based on the output signal from said transducer.

55. An apparatus according to claim 54, wherein the direction of scroll is transverse to the direction that said rows extend across the display.

56. An apparatus according to claim 54, wherein said rows consist of alphanumeric characters comprising menu selections.

57. An apparatus according to claim 54, wherein said controller identifies successive ones of the rows displayed along the axis of said display by highlighting successive said rows.

58. An apparatus according to claim 30 further comprising a power supply disposed inside said housing.

59. An apparatus according to claim 58, wherein said power supply comprises a battery.

60. An apparatus according to claim 59 further comprising a circuit which controls power transfer from the power supply too another circuit based on the output signal of the contact-sensitive transducer.


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61. An apparatus according to claim 30 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

62. An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device.

63. An apparatus according to claim 62, wherein the displayed rows of menu selectable items comprise a plurality of items in a list.


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64. An apparatus according to claim 62 further comprising a power upply disposed inside said housing.

65. An apparatus according to claim 64, wherein said power supply comprises a battery.

66. An apparatus according to claim 65 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

67. An apparatus according to claim 62 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

68. An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and


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a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

69. An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

70. An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

71. An apparatus according to claim 70, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

72. An apparatus according to claim 71, wherein the contact-sensitive transducer is an elongate strip.

73. An apparatus according to claim 68, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.


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## EVIDENCE APPENDIX

None.


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RELATED PROCEEDINGS APPENDIX

Notice of Panel Decision from Pre-Appeal Brief Review


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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 08/06/2007

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| EXAMINER | |
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| FOX, BRYAN J | |
| **ART UNIT** | **PAPER NUMBER** |
| 2617 | |

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|---|---|
| 08/06/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Application Number | Application/Control No. | Applicant(s)/Patent under Reexamination | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Bryan Fox | Art Unit 2617 | |

**Document Code - AP.PRE.DEC**

# Notice of Panel Decision from Pre-Appeal Brief Review

This is in response to the Pre-Appeal Brief Request for Review filed 6/15/07.

1. ☐ **Improper Request** – The Request is improper and a conference will not be held for the following reason(s):

☐ The Notice of Appeal has not been filed concurrent with the Pre-Appeal Brief Request.
☐ The request does not include reasons why a review is appropriate.
☐ A proposed amendment is included with the Pre-Appeal Brief request.
☐ Other: .

The time period for filing a response continues to run from the receipt date of the Notice of Appeal or from the mail date of the last Office communication, if no Notice of Appeal has been received.

2. ☐ **Proceed to Board of Patent Appeals and Interferences** – A Pre-Appeal Brief conference has been held. The application remains under appeal because there is at least one actual issue for appeal. Applicant is required to submit an appeal brief in accordance with 37 CFR 41.37. The time period for filing an appeal brief will be reset to be one month from mailing this decision, or the balance of the two-month time period running from the receipt of the notice of appeal, whichever is greater. Further, the time period for filing of the appeal brief is extendible under 37 CFR 1.136 based upon the mail date of this decision or the receipt date of the notice of appeal, as applicable.

☐ The panel has determined the status of the claim(s) is as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: _____.
Claim(s) withdrawn from consideration: _____.

3. ☐ **Allowable application** – A conference has been held. The rejection is withdrawn and a Notice of Allowance will be mailed. Prosecution on the merits remains closed. No further action is required by applicant at this time.

4. ☒ **Reopen Prosecution** – A conference has been held. The rejection is withdrawn and a new Office action will be mailed. No further action is required by applicant at this time.

All participants:

CHARLES N. APPIAH
SUPERVISORY PATENT EXAMINER

(1) *Charles N. Appiah*.
(2) *Bryan Fox*.
(3) *Tommy Chin*.
(4)_____.

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 11078916 |
| **Filing Date:** | 11-Mar-2005 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Filer:** | Steven Howard Slater/Elya Juarez |
| **Attorney Docket Number:** | ERI-888RI |

Filed as Large Entity

## Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| Filing a brief in support of an appeal | 1402 | 1 | 540 | 540 |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **540** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 5727032 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Correspondence Address:** | Steven H Slater<br>Slater & Matsil LLP<br>17950 Preston Road<br>Suite 1000<br>Dallas TX 75252<br>US 972-732-1001<br>- |
| **Filer:** | Steven Howard Slater/Elya Juarez |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 17-JUL-2009 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 18:15:16 |
| **Application Type:** | Utility under 35 USC 111(a) |

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| Payment was successfully received in RAM | $540 |

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| RAM confirmation Number | 3871 |
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| Authorized User | |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Appeal Brief Filed | ERI-888RI_Appeal_Brief.pdf | 1594691<br>62464847f22f0b3bfe3dca4c91248e82903944d6 | no | 42 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Fee Worksheet (PTO-875) | fee-info.pdf | 29813<br>ce02073f6b699d57f27aeae3da8628d0784588a1 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 1624504 | | |

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**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 06/17/2009

Steven H Slater
Slater & Matsil LLP
17950 Preston Road
Suite 1000
Dallas, TX 75252

| EXAMINER | |
|---|---|
| SMITH, SHEILA B | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2617 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 06/17/2009 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Notice of Panel Decision from Pre-Appeal Brief Review | Application/Control No. | Applicant(s)/Patent under Reexamination |
|---|---|---|
| | 11/078,916 | HAYES ET AL. |
| | Sheila Smith | Art Unit: 2617 |

This is in response to the Pre-Appeal Brief Request for Review filed 01/09/2009.

1. ☐ **Improper Request** – The Request is improper and a conference will not be held for the following reason(s):

☐ The Notice of Appeal has not been filed concurrent with the Pre-Appeal Brief Request.
☐ The request does not include reasons why a review is appropriate.
☐ A proposed amendment is included with the Pre-Appeal Brief request.
☐ Other: .

The time period for filing a response continues to run from the receipt date of the Notice of Appeal or from the mail date of the last Office communication, if no Notice of Appeal has been received.

2. ☒ **Proceed to Board of Patent Appeals and Interferences** – A Pre-Appeal Brief conference has been held. The application remains under appeal because there is at least one actual issue for appeal. Applicant is required to submit an appeal brief in accordance with 37 CFR 41.37. The time period for filing an appeal brief will be reset to be one month from mailing this decision, or the balance of the two-month time period running from the receipt of the notice of appeal, whichever is greater. Further, the time period for filing of the appeal brief is extendible under 37 CFR 1.136 based upon the mail date of this decision or the receipt date of the notice of appeal, as applicable.

☒ The panel has determined the status of the claim(s) is as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: *1-73*.
Claim(s) withdrawn from consideration: _____.

3. ☐ **Allowable application** – A conference has been held. The rejection is withdrawn and a Notice of Allowance will be mailed. Prosecution on the merits remains closed. No further action is required by applicant at this time.

4. ☐ **Reopen Prosecution** – A conference has been held. The rejection is withdrawn and a new Office action will be mailed. No further action is required by applicant at this time.

All participants:

(1) *Dwayne D. Bost*.

(3)*Rafael Perez-Gutierrez*.

(2) *Sheila Smith*.

(4)_____.

/Dwayne D. Bost/
Supervisory Patent Examiner, Art Unit 2617

It is noted that the outstanding Office action improperly indicated the Office Action was a final action. Given the 251 rejection was first introduced, the OA of 9/11/08 is a non-final action.

A 251 rejection of all claims is proper given the lack of a specific error. Claiming "more than patentee is entitled" does not indicate a specific error in the claims.

Doc Code: AP.PRE.REQ

PTO/SB/33 (10-08)
Approved for use through 11/30/2008. OMB 06551-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

| PRE-APPEAL BRIEF REQUEST FOR REVIEW | Docket Number (Optional) ERI-888RI | |
|---|---|---|
| I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]<br>on_____<br>Signature_____<br>Typed or printed name_____ | Application Number 11/078,916 | Filed March 11, 2005 |
| | First Named Inventor Hayes, Jr. et al. | |
| | Art Unit 2617 | Examiner Sheila B. Smith |

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- [ ] applicant/inventor.
- [ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- [X] attorney or agent of record. Registration number 35,361
- [ ] attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____

Signature

Steven H. Slater
Typed or printed name

972-732-1001
Telephone number

9 JAN 2009
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

- [ ] *Total of _____ forms are submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicants: | Hayes Jr., et al. | Docket No.: | ERI-888RI |
| Serial No.: | 11/078,916 | Art Unit: | 2617 |
| Filed: | March 11, 2005 | Examiner: | Sheila B. Smith |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods Of Operating Same | | |

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Dear Sir:

Applicants appeal the final rejection of pending claims 1-73.

*Issues Presented*

1. Whether a final rejection of the claims under 35 U.S.C. § 251 is proper when the rejection is raised for the first time in a final rejection and the basis for the rejection is not provided?

2. Whether the final rejection of the claims under 35 U.S.C. § 103(a) is proper when references of record teaches that the asserted references would not be combined in the manner asserted by Examiner?

*Rejection Under* 35 U.S.C. § 251

The Final Office Action raised for the first time a rejection of the claims under 35 U.S.C. § 251 as being improperly broadened in a reissue application made and sworn to by the assignee and not by the patentee, but fails to identify in what manner is it claimed that the claims have been broadened. Applicants respectfully submit that the amendments to the claims do not broaden the scope of the claims, that the finality of the rejection should be withdrawn, and that prosecution on the merits should be re-opened to identify the grounds upon which the rejection under 35 U.S.C. § 251 is based, and to provide Applicants an opportunity to respond to those grounds.



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*Rejection Under* 35 U.S.C. § 503(a)

Claims 1-13, 15-27, and 29-73 were rejected under 35 U.S.C. § 103(a) as being unpatentable over O'Hagan (6,424,830) in view of Gillespie (5,889,236) and claims 14 and 28 were rejected as being unpatentable under 35 U.S.C. § 103(a) over O'Hagan in view of Gillespie and Moore (4,566,001).

Claim 1 recites the combination of: (a) a contact-sensitive transducer, (b) a controller, and (c) a display, and furthermore recites that (1) the contact-sensitive transducer "produces an output signal in response to moving contact along the contact-sensitive surface of the contact-sensitive transducer; and (2) the controller "scrolls displayed rows . . . of the display based on the output signal" (emphasis added). In other words, the displayed rows are scrolled in response to moving contact along the contact-sensitive transducer. By way of example and not as limitation, attention is respectfully drawn to Figures 2 and 7 of Applicants' specification, reproduced below. In Figure 2, "moving contact along the contact-sensitive transducer" is embodied as moving a user's finger 210 moving (as shown by the arrows) along contact-sensitive transducer 150 to generate controls signals 155. In response, controller 220 scrolls displayed rolls 240, in the illustrated case a list of phone numbers, on display 120 (see, *e.g.*, column 5, lines 19-35).

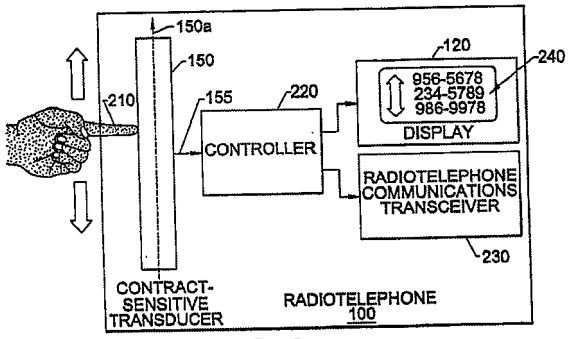



FIG. 2.

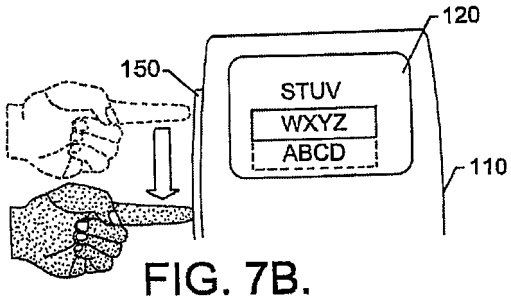



FIG. 7B.

In Figure 7, moving contact along a contact-sensitive transducer 150 is accomplished by swiping a finger along contact-sensitive strip 150 to generate control signals, which cause displayed rows of alphanumeric symbols to scroll along display 120 (see, *e.g.*, column 8 at lines 29-53).

While the present invention is broader in scope than the illustrated embodiments, the specification provides descriptive embodiments of the claim elements of "moving contact along a contact-sensitive surface" to generate control signals to "scroll displayed rows."

Examiner concedes that O'Hagan does not teach a contact-sensitive transducer, but asserts that Gillespie "discloses a position sensing transducer (see column 5, lines 47-48), which reads on the claimed, "contact-sensitive transducer" (Final Office Action, p. 5). However, Gillespie nowhere teaches or suggests that the contact-sensitive transducer is used to generate outputs signals to "[scroll] displayed rows . . . of the display based on the output signal" as recited by claim 1. Assuming for the sake of argument that it was proper to combine O'Hagan and Gillespie, one must take in account all teaching of these references (MPEP 2141.02). One skilled in the art would understand the combination of O'Hagan and Gillespie to result in a point-of-contact push button input (as taught by O'Hagan) using a contact-sensitive surface (as taught by Gillespie). In fact, the references of record demonstrate how one skilled in the art would combine the teaching of O'Hagan and Gillespie, as shown in the following paragraphs.

U.S. Patent No. 5,615,384 to Allard (which was asserted against all claims in the Office Action dated Sept. 21, 2007, but not in the Final Office Action) discloses a contact-sensitive transducer (much like Gillespie) and unlike Gillespie does disclose scrolling displayed rows. Allard, however, merely uses the contact-sensitive transducer as a point-of-contact push button input (see Amendment dated Dec. 21, 2007 at pp. 15-16). In other words, Allard takes the mechanical point-of-contact push button of Hagan and substitutes for it a contact-sensitive transducer that duplicates the point-of-contact push button feature. This clearly demonstrates how one skilled in the art would (did in fact) combine the mechanical push button taught by O'Hagan with the contact-sensitive transducer taught by Gillespie. It is speculation to suppose that Gillespie (which is at best silent regarding scrolling displayed rolls) would accomplish this function in a different manner – particularly when (1) O'Hagan explicitly teaches a point-of-contact push button input, and (2) the relevant reference (Allard) shows how one skilled in the art would modify O'Hagan to employ a contact-sensitive transducer and demonstrates that the result would still be a point-of-contact push button input even when a contact-sensitive transducer (such as taught by Gillespie) is employed.

The only suggestion to <u>further</u> modify the combination of O'Hagan and Gillespie in order to provide a device having "a contact-sensitive transducer" that "scrolls displayed rows along an axis of the display based upon the output signal of the contact-sensitive transducer," as required by claim 1, is provided by Applicants' own specification and nowhere else. Other relevant reference (Allard) teaches away from such further modification. Hence the rejection of claim 1, and by dependence claims 2-7 and 9-13 and 15, is improper and should be withdrawn. Nothing



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in Moore (which was combined with O'Hagan and Gillespie to reject claim 14) overcomes the above described deficiencies in the primary references. Hence, claim 14 is also patentably distinct by virtue of its dependence from claim 1 as well as its further respective defining limitations.

Claim 16 recites the combination of the following elements: (a) a contact-sensitive transducer, (b) a controller, and (c) a display. Furthermore, claim 16 recites that (1) the contact-sensitive transducer "produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer," and that (2) the controller configured to "scroll displayed rows along an axis of the display based on the output signal" (emphasis added). These elements are analogous to the elements discussed in detail above with respect to claim 1. And, analogously, claim 16 is patentably distinct over O'Hagan and Gillespie because these references fail to disclose or suggest the cited claim elements for reasons analogous to those provided above with respect to claim 1. Claims 16-27 and 29 are also patentably distinct over the reference by virtue of their respective dependence from claim 16 as well as their further respective defining limitations. Nothing in Moore (which was combined with O'Hagan and Gillespie to reject claim 28) overcomes the above described deficiencies in the primary references. Hence, claim 28 is also patentably distinct by virtue of its dependence from claim 16 as well as its further defining limitations.

Claim 30 recites the combination of a (a) a display, (b) a contact-sensitive transducer "which produces an output signal in response to moving contact of an object along the contact-sensitive transducer," and (c) a controller which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer." As addressed above with reference to claim 1, the combination of O'Hagan and Gillespie fails to disclose a device in which the contact-sensitive transducer generates an output signal in response to "moving contact of an object" along the contact-sensitive surface, which output signal "scrolls displayed rows" of the display. O'Hagan teaches the use of a thumb-wheel device, which is contrary to a contact-sensitive transducer; and Gillespie is at best silent regarding scrolled displayed rows; as described above, the combination would fail to meet these claim elements. Claim 30 is hence allowable over the cited references. Claims 31-61 are likewise allowable by virtue of their respective dependence from claim 30 as well as their respective further defining limitations.

Claim 62 now recites the requirement of a contact-sensitive transducer that "produces an output signal that characterizes moving contact of an object along" the contact-sensitive



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transducer, and the further requirement that a controller "scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer." As has been demonstrated above, neither O'Hagan nor Gillespie, alone or in combination, teach or suggest these claim limitations. Hence, claim 62 is patentably distinct over the references as are claims 63-67 by virtue of their respective dependence from claim 62 as well as their respective further defining limitations.

Claim 68 also requires (a) a display, (b) a contact-sensitive transducer that "produces an output signal that characterizes moving contact of an object along the contact-sensitive transducer," and (c) a controller "which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer." For reasons analogous to those provided, these claim limitations are patentably distinct over the cited references. O'Hagan provides no teaching of using a contact-sensitive transducer to scroll displayed rows, and Gillespie is at best silent regarding scrolled displayed rows. As other references (Allard) teaches, the combination of O'Hagan and Gillespie would not suggest to those skilled in the art the combination of claim elements required by claim 68. Hence, claim 68 is patentably distinct over the references as are claims 69-73 by virtue of their respective dependence from claim 68 as well as their respective further defining limitations.

Applicants respectfully request withdrawal of the final rejection of claims 1-73, that prosecution on the merits be re-opened, that Applicants be provided the basis for the rejection of the claims under 35 U.S.C. § 251 and an opportunity to respond.

Respectfully submitted,

9 JAN 2009
Date

Steven H. Slater
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Reg. No. 35,361

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Dallas, Texas 75252
Tel. 972-732-1001
Fax: 972-732-9218



TCL EXHIBIT 1007
Page 507 of 1144

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 11078916 |
| **Filing Date:** | 11-Mar-2005 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Filer:** | Steven Howard Slater/Elya Juarez |
| **Attorney Docket Number:** | ERI-888RI |

Filed as Large Entity

## Utility under 35 USC 111(a) Filing Fees

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| Notice of appeal | 1401 | 1 | 540 | 540 |
| **Post-Allowance-and-Post-Issuance:** | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| Extension - 1 month with $0 paid | 1251 | 1 | 130 | 130 |
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **670** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 4589891 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Correspondence Address:** | Steven H Slater<br>Slater & Matsil LLP<br>17950 Preston Road<br>Suite 1000<br>Dallas TX 75252<br>US 972-732-1001<br>- |
| **Filer:** | Steven Howard Slater/Elya Juarez |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 09-JAN-2009 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 18:26:00 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | $670 |

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|---|---|
| RAM confirmation Number | 3960 |
| Deposit Account | 501065 |
| Authorized User | |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | | ERI-888RI_Notice_of_appeal.pdf | 472410<br>f948ab18e7192f89a3fc8c4b41062e4b3e827f1d | yes | 8 |

**Multipart Description/PDF files in .zip description**

| Document Description | Start | End |
|---|---|---|
| Notice of Appeal Filed | 1 | 1 |
| Extension of Time | 2 | 2 |
| Pre-Brief Conference request | 3 | 8 |

**Warnings:**

**Information:**

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|---|---|---|---|---|---|
| 2 | Fee Worksheet (PTO-06) | fee-info.pdf | 31831<br>0d2332445a9c618519cd085a51a9f84a84b95a77 | no | 2 |

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**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PTO/SB/31 (10-08)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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# NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Docket Number (Optional)
ERI-888RI

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]
on_____

Signature_____

Typed or printed name_____

In re Application of
Hayes, Jr. et al.

| Application Number | Filed |
|---|---|
| 11/078,916 | March 11, 2005 |

For Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same

| Art Unit | Examiner |
|---|---|
| 2617 | Sheila B. Smith |

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 41.20(b)(1)) $ 540.00

☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $ _____

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 50-1065.

☒ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

☒ attorney or agent of record.
Registration number 35,361

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34. _____

Signature

Steven H. Slater
Typed or printed name

972-732-1001
Telephone number

9 JAN 2009
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

This collection of information is required by 37 CFR 41.31. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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| **PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)**<br>**FY 2009**<br>*(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)* | Docket Number (Optional) **ERI-888RI** |
|---|---|
| Application Number **11/078,916** | Filed **March 11, 2005** |
| For **Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same** | |
| Art Unit **2617** | Examiner **Sheila B. Smith** |

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

| | Fee | Small Entity Fee | |
|---|---|---|---|
| [X] One month (37 CFR 1.17(a)(1)) | $ 130 | $ 65 | $ 130 |
| [ ] Two months (37 CFR 1.17(a)(2)) | $ 490 | $ 245 | $ |
| [ ] Three months (37 CFR 1.17(a)(3)) | $ 1,110 | $ 555 | $ |
| [ ] Four months (37 CFR 1.17(a)(4)) | $ 1,730 | $ 865 | $ |
| [ ] Five months (37 CFR 1.17(a)(5)) | $ 2,350 | $ 1,175 | $ |

[ ] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[ ] Payment by credit card. Form PTO-2038 is attached.

[X] The Director has already been authorized to charge fees in this application to a Deposit Account.

[ ] The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number _____.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

[ ] applicant/inventor.

[ ] assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

[X] attorney or agent of record. Registration Number 35,361

[ ] attorney or agent under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 _____.

Signature — Date: 9 JAN 2009

Steven H. Slater — Typed or printed name

972-732-1001 — Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

[ ] Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 09/11/2008

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| EXAMINER | |
|---|---|
| SMITH, SHEILA B | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2617 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 09/11/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Examiner | Art Unit | |
| | SHEILA B. SMITH | 2617 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 December 2007*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Reissue Applications*

### *Oath/Declaration*

1. The reissue oath/declaration filed with this application is defective (see 37 CFR 1.175 and MPEP § 1414) because of the following: amendments (see amendment filed March 22, 2002) have been made to the claims since the filing of the Original reissue oath/declaration. A supplemental oath/declaration is required.

2. The reissue oath/declaration filed with this application is defective because it fails to identify at least one error which is relied upon to support the reissue application. See 37 CFR 1.175(a)(1) and MPEP § 1414.

3. In accordance with 37 CFR 1.175(b)(1), a supplemental reissue oath/declaration under 37 CFR 1.175(b)(1) must be received before this reissue application can be allowed.

4. Claims 1-73 are rejected as being based upon a defective reissue oath under 35 U.S.C. 251. See 37 CFR 1.175.

The nature of the defect(s) in the Oath or Declaration is set forth in the discussion above in this Office action.

5. Claims 1-73 are rejected under 35 U.S.C. 251 as being improperly broadened in a reissue application made and sworn to by the assignee and not the patentee. A claim is broader in scope

than the original claims if it contains within its scope any conceivable product or process which would have infringed the original patent. A claim is broadened if it is broader in any one respect even though it may be narrower in other respects.

6. It appears that on the Oath or Declaration filed 3/11/05 box A, An assignment from the inventors box was inadvertently left blank. Appropriate correction is required.

7. Applicant is referred to 37 CFR 1.173 for the proper format and manner of making amendments in a reissue application.

***Oath/Declaration***

1. It appears that on the Oath or Declaration filed 3/11/05 box A, An assignment from the inventors box was inadvertently left blank. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-13, 15-27 and 29-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Gillespie et al (US 5,889,236).

Regarding claim 1, O'Hagan discloses a radiotelephone, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-2), a radio telephone communications transceiver (66), supported by the housing, a display (28) supported by the housing, that displays an image at a front surface of the housing (see Figs. 7-8), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver (see processor being connected to display 28 and transceiver 66, Fig. 4), which controls at least one of the display and the radiotelephone communications transceiver which scrolls displayed rows along an axis or the display based upon the output signal (which reads on "In response to the operator rotating the three-way switch 46 clockwise or counterclockwise, the processor 60 causes a cursor 120 on the display to scroll up or down in relation to the list of possible "recipients"" as disclosed in column 9 lines 44-46). O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least one of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal in response to moving contact of an object along the surface of the wheel (which reads on "Rotation in a clockwise direction produces a first output and rotation in a counterclockwise direction produces a second output. In addition, the thumb wheel 48 may be depressed by an operator so as to move in a transaxial direction to produce a third output" as disclosed in

col. 5, lines 54-58, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 2 and 17, the combination of O'Hagan and Gillespie et al. further discloses wherein the contact- sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or thumb of the holding hand (see • Fig. 2).

Regarding claims 3 and 18, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to selectively display an image according to the output signal of the transducer (see col. 9, lines 53-67, Fig. 8). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 4 and 19, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer (see col. 9, lines 43-48). Regarding claims 5 and 20, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the transducer (see Fig. 8). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 6 and 21, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to display a plurality of graphical objects on the

display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the transducer (see col. 9, lines 46-52). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 7 and 22, O'Hagan discloses selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object (see col. 9, lines 43-52). O'Hagan fails to expressly disclose wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose the interface electronics to allow the pointing device to communicate directly with a host microprocessor, and a "finger pointer" embodiment, a position sensing system includes a position sensing transducer comprising a touch-sensitive surface disposed on a substrate, such as a printed circuit board, including a matrix of conductive lines (see column 5, lines 21-27 and column 5 lines 45-50), which reads on the claimed, "wherein the controller (186) is operative to determine a position of contact of an

object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include a position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 8 and 23, O'Hagan disclose wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the transducer (see col. 9, lines 48-52 and col. 12 lines 34-36). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 9 and 24, The combination of O'Hagan and Gillespie et al. further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the transducer (see col. 9, lines 48-52). however, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 10, O'Hagan discloses wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical wherein the controller is further operative, to initiate the action associated with the identified graphical object (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62- 67, also col. 7, lines col. 9, lines 53-67), however, O'Hagan fails to expressly disclose the use of an contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing

transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 11, O'Hagan fails to expressly disclose wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a gesture unit (see column 30, lines 20-28), which reads on the claimed, "the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the gesture unit in order to properly position the cursor.

Regarding claim 12, O'Hagan fails to expressly disclose detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval.

In a similar field of endeavor, Gillespie et al disclose a gesture unit and parameters (see column 30, lines 29-34), which reads on the claimed, "detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above gesture unit and parameters in order to properly position the cursor.

Regarding claim 13, O'Hagan discloses a thumb wheel disposed at least one of the first side surface and the second side surface (see thumbwhee148, Figs. 2-3). O'Hagan fails to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed, "elongate contact-sensitive strip." It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above scroll bar in order to properly position the cursor.

Regarding claims 15, 29, 41 and 73, O'Hagan fails to explicitly disclose wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductor transducer.

In a similar field of endeavor, Gillespie et al disclose a capacitive sensing system (see figure 1) which reads on the claimed limitation a capacitive transducer.

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above capacitive sensing system in order to provide an accurately determine the position of a finger as suggested by Gillespie et al (see column 8, lines 40-45).

Regarding claims 16, 30, 33, 62 and 68, O'Hagan discloses an apparatus and a method in an apparatus for providing user input to a hand-held electronic device, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a

user's hand such that the rear surface confronts the user's palm (see Figs. 1-4), a display (28) supported by the housing, that displays an image at a front surface of the housing (see Figs. 7-8), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least one of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal that characterizes contact of an object along the surface of the wheel (see col. 5, lines 46-61, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of an contact-sensitive transducer., however, O'Hagan fails to expressly disclose the use of an contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 25-26, The combination of O'Hagan and Gillespie et al. further discloses wherein to scroll displayed rows along an axis of the display responsive to the output signal (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 27, The combination of O'Hagan and Gillespie et al. further discloses Figs. 2-3 illustrates the (thumbwheel 48) disposed at least one of the first and second side surfaces of the housing. However, O'Hagan fails to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed, "elongate contact-sensitive strip." It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above scroll bar in order to properly position the cursor.

Regarding claim 31, The combination of O'Hagan and Gillespie et al. further discloses a radiotelephone communications transceiver Supported by the housing and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claim 32, The combination of O'Hagan and Gillespie et al. further discloses the disposed at the side of the housing, the side surface disposed adjacent the front surface and inclined away form the front surface (see Fig. 2, showing side with thumb wheel being disposed on a side adjacent the front surface and inclined away from the front surface). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 34, The combination of O'Hagan and Gillespie et al. further discloses wherein the step of providing comprises a thumb or finger of the holding hand while holding the

housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (see Fig. 3). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 35, The combination of O'Hagan and Gillespie et al. further discloses wherein the apparatus is a radio telephone that further includes a radio telephone communications transceiver (66, Fig. 2), wherein the controller is operative to control the radio telephone communications transceiver (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact sensitive transducer (see col. 5, lines 61-67, col. 9, lines 37-60).

Regarding claim 36, The combination of O'Hagan and Gillespie et al. further discloses wherein the step of controlling comprises the step of selectively displaying an image on the display according to the output of the contact-sensitive transducer (see Figs. 7 and 8).

Regarding claims 37 and 69, The combination of O'Hagan and Gillespie et al. further teach wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see Figs. 2-3 with the thumb wheel 48 on the side). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 38, The combination of O'Hagan and Gillespie et al. further discloses wherein the surface of the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 39, The combination of O'Hagan and Gillespie et al. further discloses a front surface of the housing (display may function as a touch panel display to allow input of information in addition to or in place of the keypad, see col. 5, lines 12-14). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 40, O'Hagan discloses a thumb wheel disposed at least one of the first side surface and the second side surface (see thumbwhee148, Figs. 2-3). O'Hagan fails to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Gillespie et al disclose a scroll bar (see figure 16 and column 32, lines 30-45), which reads on the claimed, "elongate contact-sensitive strip."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above scroll bar in order to properly position the cursor.

Regarding claims 42-43, The combination of O'Hagan and Gillespie et al. further discloses an additional user input interface devices for the apparatus on the front surface of the housing wherein the additional interface devices are contact-sensitive (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3).

Regarding claims 44 and 45, O'Hagan fails to disclose the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see column 5, lines 36-58), which reads on the claimed, "the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer," and, "the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above sliding output in order to allow a user to easily recover from touching an unintended button as suggested by Gillespie et al (see column 5, lines 36-58).

Regarding claims 46 and 49, O'Hagan fails to expressly disclose wherein the output signal is produced in response to detection of momentary contact with said contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a button is selected by a touch and release action (see column 5, lines 36-58), which reads on the claimed, "the output signal is produced in response to detection of momentary contact with said contact- sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above button selection in order to allow a user to select different buttons as suggested by Gillespie et al (see column 6, lines 8-17).

Regarding claims 47 and 50, O'Hagan fails to expressly disclose the output signal is produced in response to detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval.

In a similar field of endeavor, Gillespie et al disclose a pan function where a decision is made as to whether or not the touch screen is being touched, then a decision is made as to whether the position has changed, and this process can be repeated (see column 7, lines 16-45), which reads on the claimed, "detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above pan function in order to provide an improved pan function as suggested by Gillespie et al (see column 2, lines 25-59).

Regarding claims 48, O'Hagan fails to disclose the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see column 5, lines 36-58), which reads on the claimed, "an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above sliding output in order to allow a user to easily recover from touching an unintended button as suggested by Gillespie et al (see column 5, lines 36-58).

Regarding claims 51-53, the combination of O'Hagan and Gillespie further discloses inherently a second contact-sensitive transducer, supported by the housing which produces a second output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive surface of the second transducer (inherent feature of keypad 26 on surface, O'Hagan Fig. 2-3), a controller for providing controlling functions of the apparatus including an output signal in response to detection of momentary contact or predetermined number of momentary contacts with the contact-sensitive transducer (processor 60 being programmed to

control and operate the various components within the terminal 14 in order to carry out the various functions, see O'Hagan col. 6, lines 24-35). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 54-55, the combination of O'Hagan and Gillespie further discloses wherein the controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of the display based on the output signal from the transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display (operator may rotate the thumb wheel clockwise or counter- clockwise in order to scroll up or down through lines on the display, see O'Hagan col. 5, lines 51-62).

Regarding claims 56 and 57, the combination of O'Hagan and Gillespie further teach wherein the rows consist of alphanumeric characteristic comprising menu selections wherein the controller identifies successive ones of the rows displayed along the axis of the display by highlighting successive rows (see O'Hagan Figs 7-8).

Regarding claims 58, 59, 64 and 65, the combination of O'Hagan and Gillespie et al further disclose a power supply disposed inside the housing wherein the power supply comprises a battery (terminal also includes a power source 72 which is a rechargeable supply, see O'Hagan col. 7, lines 54-56).

Regarding claims 60 and 66, the combination of O'Hagan and Gillespie et al further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the transducer (power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see O'Hagan col. 7, lines 56-59). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claims 61 and 67, the combination of O'Hagan and Gillespie et al further discloses a mode of operation wherein the controller is unresponsive to contact with the transducer (feature of transitioning between different states as illustrated in O'Hagan Fig. 6). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 63 the combination of O'Hagan and Gillespie et al disclose in Figs. 7-8 of O'Hagan wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

Regarding claim 69, The combination of O'Hagan and Gillespie et al. further discloses wherein the surface of the transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see Fig. 3), However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 70, The combination of O'Hagan and Gillespie et al. further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 71, The combination of O'Hagan and Gillespie et al. further discloses wherein the transducer is disposed on the. front surface of the housing (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3). However, O'Hagan fails to expressly disclose the use of and contact- sensitive transducer.

In a similar field of endeavor, Gillespie et al disclose a pressure sensitive scrollbar feature, additionally Gillespie et al. discloses a position sensing transducer (see column 5, lines 47--48), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above position sensing transducer instead of the thumb wheel in order to provide a very convenient and easy to use cursor position solution as suggested by Gillespie et al (see column 34, lines 41-43).

Regarding claim 72, O'Hagan fails to disclose wherein the transducer is an elongate strip. In a similar field of endeavor, Gillespie et al disclose a touch overlay that is a resistive pressure

sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see column 5, lines 1-22), which reads on the claimed, "the contact sensitive transducer is an elongate strip." It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Gillespie et al to include the above touch-sensitive overlay instead of the thumb wheel in order to provide an improved pan function as suggested by Gillespie et al (see column 2, lines 25-59).

Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al in view of Gillespie et al as applied to claims 13 and 27 above, and further in view of Moore et al. (4,566,001).

Regarding claims 14 and 28, the combination of O'Hagan and Gillespie et al fails to teach wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface of the housing.

In an analogous field of endeavor, Moore discloses a touch strip input for a display in which the touch strips are mounted along the horizontal and vertical edges of the display terminal (see col. 1, lines 50-56).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Moore with the combination of O'Hagan and Gillespie et ars terminal for the benefit of having the contact overlays or strips in optional edges of the terminal for ease and convenience of use.

***Response to Arguments***

3. Applicant's arguments with respect to claims 1-73 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHEILA B. SMITH whose telephone number is (571)272-7847. The examiner can normally be reached on Monday-Thursday 6:00 am - 3:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dwayne Bost can be reached on 571-272-7023. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

S. Smith /Sheila B. Smith/
Examiner, Art Unit 2617
May 8, 2008

/DWAYNE D. BOST/
Supervisory Patent Examiner,
Art Unit 2617

| Notice of References Cited | Application/Control No. 11/078,916 | Applicant(s)/Patent Under Reexamination HAYES ET AL. | |
|---|---|---|---|
| | Examiner SHEILA B. SMITH | Art Unit 2617 | Page 1 of 1 |

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| * | B | US-6,052,606 A | 04-2000 | Bowen, Ronald A. | 455/566 |
| * | C | US-6,445,932 B1 | 09-2002 | Soini et al. | 455/556.1 |
| * | D | US-6,496,182 B1 | 12-2002 | Wong et al. | 345/173 |
| | E | US- | | | |
| | F | US- | | | |
| | G | US- | | | |
| | H | US- | | | |
| | I | US- | | | |
| | J | US- | | | |
| | K | US- | | | |
| | L | US- | | | |
| | M | US- | | | |

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**NON-PATENT DOCUMENTS**

| * | | Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) |
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| | X | |

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

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| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
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| Final | Original | 05/08/2008 | | | | | | | | |
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| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
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| Final | Original | 05/08/2008 | | | | | | | | |
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| Index of Claims | Application/Control No. | Applicant(s)/Patent Under Reexamination |
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| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

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| ✓ | Rejected | - | Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

| CLAIM | | DATE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 05/08/2008 | | | | | | | | |
| | 73 | ✓ | | | | | | | | |

| Search Notes | Application/Control No. | Applicant(s)/Patent Under Reexamination |
|---|---|---|
| | 11078916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | SHEILA B SMITH | 2617 |

## SEARCHED

| Class | Subclass | Date | Examiner |
|---|---|---|---|
| 455 | 566, 550.1, 90.3, 95, 575.1 | 4/20/08 | SS |
| 379 | 433.1, 433.3,428 | 4/20/08 | SS |

## SEARCH NOTES

| Search Notes | Date | Examiner |
|---|---|---|
| updated east search | 4/20/08 | SS |
| Dwayne Bost | 4/21/08 | SS |

## INTERFERENCE SEARCH

| Class | Subclass | Date | Examiner |
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EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| S689 | 44412 | "455"/$.ccls. and scrol$4 or ((contact or touch) near3 sensitive) or (mouse adj pad) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:35 |
| S690 | 41485 | "455"/90.ccls. and scrol$4 or ((contact or touch) near3 sensitive) or (mouse adj pad) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:37 |
| S691 | 3616 | "455"/90.ccls. and scrol$4 and ((contact or touch) near3 sensitive) or (mouse adj pad) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:38 |
| S692 | 0 | "455"/90.ccls. and scrol$4 and ((contact or touch) near3 sensitive) and (mouse adj pad) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:38 |
| S693 | 695 | "455"/90.ccls. and scrol$4 and ((contact or touch) near3 sensitive) or (mouse adj pad) same side$3 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:39 |
| S694 | 0 | "455"/90.ccls. and scrol$4 and ((contact or touch) near3 sensitive) same side$3 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:40 |
| S695 | 0 | "455"/90.ccls. and (mouse adj pad) same side$3 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:40 |
| S696 | 0 | "455"/90.ccls. and scrol$4 and ((contact or touch) near3 sensitive) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:42 |

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| S697 | 38113 | "455"/90.ccls. and scrol$4 or ((contact or touch) near3 sensitive) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:42 |
| S698 | 0 | "455"/90.ccls. and (mouse adj pad) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:43 |
| S699 | 0 | "455"/90.ccls. and ((contact or touch) near3 sensitive) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:43 |
| S700 | 0 | "455"/90.3.ccls. and scrol$4 and ((contact or touch) near3 sensitive) and (mouse adj pad) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:44 |
| S701 | 5 | "455"/90.3.ccls. and scrol$4 and ((contact or touch) near3 sensitive) same side$3 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:45 |
| S702 | 712 | "455"/90.3.ccls. and scrol$4 and ((contact or touch) near3 sensitive) or (mouse adj pad) same side$3 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:49 |
| S703 | 0 | "455"/90.3.ccls. and (mouse adj pad) same side$3 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:49 |
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| S705 | 3 | (("6278888") or ("6131047")).PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 07:56 |

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| S708 | 2 | "455"/$.ccls. and scrol$4 and ((contact or touch) near3 sensitive) and (mouse adj pad) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 08:11 |
| S709 | 1957 | "455"/$.ccls. and scrol$4 and ((contact or touch) near3 sensitive) and (mouse adj pad) or (track adj pad) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 08:17 |
| S710 | 1955 | "455"/90.3.ccls. and scrol$4 and ((contact or touch) near3 sensitive) and (mouse adj pad) or (track adj pad) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 08:21 |
| S711 | 21 | "455"/90.3.ccls. and scrol$4 and ((contact or touch) near3 sensitive) and (mouse adj pad) or (track adj pad) same (up and down) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 08:22 |



TCL EXHIBIT 1007
Page 550 of 1144

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| S712 | 95 | (phone or cell or ms or mobile or radio) and scrol$4 and ((contact or touch) near3 sensitive) and (mouse adj pad) or (track adj pad) same (up and down) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 08:29 |
| S713 | 6 | (("6424830") or ("6178338") or ("4566001")).PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 08:49 |
| S714 | 8 | (("6424830") or ("6178338") or ("4566001") or ("5615384")).PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/04/21 09:03 |
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| S716 | 4 | (("6424830") or ("5889236")).PN. | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2008/05/07 10:54 |

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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| SHEET | 1 | OF | 1 |
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| *Complete if Known* | | |
|---|---|---|
| Application Number | 11/078,916 | |
| Filing Date | March 11, 2005 | |
| First Named Inventor | Hayes, Jr. | |
| Art Unit | 2681 | CONFIRMATION NO. 1137 |
| Examiner Name | Charles N. Appiah | |
| Attorney Docket Number | ERI-888RI (P08877-US3) | |

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| Examiner's Initials | Cite No. | Document Number (Number-Kind-Code) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document |
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| Examiner's Initials | Cite No. | Foreign Patent Document (Country Code – Number – Kind) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Translation Y/N |
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| Examiner's Initials | Cite No. | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published | T |
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| Examiner Signature | /Sheila Smith/ | Date Considered | 07/14/2008 |
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Applicant: | Hayes, Jr., *et al.* | Docket No.: | ERI-888RI |
| Serial No.: | 11/078,916 | Art Unit: | 2686 |
| Filed: | March 11, 2005 | Examiner: | Charles N. Appiah |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## INFORMATION DISCLOSURE STATEMENT

Dear Sir:

Applicants wish to bring to the attention of the U.S. Patent and Trademark Office the information noted on the enclosed PTO Forms PTO/SB/08a and PTO/SB/08b, which may be considered material to the examination of the above-identified application. Copies of the U.S. Patents cited are not being submitted. However, Applicant has included copies of the foreign patents and non-patent literature.

This Information Disclosure Statement is submitted under 37 C.F.R. §1.97(c) together with a $180.00 fee under 37 C.F.R. §1.17(p) after the C.F.R. §1.97(b) time period, but before final action or notice of allowance, whichever occurs first.

Please charge the required fee of $180.00 and any additional amount, or credit any overpayment to Deposit Acct. No 50-1065 of the below mentioned firm.

07/24/2006 RMEBRAHT 00000043 501065 11078916
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Respectfully submitted,

July 14, 2006

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PTO/SB/08a (08-03)
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| Sheet | 1 | of | 3 |
|---|---|---|---|

| Complete if Known | |
|---|---|
| Application Number | 11/078,916 |
| Filing Date | March 11, 2005 |
| First Named Inventor | Hayes, Jr. |
| Art Unit | 2686 |
| Examiner Name | Charles N. Appiah |
| Attorney Docket Number | ERI-888RI |

**U.S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No.[1] | Document Number: Number - Kind Code[2] (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
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| Examiner Signature | /Sheila Smith/ | Date Considered | 09/09/2008 |
|---|---|---|---|

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Sheet 2 of 3

| Complete if Known | |
|---|---|
| Application Number | 11/078,916 |
| Filing Date | March 11, 2005 |
| First Named Inventor | Hayes, Jr. |
| Art Unit | 2686 |
| Examiner Name | Charles N. Appiah |
| Attorney Docket Number | ERI-888RI |

**U.S. PATENT DOCUMENTS**

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| Examiner Signature | /Sheila Smith/ | Date Considered | 09/09/2008 |
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| Sheet | 3 | of | 3 |
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| *Complete if Known* | |
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| Application Number | 11/078,916 |
| Filing Date | March 11, 2005 |
| First Named Inventor | Hayes, Jr. |
| Art Unit | 2686 |
| Examiner Name | Charles N. Appiah |
| Attorney Docket Number | ERI-888RI |

**NON PATENT LITERATURE DOCUMENTS**

| Examiner Initials* | Cite No.[1] | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T[2] |
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| Examiner Signature | /Sheila Smith/ | Date Considered | 09/09/2008 |
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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| In re: Reissue Application of | Docket No.: ERI-888RI |
| U.S. Patent No.: 6,278,888 to | Art Unit: 2617 |
| Hayes, Jr., *et al.* | Examiner: Bryan J. Fox |
| Serial No.: 11/078,916 | |
| Filed: March 11, 2005 | |

For: Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**AMENDMENT**

Dear Sir:

The following amendments and remarks are presented in response to the Examiner's Office Action mailed September 21, 2007. Please amend the above-referenced application as follows.



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Page 557 of 1144

In the Claims:

1. (Once amended) A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal ~~that characterizes~~ in response to moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver and which scrolls displayed rows along an axis of the display based upon ~~according to~~ the output signal of the contact-sensitive transducer.

2. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

3. (Original) A radiotelephone according to claim 1, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.

4. (Original) A radiotelephone according to claim 3, wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer.

5. (Original) A radiotelephone according to claim 4, wherein the controller is operative to



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selectively display a row on the display according to the output signal of the contact-sensitive transducer.

6. (Original) A radiotelephone according to claim 4, wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

7. (Original) A radiotelephone according to claim 4, wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

8. (Original) A radiotelephone according to claim 7, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

9. (Original) A radiotelephone according to claim 7, wherein the controller is operative display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

10. (Original) A radiotelephone according to claim 7, wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object.

11. (Original) A radiotelephone according to claim 10, wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer and to initiate the action associated with the identified graphical object responsive to detection of the momentary contact.



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12. (Original) A radiotelephone according to claim 11, wherein the controller is operative to initiate the action in response to detection of a plurality of momentary contacts occurring within a predetermined time interval.

13. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.

14. (Original) A radiotelephone according to claim 13, wherein the contact-sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

15. (Original) A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

16. (Once amended) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which is configured to scroll displayed rows along an axis of ~~control~~ the display based on ~~according to~~ the output signal of the contact-sensitive transducer.



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17. (Original) An apparatus according to claim 16, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

18. (Original) An apparatus according to claim 16, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

19. (Original) An apparatus according to claim 18, wherein the controller is operative to selectively display a graphical object on the display responsive to the output signal of the contact-sensitive transducer.

20. (Original) An apparatus according to claim 19, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

21. (Original) An apparatus according to claim 19, wherein the controller is operative to display a plurality of graphical objects on the display, and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

22. (Original) An apparatus according to claim 19, wherein the controller is operative, responsive to the contact-sensitive transducer, to determine a position of contact along the axis of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

23. (Original) An apparatus according to claim 22, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.



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24. (Original) An apparatus according to claim 22, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

25. (Original) An apparatus according to claim 24, wherein the controller is operative, responsive to the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer.

26. (Original) An apparatus according to claim 25, wherein the controller is operative, responsive to the output signal of contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and to scroll displayed rows along the axis of the display based on the detected moving contact.

27. (Original) An apparatus according to claim 19, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.

28. (Original) An apparatus according to claim 27, wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

29. (Original) An apparatus according to claim 22, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

30. (Twice Amended) An apparatus, comprising:

a housing;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal in response to moving ~~that characterizes~~ contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and



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a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

31. (Original) An apparatus according to claim 30, further comprising a radiotelephone communications transceiver supported by the housing, and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal.

32 (Original) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at side surface of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface.

33. (Original) In an apparatus including a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, a display that displays an image at the front surface, and a controller that controls the display, a method of providing user input comprising the steps of:

holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm; and

providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at at least one of the first and second side surfaces of the housing, the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer.

34. (Original) A method according to claim 33, wherein the step of providing comprises the step of contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm.

35. (Original) A method according to claim 33, wherein the apparatus is a radiotelephone that further includes a radiotelephone communications transceiver, wherein the controller is



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operative to control the radiotelephone communications transceiver, and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

36. (Original) A method according to claim 33, wherein the step of controlling comprises the step of selectively displaying an image or the display according to the output signal of the contact-sensitive transducer.

37. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

38. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

39. (New) An apparatus according to claim 38, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

40. (New) An apparatus according to claim 39, wherein the contact-sensitive transducer is an elongate strip.

41. (New) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises one of a resistive transducer a capacitive transducer and a semiconductive transducer.

42. (New) An apparatus according to claim 30, which also includes additional user input interface devices for the apparatus on the front surface of the housing.

43. (New) An apparatus according to claim 42 wherein the additional interface devices are



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contact-sensitive.

44. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer.

45. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer.

46.-47. (Canceled)

48. (New) An apparatus according to claim 43, wherein an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer.

49.-50. (Canceled)

51. (New) An apparatus according to claim 30 further comprising:

a second contact-sensitive transducer, supported by the housing, which produces a second output signal that characterizes contact of an object along the contact-sensitive surface of the second contact-sensitive transducer; and

a controller, responsive to the second output signal for controlling a function of the apparatus.

52. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of momentary contact with said second contact-sensitive transducer.

53. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of a predetermined number of momentary contacts with said second contact-sensitive transducer within a predetermined time interval.



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54. (New) An apparatus according to claim 30, wherein said controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of said display based on the output signal from said transducer.

55. (New) An apparatus according to claim 54, wherein the direction of scroll is transverse to the direction that said rows extend across the display.

56. (New) An apparatus according to claim 54, wherein said rows consist of alphanumeric characters comprising menu selections.

57. (New) An apparatus according to claim 54, wherein said controller identifies successive ones of the rows displayed along the axis of said display by highlighting successive said rows.

58. (New) An apparatus according to claim 30 further comprising a power supply disposed inside said housing.

59. (New) An apparatus according to claim 58, wherein said power supply comprises a battery.

60. (New) An apparatus according to claim 59 further comprising a circuit which controls power transfer from the power supply too another circuit based on the output signal of the contact-sensitive transducer.

61. (New) An apparatus according to claim 30 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

62. (Once amended) An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces



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adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device.

63. (New) An apparatus according to claim 62, wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

64. (New) An apparatus according to claim 62 further comprising a power supply disposed inside said housing.

65. (New) An apparatus according to claim 64, wherein said power supply comprises a battery.

66. (New) An apparatus according to claim 65 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

67. (New) An apparatus according to claim 62 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

68. (Once amended) An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the displace which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

69. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

70. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.

71. (New) An apparatus according to claim 70, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

72. (New) An apparatus according to claim 71, wherein the contact-sensitive transducer is an elongate strip.

73. (New) An apparatus according to claim 68, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.



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## REMARKS

Claims 1-73 were pending in this application and have been rejected. Claims 1-45, 48 and 51-73 are pending following this amendment. Claims 16, 30, 62, and 68 have been amended and claims 46-47, and 49-50 have been canceled. Applicants respectfully request reconsideration of the claims in view of the following remarks.

In the Office Action dated September 21, 2007, all pending claims were rejected as being unpatentable over the combination of O'Hagan et al., (U.S. Patent No. 6,424,830) in view of Allard et al., (U.S. Patent No. 5,615,384) (claims 1- 7, 9-13, 15-22, 24-27, and 29-73), or the combination of O'Hagan in view of Allard, in further view of Yamagishi, (U.S. Patent No. 6,178,338) (claims 8 and 23), or in further view of Moore, (U.S. Patent No. 4,566,001) (claims 14 and 28). Applicants have amended each pending independent claim to include limitations that more comprehensively distinguish over the prior art.

Claim 1, as amended, now recites the combination of the following elements: (a) a contact-sensitive transducer, (b) a controller, and (c) a display. Furthermore, claim 1 recites that (1) the contact-sensitive transducer "produces an output signal in response to moving contact along the contact-sensitive surface of the contact-sensitive transducer; and that (2) the controller "scrolls displayed rows . . . of the display based on the output signal" (emphasis added). In other words, the displayed rows are scrolled in response to moving contact along the contact-sensitive transducer. By way of example and not as limitation, Examiner's attention is respectfully drawn to Figures 2 and 7 of Applicants' specification, reproduced below. In Figure 2, "moving contact along the contact-sensitive transducer" is embodied as moving a user's finger 210 moving (as shown by the arrows) along contact-sensitive transducer 150 to generate controls signals 155. In response to control signals 155, controller 220 scrolls displayed rolls 240, in the illustrated case a list of phone numbers, on display 120 (see, *e.g.,* column 5, lines 19-35).



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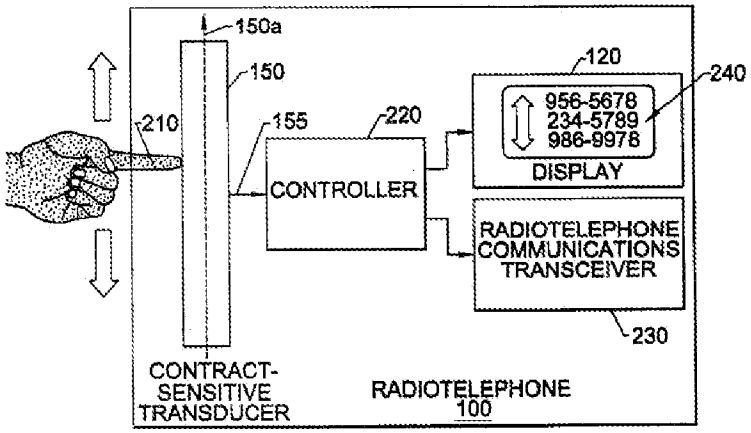



FIG. 2.

In Figure 7, moving contact along a contact-sensitive transducer 150 is accomplished by a user again swiping a finger along contact-sensitive strip 150 to generate control signals. Those controls are, in turn, used to cause the display rows, in this case rows of alphanumeric symbols, to scroll along display 120 (see, *e.g.,* column 8 at lines 29-53).

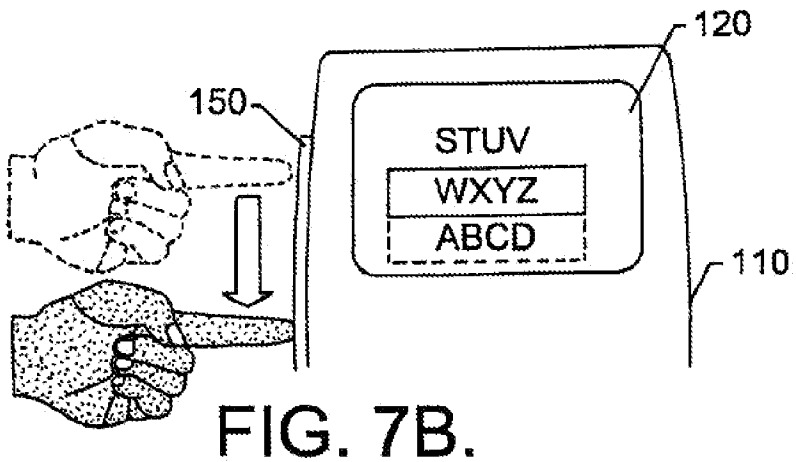
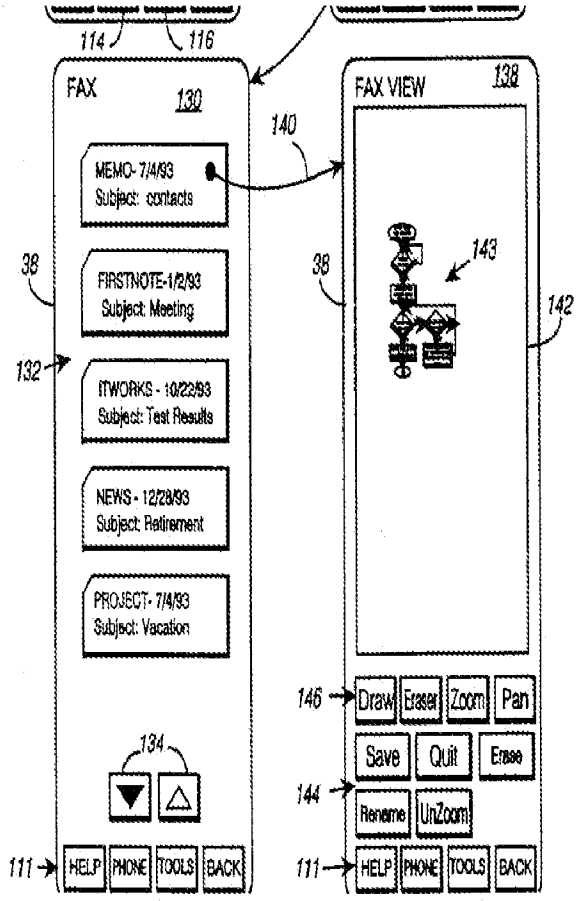



FIG. 7B.

While the invention of claim 1 is broader in scope than the illustrated embodiments, the specification provides descriptive embodiments of "moving contact along a contact-sensitive surface" to generate control signals to "scroll displayed rows."

Allard does not teach moving contact along a contact-sensitive surface" in order to scroll displayed rolls. Examiner has asserted that, "Allard et al discloses as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see column 5, lines 36-58)." What Allard does not teach, however, is sliding a finger along the contact-sensitive to generate control signals to scroll displayed rows. Quite to the contrary, Allard teaches away from this approach because Allard specifically teaches using a point of contact push button to scroll displayed rolls. With regard to Figure 4 (the relevant portion of which is reproduced below), Allard specifically teaches, "Buttons 134 are for the purpose of scrolling down and up in the list" at column 6, lines 18-21.






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Applicants recognize that Allard teaches using virtual "buttons" in a contact-sensitive display (such as buttons 134 in the above reproduced figure) and that a control signal will be generated when the "buttons" are contacted. As an important distinction, however, Allard's control signal is not generated by "moving contact along" the contact-sensitive display. It is instead based upon a static, momentary contact with the button. When Allard does teach contacting along the display, it is merely to select a button – it is not for scrolling displayed rows. Because Allard teaches a different way of scrolling displayed rows – even if Allard was combined with O'Hagan, the combination would fail to teach or suggest the combination of claim elements in claim 30, to wit: a contact-sensitive transducer that "produces an output signal in response to moving contact along the contact-sensitive surface" and a controller that "scrolls displayed rows along an axis of the display based on the output signal."

O'Hagan fails to teach or suggest a contact-sensitive transducer. Allard teaches the use of buttons to scroll rows and hence teaches away from Applicants' claimed invention of using moving contact along the contact-sensitive surface to scroll displayed rows. Hence, the references alone or in combination fail to teach or suggest the invention of claim 1. Claims 2-7 and 9-13 and 15 are also patentably distinct over the reference by virtue of their respective dependence from claim 1 as well as their further respective defining limitations. Nothing in Yamagishi (which was combined with O'Hagan and Allard to reject claim 8) or Moore (which was combined with O'Hagan and Allard to reject claim 14) overcomes the above described deficiencies in the primary references. Hence, claims 8 and 14 are also patentably distinct by virtue of their respective dependence from claim 1 as well as their further respective defining limitations.



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Claim 16, as amended, recites the combination of the following elements: (a) a contact-sensitive transducer, (b) a controller, and (c) a display. Furthermore, claim 16 recites that (1) the contact-sensitive transducer "produces an output signal that characterizers moving contact of an object along the contact-sensitive surface of the contact-sensitive transducer;" and that (2) the controller configured to "scroll displayed rows along an axis of the display based on the output signal" (emphasis added). These elements are analogous to the elements discussed in detail above with respect to claim 1. And, analogously, claim 16 is patentably distinct over O'Hagan and Allard because these references fail to disclose, and in fact teach away from, the cited claim elements for reasons analogous to those provided above with respect to claim 1. Claims 17-22 and 24-27 and 29 are also patentably distinct over the prior art by virtue of their respective dependence from claim 16 as well as their further respective defining limitations. Nothing in Yamagishi (which was combined with O'Hagan and Allard to reject claim 23) or Moore (which was combined with O'Hagan and Allard to reject claim 28) overcomes the above described deficiencies in the primary references. Hence, claims 23 and 28 are also patentably distinct by virtue of their respective dependence from claim 16 as well as their further respective defining limitations.

Claim 30, as amended, recites the combination of a (a) a display, (b) a contact-sensitive transducer "which produces an output signal in response to moving contact of an object along the contact-sensitive transducer;" and (c) a controller which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer." As addressed above with reference to claim 1, the combination of O'Hagan and Allard fail to disclose a device in which the contact-sensitive transducer generates an output signal in response to "moving contact



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of an object" along the contact-sensitive surface, which output signal "scrolls displayed rows" of the display. O'Hagan teaches the use of a thumb-wheel device, which is contrary to a contact-sensitive transducer; and Allard teaches the use of "buttons" to scroll through displayed rows. Neither reference, alone or in combination, teaches the recited combination of claim elements. Claim 30 is hence allowable over the cited references. Claims 31-61 are likewise allowable by virtue of their respective dependence from claim 30 as well as their respective further defining limitations.

Claim 62 now recites the requirement of a contact-sensitive transducer that "produces and output signal that characterizes moving contact of an object along" the contact-sensitive transducer, and the further requirement that a controller " scrolls displayed rows along an axis of the display based on the ouput signal of the contact-sensitive transducer." As has been demonstrated above, neither O'Hagan nor Allard, alone or in combination, teach or suggest these claim limitations. Also as demonstrated above, Allard's teaching of static contact with buttons to scroll displayed rows teaches away from Applicants' claimed invention. Hence, claim 62 is patentably distinct over the references as are claims 63-67 by virtue of their respective dependence from claim 62 as well as their respective further defining limitations.

Claim 68 also requires (a) a display, (b) a contact-sensitive transducer that "produces an output signal that characterizes moving contact of an object along the contact-sensitive transducer," and (c) a controller "which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer." For reasons analogous to those provided, these claim limitations are patentably distinct over the cited references. O'Hagan provides no teaching of using a contact-sensitive transducer to scroll displayed rows, and Allard teaches away from this method because Allard simply teaches the use of static contact with



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buttons to scroll displayed rows. Hence, claim 68 is patentably distinct over the references as are claims 69-73 by virtue of their respective dependence from claim 68 as well as their respective further defining limitations.

Applicants have made a diligent effort to place the claims in condition for allowance. A prompt indication of same and re-issuance of the present application is respectfully and earnestly requested.

No fee is believed due in connection with this filing. However, should one be deemed due, the Commissioner is hereby authorized to charge Deposit Account No. 50-1065.

Respectfully submitted,

December 21, 2007

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APPENDIX A

| Claims | Status | Support in Patent |
|---|---|---|
| 1-15. | Pending | Unamended. |
| 16. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 16 (col. 11, line 54 – col. 12, line7). Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. |
| 17-29. | Pending. | Unamended. |
| 30. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. |
| 31. – 36. | Pending | Unamended. |
| 37. | Pending | Figs. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37; and lines 55-57). |
| 38.~ | Pending | Figs. 1, 2, 7B, 7C and 11. Claims 1 and 2 (col. 10, lines 35-37; and lines 55-57). Col. 10, lines 2-7. |
| 39. | Pending | Fig. 11, item 150C Col. 9, line 65-Col. 10, line 7. |
| 40. | Pending | Fig. 11, item 150C Col. 9, line 65-Col. 10, line 7. |
| 41. | Pending | Col. 5, lines 29-34. Claim 15. |
| 42. | Pending | Fig. 1, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 1, lines 1-2. Fig. 11, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 5, lines 1-2. |
| 43. | Pending | Fig. 1, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 1, lines 1-2. Fig. 11, keys for "PWR" "FCN" "SEND" and numeric characters. Col. 5, lines 1-2. Figs. 3, 4. Col. 5, lines 36-39, 48-49. |
| 44. | Pending | Col. 5, lines 19-22. Col. 3, lines 20-26. Claim 26. |
| 45. | Pending | Col. 5, lines 19-22. Col. 8, lines 36-40. |
| 46. | Canceled herein | |
| 47. | Canceled herein | |
| 48. | Pending | Fig. 11. Col. 10, lines 13-21. |
| 49. | Canceled herein | |
| 50. | Canceled herein | |
| 51. | Pending | Col. 11. Col. 10, lines 13-21. Col. 5, lines 19-22. Fig. 2, item 220. Col. 5, lines 22-24. |
| 52. | Pending | Col. 9, lines 21-50. Col. 8, lines 54-59. |
| 53. | Pending | Col. 9, lines 21-50. Col. 8, lines 54-59. |
| 54. | Pending | Col. 8, lines 43-53. |



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| Claims | Status | Support in Patent |
|---|---|---|
| 55. | Pending | Fig. 7A-7C. Col. 8, lines 29-53. |
| 56. | Pending | Figs. 7A-7C. Col. 5, lines 25-26. |
| 57. | Pending | Col. 8, lines 48-50. |
| 58. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 59. | Pending | Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 60. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 61. | Pending | Col. 5, lines 42-45. Col. 3, lines 27-35. |
| 62. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. |
| 63. | Pending | Col. 5, lines 18-35. Col. 8, lines 29-53. |
| 64. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 65. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 66. | Pending | Fig. 1, "PWR" key. Col. 5, lines 48-65. Col. 6, lines 44-67. Col. 7, lines 24-63. |
| 67. | Pending | Col. 5, lines 42-45. Col. 3, lines 27-35. |
| 68. | Pending; amended herein | Figs. 1, 2, 7A, 7B, 7C, and 11. Fig. 1 and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 5, lines 1-2. Claim 30, lines 6-9. Col. 5, lines 18-22. Col. 10, lines 2-7. Claim 30 (col. 13, lines 10-13). Col. 5, lines 18-35. |
| 69. | Pending | Figs. 1 and 11. Claim 1 and 2 (col. 10, lines 35-37 and lines 55-57). |
| 70. | Pending | Figs. 1, 2, 7A, 7B, 7C, and 11. Claims 1 and 2 (col. 10, lines 35-37 and lines 55-57). Col. 10, lines 2-7. |
| 71. | Pending | Fig. 11. Col. 9, line 65- Col. 10, line 2. |
| 72. | Pending | Fig. 11. Col. 9, line 65 – Col. 10, line 2. |
| 73. | Pending | Col. 5, lines 29-34. Claim 15. |

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|---|---|
| **EFS ID:** | 2635784 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Correspondence Address:** | Steven H Slater<br>Slater & Matsil LLP<br>17950 Preston Road<br>Suite 1000<br>Dallas TX 75252<br>US 972-732-1001<br>- |
| **Filer:** | Steven Howard Slater |
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| **Attorney Docket Number:** | ERI-888RI |
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**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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# PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

| Application or Docket Number | Filing Date | ☐ To be Mailed |
|---|---|---|
| 11/078,916 | 03/11/2005 | |

## APPLICATION AS FILED – PART I

| FOR | (Column 1) NUMBER FILED | (Column 2) NUMBER EXTRA | SMALL ENTITY ☐ RATE ($) | SMALL ENTITY ☐ FEE ($) | OR | OTHER THAN SMALL ENTITY RATE ($) | OTHER THAN SMALL ENTITY FEE ($) |
|---|---|---|---|---|---|---|---|
| ☐ BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | | | N/A | |
| ☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m)) | N/A | N/A | N/A | | | N/A | |
| ☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | | | N/A | |
| TOTAL CLAIMS (37 CFR 1.16(i)) | minus 20 = | * | X $ = | | OR | X $ = | |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | minus 3 = | * | X $ = | | | X $ = | |
| ☐ APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | | | | |
| ☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | | | | |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | | | TOTAL | |

## APPLICATION AS AMENDED – PART II

| AMENDMENT 12/21/2007 | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | SMALL ENTITY RATE ($) | SMALL ENTITY ADDITIONAL FEE ($) | OR | OTHER THAN SMALL ENTITY RATE ($) | OTHER THAN SMALL ENTITY ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|---|---|
| Total (37 CFR 1.16(i)) | * 69 | Minus | ** 69 | = 0 | X $ = | | OR | X $50= | 0 |
| Independent (37 CFR 1.16(h)) | * 6 | Minus | ***6 | = 0 | X $ = | | OR | X $210= | 0 |
| ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | 0 |

| AMENDMENT | (Column 1) CLAIMS REMAINING AFTER AMENDMENT | | (Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR | (Column 3) PRESENT EXTRA | RATE ($) | ADDITIONAL FEE ($) | | RATE ($) | ADDITIONAL FEE ($) |
|---|---|---|---|---|---|---|---|---|---|
| Total (37 CFR 1.16(i)) | * | Minus | ** | = | X $ = | | OR | X $ = | |
| Independent (37 CFR 1.16(h)) | * | Minus | *** | = | X $ = | | OR | X $ = | |
| ☐ Application Size Fee (37 CFR 1.16(s)) | | | | | | | | | |
| ☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | | OR | | |
| | | | | | TOTAL ADD'L FEE | | OR | TOTAL ADD'L FEE | |

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/JACQUELINE E. COUPLIN/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

| TRANSMITTAL OF INFORMATION DISCLOSURE STATEMENT (Under 37 CFR 1.97(b), 1.97(c) or 1.97(d)) | | | Docket No. ERI-888RI (P08877-US3) |
|---|---|---|---|
| In Re Application Of: Hayes, Jr. | | | Confirmation No 1137 |
| Application No 11/078,916 | Filing Date March 11, 2005 | Examiner Charles N. Appiah | Group Art Unit 2681 |

Title RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

Address to:
Commissioner for Patents
P.O. Box 1450, Alexandria, VA 22313-1450
Fax no. (571) 273-8300

**37 CFR 1.97(b)**

☐ The Information Disclosure Statement submitted herewith is being filed (1) within three months of the filing of a national application other than a continued prosecution application under 37 CFR 1.53(d); (2) within three months of the date of entry of the national stage as set forth in 37 CFR 1.491 in an international application; (3) before the mailing of a first Office Action on the merits; or (4) before the mailing of a first Office Action after the filing of a request for continued examination under 37 CFR 1.114.

**37 CFR 1.97(c)**

☐ The Information Disclosure Statement submitted herewith is being filed after the period specified in 37 CFR 1.97(b) and before the mailing date of a Final Action under 37 CFR 1.113, a Notice of Allowance under 37 CFR 1.311, or an Action that otherwise closes prosecution in the application, and is accompanied by one of:

☐ the statement specified in 37 CFR 1.97(e);

☐ (1) Each item of information contained in the Information Disclosure Statement submitted herewith was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement submitted herewith; or

☐ (2) That no item of information contained in the information disclosure statement submitted herewith was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement submitted herewith was known to any individual designated in § 1.56(c) more than three months prior to the filing of the information disclosure statement, or

☐ the fee set forth in 37 CFR 1.17(p).

**37 CFR 1.97(d)**

☒ The Information Disclosure Statement submitted herewith is being filed after the period specified in 37 CFR 1.97(c), and on or before payment of the issue fee and is accompanied by

☒ the statement specified in 37 CFR 1.97(e); and

☒ (1) Each item of information contained in the Information Disclosure Statement submitted herewith was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement submitted herewith; or

☐ (2) That no item of information contained in the information disclosure statement submitted herewith was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement submitted herewith was known to any individual designated in § 1.56(c) more than three months prior to the filing of the information disclosure statement, and

☒ the fee set forth in 37 CFR 1.17(p).



TCL EXHIBIT 1007
Page 581 of 1144

| TRANSMITTAL OF INFORMATION DISCLOSURE STATEMENT (Under 37 CFR 1.97(b), 1.97(c) or 1.97(d)) | Docket No. ERI-888RI (P08877-US3) |
|---|---|

**Payment of Fee**

☒ The Director is hereby authorized to charge and credit Deposit Account 50-1379 as described below.

- ☒ Charge the amount of $180.00
- ☒ Credit any overpayment.
- ☒ Charge any additional fee required.


\Michael Cameron Reg. #50,298\

Michael G. Cameron
Reg. No. 50,298
Ericsson Inc.
6300 Legacy Drive
M/S EVR 1-C-11
Plano, TX 75024
972-583-4145
Michael.cameron@ericsson.com


Dated: December 13, 2007

**CERTIFICATE OF MAILING OR TRANSMISSION**

I hereby certify that this correspondence is being deposited with the United Sates Postal Service with sufficient postage for First class or Express Mail in an envelope addressed to Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, or being facsimile transmitted, or transmitted via EFS-Web to the USPTO, on the date indicated below.

Date: **December 13, 2007**

Name: **Nancy J. Lamberti**

Signature: Nancy J. Lamberti



TCL EXHIBIT 1007
Page 582 of 1144

U. S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

*(use as many sheets as necessary)*

| SHEET | 1 | OF | 1 |
|---|---|---|---|

| *Complete if Known* | | |
|---|---|---|
| Application Number | 11/078,916 | |
| Filing Date | March 11, 2005 | |
| First Named Inventor | Hayes. Jr. | |
| Art Unit | 2681 | CONFIRMATION NO. 1137 |
| Examiner Name | Charles N. Appiah | |
| Attorney Docket Number | ERI-888RI (P08877-US3) | |

**U. S. PATENT DOCUMENTS**

| Examiner's Initials | Cite No. | Document Number (Number-Kind-Code) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document |
|---|---|---|---|---|
| | | 5,452,240 A1 | 09/19/1995 | Roca, et al. |
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**FOREIGN PATENT DOCUMENTS**

| Examiner's Initials | Cite No. | Foreign Patent Document (Country Code – Number – Kind) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Translation Y/N |
|---|---|---|---|---|---|
| | | JP-07056685 | 03/03/1995 | Ricoh Co. Ltd. | |
| | | | | | |
| | | | | | |
| | | | | | |
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**NONPATENT LITERATURE DOCUMENT**

| Examiner's Initials | Cite No. | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published | T |
|---|---|---|---|
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| Examiner Signature | | Date Considered | |
|---|---|---|---|

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include a copy of this form with next communication to applicant.

(19) JAPANESE PATENT OFFICE

# PATENT ABSTRACTS OF JAPAN

(11) Publication number: **07056685 A**
(43) Date of publication of application: **03.03.1995**

(51) Int. Cl **G06F 3/033**
G06F 1/26, G06F 1/32, G06F 1/28

(21) Application number: **05222129**
(22) Date of filing: **13.08.1993**

(71) Applicant: **RICOH CO LTD**
(72) Inventor: **YOSHIDA MASAKAZU**

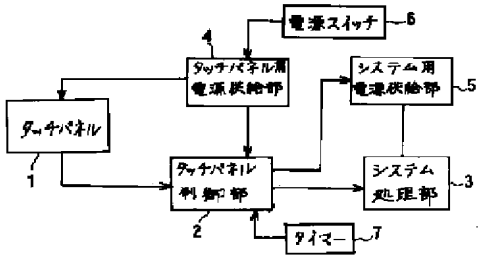
## (54) ELECTRONIC EQUIPMENT EQUIPPED WITH TOUCH PANEL

(57) Abstract:

PURPOSE: To attain power saving, to surely communicate battery consumption and force battery exchange as the degree of battery consumption increases, and to attain alarm having no problem on display or mounting and power consumption.

CONSTITUTION: This equipment is equipped with a power supplying part 4 for a touch panel which supplies a power only to a touch panel 1 and a touch panel control part 2, and a power supplying part 5 for a system. When input to the touch panel is not present within a prescribed time, the power is supplied only to the touch panel and the touch panel control part, and when the input to the touch panel is present within the prescribed time, the power is supplied to the entire system. Also, the equipment is equipped with a battery residual capacity detecting part, and a means which controls a touch panel operating pressurizing force, and the touch panel operating pressurizing force is changed according to the battery residual capacity.

COPYRIGHT: (C)1995,JPO



# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 11078916 |
| **Filing Date:** | 11-Mar-2005 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| First Named Inventor/Applicant Name: | John Joseph Hayes |
| **Filer:** | Steven Ware Smith/Nancy Lamberti |
| **Attorney Docket Number:** | ERI-888RI |

Filed as Large Entity

**Utility Filing Fees**

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| Post-Allowance-and-Post-Issuance: | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| Submission- Information Disclosure Stmt | 1806 | 1 | 180 | 180 |
| | | **Total in USD ($)** | | **180** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 2586110 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Correspondence Address:** | Steven H Slater<br>Slater & Matsil LLP<br>17950 Preston Road<br>Suite 1000<br>Dallas TX 75252<br>US 972-732-1001<br>- |
| **Filer:** | Steven Ware Smith/Nancy Lamberti |
| **Filer Authorized By:** | Steven Ware Smith |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 13-DEC-2007 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 14:22:00 |
| **Application Type:** | Utility under 35 USC 111(a) |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | Deposit Account |
| Payment was successfully received in RAM | $180 |

| | |
|---|---|
| RAM confirmation Number | 8652 |
| Deposit Account | 501379 |
| Authorized User | |

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

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Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes) /Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | | P08877-US3_2007_12_13_07-2689_IDS.pdf | 171690<br>7cb5e9fe1c29cf9c2839ed9e7e5220def9158c04 | yes | 3 |

**Multipart Description/PDF files in .zip description**

| Document Description | Start | End |
|---|---|---|
| Information Disclosure Statement Letter | 1 | 2 |
| Information Disclosure Statement (IDS) Filed | 3 | 3 |

| | | | | | |
|---|---|---|---|---|---|
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Foreign Reference | JP_7056685_A1.pdf | 12011<br>e928195f680c687dad8e412091a4a3213cc04088 | no | 1 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Fee Worksheet (PTO-06) | fee-info.pdf | 8215<br>a67befef0518191d29de1c2d38b81fcdb16a90e3 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 191916 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 09/21/2007

Steven H Slater
Slater & Matsil LLP
17950 Preston Road
Suite 1000
Dallas, TX 75252

| EXAMINER | |
|---|---|
| FOX, BRYAN J | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2617 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 09/21/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Examiner | Art Unit | |
| | Bryan J. Fox | 2617 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *15 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-7, 9-13, 15-22, 24-27 and 29-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al (US 6,424,830) in view of Allard et al (US 5,615,384).

Regarding claim 1, O'Hagan discloses a radiotelephone, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-2), a radio telephone communications transceiver (66), supported by the housing, a display (28) supported by the housing, that displays an

image at a front surface of the housing (see Figs. 7-8), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver (see processor being connected to display 28 and transceiver 66, Fig. 4), which controls at least one of the display and the radiotelephone communications transceiver according to the output signal. O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least one of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal that characterizes contact of an object along the surface of the wheel (see col. 5, lines 46-61, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of an contact-sensitive transducer.

In a similar field of endeavor, Allard et al disclose a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see column 5, lines 1-22), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above touch-sensitive overlay instead of the thumb wheel in order to provide an improved pan function as suggested by Allard et al (see column 2, lines 25-59).

Regarding claims 2 and 17, the combination of O'Hagan and Allard et al further discloses wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or thumb of the holding hand (see O'Hagan Fig. 2).

Regarding claims 3 and 18, the combination of O'Hagan and Allard et al further discloses wherein the controller is operative to selectively display an image according to the output signal of the contact-sensitive transducer (see O'Hagan col. 9, lines 53-67, Fig. 8).

Regarding claims 4 and 19, the combination of O'Hagan and Allard et al further discloses wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer (see O'Hagan col. 9, lines 43-48).

Regarding claims 5 and 20, the combination of O'Hagan and Allard et al further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer (see O'Hagan Fig. 8).

Regarding claims 6 and 21, the combination of O'Hagan and Allard et al further discloses wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer (see O'Hagan col. 9, lines 46-52).

Regarding claims 7 and 22, O'Hagan discloses selectively displaying a graphical object based on the determined position of contact to thereby identify the

graphical object (see col. 9, lines 43-52). O'Hagan fails to expressly disclose wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer.

In a similar field of endeavor, Allard et al disclose a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see column 5, lines 1-22), which reads on the claimed, "wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above touch-sensitive overlay instead of the thumb wheel in order to provide an improved pan function as suggested by Allard et al (see column 2, lines 25-59).

Regarding claims 9 and 24, the combination of O'Hagan and Allard et al further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the contact sensitive transducer (see O'Hagan col. 9, lines 48-52).

Regarding claim 10, the combination of O'Hagan and Allard et al further discloses wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and

wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claim 11, O'Hagan fails to expressly disclose wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer.

In a similar field of endeavor, Allard et al disclose a button is selected by a touch and release action (see column 5, lines 36-58), which reads on the claimed, "the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above button selection in order to allow a user to select different buttons as suggested by Allard et al (see column 6, lines 8-17).

Regarding claim 12, O'Hagan fails to expressly disclose detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval.

In a similar field of endeavor, Allard et al disclose a pan function where a decision is made as to whether or not the touch screen is being touched, then a decision is made as to whether the position has changed, and this process can be

repeated (see column 7, lines 16-45), which reads on the claimed, "detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above pan function in order to provide an improved pan function as suggested by Allard et al (see column 2, lines 25-59).

Regarding claim 13, O'Hagan discloses a thumb wheel disposed at least one of the first side surface and the second side surface (see thumbwheel 48, Figs. 2-3). O'Hagan fails to disclose an elongate contact-sensitive strip.

In a similar field of endeavor, Allard et al disclose a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see column 5, lines 1-22), which reads on the claimed, "elongate contact-sensitive strip."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above touch-sensitive overlay instead of the thumb wheel in order to provide an improved pan function as suggested by Allard et al (see column 2, lines 25-59).

Regarding claims 15, 29, 41 and 73, O'Hagan fails to explicitly disclose wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductor transducer.

In a similar field of endeavor, Allard et al disclose the touch overlay is a resistive pressure sensitive overlay (see column 5, lines 1-22).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above resistive overlay in order to provide an improved pan function as suggested by Allard et al (see column 2, lines 25-59).

Regarding claims 16, 30, 33, 62 and 68, O'Hagan discloses an apparatus and a method in an apparatus for providing user input to a hand-held electronic device, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-4), a display (28) supported by the housing, that displays an image at a front surface of the housing (see Figs. 7-8), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62). O'Hagan further discloses a thumb wheel (46, 48), supported by the housing and having a surface disposed at least one of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which

produces an output signal that characterizes contact of an object along the surface of the wheel (see col. 5, lines 46-61, operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62), however, O'Hagan fails to expressly disclose the use of an contact-sensitive transducer.

In a similar field of endeavor, Allard et al disclose a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see column 5, lines 1-22), which reads on the claimed, "contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above touch-sensitive overlay instead of the thumb wheel in order to provide an improved pan function as suggested by Allard et al (see column 2, lines 25-59).

Regarding claims 25-26, the combination of O'Hagan and Allard et al further discloses wherein the controller is operative, responsive to the contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see O'Hagan col. 5, lines 46-62).

Regarding claim 27, the combination of O'Hagan and Allard et al discloses the contact-sensitive transducer comprises an elongate contact-sensitive strip (see

O'Hagan figures 2-3, thumbwheel 48) disposed at least one of the first and second side surfaces of the housing.

Regarding claim 31, the combination of O'Hagan and Allard et al further discloses a radiotelephone communications transceiver supported by the housing and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see O'Hagan col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claim 32, the combination of O'Hagan and Allard et al further discloses wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at the side of the housing, the side surface disposed adjacent the front surface and inclined away form the front surface (see O'Hagan Fig. 2, showing side with thumb wheel being disposed on a side adjacent the front surface and inclined away from the front surface.

Regarding claim 34, the combination of O'Hagan and Allard et al further discloses wherein the step of providing comprises contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (see O'Hagan Fig. 3).

Regarding claim 35, the combination of O'Hagan and Allard et al further discloses wherein the apparatus is a radio telephone that further includes a radio

telephone communications transceiver (66, Fig. 2), wherein the controller is operative to control the radio telephone communications transceiver (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact sensitive transducer (see O'Hagan col. 5, lines 61-67, col. 9, lines 37-60).

Regarding claim 36, the combination of O'Hagan and Allard et al further discloses wherein the step of controlling comprises the step of selectively displaying an image on the display according to the output of the contact-sensitive transducer (see O'Hagan Figs. 7 and 8).

Regarding claims 37 and 69, the combination of O'Hagan and Allard et al n further teach wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see O'Hagan Figs. 2-3 with the thumb wheel 48 on the side).

Regarding claim 38, the combination of O'Hagan and Allard et al further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see O'Hagan Figs. 2-3, which illustrates the terminal 14 having a display

integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 39, the combination of O'Hagan and Allard et al further discloses wherein the contact-sensitive transducer is disposed on the front surface of the housing (display may function as a touch panel display to allow input of information in addition to or in place of the keypad, see O'Hagan col. 5, lines 12-14).

Regarding claim 40, O'Hagan fails to disclose wherein the contact-sensitive transducer is an elongate strip.

In a similar field of endeavor, Allard et al disclose a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see column 5, lines 1-22), which reads on the claimed, "the contact sensitive transducer is an elongate strip."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above touch-sensitive overlay instead of the thumb wheel in order to provide an improved pan function as suggested by Allard et al (see column 2, lines 25-59).

Regarding claims 42-43, the combination of O'Hagan and Allard et al further discloses an additional user input interface devices for the apparatus on the front surface of the housing wherein the additional interface devices are contact-sensitive (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see O'Hagan col. 5, lines 3-14, Figs. 2-3).

Regarding claims 44 and 45, O'Hagan fails to disclose the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer.

In a similar field of endeavor, Allard et al disclose as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see column 5, lines 36-58), which reads on the claimed, "the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer," and, "the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above sliding output in order to allow a user to easily recover from touching an unintended button as suggested by Allard et al (see column 5, lines 36-58).

Regarding claims 46 and 49, O'Hagan fails to expressly disclose wherein the output signal is produced in response to detection of momentary contact with said contact-sensitive transducer.

In a similar field of endeavor, Allard et al disclose a button is selected by a touch and release action (see column 5, lines 36-58), which reads on the claimed, "the output signal is produced in response to detection of momentary contact with said contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above button selection in order to allow a user to select different buttons as suggested by Allard et al (see column 6, lines 8-17).

Regarding claims 47 and 50, O'Hagan fails to expressly disclose the output signal is produced in response to detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval.

In a similar field of endeavor, Allard et al disclose a pan function where a decision is made as to whether or not the touch screen is being touched, then a decision is made as to whether the position has changed, and this process can be repeated (see column 7, lines 16-45), which reads on the claimed, "detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above pan function in order to provide an improved pan function as suggested by Allard et al (see column 2, lines 25-59).

Regarding claims 48, O'Hagan fails to disclose the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer.

In a similar field of endeavor, Allard et al disclose as a finger is slid across the overlay, new buttons are highlighted while the old buttons are returned to normal (see

column 5, lines 36-58), which reads on the claimed, "an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above sliding output in order to allow a user to easily recover from touching an unintended button as suggested by Allard et al (see column 5, lines 36-58).

Regarding claims 51-53, the combination of O'Hagan and Allard further discloses inherently a second contact-sensitive transducer, supported by the housing which produces a second output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive surface of the second contact-sensitive transducer (inherent feature of keypad 26 on surface, O'Hagan Fig. 2-3), a controller for providing controlling functions of the apparatus including an output signal in response to detection of momentary contact or predetermined number of momentary contacts with the contact-sensitive transducer (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see O'Hagan col. 6, lines 24-35).

Regarding claims 54-55, the combination of O'Hagan and Allard further discloses wherein the controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of the display based on the output signal from the transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display (operator may rotate the thumb wheel clockwise or counter-

clockwise in order to scroll up or down through lines on the display, see O'Hagan col. 5, lines 51-62).

Regarding claims 56 and 57, the combination of O'Hagan and Allard further teach wherein the rows consist of alphanumeric characteristic comprising menu selections wherein the controller identifies successive ones of the rows displayed along the axis of the display by highlighting successive rows (see O'Hagan Figs 7-8).

Regarding claims 58, 59, 64 and 65, the combination of O'Hagan and Allard et al further disclose a power supply disposed inside the housing wherein the power supply comprises a battery (terminal also includes a power source 72 which is a rechargeable supply, see O'Hagan col. 7, lines 54-56).

Regarding claims 60 and 66, the combination of O'Hagan and Allard et al further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer (power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see O'Hagan col. 7, lines 56-59).

Regarding claims 61 and 67, the combination of O'Hagan and Allard et al further discloses a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer (feature of transitioning between different states as illustrated in O'Hagan Fig. 6).

Regarding claim 63 the combination of O'Hagan and Allard et al disclose in Figs. 7-8 of O'Hagan wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

Regarding claim 69, the combination of O'Hagan and Allard et al further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see O'Hagan Fig. 3).

Regarding claim 70, the combination of O'Hagan and Allard et al further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see O'Hagan Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 71, the combination of O'Hagan and Allard et al further discloses wherein the contact-sensitive transducer is disposed on the front surface of the housing (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see O'Hagan col. 5, lines 3-14, Figs. 2-3).

Regarding claim 72, O'Hagan fails to disclose wherein the contact-sensitive transducer is an elongate strip.

In a similar field of endeavor, Allard et al disclose a touch overlay that is a resistive pressure sensitive overlay that produces an analog voltage signal indicative of an overlay location being pressed (see column 5, lines 1-22), which reads on the claimed, "the contact sensitive transducer is an elongate strip."

It would have been obvious to a person of ordinary skill in the art at the time of the invention to modify O'Hagan with Allard et al to include the above touch-sensitive overlay instead of the thumb wheel in order to provide an improved pan function as suggested by Allard et al (see column 2, lines 25-59).

Claims 8 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan in view of Allard et al as applied to claims 7 and 22 above, and further in view of Yamagishi et al. (6,178,338).

Regarding claims 8 and 23, the combination of O'Hagan and Allard et al fails to explicitly disclose wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer (see col. 9, lines 48-52).

Yamagishi discloses a cellular telephone, which utilizes a dial shuttle for selecting functions listed in various option lists (see abstract). According to Yamagishi, the dial shuttle operates to scroll through various menus displayed on a display and is operable to select a particular entry in the displayed menu that is highlighted for subsequent execution by the cellular telephone when the dial shuttle is depressed (see col. 3, line 66 to col. 4, line 14).

It would therefore have been obvious to one of ordinary skill in the art to combine Yamagishi's displayed item's highlighting feature with the combination of O'Hagan and Allard et al's portable terminal in order to have optional means of indicating and selecting displayed items as taught by Yamagishi.

Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al in view of Allard et al as applied to claims 13 and 27 above, and further in view of Moore et al. (4,566,001).

Regarding claims 14 and 28, the combination of O'Hagan and Allard et al fails to teach wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface of the housing.

In an analogous field of endeavor, Moore discloses a touch strip input for a display in which the touch strips are mounted along the horizontal and vertical edges of the display terminal (see col. 1, lines 50-56).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Moore with the combination of O'Hagan and Allard et al's terminal for the benefit of having the contact overlays or strips in optional edges of the terminal for ease and convenience of use.

***Response to Arguments***

Applicant's arguments with respect to claim1-73 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan J. Fox whose telephone number is (571) 272-7908. The examiner can normally be reached on Monday through Friday 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles N. Appiah can be reached on (571) 272-7904. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bryan Fox
September 11, 2007

CHARLES N. APPIAH
SUPERVISORY PATENT EXAMINER

| Notice of References Cited | Application/Control No. 11/078,916 | Applicant(s)/Patent Under Reexamination HAYES ET AL. | |
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| | Examiner Bryan J. Fox | Art Unit 2617 | Page 1 of 1 |

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| | C | US- | | | |
| | D | US- | | | |
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Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

## Index of Claims

| Application/Control No. | Applicant(s)/Patent under Reexamination |
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| 11/078,916 | HAYES ET AL. |
| **Examiner** | **Art Unit** |
| Bryan J. Fox | 2617 |

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## Search Notes

| Application/Control No. | Applicant(s)/Patent under Reexamination | |
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| Bryan J. Fox | 2617 | |

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| S13 | 4326 | (455/550.1,90.1,90.2,90.3,95).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:17 |
| S14 | 35 | (379/428.03).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:17 |
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| S17 | 2223 | (455/566).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:17 |
| S18 | 2983 | (455/575.1-575.5).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:17 |
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| S20 | 51 | (379/428.02).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:18 |



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# EAST Search History

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| S21 | 274 | (345/684).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:38 |
| S22 | 105 | (345/685).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:20 |
| S23 | 3908 | (345/156).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:20 |
| S24 | 3809 | (345/173).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:20 |
| S25 | 6410 | (345/173-183).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 11:51 |
| S26 | 53 | S21 and @RLAD<"19971230" | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2007/09/10 11:40 |
| S27 | 136 | S21 and (@RLAD<"19971230" @PRAD<"19971230" @PD<"19971230") | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2007/09/10 11:51 |
| S28 | 4707 | (345/173-178).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/09/10 16:01 |



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# EAST Search History

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| S29 | 1560 | S28 and (@RLAD<"19971230" @PRAD<"19971230" @PD<"19971230") | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2007/09/10 13:17 |
| S30 | 80 | S29 and thumb | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2007/09/10 13:16 |
| S31 | 741 | S28 and (touch$4 contact$4) near3 side | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2007/09/10 13:16 |
| S32 | 140 | S31 and (@RLAD<"19971230" @PRAD<"19971230" @PD<"19971230") | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2007/09/10 13:17 |
| S33 | 14 | S21 and S28 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2007/09/10 16:02 |



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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 08/06/2007

Steven H Slater
Slater & Matsil LLP
17950 Preston Road
Suite 1000
Dallas, TX 75252

| EXAMINER | |
|---|---|
| FOX, BRYAN J | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2617 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 08/06/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Application Number | Application/Control No. | Applicant(s)/Patent under Reexamination | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Bryan Fox | Art Unit 2617 | |

**Document Code - AP.PRE.DEC**

# Notice of Panel Decision from Pre-Appeal Brief Review

This is in response to the Pre-Appeal Brief Request for Review filed 6/15/07.

1. ☐ **Improper Request** – The Request is improper and a conference will not be held for the following reason(s):

☐ The Notice of Appeal has not been filed concurrent with the Pre-Appeal Brief Request.
☐ The request does not include reasons why a review is appropriate.
☐ A proposed amendment is included with the Pre-Appeal Brief request.
☐ Other: .

The time period for filing a response continues to run from the receipt date of the Notice of Appeal or from the mail date of the last Office communication, if no Notice of Appeal has been received.

2. ☐ **Proceed to Board of Patent Appeals and Interferences** – A Pre-Appeal Brief conference has been held. The application remains under appeal because there is at least one actual issue for appeal. Applicant is required to submit an appeal brief in accordance with 37 CFR 41.37. The time period for filing an appeal brief will be reset to be one month from mailing this decision, or the balance of the two-month time period running from the receipt of the notice of appeal, whichever is greater. Further, the time period for filing of the appeal brief is extendible under 37 CFR 1.136 based upon the mail date of this decision or the receipt date of the notice of appeal, as applicable.

☐ The panel has determined the status of the claim(s) is as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: _____.
Claim(s) withdrawn from consideration: _____.

3. ☐ **Allowable application** – A conference has been held. The rejection is withdrawn and a Notice of Allowance will be mailed. Prosecution on the merits remains closed. No further action is required by applicant at this time.

4. ☒ **Reopen Prosecution** – A conference has been held. The rejection is withdrawn and a new Office action will be mailed. No further action is required by applicant at this time.

All participants:

CHARLES N. APPIAH
SUPERVISORY PATENT EXAMINER

(1) *Charles N. Appiah*.
(2) *Bryan Fox*.
(3) *Tommy Chin*.
(4)_____.

Doc Code: AP.PRE.REQ

PTO/SB/33 (07-05)
Approved for use through xx/xx/200x. OMB 06551-00xx
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| PRE-APPEAL BRIEF REQUEST FOR REVIEW | Docket Number (Optional) ERI-888RI |
|---|---|

| I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]<br>on_____<br>Signature_____<br>Typed or printed name_____ | Application Number 11/078,916 | Filed 3/11/2005 |
|---|---|---|
| | First Named Inventor Hayes, Jr. *et al.* | |
| | Art Unit 2617 | Examiner Bryan J. Fox |

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☒ attorney or agent of record.
Registration number 35,361

☐ attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34. _____

Signature

Steven H. Slater
Typed or printed name

972-732-1001
Telephone number

June 15, 2007
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 form is submitted.

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | | |
|---|---|---|---|
| Appellant: | Hayes, Jr., *et al.* | Docket No.: | ERI-888RI |
| Serial No: | 11/078,916 | Art Unit: | 2617 |
| Date Filed: | March 11, 2005 | Examiner: | Bryan J. Fox |
| Title: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Dear Sir:

Claims 1 – 73 are pending in the current re-issue application. Appellant appeals the final rejection of all pending claims 1 - 73, which were rejected as being anticipated by U.S. Patent No. 6,424,830 to O'Hagan et al. ("O'Hagan") or as being obvious over O'Hagan in view of one or more other references.

*Relevant Facts*

1. Each pending claim recites the claim limitation of a "contact-sensitive transducer" in combination with other claim limitations.

2. The specification clearly defines a contact-sensitive transducer and clearly distinguishes between a contact-sensitive transducer and a prior art mechanical wheel-type switch.

3. The O'Hagan reference relied upon by Examiner teaches only a mechanical wheel-type switch; O'Hagan nowhere teaches or suggests a contact-sensitive transducer, as that term is used in the pending claims.

4. The term contact-sensitive transducer has a recognized meaning to skilled artisans, and that recognized meaning does not encompass a mechanical switch, such as taught by O'Hagan.

5. Examiner has asserted that the term "contact-sensitive transducer" should be interpreted broadly enough to encompass a mechanical wheel-type switch.

*Issue Presented for Review*

The sole issue presented by this request for review is whether the Examiner's interpretation of the claim element "contact-sensitive transducer" is proper. The standard for resolving this issue is that "pending claims must be given their broadest reasonable interpretation consistent with the specification." *See, e.g.*, MPEP § 2111, *citing*, *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005). Examiner's interpretation of the rejected claims is unreasonable because it is at odds with the clear and unequivocal teaching of Appellant's specification.

*Examiner's Interpretation is Inconsistent with Appellant's Specification*

Each and every pending claim recites a "contact-sensitive transducer" in combination with other claim elements. This claim element must be given its broadest reasonable interpretation consistent with the specification. Throughout the specification, Appellant took great strides to distinguish a "contact-sensitive transducer" of the claimed invention from the type of mechanical wheel-type push button known in the prior art, including as taught by O'Hagan.

The shortcomings of the wheel-type push button were discussed in the Background section of Appellant's specification. Specifically, the Background section of Appellant's specification states:

> In other conventional radiotelephone designs, a wheel-like input device may be mounted on the radiotelephone case that may be turned by a user to effect scrolling or graphical objects on the display. The wheel device may also be configured to select items on the display in response to user application of radial pressure to the wheel.
>
> * * *
>
> A wheeled input device may provide faster and more intuitive scrolling control, but such a device may take up an inordinate amount of space and require moving



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> parts which may be more prone to failure. Accordingly, there is a need for improved input devices for radiotelephones.

U.S. Patent No. 6,278,888, col. 1, lines 44 – 59

In addition to disclosing that mechanical wheel-type switches were known in the art, Appellant's specification distinguishes a "contact-sensitive transducer" from prior art mechanical wheel-type switch (such as taught by O'Hagan and relied upon by the examiner). Specifically, Applicant's specification notes that, unlike a wheel-type switch:

> a contact-sensitive transducer . . . offers several advantages. Because a contact-sensitive transducer may be configured to have a thin profile, the transducer may be mounted at a surface of the radiotelephone without taking up an inordinate amount of valuable space. Because characteristic types of contact with the transducer can be detected, such as swiping motions or taps, the transducer may be used to perform display movements such as scrolling or cursor movement, as well as for selection of items displayed on the display. In addition, because a contact-sensitive transducer may be fabricated without moving parts, reliability may be improved.

U.S. Patent No. 6,278,888, col. 2, lines 20 – 30

None of the characteristics or advantages attributed to a "contact-sensitive transducer" could be realized using a wheel-type switch. Hence, *Appellant's specification disavows the overly broad interpretation Examiner has sought to apply to the claim term.* In other words, *Examiner's interpretation of the claims clearly ignores and is hence inconsistent with the specification.*

*Examiner's Claim Interpretation is Inconsistent with Skilled Artisans*

As the MPEP directs: "The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach." MPEP § 2111, *citing*, *In re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999). Examiner's attempt to interpret "contact-sensitive transducer" broadly enough to encompass a mechanical switch is contrary to the way the term is used by skilled artisans.



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Attention is respectfully directed to U.S. Patent No. 6,238,341 (the "`341 Patent")[1], which patent also distinguishes between a mechanical switch and a contact-sensitive transducer.[2] In the `341 Patent, it is noted that:

> Although the switch of the disclosed preferred embodiment is of the mechanical type, in accordance with alternative preferred embodiments the switch activator may be non-mechanical. For example, the state of the electrical switch could be changed in response to receipt of an electrical signal (in contrast to movement of a mechanism) output by a heat-or contact-sensitive transducer situated on the exterior of the probe.

U.S. Patent No. 6,283,341 at col. 4, lines 53 – 60 (emphasis added)

As the `341 Patent reveals, a contact-sensitive transducer is understood to be a non-mechanical device, not a mechanical wheel-type switch such as disclosed by O'Hagan. *See also* U.S. Patent Nos. 6,290,694; 6,131,047; 5,623,944.

*Interpreting Claims Consistent with the Specification Does Not Require Reading the Specification Into the Claims*

Examiner has asserted that Appellant is attempting to read limitations from the specification into the claims (see Examiner's Response to Arguments in Office Action dated March 19, 2007). This is not the case. Appellant respectfully submits that the claim limitation "contact-sensitive transducer" by itself is sufficient to distinguish the claimed invention from the prior art – provided the term is properly construed consistently with the specification as addressed above and as directed by the MPEP. No limitations need be imported into the claim if "contact-sensitive transducer" is interpreted in this manner. The features and advantages of a contact-sensitive transducer identified by Appellant during prosecution and above are not intended and should not be construed as claim limitations. Rather, those features and advantages are simply relied upon to establish the clear distinction between a contact-sensitive transducer and a mechanical wheel-type switch. They are different things, and Examiner's attempt to read this difference out of the claim language is improper.

[1] For convenience, a copy of the `341 Patent is provided herewith but is not part of the substantive reply. To the extent the attached copy of the '341 patent would be considered to impact the page count of this Request, it should be disregarded.

[2] Appellant makes no assertion that the art of the `341 Patent is analogous to Appellant's own field of inventive endeavor.



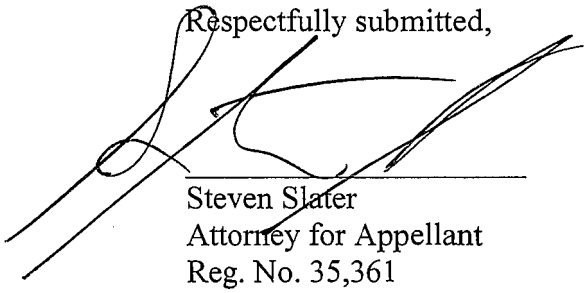
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*Conclusion*

Each and every pending claim recites a "contact-sensitive transducer" in combination with the several other claim limitations. This combination of limitations is neither disclosed nor suggested in the prior art. When the claims are interpreted properly to be consistent with the specification and with usage in the art, it is clear that the claims, as they stand, are patentably distinct over the prior art. Appellant respectfully requests that the final rejection of claims 1 – 73 be withdrawn and the present case be passed to issuance.

Respectfully submitted,

June 15, 2007



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US006238341B1

(12) **United States Patent**
**Mullen**

(10) **Patent No.: US 6,238,341 B1**
(45) **Date of Patent: May 29, 2001**

(54) **ULTRASOUND PROBE HAVING INTEGRATED USER-OPERABLE FUNCTION SWITCH**

(75) Inventor: **Paul Mullen**, Waukesha, WI (US)

(73) Assignee: **General Electric Company**, Milwaukee, WI (US)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/221,969**

(22) Filed: **Dec. 28, 1998**

(51) **Int. Cl.**[7] ..... **A61B 8/00**
(52) **U.S. Cl.** ..... **600/437**; 600/458
(58) **Field of Search** ..... 600/459, 460, 600/458, 437, 461

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,351,692 * 10/1994 Dow et al. ..... 600/459
5,505,203 * 4/1996 Deitrich et al. ..... 600/459

* cited by examiner

*Primary Examiner*—Marvin M. Lateef
*Assistant Examiner*—Maulin Patel
(74) *Attorney, Agent, or Firm*—Dennis M. Flaherty; Christian G. Cabou; Phyllis Y. Price

(57) **ABSTRACT**

An ultrasound probe having an integrated user-operable switch mechanism with two or more positions for respectively requesting activation of a single function or multiple functions. For example, the user-operable switch mechanism may be of the type having only "on" and "off" positions. In response to movement (e.g., by depression, rotation or sliding) of the switch to the "on." position, the system host computer will activate the associated system function in accordance with the current order of prioritized tasks to be performed. For example, the switch could be mapped to a freeze or print function. Alternatively, the user-operable switch may be of the type having multiple positions (e.g., a sliding switch or a rotary switch) corresponding to multiple functions.

**21 Claims, 3 Drawing Sheets**

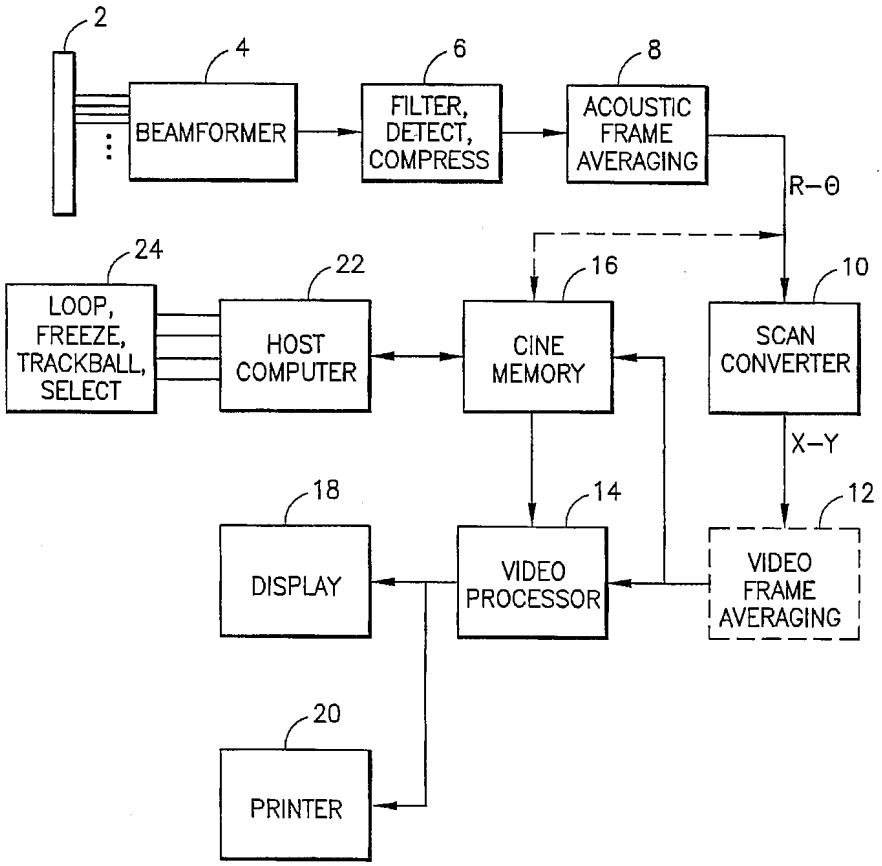
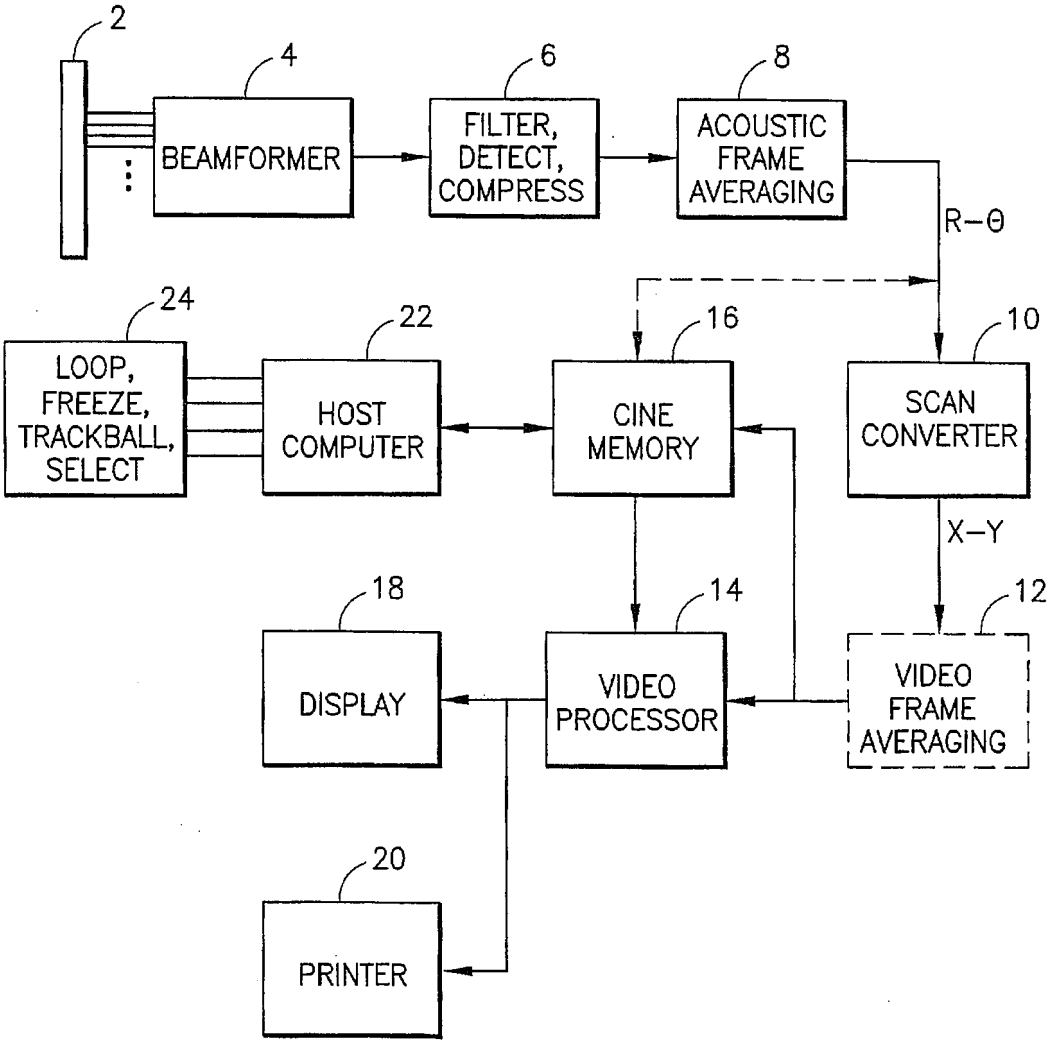


FIG. 1


2
4
BEAMFORMER
6
FILTER, DETECT, COMPRESS
8
ACOUSTIC FRAME AVERAGING
R–θ
24
LOOP, FREEZE, TRACKBALL, SELECT
22
HOST COMPUTER
16
CINE MEMORY
10
SCAN CONVERTER
X–Y
18
DISPLAY
14
VIDEO PROCESSOR
12
VIDEO FRAME AVERAGING
20
PRINTER

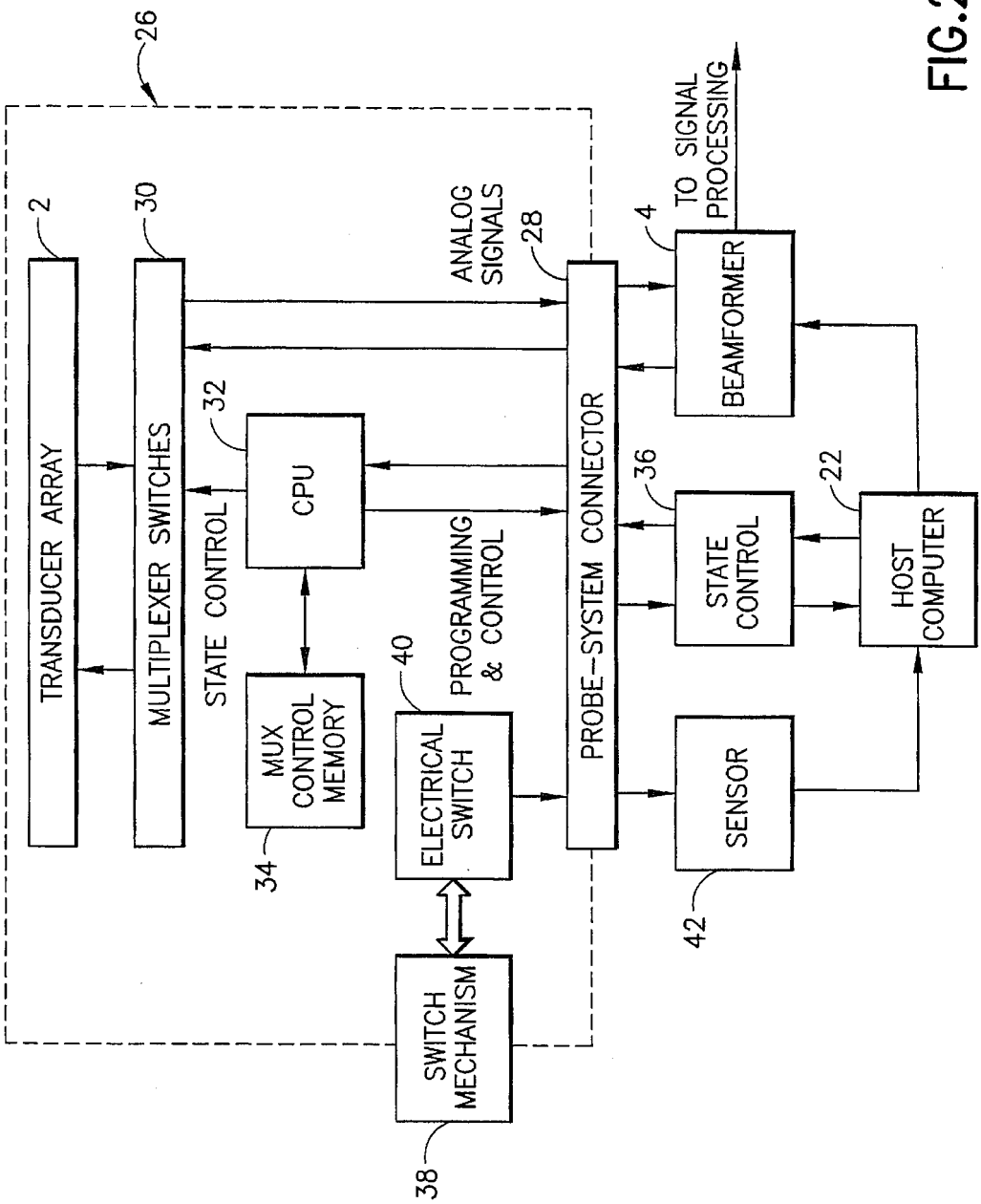

26
2
TRANSDUCER ARRAY
30
MULTIPLEXER SWITCHES
STATE CONTROL
32
CPU
MUX CONTROL MEMORY
34
40
ELECTRICAL SWITCH
PROGRAMMING & CONTROL
SWITCH MECHANISM
38
ANALOG SIGNALS
28
PROBE-SYSTEM CONNECTOR
4
TO SIGNAL PROCESSING
BEAMFORMER
36
STATE CONTROL
22
HOST COMPUTER
SENSOR
42

FIG.2

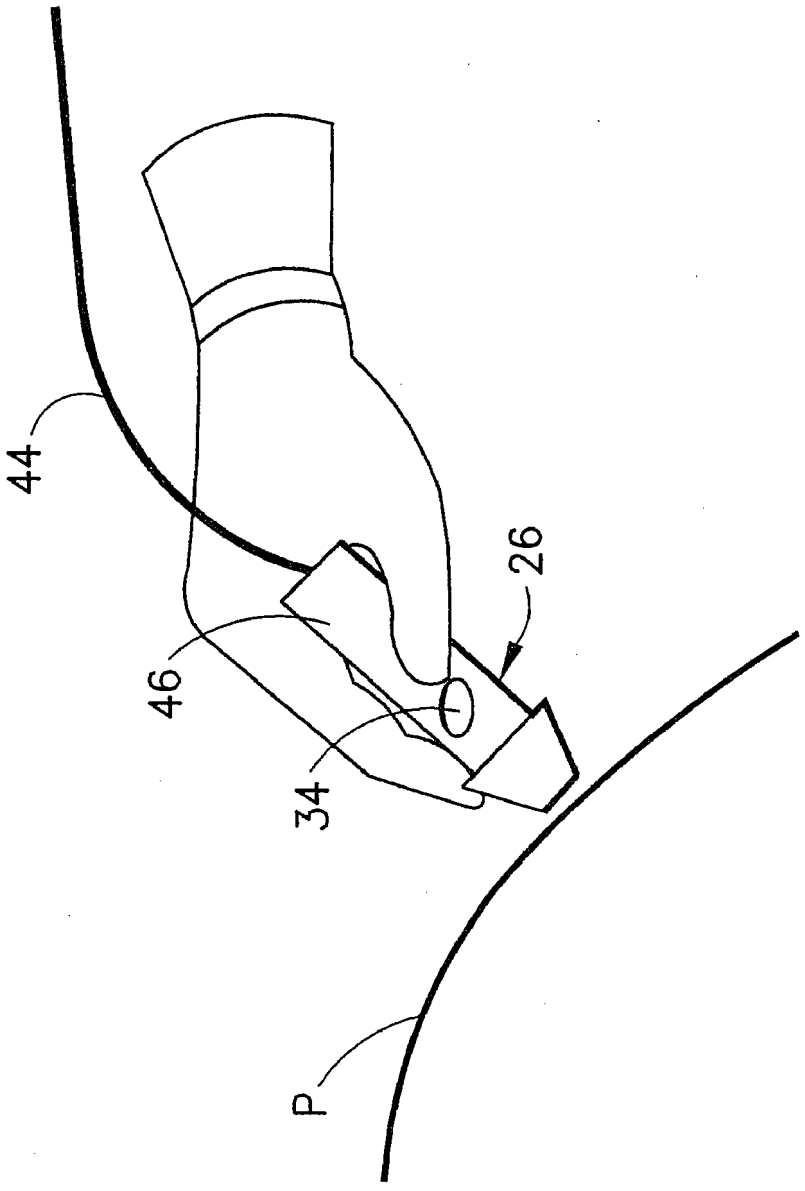



FIG.3

# ULTRASOUND PROBE HAVING INTEGRATED USER-OPERABLE FUNCTION SWITCH

## FIELD OF THE INVENTION

This invention generally relates to the operator interface of an ultrasound imaging system. In particular, the invention relates to means for operator input of commands for controlling the system modes of operation and for setting selectable system parameters.

## BACKGROUND OF THE INVENTION

Conventional ultrasound imaging systems are capable of operating in any one of a plurality of modes. The most common modes of diagnostic ultrasound imaging include B- and M-modes (used to image internal, physical structure), and the Doppler and color flow modes (the latter two being primarily used to image flow characteristics, such as in blood vessels). In conventional B-mode imaging, ultrasound scanners create images in which the brightness of a pixel is based on the intensity of the echo return. The color flow mode is typically used to detect the velocity of fluid flow toward/away from the probe, and it essentially utilizes the same technique as is used in the Doppler mode. Whereas the Doppler mode displays velocity versus time for a single selected sample volume, color flow mode displays hundreds of adjacent sample volumes simultaneously, all superimposed on a B-mode image and color-coded to represent each sample volume's velocity.

Conventional ultrasound imaging systems provide a two-dimensional image representing the biological tissue in a plane scanned by a probe. A three-dimensional volume can be imaged by moving the probe so that scanning occurs in a succession of scan planes, each scan producing a respective image frame of acquired data.

The probe is typically configured to be held in the hand of the sonographer. A typical probe comprises a transducer array seated in the distal end of a probe housing and an electrical cable penetrating the proximal end of the probe housing. The cable comprises a multiplicity of coaxial wires which connect the elements of the transducer array to the receive channels of the beamformer via a probe/system connector. A conventional transducer array comprises a multiplicity of transducer elements made of piezo-electric material. Typically, each transducer element has metallic coatings on opposing front and back faces to serve as ground and signal electrodes respectively. The signal electrodes are typically connected to respective electrical conductors formed on one or more flexible printed circuit boards (PCBs). The flexible PCBs are in turn electrically coupled to the coaxial wires of the probe cable.

By selecting the time delay (or phase) and amplitude of the voltages applied to the transducer elements, ultrasonic waves can be transmitted which combine to form a net ultrasonic wave that travels along a preferred vector direction and is focused at a selected point along the beam. The same principles apply when the transducer probe is employed to receive the reflected sound in a receive mode. The voltages produced at the receiving transducer elements are summed so that the net signal is indicative of the ultrasound reflected from a single focal point in the object. As with the transmission mode, this focused reception of the ultrasonic energy is achieved by imparting separate time delay (and/or phase shifts) and gains to the signal from each receiving transducer element. A single scan line (or small localized group of scan lines) is acquired by transmitting



focused ultrasound energy at a point in the region of interest and then receiving the reflected energy over time.

In the B-mode, for example, the ultrasound image is composed of multiple image scan lines. The brightness of a pixel is based on the intensity of the echo return from the biological tissue being scanned. The outputs of the receive beamformer channels are coherently summed to form a respective pixel intensity value for each sample volume in the object region or volume of interest. These pixel intensity values are log-compressed and scan-converted to form an image frame of pixel data which can be displayed on a monitor. Multiple scans are performed in succession and multiple image frames are displayed at the acoustic frame rate on the display monitor.

In the case where the sonographer is manipulating the transducer probe by hand, one hand is used to control the position of the probe relative to the patient while the other hand is used as necessary to operate levers and keys on the control panel. For example, if the sonographer wishes to freeze or print the ultrasound image currently being displayed on the monitor, the sonographer depresses a "freeze" or "print" button on the control panel with his free hand. There is a need for an operator interface which is located to reduce the operator movements required to perform ultrasound examination.

## SUMMARY OF THE INVENTION

The present invention is an ultrasound probe having an integrated user-operable input device with two or more positions for respectively requesting activation of a single function or multiple functions or for setting a system parameter. For example, the user-operable input device may be a switch mechanism of the type having only "on" and "off" positions. In response to movement (e.g., by depression, rotation or sliding) of the switch to the "on" position, the system host computer will activate the associated system function in accordance with the current order of prioritized tasks to be performed. For example, the switch could be mapped to a freeze or print function. Alternatively, the user-operable switch may be of the type having multiple positions (e.g., a sliding switch or a rotary switch) corresponding to multiple functions. In the case of multiple-function switches, the positions may indicate variable levels of a parameter or the selection of a function or combination of functions. The switch may also be implemented as a continuously variable device such as a potentiometer, touch pad or encoder. In this implementation the mechanism may represent the selection of a variable parameter such as ultrasound receiver gain, dynamic range or Doppler velocity scale.

Preferably the switch is mounted on the probe at an ergonomically acceptable location. For example, the switch could placed at a location which is readily depressed by the thumb of the hand holding the probe. The incorporation of this switch in an ultrasound probe will reduce operator movements required to perform ultrasound examinations.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of a typical ultrasound imaging system.

FIG. **2** is a block diagram showing a transducer probe with user-operable switch connected to an ultra-sound imaging system in accordance with a preferred embodiment of the invention.

FIG. **3** is a schematic depicting a hand-held transducer probe in accordance with the preferred embodiment.

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## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The basic signal processing chain for a conventional ultrasound imaging system is depicted in FIG. **1**. An ultrasound transducer array **2** is activated to transmit an acoustic burst along a scan line. The return RF signals are detected by the transducer elements and then formed into a receive beam by the beamformer **4**. The beamformer output data (I/Q or RF) for each scan line is passed through a processing chain **6** which, for the B-mode, includes equalization filtering, envelope detection and logarithmic compression. Depending on the scan geometry, up to a few hundred vectors may be used to form a single acoustic image frame. To smooth the temporal transition from one acoustic frame to the next, some acoustic frame averaging **8** may be performed before scan conversion. The frame averaging may be implemented by an FIR or an IIR filter. In general, the compressed images are in R-θ format (for a sector scan), which is converted by the scan converter **10** into X-Y format for video display. on some systems, frame averaging may be performed on the video X-Y data (indicated by dashed block **12**) rather than the acoustic frames before scan conversion, and sometimes duplicate video frames may be inserted between acoustic frames in order to achieve a given video display frame rate. The video frames are passed on to a video processor **14**, which basically maps the video data to a gray map for video display on a display monitor **18**. A gray-mapped image frame from video processor **14** can also be printed out on a printer **20**.

System control is centered in a host computer **22**, which accepts operator inputs through an operator interface **24** (e.g., a control panel) and in turn controls and synchronizes the various subsystems. (In FIG. **1**, only the image data transfer paths are depicted.) During B-mode imaging, a long sequence of the most recent images are stored and continuously updated automatically in a cine memory **16**. Some systems are designed to save the R-θ acoustic images (this data path is indicated by the dashed line in FIG. **1**), while other systems store the X-Y video images. The image loop stored in cine memory **16** can be reviewed via track-ball control, and a section of the image loop can be selected for hard disk storage. For an ultrasound scanner with free-hand three-dimensional imaging capability, the selected image sequence stored in cine memory **16** is transferred to the host computer **22** for three-dimensional reconstruction. The result is written back into another portion of the cine memory, from where it is sent to the display system **18** via video processor **14**. In addition, the host computer may be programmed to control various operating parameters as a function of the current frame (or latest sequence of frames) of video X-Y data. This is accomplished by freezing the current image frame of data via the user control panel, analyzing the data and then setting the appropriate system parameters in accordance with an adaptive algorithm. When adaptive parameter optimization is complete, the user unfreezes the display via the control panel.

Referring to FIG. **2**, a probe **26** (generally indicated by the dashed rectangle) is connected to the imaging system by means of a probe/system connector **28**. In the transmit mode, respective analog transmit waveforms are sent from the transmitter of beamformer **4** to respective elements of the transducer array **2** via respective switches of a multiplexer **30** and via respective electrical connections incorporated in the probe/system connector **28**. Similarly, in the receive mode, respective analog receive signals representing ultrasound echoes detected by the elements of the transducer array **2** are sent to respective receive channels of beamformer **4** via the multiplexer **30** and the probe/system connector **28**. The time delays and other beamforming parameters are changed by the host computer **22** to correspond to the multiplexer state for each image vector acquired. Also, the same multiplexer hardware may be used to scan the active aperture across the array.

The state of multiplexer **30** is controlled by a central processing unit (CPU) **32** incorporated in the probe. The MUX control data is stored in a MUX control memory **34**, also incorporated in the probe. A MUX State control signal, which configures the probe with a desired aperture, is output by the host computer **22** to a state control device **36**. In response to the MUX State control signal, the state control device **36** sets a register on the probe/system connector **28**. The CPU **32** reads that register to determine the desired MUX State and then retrieves the MUX control data corresponding to that state from memory **34**. The switches of multiplexer **30** are then set by the CPU.

In accordance with one preferred embodiment of the invention, the transducer probe has an integrated switch which can be operated by the user to implement one or more preselected functions, e.g., freezing or printing a copy of the image frame currently being displayed. The switch comprises a mechanical element or mechanism **38** and an electrical switch **40**, both of which are incorporated in the probe. The electrical switch **40** is electrically connected to a switch state sensor **42** in the imaging system via the probe/system connector **28**. In response to appropriate operation of the mechanism **38** by the sonographer, the switch state sensor **42** detects a change in state of the electrical switch **40** and outputs a corresponding control signal to the host computer **22**. The host computer then activates or de-activates the appropriate function in accordance with the current order of prioritized tasks to be performed.

As depicted in FIG. **2**, the integrated switch **38/40** is mounted on the probe **26**. The switch mechanism **38** may take any one of several different forms. For example, it may take the form of a rocker switch, pushbutton switch, rotary switch, sliding switch, joystick or touch pad. The switch may have two or more positions. In the case of a single-function, two-position switch, the positions may indicate "ON" and "OFF" or similar binary selections. In the case of multiple-function switches, the positions may indicate variable levels of a parameter or the selection of a function or combination of functions. The switch **38/40** may also be implemented as a continuously variable device such as a potentiometer, touch pad or encoder. In this implementation the mechanism may represent the selection of a variable parameter such as ultrasound receiver gain, dynamic range or Dopplervelocity scale.

Although the switch of the disclosed preferred embodiment is of the mechanical type, in accordance with alternative preferred embodiments the switch activator may be non-mechanical. For example, the state of the electrical switch could be changed in response to receipt of an electrical signal (in contrast to movement of a mechanism) output by a heat-or contact-sensitive transducer situated on the exterior of the probe.

Returning to the preferred embodiment shown in FIG. **2**, the electrical switch **40** preferably comprises an electrical contact (not shown) which is mechanically linked to mechanism **38**. For example, for a single-function switch, the electrical contact may be constructed to bridge a pair of switch terminals inside the electrical switch **40**, one switch terminal being connected by one electrical conductor to one

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terminal of a first electrical connector in probe/system connector **28** and the other switch terminal being connected by another electrical conductor to one terminal of a second electrical connector in probe/system connector **28**. The other terminals of the first and second electrical connectors in probe/system connector **28** are respectively connected to a detecting circuit inside the switch state sensor **42**. When the electrical switch **40** is closed, a closed circuit across two terminals of the detecting circuit will produce a signal at a third terminal of the detecting circuit, from which the control signal sent to the host computer is derived.

In the case of a multi-function switch, the single electrical switch **40** is supplemented by one or more additional electrical switches, the total number of electrical switches equaling the number of functions. Similarly, the switch state sensor may incorporate multiple detecting circuits to detect the changes in state of the multiple electrical, the outputs of the multiple detecting circuits being connected in parallel to the switch state sensor output. In a further alternative, multiple switch mechanisms can be movably mounted on the probe, each mechanism controlling the state of a respective one of the multiple electrical switches.

FIG. **3** generally depicts a transducer probe **26** being held in the hand of an operator while being pointed at a patient P. The reference numeral **44** indicates the probe cable, while the reference numeral **46** indicates the probe housing. The probe cable **44** comprises a multiplicity of coaxial wires for electrically coupling the transducer array elements to respective switches of the multiplexer, which is preferably mounted on a printed circuit board located near the probe/system connector. One or more of the coaxial wires is dedicated to connecting respective user-operable electrical switches to the probe/system connector. The switch mechanism is mounted so that it either protrudes outside the probe housing **46** or is accessible through an opening in the probe housing. Preferably the switch mechanism **38** is movably mounted on the probe at an ergonomically acceptable location. For example, the switch could be placed at a location which is readily depressed by the thumb or index finger of the operator, as seen in FIG. **3**.

The foregoing preferred embodiment has been disclosed for the purpose of illustration. variations and modifications will be readily apparent to persons skilled in the art. For example, whether the multiplexer is incorporated in the system or in the probe is not important to practice of the present invention. All such variations and modifications are intended to be encompassed by the claims set forth hereinafter.

What is claimed:

**1**. A system comprising:

an ultrasound transducer probe comprising an array of piezoelectric transducer elements and a user-operable switch operable to transition between first and second states; and

an ultrasound imaging system electrically coupled to said probe and comprising:

means for pulsing said transducer array to transmit ultrasound beams;

means for forming receive beams of acoustic data derived from echo signals detected by the transducer array subsequent to said beam transmits;

signal processing means for converting said acoustic data into a respective set of imaging data for each successive scan;

means for displaying an image for each scan which is a function of said respective set of imaging data; and

means for performing a function on a selected set of imaging data in response to a transition from said first state to said second state of said user-operable switch.

**2**. The system as recited in claim **1**, wherein said function is freezing said selected set of imaging data on said displaying means.

**3**. The system as recited in claim **1**, further comprising a memory for storing imaging data, wherein said function is storing said selected set of imaging data in said memory.

**4**. The system as recited in claim **1**, further comprising a printer for printing imaging data, wherein said function is printing said selected set of imaging data.

**5**. The system as recited in claim **1**, wherein said user-operable switch comprises:

a switch mechanism movable relative to said probe housing between first and second positions; and

an electrical switch operatively coupled to said switch mechanism, said electrical switch having a first state when said switch mechanism is in said first position and a second state when said switch mechanism is in said second position.

**6**. An ultrasound probe comprising:

a probe housing;

an ultrasound transducer array seated in said probe housing;

a switch mechanism movable relative to said probe housing between first and second positions;

a first electrical switch operatively coupled to said switch mechanism, said first electrical switch having an first state when said switch mechanism is in said first position and a second state when said switch mechanism is in said second position; and

an electrical cable comprising a multiplicity of electrical conductors, a first of said electrical conductors being connected to said first electrical switch,

wherein said switch mechanism is further movable between said first position and a third position, further comprising a second electrical switch operatively coupled to said switch mechanism, said second electrical switch having a first state when said switch mechanism is in said first position and a second state when said switch mechanism is in said third position, a second of said electrical conductors of said cable being connected to said second electrical switch.

**7**. A system comprising an ultrasound probe connected to an ultrasound imaging system by a probe/system connector comprising a multiplicity of electrical connections, wherein said probe comprises

a probe housing;

an ultrasound transducer array seated in said probe housing;

a switch mechanism movable relative to said probe housing between first and second positions;

a first electrical switch operatively coupled to said switch mechanism, said first electrical switch having a first state when said switch mechanism is in said first position and a second state when said switch mechanism is in said second position; and

an electrical cable extending outside said probe housing and comprising a multiplicity of electrical conductors, a first one of said electrical conductors connecting said first electrical switch to a first of said electrical connections of said probe/system connector, and

said ultrasound imaging system comprises:

a beamformer for activating said ultrasound transducer array to transmit beams and forming vectors of

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acoustic data from receive signals transduced by said ultrasound transducer array following said beam transmits;

a display subsystem for displaying imaging data derived from said acoustic data;

first means for performing a first predetermined function on a set of said imaging data;

a sensor comprising a detecting circuit and a first input terminal connecting said detecting circuit to said first electrical connection of said probe/system connector, said detecting circuit outputting a first control signal in response to detecting a transition of said electrical switch from said first state to said second state; and

a computer programmed to activate and control said first means to perform said first predetermined function in response to said first control signal.

8. The system as recited in claim 7, wherein said first predetermined function is freezing an image currently being displayed by said display subsystem.

9. The system as recited in claim 7, wherein said switch mechanism is further movable between said first position and a third position; said probe further comprises a second electrical switch operatively coupled to said switch mechanism, said second electrical switch having a first state when said switch mechanism is in said first position and a second state when said switch mechanism is in said third position, a second of said electrical conductors of said cable being connected to said second electrical switch; said ultrasound imaging system further comprising second means for performing a second predetermined function on said set of said imaging data, said sensor further comprises a second input terminal connecting said detecting circuit to said second electrical connection of said probe/system connector, said detecting circuit outputting a second control signal in response to detecting a transition of said second electrical switch from said first state to said second state, and said computer being programmed to activate and control said second means to perform said second predetermined function in response to said second control signal.

10. The system as recited in claim 9, further comprising a printer for printing said imaging data, wherein said second predetermined function is printing a copy of an image currently being displayed by said display subsystem.

11. A system comprising:

an ultrasound transducer probe comprising an array of piezoelectric transducer elements, a user-operable switch operable to transition between first and second states, and respective electrical conduction paths electrically connected to said piezoelectric transducer elements and to said user-operable switch; and

an ultrasound imaging system comprising:

a transmit beamformer for pulsing said transducer array to transmit ultrasound beams;

a receive beamformer for forming receive beams of acoustic data derived from echo signals detected by the transducer array subsequent to said beam transmits;

a signal processing chain for converting said acoustic data into imaging data;

a display monitor for displaying said imaging data;

means for performing a function on said imaging data;

a sensor electrically connected to that electrical conduction path which is electrically connected to said user-operable switch, said sensor outputting a control signal in response to a transition from said first state to said second state of said user-operable switch; and

a computer programmed to activate and control said means to perform said function in response to said control signal.

12. The system as recited in claim 11; wherein said function is freezing an image currently being displayed on said display monitor.

13. The system as recited in claim 11, further comprising a cine memory for storing imaging data, wherein said function is storing in said cine memory imaging data corresponding to an image currently being displayed on said display monitor.

14. The system as recited in claim 11, further comprising a printer for printing said imaging data, wherein said function is printing a copy of an image currently being displayed on said display monitor.

15. The system as recited in claim 11, wherein said user-operable switch comprises:

a switch mechanism movable relative to said probe housing between first and second positions;

a first electrical switch operatively coupled to said switch mechanism, said first electrical switch having an first state when said switch mechanism is in said first position and a second state when said switch mechanism is in said second position.

16. A system comprising:

an ultrasound transducer probe comprising an array of piezoelectric transducer elements and a user-operable switch operable to transition between first and second states; and

an ultrasound imaging system comprising:

a transmitter for pulsing said transducer array to transmit ultrasound beams;

a receiver for acquiring acoustic data derived from echo signals detected by the transducer array subsequent to said beam transmits;

a signal processing chain for converting said acoustic data into imaging data in accordance with operating parameter settings;

a display device for displaying images representing said imaging data; and

a controller for setting an operating parameter of said ultrasound imagine system in response to a transition from said first state to said second state of said user-operable switch.

17. A system comprising:

an ultrasound transducer probe comprising an array of piezoelectric transducer elements and a user-operable input device operable to transition between first and second states; and

an ultrasound imaging system comprising:

a transmitter for pulsing said transducer array to transmit ultrasound beams;

a receiver for acquiring acoustic data derived from echo signals detected by the transducer array subsequent to said beam transmits;

a signal processing chain for converting said acoustic data into imaging data in accordance with operating parameter settings;

a display device for displaying images representing said imaging data; and

a controller for changing an operating parameter of said ultrasound imaging system in response to a transition from said first state to said second state of said user-operable input device.

18. The system as recited in claim 17, wherein said operating parameter is receiver gain.

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19. The system as recited in claim 17, wherein said operating parameter is dynamic range.

20. The system as recited in claim 17, wherein said operating parameter is a Doppler velocity scale.

21. A method for operating an ultrasound imaging system having a hand-held transducer probe, comprising the steps of:

holding the transducer probe;

placing the remote end of the transducer probe in acoustically coupled relationship with the body being examined;

viewing a first succession of images on a display screen while moving the transducer probe across the body, said first succession of images being produced while an operating parameter of the ultrasound imaging system is set at a first value;

operating a switch on the transducer probe to change the setting of said operating parameter of said ultrasound imaging system from said first value to a second value different than said first value; and

viewing a second succession of images on the display screen while moving the transducer probe across the body, said second succession of images being produced while said operating parameter of the ultrasound imaging system is set at said second value.

* * * * *

# Electronic Patent Application Fee Transmittal

| | |
|---|---|
| **Application Number:** | 11078916 |
| **Filing Date:** | 11-Mar-2005 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| First Named Inventor/Applicant Name: | John Joseph Hayes |
| **Filer:** | Steven Howard Slater/Judy Betts |
| **Attorney Docket Number:** | ERI-888RI |

Filed as Large Entity

**Utility Filing Fees**

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Basic Filing:** | | | | |
| **Pages:** | | | | |
| **Claims:** | | | | |
| **Miscellaneous-Filing:** | | | | |
| **Petition:** | | | | |
| **Patent-Appeals-and-Interference:** | | | | |
| Notice of appeal | 1401 | 1 | 500 | 500 |
| Post-Allowance-and-Post-Issuance: | | | | |
| **Extension-of-Time:** | | | | |

| Description | Fee Code | Quantity | Amount | Sub-Total in USD($) |
|---|---|---|---|---|
| **Miscellaneous:** | | | | |
| | | | **Total in USD ($)** | **500** |

# Electronic Acknowledgement Receipt

| | |
|---|---|
| **EFS ID:** | 1879259 |
| **Application Number:** | 11078916 |
| **International Application Number:** | |
| **Confirmation Number:** | 1137 |
| **Title of Invention:** | Radiotelephones having contact-sensitive user interfaces and methods of operating same |
| **First Named Inventor/Applicant Name:** | John Joseph Hayes |
| **Correspondence Address:** | Steven H Slater<br>Slater & Matsil LLP<br>17950 Preston Road<br>Suite 1000<br>Dallas TX 75252<br>US 972-732-9218<br>- |
| **Filer:** | Steven Howard Slater/Judy Betts |
| **Filer Authorized By:** | Steven Howard Slater |
| **Attorney Docket Number:** | ERI-888RI |
| **Receipt Date:** | 15-JUN-2007 |
| **Filing Date:** | 11-MAR-2005 |
| **Time Stamp:** | 18:08:01 |
| **Application Type:** | Utility |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment was successfully received in RAM | $500 |
| RAM confirmation Number | 2316 |

| Deposit Account | 501065 |
|---|---|
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17 | |

## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes) | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | | AppealBriefRequest.pdf | 894633 | yes | 16 |
| | **Multipart Description/PDF files in .zip description** | | | | |
| | **Document Description** | | **Start** | **End** | |
| | Notice of Appeal Filed | | 1 | 1 | |
| | Pre-Brief Conference request | | 2 | 16 | |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 2 | Fee Worksheet (PTO-06) | fee-info.pdf | 8180 | no | 2 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| | | **Total Files Size (in bytes):** | 902813 | | |

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**
**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**
**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**
**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

PTO/SB/31 (04-07)
Approved for use through 09/30/2007. OMB 06551-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Docket Number (Optional): ERI-888RI

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 [37 CFR 1.8(a)]
on_____

Signature_____

Typed or printed name_____

In re Application of: Hayes, Jr. *et al.*

| Application Number | Filed |
|---|---|
| 11/078,916 | 3/11/2005 |

For: Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same

| Art Unit | Examiner |
|---|---|
| 2617 | Bryan J. Fox |

Applicant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 41.20(b)(1)) $ 500.00

☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $ _____

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account. I have enclosed a duplicate copy of this sheet.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 50-1065. I have enclosed a duplicate copy of this sheet.

☐ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant/inventor.

☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☒ attorney or agent of record. Registration number 35,361

☐ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____

Signature

Steven H. Slater
Typed or printed name

972-732-1001
Telephone number

June 15, 2007
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☒ *Total of 1 form is submitted.

This collection of information is required by 37 CFR 41.31. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 03/19/2007

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Slater & Matsil LLP
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| EXAMINER | |
|---|---|
| FOX, BRYAN J | |
| **ART UNIT** | **PAPER NUMBER** |
| 2617 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 03/19/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.



TCL EXHIBIT 1007
Page 639 of 1144

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Examiner | Art Unit | |
| | Bryan J. Fox | 2617 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-7, 9-13, 16-22, 24-27, 30-40, 42-62-68, 70, 71, 72 and 73 are rejected under 35 U.S.C. 102(e) as being anticipated by O'Hagan et al. (6,424,830).

Regarding claim 1, O'Hagan discloses a radiotelephone, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-2), a radio telephone communications transceiver (66), supported by the housing, a display (28) supported by the housing, that displays an image at a front surface of the housing (see Figs. 7-8), a contact sensitive transducer (46, 48), supported by the housing and having a contact-sensitive surface disposed at least one of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact- sensitive transducer (see col. 5, lines 46-61), and a

controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver (see processor being connected to display 28 and transceiver 66, Fig. 4), which controls at least one of the display and the radiotelephone communications transceiver according to the output signal of the contact –sensitive transducer (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claims 2 and 17, O'Hagan further discloses wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or thumb of the holding hand (see Fig. 2).

Regarding claims 3 and 18, O'Hagan further discloses wherein the controller is operative to selectively display an image according to the output signal of the contact-sensitive transducer (see col. 9, lines 53-67, Fig. 8).

Regarding claims 4 and 19, O'Hagan further discloses wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer (see col. 9, lines 43-48).

Regarding claims 5 and 20, O'Hagan further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer (see Fig. 8).

Regarding claims 6 and 21, O'Hagan further discloses wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer (see col. 9, lines 46-52).

Regarding claims 7 and 22, O'Hagan further discloses wherein the controller is operative to determine a position of contact (rotational movement o the three-way switch clock wise or counter-clockwise) of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact sensitive transducer and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object (see col. 9, lines 43-52).

Regarding claims 9 and 24, O'Hagan further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the contact sensitive transducer (see col. 9, lines 48-52).

Regarding claim 10, O'Hagan further discloses wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a

voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claims 11-12, O'Hagan further discloses wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer or detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claim 13, O'Hagan further discloses wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at least one of the first side surface and the second side surface (see thumbwheel 48, Figs. 2-3).

Regarding claims 16, 30, 33, 62 and 68, O'Hagan discloses an apparatus and a method in an apparatus for providing user input to a hand-held electronic device, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-4), a display (28) supported by the housing, that displays an image at a front surface of the housing (see Figs. 7-8), a contact sensitive transducer (46, 48), supported by the housing, which produces an output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive transducer (see col. 5, lines 46-61), and a controller (processor 60 being

programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claims 25-26, O'Hagan further discloses wherein the controller is operative, responsive to the contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claim 27, O'Hagan's Figs. 2-3 illustrates the contact-sensitive transducer comprises an elongate contact-sensitive strip (thumbwheel 48) disposed at least one of the first and second side surfaces of the housing.

Regarding claim 31, O'Hagan further discloses a radiotelephone communications transceiver supported by the housing and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claim 32, O'Hagan further discloses wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at the side of the housing, the side surface disposed adjacent the front surface and inclined away form the front surface (see Fig. 2, showing side with thumb wheel being disposed on a side adjacent the front surface and inclined away from the front surface.

Regarding claim 34, O'Hagan further discloses wherein the step of providing comprises contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm (see Fig. 3).

Regarding claim 35, O'Hagan further discloses wherein the apparatus is a radio telephone that further includes a radio telephone communications transceiver (66, Fig. 2), wherein the controller is operative to control the radio telephone communications transceiver (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact sensitive transducer (see col. 5, lines 61-67, col. 9, lines 37-60).

Regarding claim 36, O'Hagan further discloses wherein the step of controlling comprises the step of selectively displaying an image on the display according to the output of the contact-sensitive transducer (see Figs. 7 and 8).

Regarding claims 37 and 69, O'Hagan further teach wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see Figs. 2-3 with the thumb wheel 48 on the side).

Regarding claim 38, O'Hagan further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 39, O'Hagan further discloses wherein the contact-sensitive transducer is disposed on the front surface of the housing (display may function as a touch panel display to allow input of information in addition to or in place of the keypad, see col. 5, lines 12-14).

Regarding claim 40, O'Hagan further discloses wherein the contact-sensitive transducer is an elongate strip (see thumbwheel 48, Figs. 2-3).

Regarding claims 42-43, O'Hagan further discloses an additional user input interface devices for the apparatus on the front surface of the housing wherein the additional interface devices are contact-sensitive (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3).

Regarding claim 44, O'Hagan further discloses wherein the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claims 45-50, O'Hagan further discloses wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer, detection of momentary contact with the contact-sensitive transducer or detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claims 51-53, O'Hagan further discloses inherently a second contact-sensitive transducer, supported by the housing which produces a second output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive surface of the second contact-sensitive transducer (inherent feature of keypad 26 on surface, Fig. 2-3), a controller for providing controlling functions of the apparatus including an output signal in response to detection of momentary contact or predetermined number of momentary contacts with the contact-sensitive transducer (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35).

Regarding claims 54-55, O'Hagan further discloses wherein the controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of the display based on the output signal from the transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 51-62).

Regarding claims 56 and 57, O'Hagan further teach wherein the rows consist of alphanumeric characteristic comprising menu selections wherein the controller identifies successive ones of the rows displayed along the axis of the display by highlighting successive rows (see Figs 7-8).

Regarding claims 58, 59, 64 and 65 O'Hagan further disclose a power supply disposed inside the housing wherein the power supply comprises a battery (terminal also includes a power source 72 which is a rechargeable supply, see col. 7, lines 54-56).

Regarding claims 60, 64 and 66, O'Hagan further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer (power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see col. 7, lines 56-59).

Regarding claims 61 and 67, O'Hagan further discloses a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer (feature of transitioning between different states as illustrated in Fig. 6).

Regarding claim 63, O'Hagan's Figs. 7-8 shows wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

Regarding claim 69, O'Hagan further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see Fig. 3).

Regarding claim 70, O'Hagan further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 71, O'Hagan further discloses wherein the contact-sensitive transducer is disposed on the front surface of the housing (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3).

Regarding claim 72, O'Hagan further discloses wherein the contact-sensitive transducer is an elongate strip (see thumbwheel 48, Figs. 2-3).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 8 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al as applied to claims 7 and 22 above, and further in view of Yamagishi et al. (6,178,338).

Regarding claims 8 and 23, O'Hagan fails to explicitly disclose wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer (see col. 9, lines 48-52).

Yamagishi discloses a cellular telephone, which utilizes a dial shuttle for selecting functions listed in various option lists (see abstract). According to Yamagishi, the dial shuttle operates to scroll through various menus displayed on a display and is operable to select a particular entry in the displayed menu that is highlighted for subsequent execution by the cellular telephone when the dial shuttle is depressed (see col. 3, line 66 to col. 4, line 14).

It would therefore have been obvious to one of ordinary skill in the art to combine Yamagishi's displayed item's highlighting feature with O'Hagan's portable terminal in order to have optional means of indicating and selecting displayed items as taught by Yamagishi.

5. Claims 15, 29, 41 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al as applied to claims 1, 22, 30 and 68 above, and further in view of Yaniv et al. (EPO 499 012).

Regarding claims 15, 29, 41 and 73, O'Hagan fails to explicitly disclose wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductor transducer.

In an analogous field of endeavor, Yaniv discloses a portable compact voice and data communication apparatus in which a contact-sensitive transducer includes resistive transducer (see col. 13, lines 27-35).

It would therefore have been obvious to one of ordinary skill in the art to use different operating parameters for the touch sensing capability such as Yaniv's resistive means with O'Hagan's terminal for providing the input means for dynamic information on the display as taught by Yaniv.

6. Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al as applied to claims 13 and 27 above, and further in view of Moore et al. (4,566,001).

Regarding claims 14 and 28, O'Hagan fail to teach wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface of the housing.

In an analogous field of endeavor, Moore discloses a touch strip input for a display in which the touch strips are mounted along the horizontal and vertical edges of the display terminal (see col. 1, lines 50-56).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Moore with O'Hagan's terminal for the benefit of having the

contact overlays or strips in optional edges of the terminal for ease and convenience of use.

***Response to Arguments***

Applicant's arguments filed February 20, 2007 have been fully considered but they are not persuasive.

The Applicant argues O'Hagan fails to disclose the "contact-sensitive transducer." The Examiner respectfully disagrees. The broadest reasonable interpretation in light of the specification of "contact-sensitive transducer" would include the thumb wheel disclosed by O'Hagan.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the advantages of the Applicant's contact-sensitive transducer) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Applicant argues O'Hagan fails to disclose a contact sensitive surface. The Examiner respectfully disagrees. The broadest reasonable interpretation in light of the specification of contact sensitive surface would include the thumb wheel (46, 48) disclosed by O'Hagan.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the contact-sensitive transducer produces an output signal that characterizes

contact of an object, such as a user's finger, along an axis of the transducer) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The Applicant argues O'Hagan fails to disclose the contact-sensitive transducer produces an output signal that characterizes contact of an object along the contact-sensitive surface. The Examiner respectfully disagrees. The thumb wheel disclosed by O'Hagan would produce an output signal in response to an object turning the wheel, fulfilling the limitation.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to combine Yaniv with O'Hagan, for providing the input means for dynamic information on the display, can be found in Yaniv (see, e.g. column 2, line 54 – column 3, line 4).

The Applicant argues the combination of O'Hagan and Moore fails to disclose the contact sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact strip mounted at the second side surface. The Examiner respectfully disagrees. The mounting of the transducers as suggested by

the combination of O'Hagan and Moore (see e.g. O'Hagan figure 2 and Moore column 1, lines 50-56), would fulfill the limitations of the claim as mounted on first and second side surfaces.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan J. Fox whose telephone number is (571) 272-7908. The examiner can normally be reached on Monday through Friday 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles N. Appiah can be reached on (571) 272-7904. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Bryan Fox
March 6, 2007

CHARLES N. APPIAH
SUPERVISORY PATENT EXAMINER

## Index of Claims

| Application/Control No. | Applicant(s)/Patent under Reexamination |
|---|---|
| 11/078,916 | HAYES ET AL. |
| **Examiner** | **Art Unit** |
| Bryan J. Fox | 2617 |

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| Search Notes | Application/Control No. | Applicant(s)/Patent under Reexamination |
|---|---|---|
| | 11/078,916 | HAYES ET AL. |
| | Examiner | Art Unit |
| | Bryan J. Fox | 2617 |

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# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 3978 | (455/550.1,90.1,90.2,90.3,95).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 10:59 |
| L2 | 2706 | (455/575.1-575.5).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 10:59 |
| L3 | 2069 | (455/566).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 10:59 |
| L4 | 9177 | (345/156,168,123,184,173,174).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 11:00 |
| L5 | 63 | (379/433.1,433.3).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 11:00 |
| L6 | 373 | (379/428.01).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 11:01 |
| L7 | 46 | (379/428.02).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 11:01 |
| L8 | 32 | (379/428.03).CCLS. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 11:01 |



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| L9 | 16474 | 1 2 3 4 5 6 7 8 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | OR | ON | 2007/03/06 11:48 |
| L10 | 2 | ("4566001").PN. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 11:48 |
| S1 | 2 | ("6278888").PN. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/06 10:57 |
| S2 | 2 | ("6424830").PN. | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB | OR | OFF | 2007/03/05 13:58 |



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## FACSIMILE COVER SHEET

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| To: Commissioner for Patents | Total Pages Sent: 10 |
| Technology Center 2600 | (including cover sheet) |
| Facsimile Number: 571-273-8300 | Transmission Date: February 20, 2007 |

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant: | Hayes, Jr., *et al.* | Docket No.: | ERI-888RI |
| Serial No: | 11/078,916 | Art Unit: | 2617 |
| Date Filed: | March 11, 2005 | Examiner: | Charles N. Appiah |
| Title: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

## CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that the following papers are being transmitted by facsimile to the U.S. Patent and Trademark Office at 571-273-8300 on the date shown above:

- Certification of Facsimile Transmission (1 page)
- Response to Office Action (9 pages)

Respectfully submitted,

Judy A. Betts
Legal Assistant

**Confirmation Respectfully Requested**

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## RESPONSE TO OFFICE ACTION

Dear Sir:

The following remarks are presented in response to the Examiner's Office Action mailed November 24, 2006.



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## REMARKS

Claims 1 – 73 are pending and were rejected as being anticipated by U.S. Patent No. 6,424,830 to O'Hagan et al. ("O'Hagan") or obvious over O'Hagan in combination with other references. Applicant respectfully traverses the rejection and requests withdrawal of the rejection in light of the following comments.

***Claims 1, 2 – 7, and 9 – 13***

Claim 1 recites a radiotelephone comprising, among other elements, a "housing" and a "contact-sensitive transducer." Respectfully, O'Hagan does not disclose this limitation. Rather, O'Hagan merely discloses a "three-way switch 46" that includes a "thumb wheel 48" as illustrated in Figure 2 and discussed at col. 5, lines 46 – 67 of O'Hagan.

The thumb wheel and three-way switch of O'Hagan is not a contact-sensitive transducer. Rather, the disclosure of O'Hagan is exactly the type of prior art technology that is distinguished over in the Background section of Applicant's specification. Specifically, the Background section of Applicant's specification states:

> In other conventional radiotelephone designs, a wheel-like input device may be mounted on the radiotelephone case that may be turned by a user to effect scrolling or graphical objects on the display. The wheel device may also be configured to select items on the display in response to user application of radial pressure to the wheel.
>
> * * *
>
> A wheeled input device may provide faster and more intuitive scrolling control, but such a device may take up an inordinate amount of space and require moving parts which may be more prone to failure. Accordingly, there is a need for improved input devices for radiotelephones.

U.S. Patent No. 6,278,888, col. 1, lines 44 – 59



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By sharp contrast to the conventional technology of O'Hagan, claim 1 specifically recites a "contact-sensitive transducer." The distinctions and advantages of a contact-sensitive transducer, relative a wheel-like push button (such as taught by O'Hagan) are discussed in Applicant's Summary of the Invention section. Specifically, Applicant's specification notes that, unlike a wheel-type push button:

> "a contact-sensitive transducer . . . offers several advantages. Because a contact-sensitive transducer may be configured to have a thin profile, the transducer may be mounted at a surface of the radiotelephone without taking up an inordinate amount of valuable space. Because characteristic types of contact with the transducer can be detected, such as swiping motions or taps, the transducer may be used to perform display movements such as scrolling or cursor movement, as well as for selection of items displayed on the display. In addition, because a contact-sensitive transducer may be fabricated without moving parts, reliability may be improved."

U.S. Patent No. 6,278,888, col. 2, lines 20 – 30

Nothing in O'Hagan teaches or suggests that the three-way switch 46 and thumb wheel 48 is or can be configured to obtain any of the advantageous features of a true contact-sensitive transducer. In short, the three-way switch 46 and thumb wheel 48 of O'Hagan are not a contact-sensitive transducer – they are a switch, such as was specifically addressed and distinguished over in Applicant's specification.

Claim 1 further recites that the contact-sensitive transducer has "a contact-sensitive surface disposed at least one of the first and second sides [of the housing]." Examiner has apparently cited to Figures 7 and 8 of O'Hagan as disclosing this element. Upon review of the cited figures, Applicant finds no teaching or suggestion of the cited element of a "contact-sensitive surface," however. Rather, Figures 7 and 8 merely disclose display formats for the display 28 of O'Hagan (O'Hagan, col. 9, lines 37 – 65). Further, because elements 46 and 48 of O'Hagan are merely a three-way switch and a thumb-wheel, respectively, neither of these elements can be said to provide a "contact-sensitive surface" as that term is used in claim 1.

As is clear by reference to the exemplary embodiments of Applicant's specification, a contact-sensitive surface is one wherein the output signal corresponds, at least in part, to a location of a point of contact on the surface. "A contact-sensitive



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transducer . . . produces an output signal that characterizes contact along a contact-sensitive surface of the contact-sensitive transducer" (col. 2, lines 35 – 40, emphasis added). Furthermore, "the contact-sensitive transducer 150 produces an output signal 155 that characterizes contact of an object, such as a user's finger 210, along an axis 150a of the transducer" (col. 5, lines 18 – 22, emphasis added). Even further, Figure 5 of Applicant's specification "illustrates methods and apparatus for determining a position of contact with a contact-sensitive transducer according to an aspect of the present invention" (col. 6, lines 13 – 16, emphasis added). Applicants respectfully note that these references to the specification are by way of illustration only and that the claimed invention is not limited to the specific described embodiments. Rather, reference is made to the specification herein solely to demonstrate that Applicant's position that O'Hagan fails to teach or suggest a "contact-sensitive transducer" having a "contact-sensitive surface" is fully supported by and consistent with Applicant's specification.

Because the three way switch 46 and thumb wheel 48 of O'Hagan are neither a "contact-sensitive transducer" nor a "contact-sensitive surface," O'Hagan fails to disclose each element of claim 1. Claim 1 is hence patentably distinct over O'Hagan. Claims 2 – 7 and 9 – 13 are likewise patentably distinct over O'Hagan by virtue of their respective dependence from claim 1 as well as their respective further defining limitations.

***Claims 16, 17 – 22 and 24 – 27***

Claim 16 recites an apparatus having, among other elements, a "contact-sensitive transducer" having a "contact-sensitive surface." As established above with reference to claim 1, these elements are neither taught nor suggested by O'Hagan. Hence, claim 16 is patentably distinct over O'Hagan. Claims 17 – 22 and 24 – 27 are likewise allowable over O'Hagan by virtue of their respective dependence from claim 16 as well as for their further respective defining limitations.



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***Claims 30, 31 – 40 and 42 – 60***

Claim 30 recites a "contact-sensitive transducer." As addressed above with reference to claim 1, O'Hagan fails to teach or suggest this limitation. Claim 30 further recites that the contact-sensitive transducer "produces an output signal that characterizes contact of an object along the contact-sensitive surface." As established above, O'Hagan fails to teach or suggest a contact-sensitive transducer having a "contact-sensitive surface." This point is further emphasized by claim 30's recitation that the output signal characterizes contact of an object "along the contact-sensitive surface." O'Hagan merely discloses a three-way switch 46 and thumb wheel 48. At best, the output signal characterizes rotation in one direction or another or in the radial direction (O'Hagan, col. 5, lines 46 – 65). Nowhere does O'Hagan even remotely teach or suggest that the output signal characterizes contact along the contact-sensitive surface. Hence, claim 30 is patentably distinct over O'Hagan. Claims 31 – 40 and 42 – 60 are also allowable over O'Hagan by virtue of their respective dependence from claim 30 as well as for their further respective defining limitations.

***Claims 62 –67***

Claim 62 recites a "contact-sensitive transducer . . . which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer." For at least the reasons provided above with respect to claims 1 and 30, O'Hagan fails to teach or suggest the recited limitations of claim 62 and claim 62 is hence allowable over the reference. Claims 63 – 67 are also patentably distinct over the reference by virtue of their dependence from claim 62 as well as for their further respective defining limitations.



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***Claims 68 and 70 – 73***

Claim 68 also recites a "contact-sensitive transducer . . . which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer." For at least the reasons provided above with respect to claims 1 and 30, O'Hagan fails to teach or suggest the recited limitations of claim 68. Claim 68 is hence allowable over the reference. Claims 70 – 73 are also patentably distinct over the reference by virtue of their dependence from claim 68 as well as for their further respective defining limitations.

***Claims 8 and 23***

Claims 8 and 23 were rejected as being obvious over O'Hagan in view of U.S. Patent No. 6,178,338 to Yamagishi et al. ("Yamagishi"). The shortcomings of O'Hagan as a prior art reference are discussed above with reference to claim 1. Yamagishi, like O'Hagan, merely discloses a thumb wheel type switch mechanism that can be either rotated or depressed. Yamagishi does not, however, teach or suggest a contact-sensitive transducer having a contact-sensitive surface, for the same reasons as provided above with reference to O'Hagan. As such, the combination of O'Hagan and Yamagishi fails to make obvious the claim limitations of claims 8 and 23.

***Claims 15, 29, 41 and 73***

Claims 15, 29, 41, and 73 were rejected as being obvious over O'Hagan in view of European Patent Publication No. EPO 449 012 to Yaniv et al. ("Yaniv"). The rejection of claims 15, 29, 41, and 73 is premised upon the incorrect assertion that O'Hagan teaches a contact-sensitive transducer and hence it would have been obvious to substitute a resistive transducer of Yaniv for the asserted contact-sensitive transducer of O'Hagan. As demonstrated above, however, O'Hagan nowhere teaches or suggests a



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contact-sensitive transducer – hence the alleged motivation to combine is lacking in either reference. Furthermore, even assuming this distinction in O'Hagan was not relevant (although it is highly relevant), a review of the reference teaches that Yaniv teaches a touch sensitive position sensor that is "integrally formed with a display means." By sharp contrast, O'Hagan clearly teaches that three way switch 46 and thumb wheel 48 are separate from, spaced away from, and functionally different than, display 28. There is simply no motivation to take the switch on the side of O'Hagan and replace it with a touch sensitive display device of Yaniv.

Furthermore, Figure 1 of Yaniv discloses that the device has a scanner slot 2 along one side and the touch sensitive display 4 along the front face. One skilled in the art would recognize that having the touch sensitive input integral to the display would be a keenly advantageous feature in the operation of the device of Yaniv. By comparison, Figures 2 and 3 of O'Hagan reveal an entirely different product and arrangement, wherein the switch and thumb wheel arrangement are remote from the display and located on a side surface, rather than the front surface, and wherein the product is used in an entirely different matter. Given that O'Hagan and Yaniv disclose different products, used in different manners, having substantially different ergonomic arrangements –which arrangements are by the very nature of the product very significant to the products' operation – the suggested combination of those products based upon nothing more that the two are in "an analogous field of endeavor," is unsupportable. For at least these reasons, claims 15, 29, 41, and 73 are patentably distinct over the prior art of record.

***Claims 14 and 28***

Claims 14 and 28 were rejected as being obvious over O'Hagan in view of U.S. Patent No. 4,566,001 to Moore et al. ("Moore"). Claim 14 recites a first contact-sensitive transducer mounted at the first side surface and a second contact-sensitive transducer mounted at the second side surface." As addressed above, O'Hagan fails to teach or suggest a contact-sensitive transducer at all, much less a first and second contact-sensitive transducer mounted at a first and second side surface, respectively. Moore also



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fails to disclose this combination of limitations. Examiner has asserted that Moore teaches (first and second) touch strips mounted along the horizontal and vertical edges of the display terminal." Note, however, that both of these edges are on the same surface, that surface being the surface upon which the display is formed. This is evident from review of Figure 1 of Moore and also the text wherein Moore states, "The display screen can be of rectangular form having the touch screen extending along one edge. A second touch strip can be mounted to extend along an adjacent edge of the screen" (col. 1, lines 49 – 52). Clearly, the "edges" of Moore refer to the edges of the screen which are all on a same surface. This is, again, confirmed by reference to Figure 1 of Moore. Claim 14, on the other hand, requires that one contact-sensitive transducer is mounted on a "first side surface" and another is mounted on a "second side surface." These side surfaces are defined in claim 1 (from which 14 depends) as "adjoining respective opposite edges of the front surface." In other words, claim 14 requires a first contact-sensitive transducer on a first side surface and a second contact-sensitive transducer on a second opposite side surface. Moore, which merely teaches touch strips along adjacent edges of a single front surface nowhere teaches or suggests the limitations of claim 14. For at least this reason claim 14 is patentably distinct over O'Hagan or Moore, either alone or in combination.

Claim 28 likewise recites a "first contact-sensitive transducer mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface." Claim 28 depends from claim 16, which defines the side surfaces as "adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface." Nowhere does Moore teach or suggest such a limitation, for reasons analogous to those provided with respect to claim 14.

For at least the reasons provided above, claims 1 – 73 are patentably distinct and allowable over the prior art of record. A prompt indication of the allowance of the pending claims and re-issuance of the present application is respectfully requested.



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No fee is believed due in connection with this filing. However, in the event that there are any fees due, please charge the same, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

February 20, 2007

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 11/24/2006

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| EXAMINER | |
|---|---|
| APPIAH, CHARLES NANA | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2617 | |

DATE MAILED: 11/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Examiner | Art Unit | |
| | Charles N. Appiah | 2617 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *20 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/20/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.



TCL EXHIBIT 1007
Page 672 of 1144

## DETAILED ACTION

### *Information Disclosure Statement*

1. The information disclosure statement (IDS) submitted on 20 July 2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statement.

### *Terminal Disclaimer*

2. The terminal disclaimer filed on July 20, 2006 disclaiming the terminal portion of any patent granted on this application, which would extend beyond the expiration date of US Patent No.6,131,047 has been reviewed and is accepted. The terminal disclaimer has been recorded.

### *Response to Arguments*

3. Applicant's arguments with respect to claims 1-73 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-7, 9-13, 16-22, 24-27, 30-40, 42-62-68, 70, 71, 72 and 73 are rejected under 35 U.S.C. 102(e) as being anticipated by O'Hagan et al. (6,424,830).

Regarding claim 1, O'Hagan discloses a radiotelephone, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-2), a radio telephone communications transceiver (66), supported by the housing, a display (28) supported by the housing, that displays an image at a front surface of the housing (see Figs. 7-8), a contact sensitive transducer (46, 48), supported by the housing and having a contact-sensitive surface disposed at least one of the first and second side surfaces (see 46, 48 on the side Figs. 7-8), which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact- sensitive transducer (see col. 5, lines 46-61), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver (see processor being connected to display 28 and transceiver 66, Fig. 4), which controls at least one of the display and the radiotelephone communications transceiver according to the output signal of the contact –sensitive transducer (operator may rotate the thumb wheel clockwise or counter-

clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claims 2 and 17, O'Hagan further discloses wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or thumb of the holding hand (see Fig. 2).

Regarding claims 3 and 18, O'Hagan further discloses wherein the controller is operative to selectively display an image according to the output signal of the contact-sensitive transducer (see col. 9, lines 53-67, Fig. 8).

Regarding claims 4 and 19, O'Hagan further discloses wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer (see col. 9, lines 43-48).

Regarding claims 5 and 20, O'Hagan further discloses wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer (see Fig. 8).

Regarding claims 6 and 21, O'Hagan further discloses wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer (see col. 9, lines 46-52).

Regarding claims 7 and 22, O'Hagan further discloses wherein the controller is operative to determine a position of contact (rotational movement o the three-way switch clock wise or counter-clockwise) of an object along an axis of the contact-

sensitive transducer responsive to the output signal of the contact sensitive transducer and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object (see col. 9, lines 43-52).

Regarding claims 9 and 24, O'Hagan further discloses wherein the controller is operative to display a cursor that indicates one of the plurality displayed graphical objects responsive to the output signal of the contact sensitive transducer (see col. 9, lines 48-52).

Regarding claim 10, O'Hagan further discloses wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claims 11-12, O'Hagan further discloses wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer or detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claim 13, O'Hagan further discloses wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at least one of the first side surface and the second side surface (see thumbwheel 48, Figs. 2-3).

Regarding claims 16, 30, 33, 62 and 68, O'Hagan discloses an apparatus and a method in an apparatus for providing user input to a hand-held electronic device, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Figs. 1-4), a display (28) supported by the housing, that displays an image at a front surface of the housing (see Figs. 7-8), a contact sensitive transducer (46, 48), supported by the housing, which produces an output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive transducer (see col. 5, lines 46-61), and a controller (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claims 25-26, O'Hagan further discloses wherein the controller is operative, responsive to the contact-sensitive transducer, to detect moving contact with

the contact-sensitive transducer along the axis of the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claim 27, O'Hagan's Figs. 2-3 illustrates the contact-sensitive transducer comprises an elongate contact-sensitive strip (thumbwheel 48) disposed at least one of the first and second side surfaces of the housing.

Regarding claim 31, O'Hagan further discloses a radiotelephone communications transceiver supported by the housing and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal (feature of using the thumbwheel to select a recipient of a telephone call, or voice message, or to initiate a telephone call or send a voice message, for example, see col. 5, lines 62-67, also col. 7, lines col. 9, lines 53-67).

Regarding claim 32, O'Hagan further discloses wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at the side of the housing, the side surface disposed adjacent the front surface and inclined away form the front surface (see Fig. 2, showing side with thumb wheel being disposed on a side adjacent the front surface and inclined away from the front surface.

Regarding claim 34, O'Hagan further discloses wherein the step of providing comprises contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface

confronts the user's palm and the display projects away from the user's palm (see Fig. 3).

Regarding claim 35, O'Hagan further discloses wherein the apparatus is a radio telephone that further includes a radio telephone communications transceiver (66, Fig. 2), wherein the controller is operative to control the radio telephone communications transceiver (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35), and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact sensitive transducer (see col. 5, lines 61-67, col. 9, lines 37-60).

Regarding claim 36, O'Hagan further discloses wherein the step of controlling comprises the step of selectively displaying an image on the display according to the output of the contact-sensitive transducer (see Figs. 7 and 8).

Regarding claims 37 and 69, O'Hagan further teach wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see Figs. 2-3 with the thumb wheel 48 on the side).

Regarding claim 38, O'Hagan further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates

the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 39, O'Hagan further discloses wherein the contact-sensitive transducer is disposed on the front surface of the housing (display may function as a touch panel display to allow input of information in addition to or in place of the keypad, see col. 5, lines 12-14).

Regarding claim 40, O'Hagan further discloses wherein the contact-sensitive transducer is an elongate strip (see thumbwheel 48, Figs. 2-3).

Regarding claims 42-43, O'Hagan further discloses an additional user input interface devices for the apparatus on the front surface of the housing wherein the additional interface devices are contact-sensitive (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3).

Regarding claim 44, O'Hagan further discloses wherein the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claims 45-50, O'Hagan further discloses wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer, detection of momentary contact with the

contact-sensitive transducer or detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 46-62).

Regarding claims 51-53, O'Hagan further discloses inherently a second contact-sensitive transducer, supported by the housing which produces a second output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive surface of the second contact-sensitive transducer (inherent feature of keypad 26 on surface, Fig. 2-3), a controller for providing controlling functions of the apparatus including an output signal in response to detection of momentary contact or predetermined number of momentary contacts with the contact-sensitive transducer (processor 60 being programmed to control and operate the various components within the terminal 14 in order to carry out the various functions, see col. 6, lines 24-35).

Regarding claims 54-55, O'Hagan further discloses wherein the controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of the display based on the output signal from the transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display (operator may rotate the thumb wheel clockwise or counter-clockwise in order to scroll up or down through lines on the display, see col. 5, lines 51-62).

Regarding claims 56 and 57, O'Hagan further teach wherein the rows consist of alphanumeric characteristic comprising menu selections wherein the controller

identifies successive ones of the rows displayed along the axis of the display by highlighting successive rows (see Figs 7-8).

Regarding claims 58, 59, 64 and 65 O'Hagan further disclose a power supply disposed inside the housing wherein the power supply comprises a battery (terminal also includes a power source 72 which is a rechargeable supply, see col. 7, lines 54-56).

Regarding claims 60, 64 and 66, O'Hagan further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer (power supply circuit regulating the output of power source 72 which in turn provides operating power to the various components within the terminal, see col. 7, lines 56-59).

Regarding claims 61 and 67, O'Hagan further discloses a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer (feature of transitioning between different states as illustrated in Fig. 6).

Regarding claim 63, O'Hagan's Figs. 7-8 shows wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

Regarding claim 69, O'Hagan further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand (see Fig. 3).

Regarding claim 70, O'Hagan further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that

the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Figs. 2-3, which illustrates the terminal 14 having a display integrated with a display 28, and a thumbwheel 48 which can be depressed by a finger of or other object held in the other hand of the user than the holding hand).

Regarding claim 71, O'Hagan further discloses wherein the contact-sensitive transducer is disposed on the front surface of the housing (display functioning as a touch panel display to allow input of information in addition to or in place of the keypad 26 on surface, see col. 5, lines 3-14, Figs. 2-3).

Regarding claim 72, O'Hagan further discloses wherein the contact-sensitive transducer is an elongate strip (see thumbwheel 48, Figs. 2-3).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 8 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al as applied to claims 7 and 22 above, and further in view of Yamagishi et al. (6,178,338).

Regarding claims 8 and 23, O'Hagan fails to explicitly disclose wherein the controller is operative to highlight one of a plurality of displayed graphical objects

responsive to the output signal of the contact-sensitive transducer (see col. 9, lines 48-52).

Yamagishi discloses a cellular telephone, which utilizes a dial shuttle for selecting functions listed in various option lists (see abstract). According to Yamagishi, the dial shuttle operates to scroll through various menus displayed on a display and is operable to select a particular entry in the displayed menu that is highlighted for subsequent execution by the cellular telephone when the dial shuttle is depressed (see col. 3, line 66 to col. 4, line 14).

It would therefore have been obvious to one of ordinary skill in the art to combine Yamagishi's displayed item's highlighting feature with O'Hagan's portable terminal in order to have optional means of indicating and selecting displayed items as taught by Yamagishi.

8. Claims 15, 29, 41 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al as applied to claims 1, 22, 30 and 68 above, and further in view of Yaniv et al. (EPO 499 012).

Regarding claims 15, 29, 41 and 73, O'Hagan fails to explicitly disclose wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductor transducer.

In an analogous field of endeavor, Yaniv discloses a portable compact voice and data communication apparatus in which a contact-sensitive transducer includes resistive transducer (see col. 13, lines 27-35).

It would therefore have been obvious to one of ordinary skill in the art to use different operating parameters for the touch sensing capability such as Yaniv's resistive means with O'Hagan's terminal for providing the input means for dynamic information on the display as taught by Yaniv.

9. Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Hagan et al as applied to claims 13 and 27 above, and further in view of Moore et al. (4,566,001).

Regarding claims 14 and 28, O'Hagan fail to teach wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface of the housing.

In an analogous field of endeavor, Moore discloses a touch strip input for a display in which the touch strips are mounted along the horizontal and vertical edges of the display terminal (see col. 1, lines 50-56).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Moore with O'Hagan's terminal for the benefit of having the contact overlays or strips in optional edges of the terminal for ease and convenience of use.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rosecrans et al. (5,889,852) discloses a graphical user interface for use with electronic phonebooks.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles N. Appiah whose telephone number is 571 272-7904. The examiner can normally be reached on M-F 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571-272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CA

CHARLES APPIAH
PRIMARY EXAMINER

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

*(Use as many sheets as necessary)*

Sheet 1 of 3

| Complete if Known | |
|---|---|
| Application Number | 11/078,916 |
| Filing Date | March 11, 2005 |
| First Named Inventor | Hayes, Jr. |
| Art Unit | 2686 |
| Examiner Name | Charles N. Appiah |
| Attorney Docket Number | ERI-888RI |

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| Examiner Initials* | Cite No.[1] | Document Number: Number - Kind Code[2] (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
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| Examiner Signature | | Date Considered | 11/16/06 |
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| Application Number | 11/078,916 |
| Filing Date | March 11, 2005 |
| First Named Inventor | Hayes, Jr. |
| Art Unit | 2686 |
| Examiner Name | Charles N. Appiah |
| Attorney Docket Number | ERI-888RI |

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| Examiner Signature | Ch Appiah | Date Considered | 11/16/06 |
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Sheet 3 of 3

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| First Named Inventor | Hayes, Jr. |
| Art Unit | 2686 |
| Examiner Name | Charles N. Appiah |
| Attorney Docket Number | ERI-888RI |

| NON PATENT LITERATURE DOCUMENTS | | | |
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| Examiner Initials* | Cite No.[1] | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T[2] |
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| Notice of References Cited | Application/Control No. 11/078,916 | Applicant(s)/Patent Under Reexamination HAYES ET AL. | |
|---|---|---|---|
| | Examiner Charles N. Appiah | Art Unit 2617 | Page 1 of 1 |

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| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Name | Classification |
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## Search Notes

| Application/Control No. | Applicant(s)/Patent under Reexamination | |
|---|---|---|
| 11/078,916 | HAYES ET AL. | |
| **Examiner** | **Art Unit** | |
| Charles N. Appiah | 2617 | |

| SEARCHED | | | |
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| Class | Subclass | Date | Examiner |
| 455 | updated | 11/20/2006 | CA |
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| SEARCH NOTES (INCLUDING SEARCH STRATEGY) | | |
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| | DATE | EXMR |
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| EPO, Derwent, JPO | | |
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# Index of Claims

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| 11/078,916 | HAYES ET AL. |
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| Charles N. Appiah | 2617 |

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| √ | Rejected | – | (Through numeral) Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | ÷ | Restricted | I | Interference | O | Objected |

| Claim | | Date | | | | | | | | |
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| Final | Original | 11/20/06 | | | | | | | | |
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# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 3597 | 455/550.1,90.1,90.2,90.3,95.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:09 |
| L2 | 2496 | 455/575.1-575.5.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:10 |
| L3 | 1970 | 455/566.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:10 |
| L4 | 7768 | 345/156,168,123,184,173,174.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:10 |
| L5 | 58 | 379/433.1,433.3.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:11 |
| L6 | 0 | 379/428.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:11 |
| L7 | 0 | 379/428.1.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:11 |
| L8 | 291 | 379/428.01.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:11 |
| L9 | 42 | 379/428.02.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:11 |
| L10 | 30 | 379/428.03.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:11 |
| L11 | 58209 | (contact touch) near (pad strip sensitive) | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:12 |
| L12 | 14642 | 1 2 3 4 5 8 9 10 | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:12 |
| L13 | 3597 | 1 and 12 | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:12 |
| L14 | 386 | 13 and display$ and scroll$3 | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:13 |
| L15 | 68 | 11 and 14 | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:15 |
| L16 | 2199 | display$ with menu with scroll$3 | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:16 |
| L17 | 73 | 3 and 16 | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:16 |
| L18 | 27 | 15 and 2 | US-PGPUB; USPAT | OR | OFF | 2006/11/20 16:16 |

# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 23 | (removable replaceable changeable) with (joystick rotary near (key switch)) | EPO; JPO; DERWENT | OR | OFF | 2006/11/20 14:38 |
| L2 | 58 | (removable replaceable changeable) with (joystick rotary near (key switch)) | US-PGPUB | OR | OFF | 2006/11/20 14:39 |
| L3 | 162 | (removable replaceable changeable) with (joystick rotary near (key switch)) | US-PGPUB; USPAT | OR | OFF | 2006/11/20 14:39 |
| L4 | 19 | 3 and ("455"/$.ccls. "463"/$.ccls.) | US-PGPUB; USPAT | OR | OFF | 2006/11/20 14:39 |


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# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 798 | display$ with scroll$3 with highlight$3 | US-PGPUB; USPAT | OR | OFF | 2006/11/20 09:29 |
| L2 | 81 | 1 and "455"/$.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/20 09:29 |
| L3 | 47 | 2 and graphic$ | US-PGPUB; USPAT | OR | OFF | 2006/11/20 09:45 |
| L4 | 20 | 3 and image | US-PGPUB; USPAT | OR | OFF | 2006/11/20 09:43 |
| L5 | 6 | ("5396264" \| "5436954" \| "5479476" \| "5761610" \| "5905964" \| "5915228"). PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/20 09:53 |
| L6 | 8 | ("4677653" \| "4896370" \| "4899373" \| "5119413" \| "5228074" \| "5243643" \| "5309502" \| "5317622").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/20 10:00 |
| L7 | 47 | ("5396264").URPN. | USPAT | OR | OFF | 2006/11/20 10:03 |
| L8 | 2 | ("5715417").URPN. | USPAT | OR | OFF | 2006/11/20 10:05 |
| L9 | 7 | ("5757279").URPN. | USPAT | OR | OFF | 2006/11/20 10:17 |
| L10 | 6 | "726668" | EPO; DERWENT | OR | OFF | 2006/11/20 10:18 |


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# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 77 | (phone portable pda) with (image$1 picture$1) same scroll$3 | FPRS; EPO; JPO; DERWENT | OR | OFF | 2006/11/17 13:54 |
| L2 | 65 | 1 and display$3 | FPRS; EPO; JPO; DERWENT | OR | OFF | 2006/11/17 13:47 |
| L3 | 287 | (phone portable pda) with (image$1 picture$1) same scroll$3 | US-PGPUB; USPAT | OR | OFF | 2006/11/17 13:54 |
| L4 | 199 | (phone portable pda) with (image$1 picture$1) same scroll$3 with display$3 | US-PGPUB; USPAT | OR | OFF | 2006/11/17 14:29 |
| L5 | 0 | (phone portable pda) with (igraphic$2) same scroll$3 with display$3 | US-PGPUB; USPAT | OR | OFF | 2006/11/17 14:30 |
| L6 | 59 | (phone portable pda) with (graphic$2) same scroll$3 with display$3 | US-PGPUB; USPAT | OR | OFF | 2006/11/17 14:41 |
| L7 | 2 | (phone portable pda) with (graphic$2) same scroll$3 with display$3 | JPO | OR | OFF | 2006/11/17 14:42 |
| L8 | 5 | ikemure.in. and portable | JPO | OR | OFF | 2006/11/17 14:44 |
| L9 | 548 | image with display with scroll$3 | JPO | OR | OFF | 2006/11/17 14:46 |
| L10 | 37 | 9 and (phone radio portable wireless) | JPO | OR | OFF | 2006/11/17 14:44 |
| L11 | 772 | image with display with scroll$3 | EPO; DERWENT; IBM_TDB | OR | OFF | 2006/11/17 14:48 |
| L12 | 9 | 11 and (portable radio wireless cellular pda) near (phone device unit station terminal) | EPO; DERWENT; IBM_TDB | OR | OFF | 2006/11/17 14:48 |
| L13 | 2503 | image with display with scroll$3 | US-PGPUB; USPAT | OR | OFF | 2006/11/17 14:48 |
| L14 | 470 | 13 and (portable radio wireless cellular pda) near (phone device unit station terminal) | US-PGPUB; USPAT | OR | OFF | 2006/11/17 14:49 |
| L15 | 170 | (tactile contact touch) with (transduc$3 switch bar) with display same scroll$3 | US-PGPUB; USPAT | OR | OFF | 2006/11/17 14:50 |
| L16 | 11 | 14 and 15 | US-PGPUB; USPAT | OR | OFF | 2006/11/17 14:51 |
| L17 | 8 | 15 and "455"/$.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/17 14:51 |
| L18 | 55 | 15 and "345"/$.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/17 14:51 |


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# EAST Search History

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|---|---|---|---|---|---|---|
| L19 | 30 | ("3517678" \| "4497982" \| "4641857" \| "4831736" \| "4862165" \| "5011149" \| "5287090" \| "5327161" \| "5414445" \| "5530455" \| "5543590" \| "5563628" \| "5570112" \| "5576733" \| "5648798" \| "5726683" \| "5748185" \| "5832323" \| "5943052" \| "5990871" \| "6031518" \| "6057554" \| "6096984" \| "6184862" \| "6222526" \| "6232956" \| "6492633" \| "D381970" \| "D396034").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/17 15:13 |
| L20 | 48 | rosecrans.in. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/17 15:13 |
| L21 | 5 | ("5414457" \| "5422656" \| "5457738" \| "5609508" \| "5657378").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/17 15:14 |
| L22 | 99 | ("5029982" \| "5119204" \| "5148155" \| "5166666" \| "5260697").PN. OR ("5422656").URPN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/17 15:15 |
| L23 | 39 | ("5414457").URPN. | USPAT | OR | OFF | 2006/11/17 15:43 |
| L24 | 6 | ("5751722").URPN. | USPAT | OR | OFF | 2006/11/17 15:46 |


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# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 36 | contact near sensitive with transducer | US-PGPUB; USPAT | OR | OFF | 2006/11/16 12:51 |
| L2 | 20 | 1 and (capacitive resistive conductive) | US-PGPUB; USPAT | OR | OFF | 2006/11/16 12:52 |
| L3 | 2 | 2 and "455"/$.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/16 12:51 |
| L4 | 41 | ("4177421").URPN. | USPAT | OR | OFF | 2006/11/16 12:53 |
| L5 | 2 | ("6131047").URPN. | USPAT | OR | OFF | 2006/11/16 14:17 |
| L6 | 2 | "7133670".pn. "7130641".pn. | USPAT | OR | OFF | 2006/11/16 14:20 |
| L17 | 6 | capacitive with contact near sensitive | DERWENT | OR | OFF | 2006/11/16 16:04 |
| L18 | 1 | 2000-443473.NRAN. | DERWENT | OR | OFF | 2006/11/16 16:05 |
| L19 | 14 | (contact touch) near sensitive with transducer same (capcitive resistive semiconductive) | US-PGPUB; USPAT | OR | OFF | 2006/11/16 16:07 |
| L20 | 324 | 345/173,168,169.ccls. and transducer | US-PGPUB; USPAT | OR | OFF | 2006/11/16 16:08 |
| L21 | 3 | 20 and 455/566,575.1,575.2,575.3, 575.4,575.5,575.8,550.1,95.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/16 16:09 |
| L22 | 6023 | 455/566,575.1,575.2,575.3,575.4,575. 5,575.8,550.1,95.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/11/16 16:09 |
| L23 | 277 | 22 and (touch contact) near sensitive | US-PGPUB; USPAT | OR | OFF | 2006/11/16 16:10 |
| L24 | 34 | 23 and (capacitive resistive semiconductive) | US-PGPUB; USPAT | OR | OFF | 2006/11/16 17:08 |
| L25 | 8 | 24 and transduc$ | US-PGPUB; USPAT | OR | OFF | 2006/11/16 16:10 |
| L26 | 2 | "6424830".pn. "6724892".pn. | US-PGPUB; USPAT | OR | OFF | 2006/11/16 17:09 |
| L27 | 9 | ("5073054" \| "5332322" \| "5633912" \| "5715311" \| "D356562" \| "D370222" \| "D374872" \| "D388431" \| "D389142"). PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/16 17:09 |
| L28 | 51 | ("2369807" \| "4020527" \| "4244659" \| "4332493" \| "4579470" \| "4597681" \| "4824268" \| "4849732" \| "4913573" \| "D285200").PN. OR ("5332322"). URPN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/16 17:12 |


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# EAST Search History

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| L29 | 67 | ("4210802" \| "4409470" \| "4734566" \| "4766300" \| "4835615" \| "4877949" \| "4940974" \| "4952966" \| "4962432" \| "4996413" \| "5010580" \| "5019699" \| "5025319" \| "5080456" \| "5083150" \| "5128769" \| "5130520" \| "5131053" \| "5168149" \| "5184005" \| "5187356" \| "5200597" \| "5210398" \| "5235167" \| "5237365" \| "5243666" \| "5245445" \| "5258604" \| "5262871" \| "5272538" \| "5276315" \| "5278397" \| "5291009" \| "5293238" \| "5296690" \| "5308960" \| "5308966" \| "5309243" \| "5314631" \| "5315095" \| "5319181" \| "5331143" \| "5332892" \| "5340973" \| "5345266" \| "5349172" \| "5352884" \| "5354977" \| "5359185" \| "5386271" \| "5401949" \| "5406063" \| "5408084" \| "5414251" \| "5418357" \| "5420635" \| "5420943" \| "5448293" \| "5468947" \| "5468950" \| "5478997" \| "5484994" \| "5486688" \| "5496992" \| "5504316" \| "5778314" \| "5857156").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/16 17:17 |
| L30 | 1 | 26 and (imag$3 object) | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/11/16 17:17 |


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| Application Number | Application/Control No. | Applicant(s)/Patent under Reexamination | |
|---|---|---|---|
| *11078916* | 11/078,916 | HAYES ET AL. | |

| Document Code - DISQ | Internal Document – DO NOT MAIL |
|---|---|

| TERMINAL DISCLAIMER | ☒ APPROVED | ☐ DISAPPROVED |
|---|---|---|
| Date Filed : 07-20-06 | This patent is subject to a Terminal Disclaimer | |

**Approved/Disapproved by:**

TERMINAL DISCLAIMER APPROVED SENT TO SCANNING ON 07-31-06 BY KAREN L. WARD

U.S. Patent and Trademark Office

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JUL 20 2006
PATENT & TRADEMARK OFFICE

# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant: | Hayes, Jr., *et al.* | Docket No.: | ERI-888RI |
| Serial No: | 11/078,916 | Art Unit: | 2686 |
| Date Filed: | March 11, 2005 | Examiner: | Charles N. Appiah |
| Title: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## RESPONSE TO OFFICE ACTION

Dear Sir:

The following remarks are presented in response to the Examiner's Office Action mailed March 17, 2006. They are believed to be a full and complete response to said Action.

Claims 1-73 are pending in the present application. Claims 1-73 have been rejected.

### I. RESPONSE TO REJECTION BASED ON DEFECTIVE DECLARATION

Claims 1-73 were rejected as being based upon a defective declaration. A Supplemental Declaration is submitted herewith that specifically points out an exact word, phrase, or expression that makes that patent invalid. It is, hence, believed the rejection has been overcome. Claims 1-73 were also rejected under a non-statutory obviousness-type double patenting rejection. Applicant has submitted herwith a Terminal Disclaimer to obviate this rejection.



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It is believed that the Supplemental Disclosure and Terminal Disclaimer overcome all rejections of claims 1 – 29.

## II. TRAVERSE OF THE §102 REJECTION OVER YANIV ET AL.

Claims 30, 31, 38-62, 70, and 71-73 were rejected as being anticipated by European Patent Application Publication EP 0 499 012 to Yaniv ("Yaniv"). Applicant respectfully traverses the rejection for the reasons set forth below.

**Yaniv Fails to Disclose a "Controller Which Scrolls Displayed Rows Along an Axis . . ."**

*Claims 30, 31, and 38- 61*

Claim 30 recites a "controller . . . which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer." Examiner has cited to Col. 11, lines 6-38 of Yaniv as disclosing this limitation. Applicant has carefully reviewed the cited portion of Yaniv and finds no teaching or suggestion of scrolling displayed rows along an axis of the display. Rather than teaching a scrolling display, Yaniv appars to teach a static "touch point" and identifying a "precise location," (Col. 11, lines 18-25). Applicant finds no teaching or suggestion in the cited portion of Yaniv, and are unaware of any other teaching or suggestion in Yaniv, disclosing or relating to a controller that "scrolls displayed rows along an axis." In the absence of such disclosure, Applicant respectfully submits that claim 30 is allowable over the reference.

Claims 31 and 38-61 are allowable by virtue of their respective dependence from claim 30 as well as for their further defining limitations. Because claim 30 is allowable over the cited references, Applicant believes it is not necessary to address individually the additional elements of claims 31 and 38-61. Applicant expressly reserves the right,



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however, to rely upon the elements of the dependent claims to further distinguish over the prior art, if necessary, and Applicant's failure to do so in this response should not be construed and is not intended as a concession to Examiner's assertions with regard to those claims.

*Claims 62 and 64-67*

Claim 62 also recites a controller "which scrolls displayed rows along an axis of the display." As discussed above with reference to claim 30, Examiner has failed to identify, and Applicant is unaware of any, teaching or suggestion in Yaniv of a controller that scrolls displayed rows along an axis of the display. Yaniv is simply silent on this point, and at best merely teaches identifying points and precise locations on a display. *See* Yaniv at col. 2, lines 38-53 and col. 11, lines 16-38.

Claims 64-67 depend from claim 62 and include the above discussed limitation. Hence, these claims are allowable over the prior art by virtue of their dependence from claim 62 as well as for their further respective defining limitations. Applicant expressly reserves the right, however, to rely upon the elements of the dependent claims to further distinguish over the prior art, if necessary, and Applicant's failure to do so in this response should not be construed and is not intended as a concession to Examiner's assertions with regard to those claims.

*Claims 68 and 70-73*

Claim 68 also recites a controller "which scrolls displayed rows along an axis of the display." As discussed above with reference to claim 30, Examiner has failed to identify, and Applicant is unaware of any, teaching or suggestion in Yaniv of a controller that scrolls displayed rows along an axis of the display. Yaniv is simply silent on this



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point, and at best merely teaches identifying points and precise locations on a display. *See* Yaniv at col. 2, lines 38-53 and col. 11, lines 16-38.

Claims 70-73 depend from claim 68 and include the above discussed limitation. Hence, these claims are allowable over the prior art by virtue of their dependence from claim 68 as well as for their further respective defining limitations. Applicant expressly reserves the right, however, to rely upon the elements of the dependent claims to further distinguish over the prior art, if necessary, and Applicant's failure to do so in this response should not be construed and is not intended as a concession to Examiner's assertions with regard to those claims.

**Yaniv Fails to Disclose a "Front Surface" and an Opposite "Rear Surface [that] Confronts a User's Palm"**

*Claims 30, 31, and 38- 61*

Claim 30 recites a housing having a "front surface" and a "rear surface." The claim also recites a "display . . . at [the] front surface" and that the "rear surface confronts the user's palm." Yaniv does not disclose this arrangement, as discussed below.

From Figure 1, it is clear that Yaniv does teach a surface having a display 4. In order for Applicant's claim 30 to read on Yaniv, this must be the "front surface," (claim 30 requires that the display be at the front surface). This is illustrated in the below-reproduced Figure 1 from Yaniv.



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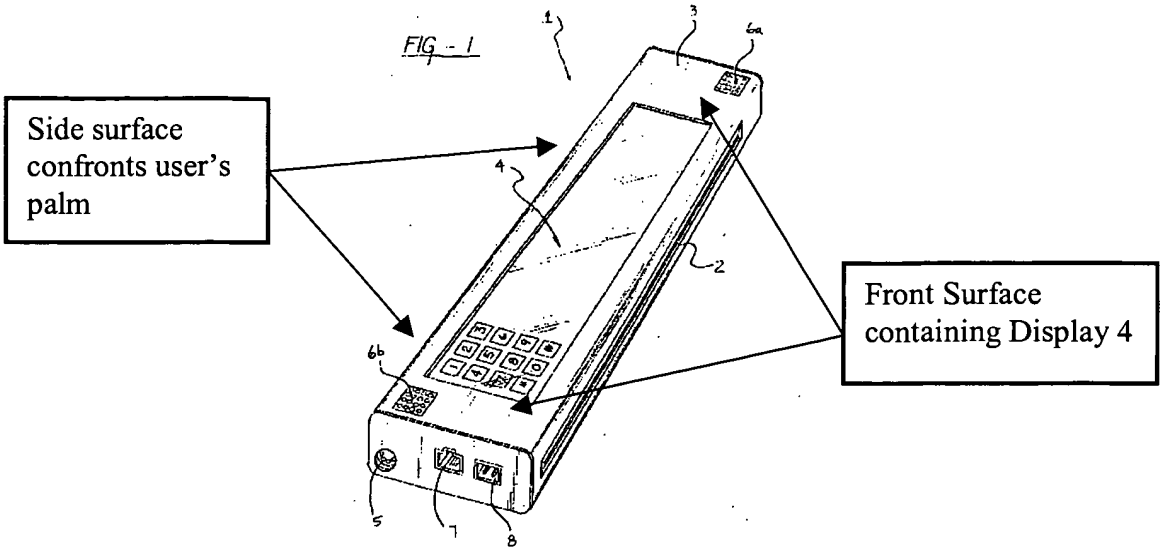



**Figure 1 of Yaniv**

Given that the surface carrying display 4 must be the "front surface," then the opposite surface (the hidden surface of Figure 1) must be the "rear surface" which "confronts the user's palm," according to claim 30. However, it is clear from Figure 1 of Yaniv that the surface opposite the "front surface" is not configured to confront the user's palm. This is because Yaniv teaches that, in operation, scanner 2 must be "moved over an image bearing member to scan the image present thereon" (Col. 3, lines 51-58). In order to move scanner 2 over the paper ("image bearing member"), the housing would be held with the surface opposite scanner 2 (again not shown in Figure 1, but clearly not the surface opposite to the "front surface" having display 4) in the user's palm. For clarity, this surface has been labled the "side surface" in the above reproduced figure. This is consistent with Yaniv's own usage ("a slit formed through the housing on the side opposite the scanner," Col. 3, lines 53-56).

Arguably, Yaniv does teach a "display" in a "front surface" and a "rear surface" opposite the "front surface" as recited by claim 30. Nothing in Yaniv teaches or suggests,



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however, that the "rear surface . . . confronts the user's palm," as required by claim 30. Rather, at best, Yaniv teaches that a side surface (the surface opposite scanner 2) is held in a user's palm (Applicant does not concede that Yaniv teaches the device is held in the user's palm, but assumes so for the sake of argument).

Claim 30 expressly requires that the "rear surface confronts the user's palm," and this limitation is lacking in Yaniv. Hence, claim 30 is patentably distinct over Yaniv. This distinction is not a mere matter of design choice. Rather, the placement of elements in the system of Yaniv are fundamentally important to that reference. Yaniv teaches that the housing is "ergonimically designed" and specifically "adapted to allow the image scanning device to operate as a hand held scanner" (Col. 3, lines 48-53). Yaniv teaches the need for the slit 2 to be "opposite the scanner so that the housing may be moved over an image bearing member" (Col. 3, lines 53-58). This requirement places limitations on where the display 4 can be placed as well. Further limitations are placed on the housing design of Yaniv because the scanner 2 is a "contact-type document scanner 2 integrated into the telecommunications system's housing 3 . . . so as to traverse, for example, the entire width dimension of an image bearing member, such as a standard sheet of paper" (Col. 6, lines 6-13). Because the placement and interaction of the housing, scanner, slit, and display are key aspects of Yaniv's teaching, one cannot say that Applicant's claimed housing elements are mere design choices or obvious variations of Yaniv. For at least these reasons, claim 30 should be allowed.

Claims 31 and 38-61 are allowable by virtue of their respective dependence from claim 30 as well as for their further defining limitations. Because claim 30 is allowable over the cited references, Applicant believes it is not necessary to address individually the



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additional elements of claims 31 and 38-61. Applicant expressly reserves the right, however, to rely upon the elements of the dependent claims to further distinguish over the prior art, if necessary, and Applicant's failure to do so in this response should not be construed and is not intended as a concession to Examiner's assertions with regard to those claims.

*Claims 62 and 64-67*

Claim 62 also recites a housing having a "display" at a "front surface" of the housing, and a "rear surface" opposite the front surface that "confronts a user's palm." As discussed above with reference to claim 30, Yaniv fails to teach or suggest this limitation. In fact, Yaniv teaches a very different configuration in which the front surface (arguably) carries a display and a side surface (arguably) confronts a user's palm. This configuration is required by the express requirements of the Yaniv device, as discussed in greater detail above. By contrast, the express claim elements of claim 62 require a very different and patentably distinct configuration of the housing surfaces. As such, claim 62 is patentably distinct over the cited references.

Claims 64-67 depend from claim 62 and include the above discussed limitation. Hence, these claims are allowable over the prior art by virtue of their dependence from claim 62 as well as for their further respective defining limitations. Applicant expressly reserves the right, however, to rely upon the elements of the dependent claims to further distinguish over the prior art, if necessary, and Applicant's failure to do so in this response should not be construed and is not intended as a concession to Examiner's assertions with regard to those claims.



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*Claims 68 and 70-73*

Claim 68 also recites a housing having a "display" at a "front surface" of the housing, and a "rear surface" opposite the front surface that "confronts a user's palm." As discussed above with reference to claim 30, Yaniv fails to teach or suggest this limitation. In fact, Yaniv teaches a very different configuration in which the front surface (arguably) carries a display and a side surface (arguably) confronts a user's palm. This configuration is required by the express requirements of the Yaniv device, as discussed in greater detail above. By contrast, the express claim elements of claim 68 require a very different and patentably distinct configuration of the housing surfaces. As such, claim 68 is patentably distinct over the cited references.

Claims 70-73 depend from claim 68 and include the above discussed limitation. Hence, these claims are allowable over the prior art by virtue of their dependence from claim 68 as well as for their further respective defining limitations. Applicant expressly reserves the right, however, to rely upon the elements of the dependent claims to further distinguish over the prior art, if necessary, and Applicant's failure to do so in this response should not be construed and is not intended as a concession to Examiner's assertions with regard to those claims.

## III. TRAVERSAL OF THE §103 REJECTION OVER YANIV

Claims 37 and 69 were rejected as being unpatentable over Yaniv. Examiner has conceded that Yaniv fails to teach or suggest that the surface of the contact-sensitive transducer can be engaged by the thumb of the holding hand when the housing is held. Examiner has asserted, however, that this limitation would be an obvious modification to Yaniv. Applicant respectfully traverses.



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Yaniv's only teaching regarding how the disclosed device would be held is that "the housing may be moved over an image bearing member to scan the image present thereon" (Col. 3, lines 53-58). Nothing with regard to Figure 1 or with regard to the cited portion of the specification requires or otherwise suggests the desirability of engaging the touch-sensitive transducer with the thumb during operation. Arguably it is equally likely that the thumb should not touch the contact-sensitive transducer during operation of Yaniv's device in order to prevent inadvertent commands being sent to the device during the scan operation. Either position is equally plausible and neither position is addressed by the teaching of Yaniv.

Applicant respectfully submits that Examiner is impermissibly interpreting Yaniv with the benefit of Applicant's own teaching, because it is only in Applicant's disclosure that the desirability of having the contact-sensitive transducer engagable by the user's thumb is discussed. Such hindsight cannot support a claim rejection, however, and the rejection of claims 37 and 69 should be withdrawn.

In addition to the above, claims 37 and 69 are allowable by virtue of their dependence from claims 30 and and 68, respectively, for the reasons discussed above with reference to those claims.

## IV. TRAVERSAL OF THE §103 REJECTION OVER YANIV IN VIEW OF DI SANTO

Claims 54 and 55 were rejected as being unpatentable over Yaniv in view of U.S. Patent No. 4,870,677 to Di Santo et al. ("Di Santo").

Examiner has conceded that Yaniv does not disclose a controller that "scrolls the displayed rows by indentifying successsive ones of the rows displayed" or "wherein the direction of scroll is transverse to the direction that said rows extend across the display."



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As stated above with respect to claim 30, Yaniv in fact fails to teach or suggest any form of scrolling of the display. The reference is simply silent on this crucial point.

Di Santo does not overcome the deficiencies of the Yaniv reference. In fact, Examiner has nowhere identified and Applicant is unaware of any teaching in Di Santo of "scrolling" through a display. While Di Santo does disclose displaying multiple telephone numbers, there is no teaching or suggestion that the device "scrolls" through those telephone numbers. Figure 5 of Di Santo teaches "N" telephone numbers may be displayed – but note that each of those N telephone numbers is displayed at one time, thus avoiding the need to scroll. Assuming that more than N telephone nubmers are available, Applicant respectfully asks what basis is there to assume that Di Santo "scrolls" through the list? Is it not equally probable that a first subset of N numbers are displayed at one time, followed by a second subset of numbers, followed by another subset of numbers? Examiner's presumption that Di Santo "scrolls" appears to be derived from the benefit of Applicant's own teaching. This is impermissible hindsight and the rejection should be withdrawn.

In addition to the above, claims 54 and 55 depend from claim 30 which, for the reasons discussed in detail above, is patentably distinct over Yaniv, either alone or in combination with Di Santo. For at least these reasons, claims 54 and 55 are allowable.

## V. TRAVERSAL OF THE §103 REJECTION OVER YANIV AND DI SANTO AND MEINS

Claims 56 and 57 were rejected as being obvious over Yaniv and Di Santo in view of U.S. Patent No. 6,587,700 to Meins et al. ("Meins"). Applicant respectfully traverses this rejection for the reasons provided above with regard to claim 30 from



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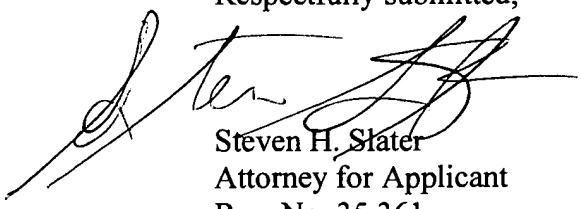
which claims 56 and 57 both depend. For at least these reasons, the claims are allowable over the references.

**SUMMARY**

Based upon the foregoing, Applicant respectfully submits that pending claims 1-73 are in condition for allowance and requests a prompt indication of same. If Examiner should have any questions, Applicant requests that Examiner contact Applicants' attorney at the address below. No fee is believed due in connection with this filing. However, in the event that there are any fees due, please charge the same, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

July 14, 2006



Steven H. Slater
Attorney for Applicant
Reg. No. 35,361

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Tel. 972-732-1001
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OIPE IAP2 JUL 20 2006 PATENT & TRADEMARK OFFICE

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re: Reissue Application of

U.S. Patent No.: 6,278,888 to

HAYES, Jr., *et al.*

Serial No.: 11/078,916

Filed: March 11, 2005

For: Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same

Docket No.: ERI-888RI

Art Unit: 2686

Examiner: Charles N. Appiah

## SUPPLEMENTAL DECLARATION IN SUPPORT OF REISSUE APPLICATION

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

I hereby declare that:

(1) The last known residence, mailing address and the citizenship of the inventors are stated below.

(2) I am authorized to act on behalf of the assignee, Ericsson, Inc. and the title of my position with said assignee is Assistant Secretary.

(3) The entire title to the patent identified below is vested in said assignee.

(4) The first named inventor is John Joseph Hayes Jr.; residence address; 2408 Canonbie Lane, Wake Forest, North Carolina 27587, citizenship - United States of America.

(5) The second named inventor is Curtis Wayne Thornton; residence address; 103 Indigo Drive, Cary, North Carolina 27513, citizenship - United States of America.

(6) The Patent No. is 6,278,888.

(7) The Date of Patent Issue is August 21, 2001.



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(8) I believe said inventors to be the original and first inventors of the subject matter which is described and claimed in said patent, for which a reissue patent is sought on the invention entitled: Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same, the specification of which was filed on March 11, 2005.

(9) I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

(10) I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

(11) I verily believe the original patent to be wholly or partly inoperative or invalid by reason of the patentee claiming more or less than he had the right to claim in the patent.

(12) At least one error upon which reissue is based is described as follows:

Claim 30 of the patent is believed to be wholly or partially invalid in that it claims more than patentee is entitled to. Specifically originally issued claim 30 lacks the limitation of a "housing configured to be held in a user's hand such that the rear surface confronts the user's palm." The absence of this limitation constitutes an error.

(13) All errors corrected in this reissue application arose without any deceptive intention on the part of the applicant.

(14) Assignee hereby offers to surrender U.S. Patent No. 6,278,888 upon allowance of the subject reissue application.

(15) I hereby appoint the following as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith:

Steven Slater, registration no. 35361
Glenn Boisbrun, registration no. 39615
Brian Carlson, registration no. 37793
Binh Dao, registration no. 43576
Kay Houston, registration no. 38495
James Kesterson, registration no. 25882
Roger Knapp, registration no. 46836
Ira Matsil, registration no. 35272
Brian Mair, registration no. 58,233
Stephen Wyse, registration no. 40,880

Direct all communications about the application to:

Steven H. Slater
Slater & Matsil, L.L.P.
17950 Preston Road
Suite 1000
Dallas, TX 75252
telephone: 972-732-1001
facsimile: 972-732-9218

(16) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application ion any patent issuing thereon, or any patent to which this declaration is directed.

Date: 7-13-06

By: _____
John Han, Assistant Secretary



TCL EXHIBIT 1007
Page 714 of 1144

PTO/SB/26 (09-04)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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| TERMINAL DISCLAIMER TO OBVIATE A DOUBLE PATENTING REJECTION OVER A "PRIOR" PATENT | Docket Number (Optional) ERI-888RI |
|---|---|

IAP2 JUL 20 2006 PATENT & TRADEMARK OFFICE

In re Application of: HAYES, JR., et al.

Application No.: 11/078,916

Filed: March 11, 2005

For: Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same

The owner*, Ericsson, Inc., of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term prior patent No. 6,131,047 as the term of said prior patent is defined in 35 U.S.C. 154 and 173, and as the term of said prior patent is presently shortened by any terminal disclaimer. The owner hereby agrees that any patent so granted on the instant application shall be enforceable only for and during such period that it and the prior patent are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the owner does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term as defined in 35 U.S.C. 154 and 173 of the prior patent, "as the term of said prior patent is presently shortened by any terminal disclaimer," in the event that said prior patent later:

expires for failure to pay a maintenance fee;
is held unenforceable;
is found invalid by a court of competent jurisdiction;
is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
has all claims canceled by a reexamination certificate;
is reissued; or
is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☑ For submissions on behalf of a business/organization (e.g., corporation, partnership, university, government agency, etc.), the undersigned is empowered to act on behalf of the business/organization.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

2. ☐ The undersigned is an attorney or agent of record. Reg. No. _____

_____ 7-13-06
Signature Date

John Han, Assistant Secretary
Typed or printed name

972-583-7686
Telephone Number

☑ Terminal disclaimer fee under 37 CFR 1.20(d) included.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

*Statement under 37 CFR 3.73(b) is required if terminal disclaimer is signed by the assignee (owner).
Form PTO/SB/96 may be used for making this certification. See MPEP § 324.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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JUL 20 2006
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PTO/SB/22 (12-04)
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| PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)<br>FY 2005<br>*(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)* | Docket Number (Optional)<br>**ERI-888RI** |
|---|---|
| Application Number **11/078,916** | Filed **March 11, 2005** |
| For **Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same** | |
| Art Unit **2686** | Examiner **Charles N. Appiah** |

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

| | Fee | Small Entity Fee | |
|---|---|---|---|
| [x] One month (37 CFR 1.17(a)(1)) | $ 120 | $ 60 | $ 120.00 |
| [ ] Two months (37 CFR 1.17(a)(2)) | $ 450 | $ 225 | $ |
| [ ] Three months (37 CFR 1.17(a)(3)) | $ 1,020 | $ 510 | $ |
| [ ] Four months (37 CFR 1.17(a)(4)) | $ 1,590 | $ 795 | $ |
| [ ] Five months (37 CFR 1.17(a)(5)) | $ 2,160 | $ 1,080 | $ |

[ ] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[ ] Payment by credit card. Form PTO-2038 is attached.

[X] The Director has already been authorized to charge fees in this application to a Deposit Account.

[X] The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-1065. I have enclosed a duplicate copy of this sheet.

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

[ ] applicant/inventor.

[ ] assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

[X] attorney or agent of record. Registration Number 35,361

[ ] attorney or agent under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____.

Steven N. Slater
Typed or printed name

July 14, 2006

972-732-1001
Telephone Number

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

[x] Total of 1 form is submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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*Effective on 12/8/2004.*
*Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).*

# FEE TRANSMITTAL
## For FY 2005

☐ Applicant Claims small entity status. See 37 CFR 1.27

**TOTAL AMOUNT OF PAYMENT** ($) 250.00

| Complete if Known | |
|---|---|
| Application Number | 11/078,916 |
| Filing Date | 3/11/2005 |
| First Named Inventor | Hayes, Jr. |
| Examiner Name | Charles N. Appiah |
| Art Unit | 2686 |
| Attorney Docket No. | ERI-888RI |

**METHOD OF PAYMENT** (check all that apply)

☐ Check ☐ Credit Card ☐ Money Order ☐ None ☐ Other (please identify):_____

☒ Deposit Account Deposit Account Number: 50-1065 Deposit Account Name: Slater & Matsil, L.L.P.

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☐ Charges fee(s) indicated below, **except for the filing fee**

☒ Charge any additional fee(s) or underpayments of fee(s) under 37 CFR 1.16 and 1.17 ☒ Credit any overpayments

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**FEE CALCULATION**

**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

| | FILING FEES | | SEARCH FEES | | EXAMINATION FEES | | |
|---|---|---|---|---|---|---|---|
| | | Small Entity | | Small Entity | | Small Entity | |
| Application Type | Fee ($) | Fee ($) | Fee ($) | Fee ($) | Fee ($) | Fee ($) | Fees Paid ($) |
| Utility | 300 | 150 | 500 | 250 | 200 | 100 | |
| Design | 200 | 100 | 100 | 50 | 130 | 65 | |
| Plant | 200 | 100 | 300 | 150 | 160 | 80 | |
| Reissue | 300 | 150 | 500 | 250 | 600 | 300 | |
| Provisional | 200 | 100 | 0 | 0 | 0 | 0 | |

**2. EXCESS CLAIM FEES**

| Fee Description | Fee ($) | Small Entity Fee ($) |
|---|---|---|
| Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent | 50 | 25 |
| Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent | 200 | 100 |
| Multiple dependent claims | 360 | 180 |

| Total Claims | Extra Claims | Fee ($) | Fee Paid ($) |
|---|---|---|---|
| _____ - 20 or HP = | _____ x | $50.00 = | 0.00 |

HP = highest number of total claims paid for, if greater than 20

| Multiple Dependent Claims Fee ($) | Fee Paid ($) |
|---|---|
| $360.00 | 0.00 |

| Indep. Claims | Extra Claims | Fee ($) | Fee Paid ($) |
|---|---|---|---|
| _____ - 3 or HP = | _____ x | $200.00 = | 0.00 |

HP = highest number of independent claims paid for, if greater than 3

**3. APPLICATION SIZE FEE**

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41 (a)(1)(G) and 37 CFR 1.16(s).

| Total Sheets | Extra Sheets | Number of each additional 50 or fraction thereof | Fee ($) | Fee Paid ($) |
|---|---|---|---|---|
| _____ - 100 = | 0 / 50 = | 0 (round up to a whole number) x | $250.00 = | $ 0.00 |

**4. OTHER FEE(S)**

| | Fees Paid($) |
|---|---|
| Non-English Specification, $130 fee (no small entity discount) | |
| Other: Petition for Extension of Time ($120.00) and Terminal Disclaimer ($130.00) | $250.00 |

**SUBMITTED BY**

| | | | |
|---|---|---|---|
| Signature | | Registration No. (Attorney/Agent) 35,361 | Telephone 972-732-1001 |
| Name (Print/Type) | Steven H. Slater | | Date July 14, 2006 |

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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|---|---|---|---|
| Applicant: | Hayes, Jr., *et al.* | Docket No.: | ERI-888RI |
| Serial No.: | 11/078,916 | Art Unit: | 2686 |
| Filed: | March 11, 2005 | Examiner: | Charles N. Appiah |
| For: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

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Information Disclosure Statement (2 duplicate pages)
IDS Forms PTO/SB/08a and PTO/SB/08b (3 pages) citing 62 references
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Respectfully submitted,

Judy A. Betts
Legal Assistant

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Fax: 972-732-9218

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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|---|---|---|---|
| Applicant: | Hayes, Jr., *et al.* | Docket No.: | ERI-888RI |
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Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## INFORMATION DISCLOSURE STATEMENT

Dear Sir:

Applicants wish to bring to the attention of the U.S. Patent and Trademark Office the information noted on the enclosed PTO Forms PTO/SB/08a and PTO/SB/08b, which may be considered material to the examination of the above-identified application. Copies of the U.S. Patents cited are not being submitted. However, Applicant has included copies of the foreign patents and non-patent literature.

This Information Disclosure Statement is submitted under 37 C.F.R. §1.97(c) together with a $180.00 fee under 37 C.F.R. §1.17(p) after the C.F.R. §1.97(b) time period, but before final action or notice of allowance, whichever occurs first.

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07/24/2006 RMEBRAHT 00000043 501065 11078916
01 FC:1806 180.00 DA

Respectfully submitted,

July 14, 2006

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OIPE IAP2 JUL 20 2006 PATENT & TRADEMARK OFFICE

PTO/SB/08a (08-03)
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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

*(Use as many sheets as necessary)*

| Sheet | 1 | of | 3 |
|---|---|---|---|

| Complete if Known | |
|---|---|
| Application Number | 11/078,916 |
| Filing Date | March 11, 2005 |
| First Named Inventor | Hayes, Jr. |
| Art Unit | 2686 |
| Examiner Name | Charles N. Appiah |
| Attorney Docket Number | ERI-888RI |

**U.S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No.[1] | Document Number: Number - Kind Code[2] (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
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| Examiner Initials* | Cite No.[1] | Foreign Patent Document: Country Code[3] - Number[4] - Kind Code[5] (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear | T[6] |
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| Examiner Signature | | Date Considered | |
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Sheet 2 of 3

| Complete if Known | |
|---|---|
| Application Number | 11/078,916 |
| Filing Date | March 11, 2005 |
| First Named Inventor | Hayes, Jr. |
| Art Unit | 2686 |
| Examiner Name | Charles N. Appiah |
| Attorney Docket Number | ERI-888RI |

**U.S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No.[1] | Document Number: Number - Kind Code[2] (if known) | Publication Date MM-DD-YYYY | Name of Patentee or Applicant of Cited Document | Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear |
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| Examiner Signature | | Date Considered | |
|---|---|---|---|

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Page 721 of 1144

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| Sheet | 3 | of | 3 |
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| Application Number | 11/078,916 |
| Filing Date | March 11, 2005 |
| First Named Inventor | Hayes, Jr. |
| Art Unit | 2686 |
| Examiner Name | Charles N. Appiah |
| Attorney Docket Number | ERI-888RI |

| NON PATENT LITERATURE DOCUMENTS | | | |
|---|---|---|---|
| Examiner Initials* | Cite No.[1] | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published. | T[2] |
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(19)日本国特許庁（ＪＰ）　(12)**公開特許公報**（Ａ）　(11)特許出願公開番号

**特開平8－30378**

(43)公開日　平成８年(1996)２月２日

| (51)Int.Cl.[6] | 識別記号 | 庁内整理番号 | ＦＩ | 技術表示箇所 |
|---|---|---|---|---|
| Ｇ０６Ｆ　3/03 | ３４５　Ａ | | | |
| | ３２０　Ａ | | | |

審査請求　未請求　請求項の数１　ＦＤ　（全 ７ 頁）

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(22)出願日　平成７年(1995)７月６日

(31)優先権主張番号　２７１，４０６

(32)優先日　1994年７月６日

(33)優先権主張国　米国（ＵＳ）

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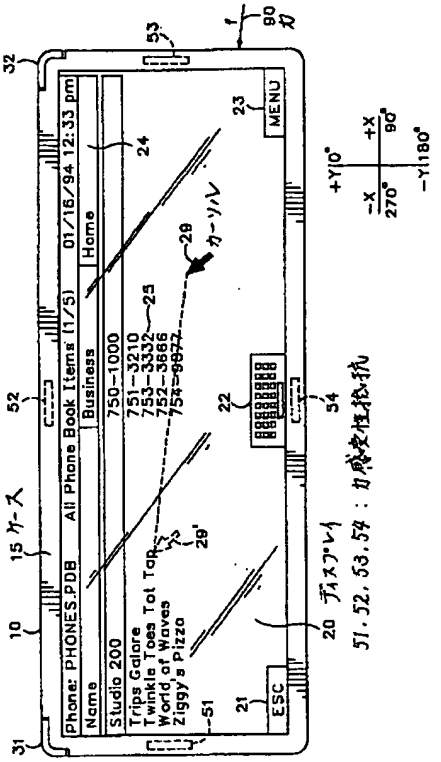
(74)代理人　弁理士　上野　英夫

(54)【発明の名称】　感圧性電子装置

(57)【要約】

【目的】超小型の電子機器から、入力用のキーやスイッチ類をできるだけ取り除くことによって、このような機器をより小さくする。

【構成】ケース１５に力センサ５１～５４を設け、ケースに力をかけることによって、カーソル２９の移動などの指示を与える。その他、力の与えかたによって、例えばマウスのボタンのクリックに相当する指示を与えるようにできる。






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Page 723 of 1144

【特許請求の範囲】
【請求項１】ケースと、
前記ケース内に組込んだ情報表示ディスプレィと、
前記ケース内に収容され、前記ディスプレィに接続されたプロセッサと、
前記ケース及び前記プロセッサと作動的に結合され、前記ケースに加わった圧力を検知する圧力センサとを設け、
前記圧力センサが前記ケースへの圧力を検知したことに応答して、前記ディスプレィが表示する情報を変更させる信号を前記プロセッサが前記ディスプレィに送る電子装置。
【発明の詳細な説明】
【０００１】
【発明の分野】本発明は電子回路の分野に関し、特に感圧性電子装置に関する。
【０００２】
【発明の背景】従来、多様な機能を実行できる電子装置は極めて大型であった。このような装置のサイズは主として、装置の機能を実行するために必要な回路のサイズによって規定された。真空管がこれらの機能を実行する大量の電子回路を構成した時代は、これらの装置のサイズは小さくとも卓上型（ＴＶ、ステレオ受信機）であり、部屋や建物全体を占めるようなサイズであることも多かった（コンピュータ）。このような装置では、装置自体が極めて大型であったので、ユーザが装置を制御できるキーボードやキー、スイッチ等の諸々の機器のためのスペースは問題ではなかった。
【０００３】しかし、テクノロジーが発展して、電子装置の機能を実行するために必要な回路の小型化は急激に進展した。真空管に代わってトランジスタが登場した。トランジスタに代わって集積回路が登場した。今日のＶＬＳＩ（超大規模集積）回路は単一チップ上に１００万個ものトランジスタを集積する能力を有している。電子装置用の回路の小型化とともに、装置自体も小型化してきた。かつては部屋全体を占めた電子装置も、現在では文字どおりユーザの手のひらや手首におさめることができる。
【０００４】進展中の電子装置の小型化は実際技術進展の革命であったが、問題がない訳ではなかった。そのような問題点の１つは、ユーザが装置を制御できるようにするキーボードやキー、スイッチ等の諸々の機器のためのスペースが、現在では電子装置のサイズを規定する決定的な要因となっている場合が多いことである。ユーザによる装置の制御のためのスペースを最小限に縮小できれば、コンピュータから時計までの全ての装置をより小型で、効率よくすることができるであろう。
【０００５】
【発明の概要】感圧性電子装置は、ディスプレィと、ケースと、プロセッサと、１つまたはもっと多くの力受感性抵抗のような圧力センサを有している。圧力センサがケースに加わった圧力を検知すると、ディスプレィに表示される情報が変更される。ケース上の１つまたはもっと多くの次元（Ｘ，Ｙ及び／またはＺ）での圧力が圧力センサによって検知される。最も一般的には、ディスプレィ上で変化する情報はディスプレィ上のカーソル位置の変化であるが、多様な動作モードへの切換え、及び／または書込みによっても可能である。カーソルはケースで検知された圧力の方向と大きさに対応してその位置が変化する。更に、ディスプレィ上のカーソル位置に対応する動作を実行するためにも圧力を利用できる。ディスプレィ上のカーソルの動きを制御し、動作を実行し、または装置の種々の動作モードを切換えるために、キーまたはその他の入力機器（マスウ、トラックボール等）は必要ない。
【０００６】
【実施例】図１は本発明の実施例の電子装置１０の平面図である。装置１０はケース１５内に組込まれたディスプレィ２０を有している。実施例では、装置１０は一般にパーソナル・ディジタル・アシスタント（ＰＤＡ）と呼ばれる携帯型、または手首装着式のコンピュータである。情報２１ないし２９がディスプレィ２０上に表示される。情報２１ないし２３はディスプレィ２０の下部分に表示されるソフト・キーである。情報２４及び２５はヘッダ情報及び、電話帳のような通常はＰＤＡの一部であるデータである。カーソル２９は、後に詳述するようにディスプレィ２０上を動きまわることができる。マウスまたはトラックボール上のボタンと同様に、選択スイッチ３１と３２が、ディスプレィ上のカーソル位置に対応して、ディスプレィ上に表示された情報に基づいて動作を実行する。後述するように、選択スイッチ３１と３２は必須ではない。
【０００７】装置１０と連結された機械式キーボードがないことに注目されたい。テキスト入力が必要な場合は、ユーザはキーボードのアイコン２２を選択できる。（例えばキーボード・アイコン２２上にカーソル２９を動かし、選択スイッチ３１を２度クリックして）キーボード・アイコン２２を選択した場合は、より大きいキーボードがディスプレィ２０上に表示され、個々のキーを選択できるようになる。
【０００８】好ましい実施例では、装置１０は本願出願人が製造している１００ＬＸ型パームトップＰＣの適宜のサイズと形状のものであるが、ディスプレィ２０は回路板の上面に配され、キーボードは削除されている。装置１０のサイズは任意でよいが、ユーザの手で携帯できるか、ユーザの手首、またはベルトに掛けることができるサイズであることが好ましいことが当業者には明らかであろう。
【０００９】圧力センサ５１ないし５４の相対位置は、これらのセンサがケース１５によって視界を阻まれてい


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るため、図１では点線で示してある。圧力センサ５１ないし５４は圧力センサ５０（図３）の一部であり、その動作については後に詳述する。それぞれが隣接するセンサに対して直角の方向を向いている４個のセンサを図示しているが、センサの個数はもっと多くても少なくてもよいことが当業者には明らかであろう。実施例では、圧力センサは例えばInterlink Electronics製の力受感抵抗であるが、圧力を電子信号に変換できる例えば歪みゲージのようなその他の部品でもよい。“力”及び“圧力”という用語は、この明細書の以下の記載では互換的に用いるものとする。

【００１０】ユーザの手、または図１に示した力９０のようなその他の圧力源によってケース１５に圧力が印加されると、ディスプレィ２０上に表示された情報２１ないし２９が変化する。ケース１５のＸとＹの双方の方向の圧力が圧力センサ５１ないし５４によって検知される。図１に示したように、ディスプレィ上での情報の変化は、ディスプレィ２０上のカーソル２９が２９’の位置に際配置されることである。カーソル２９の位置は、ケース１５のＸとＹの方向で検知された圧力に対応して変更される。図１に示した例では、ユーザはカーソル２９を動かすためにケース１５に力９０を加え、その結果、ユーザは"Twinkle Toes Top Tap"という電話帳の一項目についての動作を実行できる。実行される動作は、選択した電話番号のダイアル、見項目の編集、項目に関する詳細情報の取得などのうちのどれでもよい。動作は選択スイッチ３１及び／または３２の種々の操作によって、または単にカーソル２９を特定時間だけカーソル２９’の位置に留めておくことによって、実行できる。加えて、後により詳細に説明するように、選択スイッチ３１及び３２の代わりに、Ｚ方向での圧力を検知する１つまたはもっと多くの圧力センサを追加した別の実施例も可能である。いずれの実施例でも、ディスプレィ上のカーソルの動きを制御するためにキーまたはその他の入力機器（マウス、トラックボール等）は必要ない。

【００１１】図２は、本発明の実施例の電子装置１０の側断面図である。ケース１５は上部１５ａと、（１つまたはもっと多くの）側部１５ｂと、底部１５ｃを含んでいる。この実施例では、底部１５ｃは、テーブルまたはその他の同類の表面に置いた時に、装置１０が動かないような摩擦係数を有するゴム引材料、またはその他の材料からなっている。装置をその他の固定した面、または相対的に固定した面（例えばユーザが手首に掛ける時計バンド）に取付けたり、ユーザのベルトにページング装置のクレードルをクリップ止めしたり、単にユーザの手のひらで装置を持ったりする場合のように、ケース１５に加えられる外力を相殺する方法を採用した場合は、底部１５ｃをケース１５の別の部分と異なる材料にする必要はない。

【００１２】図３は本発明の実施例の電子装置１０のブロック図である。バッテリ８０が、ディスプレィ２０と、選択回路３０と、プロセッサ４０と、圧力センサ５０と、Ｉ／Ｏドライバ６０と、その他の回路７０に接続されている。前述したように、圧力センサ５０は４個の力受感性抵抗５１ないし５４を含んでいる。圧力センサ５０は更に、プルアップ用の固定抵抗５５ないし５８も含んでいる。プルアップ抵抗５５ないし５８は力受感性抵抗５１ないし５４とともに分圧器回路を構成している。入力線６１ないし６４上でＩ／Ｏドライバ６０に送られる信号は、力受感性抵抗５１ないし５４に加えられた力と比例する。力受感性抵抗５１ないし５４が図１に示した向きである場合は、入力線６４上の信号は、角度０°である＋Ｙ方向でケース１５に加えられた力に比例する。同様に、入力線６１上の信号は角度９０°である＋Ｘ方向に加えられた力と比例し、入力線６２上の信号は角度１８０°である－Ｙ方向に加えられた力と比例し、入力線６３上の信号は角度２７０°である－Ｘ方向に加えられた力と比例する。例えば、図１に示した力９０によって、入力線６３上の信号は力９０の－Ｘ方向の分力を示し、入力線６４上の信号は力９０のＹ方向の分力を示す。この実施例では二対の力受感性抵抗（一対の“Ｘ”抵抗５１、５３、及び一対の“Ｙ”抵抗５２、５４）を使用したが、抵抗５１と５２に所定量の力を予め印加しておくことにより、抵抗に対する“負圧”（例えば、図１の力９０によって抵抗５１及び５２にかかる力）を測定できれば、抵抗５３と５４は不要になることが当業者には明らかであろう。好ましい実施例では、ケース１５にかかる力の方向を正圧を測定する力受感性抵抗から発生される信号によって一意的に判定できるので、負圧を測定する“一対の”何らかの力受感性抵抗から発生される信号は（もし存在したとしても）単に無視されるだけである。

【００１３】入力線６１ないし６４上の信号の組合わせによって、Ｉ／Ｏドライバ６０はケース１５にいかなるＸ－Ｙ力が印加されてもその方向及び力の量を一意的に判定できる。Ｉ／Ｏドライバ６０は、Ｘ－Ｙローラまたはこれに類似する装置から位置データを受けるマウスやトラックボールのような従来型の入力素子で用いられているドライバ回路と多くの面で同様であることが当業者には理解されよう。この位置データ、並びに（実施例ではスイッチ３１と３２から構成された）選択回路３０からのデータは、プロセッサ４０が理解できるＲＳ－２３２クロック・プロトコル（clocked-protocol）のような特定のクロック・プロトコルを利用して、Ｉ／Ｏドライバ６０によって線４５を経てプロセッサ４０に伝送される。プロセッサ４０は線４５を介してプロセッサ４０に送られた信号に応答して、図１に示したようにカーソル２９の位置を２９’に移動させて、ディスプレィ２０上に含まれる情報を変更せしめる。回路７０は、装置１０の機能の幾つかを実行するために設けてもよいモデム、



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ページング装置、サウンド・カード等のその他の特別な目的の回路である。

【００１４】図４ないし図６は本発明の別の実施例の電子装置を示している。図４は装置１００を図示している。装置１０と同様に、装置１００は、ディスプレィ２０と、力受感性抵抗５１及び５２を有している。窪み１０１及び１０２はユーザの親指と人指し指が入るよう担っている。窪み１０１と１０２に置いたユーザの親指と人指し指によって装置１００に力が加えられる。この実施例では、正圧と負圧の双方を検知できるように力受感性抵抗５１と５２に予め力を印加してあるので、力受感性抵抗は２個しか必要ない。この実施例では、装置１００は（機能ではなく）外見がMotorola Corporation製のAdvisorページャとやや似通っている英数字ページング装置である。

【００１５】図５は装置２００を図示している。例えば人指し指または手のひらでディスプレィ２０を押下げることによって、装置２００を押圧して力が装置２００に加えられる。装置１０及び１００とは異なり、装置２００はカーソル２９を有しておらず、従って多次元面での全ての方向の圧力を検知する必要はない。その代わりに、力受感性抵抗５９は装置２００の上面に加えられたＺ方向の力を検知し、装置２００の複数の動作モードを切換えるために利用される。この実施例では、装置２００はストップウォッチ、ユーザの脈拍モニタ等として機能するような、刻時、及びその他の作業を実行可能な多機能時計またはエクササイズ・モニタである。ユーザは装置２００の上面に種々の態様（例えば加圧の継続時間の長短、短期間で圧力を複数回加える等）で圧力を加えるだけで、時刻の更新等の種々の動作モードを切換えることができる。装置２００にはキー、つまみ、ダイアル、スイッチ、またはいかなる種類の押しボタンもないことに留意されたい。装置２００の動作を制御するのは装置の上面に加えられる圧力だけである。

【００１６】装置１０または１００は、これらの装置に力受感性抵抗５９を付加することによってＺ方向の圧力も検知できるように修正可能である。三次元での圧力検知能力によって、装置１０及び１００の能力と機能が強化される。例えば、Ｚ方向での圧力の検知によって、選択回路３０（図３）の機能を果たすことができ、スイッチ３１と３２を装置１０から除去することができる。あるいは、Ｚ方向での圧力の検知によって単に装置のスイッチを切ることもできるし、また、カーソル２９をディスプレィ２０上に表示された三次元のオブジェクトや重なったウインドゥの内外に移動させることもできる。

【００１７】図６は装置３００を図示している。図示された装置３００のサイズは装置２００と同一であるが、装置１０のようなより大型の装置のＰＤＡ機能を実行することができる。すなわち、装置３００には、Apple Newtonのようなペン操作を基本とするＰＤＡと類似した、装置への“書込み”という通常のＰＤＡ機能を実行することができるが、この操作ではペンあるいはその他の書込み機器を使用しない。ユーザはペンの代わりに、装置３００のケース３１５に圧力を加えることによって書込み動作を行って、ユーザが手紙等を書く時に用紙上で鉛筆を動かす場合と同様に、カーソル３２９を移動させる。実際に、装置３００は用紙の電子的な代用であるばかりではなく、鉛筆自体をも代用する。カーソル３２９はユーザに位置のフィードバックを提供する上で有用ではあるが、ユーザに対して表示される必要はない。力受感性抵抗５９は前述の場合と同様の態様でＺ方向の圧力を検知し、ダウン／アップのスクロール、メニューからの項目の選択等によって装置３００を制御するために利用できる。

【００１８】以下に、本発明の実施の態様の例を列挙する。

【００１９】〔実施態様１〕ケースと、前記ケース内に組込んだ情報表示ディスプレィと、前記ケース内に収容され、前記ディスプレィに接続されたプロセッサと、前記ケース及び前記プロセッサと作動的に結合され、前記ケースに加わった圧力を検知する圧力センサとを設け、前記圧力センサが前記ケースへの圧力を検知したことに応答して、前記ディスプレィが表示する情報を変更させる信号を前記プロセッサが前記ディスプレィに送る電子装置。

【００２０】〔実施態様２〕前記圧力センサが前記ケースのＹ方向の圧力を検知することを特徴とする実施態様１に記載の電子装置。

【００２１】〔実施態様３〕前記ディスプレィに表示される前記情報の変更は、前記ケースのＹ方向で検知された圧力に対応して、前記ディスプレィ上のカーソルの位置を変更することによって行われることを特徴とする実施態様２に記載の電子装置。

【００２２】〔実施態様４〕前記圧力センサが前記ケースのＸ方向の圧力を検知することを特徴とする実施態様１に記載の電子装置。

【００２３】〔実施態様５〕前記ディスプレィに表示される前記情報の変更は、前記ケースのＸ方向で検知された圧力に対応して、前記ディスプレィ上のカーソルの位置を変更することによって行われることを特徴とする実施態様２に記載の電子装置。

【００２４】〔実施態様６〕前記圧力センサが前記ケースのＸ方向の圧力を検知することを特徴とする実施態様２に記載の電子装置。

【００２５】〔実施態様７〕前記ディスプレィに表示される前記情報の変更は、前記ケースのＸ方向とＹ方向の双方で検知された圧力に対応して、前記ディスプレィ上のカーソルの位置を変更することによって行われることを特徴とする実施態様６に記載の電子装置。

【００２６】〔実施態様８〕前記圧力センサは、前記ケ



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ースのＸ方向とＹ方向の双方で圧力を検知するような向きで前記ケースに配置した複数個の力受感性抵抗を有することを特徴とする実施態様７に記載の電子装置。

【００２７】〔実施態様９〕前記ディスプレィ上に表示される前記情報の前記変更によって、前記電子装置の動作モードが複数の動作モード間で切換わることを特徴とする実施態様１に記載の電子装置。

【００２８】〔実施態様１０〕前記圧力センサが前記ケースのＺ方向の圧力を検知することを特徴とする実施態様１に記載の電子装置。

【００２９】〔実施態様１１〕前記ディスプレィ上に表示される前記情報の前記変更によって、前記電子装置の動作モードが複数の動作モード間で切換わることを特徴とする実施態様１０に記載の電子装置。

【００３０】〔実施態様１２〕前記圧力センサが前記ケースのＺ方向の圧力を検知することを特徴とする実施態様６に記載の電子装置。

【００３１】〔実施態様１３〕前記ディスプレィに表示される前記情報の変更が、前記ケースの前記Ｘ方向、前記Ｙ方向、及び前記Ｚ方向で検知された圧力に対応して、前記ディスプレィ上のカーソルの位置を変更することであることを特徴とする実施態様１２に記載の電子装置。

【００３２】〔実施態様１４〕前記ディスプレィ上の前記カーソルの位置に対応する動作を前記ディスプレィ上に表示された情報に基づいて実行する選択回路を更に備えたことを特徴とする実施態様８に記載の電子装置。

【００３３】〔実施態様１５〕前記ディスプレィ上の前記情報の変更が、前記ケースの前記Ｘ方向と前記Ｙ方向の双方で検知された圧力に対応して前記装置に書込むことによって行われることを特徴とする実施態様６に記載の電子装置。

【００３４】〔実施態様１６〕前記電子装置が携帯用コンピュータであることを特徴とする実施態様１に記載の電子装置。

【００３５】〔実施態様１７〕前記電子装置がページング装置であることを特徴とする実施態様１に記載の電子装置。

【００３６】〔実施態様１８〕前記電子装置が時計であることを特徴とする実施態様１に記載の電子装置。

【００３７】〔実施態様１９〕ケースと、プロセッサと、前記ケース及びプロセッサと作動的に連結された圧力センサとを有する電子装置のディスプレィ上に表示される情報を変更する方法において、前記圧力センサが前記ケースに加わった圧力を検知するステップと、前記ケース上で検知された前記圧力に応答して、前記ディスプレィに表示される情報を変更するステップ、とを設けたことを特徴とする方法。

【００３８】〔実施態様２０〕前記検知ステップが、前記ケースのＹ方向の圧力を検知することを特徴とする実施態様１９に記載の方法。

【００３９】〔実施態様２１〕前記変更ステップが、前記ケースのＹで検知された前記圧力に対応して前記ディスプレィ上のカーソルの位置を変更するステップであることを特徴とする実施態様２０に記載の方法。

【００４０】〔実施態様２２〕前記検知ステップが、前記ケースのＸ方向の圧力を検知することを特徴とする実施態様２０に記載の方法。

【００４１】〔実施態様２３〕前記検知ステップが、前記ケースの前記Ｘ方向と前記Ｙ方向の双方で検知された圧力に対応して前記ディスプレィ上のカーソルの位置を変更することによって行われることを特徴とする実施態様２２に記載の方法。

【００４２】〔実施態様２４〕前記ディスプレィ上の前記カーソルの位置に対応する動作を前記ディスプレィ上に表示された情報に基づいて実行するステップを設けたことを特徴とする実施態様２３に記載の方法。

【００４３】〔実施態様２５〕前記変更ステップが、前記ケースの前記Ｘ方向と前記Ｙ方向の双方で検知された圧力に対応して前記装置に書込むステップであることを特徴とする実施態様２２に記載の方法。

【００４４】〔実施態様２６〕前記変更ステップが、前記ケースのＺ方向の圧力を検知することを特徴とする実施態様２２に記載の方法。

【００４５】〔実施態様２７〕前記変更ステップが、前記ケースの前記Ｘ方向、前記Ｙ方向、及び前記Ｚ方向で検知された圧力に対応して前記ディスプレィ上のカーソルの位置を変更するステップであることを特徴とする実施態様２６に記載の方法。

【図面の簡単な説明】

【図１】本発明の実施例の電子装置の平面図。

【図２】本発明の実施例の電子装置の側断面図。

【図３】本発明の実施例の電子装置のブロック図。

【図４】本発明の別の実施例の電子装置の平面図。

【図５】本発明の別の実施例の電子装置の平面図。

【図６】本発明の別の実施例の電子装置の平面図。

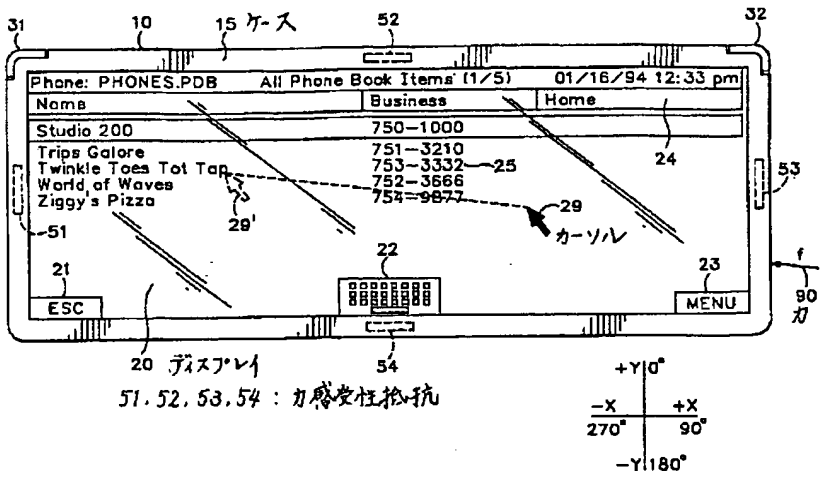
【符号の説明】

１０：電子装置
１５：ケース
２０：ディスプレィ
２１、２２、２３、２４、２５：情報
２９：カーソル
３１、３２：スイッチ
５１、５２、５３、５４：力感受性抵抗
９０：力

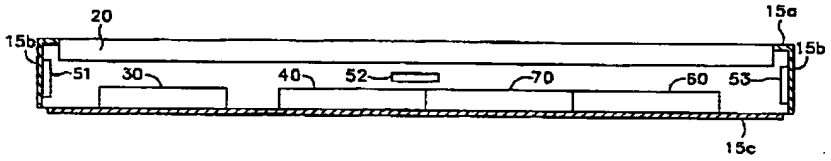


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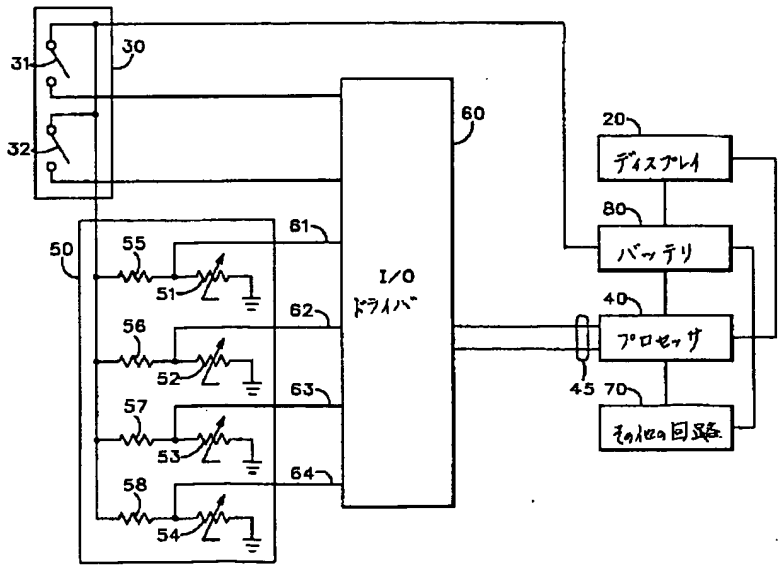
【図１】



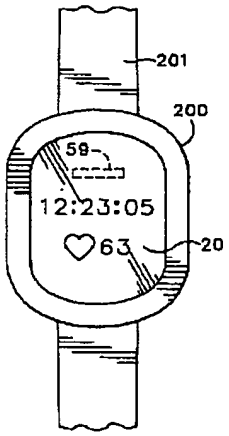

【図２】



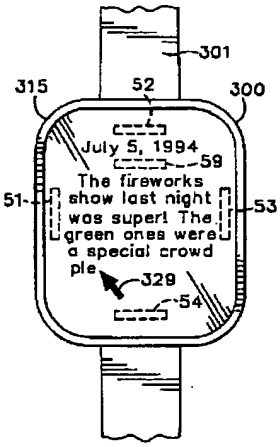
【図３】




【図５】



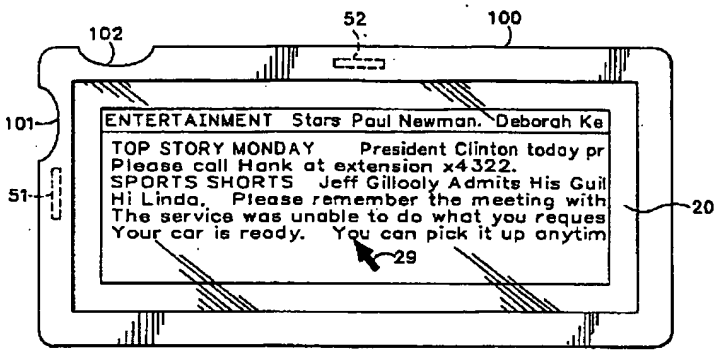

【図６】






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【図４】






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⑲ 日本国特許庁（JP）　　⑪ 特許出願公開

⑫ 公開特許公報（A）　　昭59—153342

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審査請求　未請求

（全 3 頁）

⑤4コードレス電話移動機の誤動作防止装置

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⑳特　願　昭58—28163

㉒出　願　昭58(1983) 2月21日

明　細　書

1. 発明の名称

コードレス電話移動機の誤動作防止装置

2. 特許請求の範囲

コードレス電話移動機のグリップ部にタッチ・センサを取付け、該タッチ・センサからの信号と前記移動機が備える少なくとも該移動機不使用時に遮断すべき電源電流遮断機能を備えたフック・スイッチの断接による信号との論理によって前記フック・スイッチが電源電流を導通状態に維持する場合にあってもオペレータが前記グリップ部から手を離した後所定時間後に前記移動機不使用時に遮断すべき電源電流を自動的に遮断するようにしたことを特徴とするコードレス電話移動機の誤動作防止装置。

3. 発明の詳細な説明

本発明はコードレス電話移動機の誤動作防止装置、更に詳しくは移動機不使用時に遮断すべき電流を遮断する機能を備えたフック・スイッチの切り忘れ或は操作ミスによる接続状態の維持に起因する内蔵電池の消耗及び電話回線の接続状態放置を防止する為の装置に関する。

近年宅内配線の煩雑を回避すると共に送受話機の取扱いを容易ならしむる等の目的からコードレス電話器が普及しつつあるがこれらは一般に宅内に引き込まれた加入者線に接続する固定局と、該固定局との間で無線通信可能な移動機とによって構成するものである。

而して前記移動機には一般の電話機と同等の機能を与えると共に無線送受信装置及び必要な電源を内蔵する。

従ってコードレス電話不使用時には移動機の電源電流は無線受信機及び所要のロジック回路に対するものを除き遮断して電池の消耗を防止する必要がある。

しかしながら従来の移動機は動作の正確を期す目的もあってスライド・スイッチ等オペレータによる格別の操作によって動作するフック・スイッチを設けるか或は本願発明者等の考案に係る移動機自重によって断接するスイッチを用



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いるものである為スイッチを切り忘れたり或は移動機を文具等の散乱した卓上等に放置する場合にはスイッチが動作しないといった事態が発生し電池を消耗し必要な時に通話不能に陥いる等の欠点があった。

本発明は上述の如き従来のコードレス電話移動機の欠点を除去する為になされたものであって、前記移動機のグリップ部にタッチ・センサを取付け、該センサからの信号と前記フック・スイッチからの信号の論理によって前記フック・スイッチが通話或は通話及び全回路への給電状態に維持されていてもオペレータが前記タッチ・センサから手を離した場合には一定時間経過後前記移動機不使用時に於いて遮断すべき電源電流を断つようにしたコードレス電話移動機の誤動作防止装置を提供することを目的とする。

以下、本発明を図面に示す実施例に基づいて詳細に説明する。

第1図及び第2図は夫々本発明を適用したコードレス電話移動機の正面及び背面外観図である。

即ち、一般ダイアル電話機或はプッシュフォンの送受話器に類似した形状の移動機のグリップ部1の凹陥平面にダイアル用のボタン（キー・パッド）2を配置し、その両端部の一方にレシーバ3を他方に送話用マイクロフォン4を設け、図示を省略するが内部には無線機及び電源を装備したものである。

上述の如く構成する移動機に於いては不使用時に電池の消耗を避けを為無線受信機等への通電を除き電源電流を遮断しておく必要のあること前述のとうりである。

そこで移動機操作面の適所に例えばスライド・スイッチ5を設け通話時以外はこれを切っておくようにしている。

しかしながら前述のとうり一般電話器に親しんだオペレータはしばしば前記スライド・スイッチ5を切り忘れるものである。

そこで本発明に於いては前記移動機のグリップ部1の背面から両側面にかけてタッチ・センサ6を設け、該タッチ・センサ断接信号と前記スライド・スイッチ5のそれとを利用して仮に前記スライド・スイッチ5を切り忘れることがあっても前記タッチ・センサから手が離れたことを検知して所要の給電回路を遮断するように構成する。

上述の如き信号処理は例えば第3図に示すような回路を用いればよい。

即ち、タッチ・センサ6の発する信号を所要の、例えば10乃至20秒の遅延回路7を通した信号との論理和をとり、この信号と前記スライド・スイッチ5からの信号との論理の積によって電源8からの電流を適当なスイッチング素子9を用いて断接し移動機のメイン回路10を制御するよう構成すればオペレータが前記スライド・スイッチ5を切り忘れても一定時間の後には必ず所定の電源電流は遮断され電池の消耗、意図せざる通話状態の継続等の誤動作を防止することができる。

尚、前記遅延回路7の役割は通話中オペレータが移動機を手から離して何等かの動作を行ってもしばらくの間電話回線の通話状態を保持する為のものであることはいうまでもあるまい。

上述の実施例に於いてはフック・スイッチとしてスライド・スイッチを用いた移動機についてのみ説明したが、これがシーソー・スイッチであれ移動機の自重によって動作するようなものであれ何等異なることはない。又タッチ・センサの添着部位についてもグリップ部の形状によって適宜変更して差しつかえないことは自明であろう。

本発明は以上説明した如く構成しかつ動作するものであるからコードレス電話移動機のフック・スイッチ切り忘れ或は操作の不手際に起因する意図せざる内感電池の消耗、通話状態の継続を防止することが可能となるので移動機の使い勝手の向上と電池消耗等による通話不能等の事故の大幅な減少に顕著なる効果を発揮する。

4. 図面の簡単な説明

第1図及び第2図は夫々本発明を適用したコ

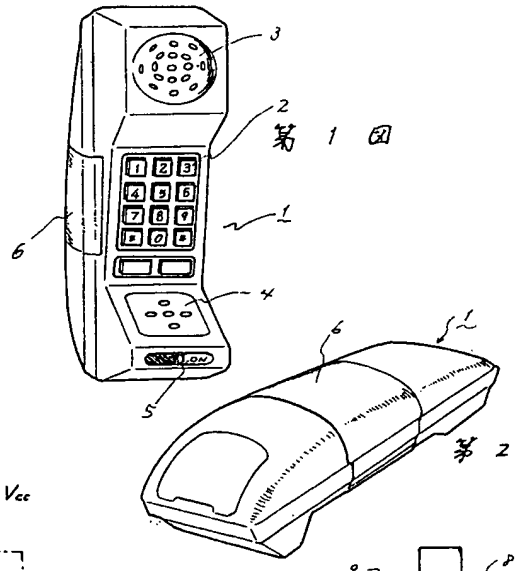


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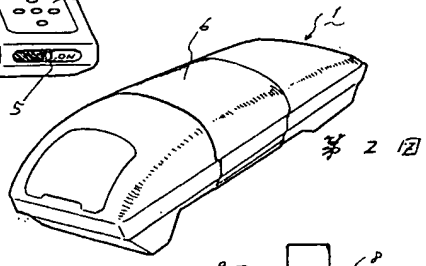
ードレス電話移動機の一実施例を示す正面及び背面外観図、第3図は本発明に係る誤動作防止装置の一実施例を示す回路図である。

1…グリップ部，5…フック・スイッチ，
6…タッチ・センサ

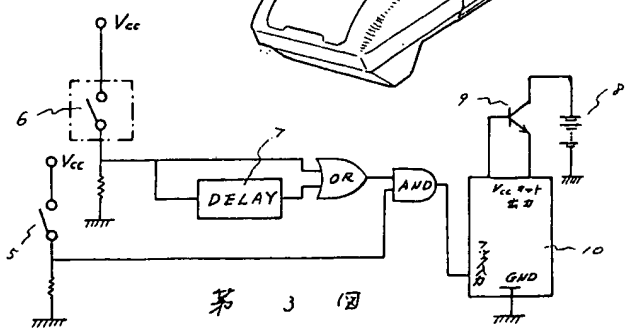
特許出願人　東洋通信機株式会社




第1図




第2図




第3図



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(19) Europäisches Patentamt
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## (54) A touch indicating device.

(57) A touch indicating device comprises an elongated strip (11), or the like, of an electrically resistive material and a metal frame (10) arranged at a distance from the strip. The strip is supported with the metal frame by a carrier, for example an apparatus, a wall or a vehicle. The ends of the strip are connected to a voltage source (V1). Moreover, upon touch the strip is arranged to be moved against the metal frame to apply to the frame a potential which depends on the position of the contact point.

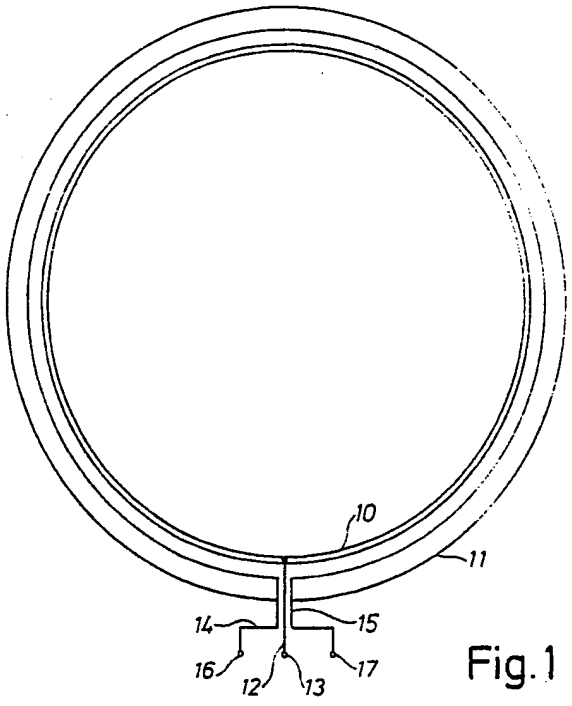



Fig.1

EP 0 229 601 A1

# A touch indicating device

The present invention refers to a touch indicating device.

In various connections it may be of interest to indicate the touch of a fixed or a movable object. Moreover, it may be desireable to indicate the position of contact on the object.

For example, in mobile robots it is important to be able to indicate if the robot strikes against an obstacle of some kind and also the point of contact along the outer periphery of the robot. This information is of importance for the robot to be able to move backwards in a direction away from the obstacle and then to perform an evasive action around the obstacle.

The object of the invention is to provide a device of the kind indicated which meets with the desires presented. The object will be achieved in a device having the characterizing features indicated in claim 1. Preferred embodiments appear from the appending sub-claims.

The invention will now be described in detail in connection with an embodiment with reference to the enclosed drawings, in which Fig. 1 - schematically shows the set-up of a touch indicating device. Fig. 2 is a detail view schematically showing how the device is effected when striking against an obstacle. Fig. 3 is an electric circuit diagram for the device comprising means which converts an analog signal emitted by the device into digital form.

The touch indicating device according to Fig. 1 comprises a metal frame 10 and at a distance therefrom an annular strip, border, or the like, 11 of an electrically resistive material, for example an electrically conducting rubber material. Distance elements not shown, ensure that normally the metal frame is insulated from the strip 11. The distance elements are constructed such that upon external influence the strip can resiliently move into contact with the metal frame and when the influence ceases the strip by resilient force can move back to its original position. By a conductur 12 the metal frame is connected to a terminal 13. In the same way the two ends of the strip via conductors 14,15 are connected to terminals 16,17.

In the embodiment described the device according to Fig. 1 is mounted on a mobil robot, not shown. Then, the metal frame 10 and the strip 11 are arranged as unit to surround the robot at all sides like a bumper in order to indicate if during its movement the robot hits any obstacle. The metal frame and the strip are in a suitable way insulated from the robot.

According to the principle of invention the strip 11 forms a resistance path which when an obstacle 18 is contacted will be divided into two parts 19,20. If a voltage is applied on the terminals 16,17, then the metal frame will take potential determined by the position of the contact point. This potentional is an analog measurement value which in the practical case has to be converted to a digital value to be treated by the control unit, usually a microcomputer, controlling the movements of the robot.

In Fig. 3 a coupling is shown which handles the converting of the analog potential to a digital number. Here, the strip 11 is represented by the potentiometer P having the two resistance parts R1,R2 - (corresponding to parts 19,20 of Fig. 2). The ends of the potentiometer are connected to terminals 16 and 17, respectively, the latter being connected to system ground. Via a resistor R3 the terminal 16 is connected to the voltage V1, for example being +5V. The metal frame 10 contacts the resistance path of the potentiometer at a point towards which an arrow 21 points which represents the movable slide of the potentiometer. As before, the metal frame is connected to the terminal 13 which in turn via a resistor R4 is connected to the positive input of an operational amplifier 22 coupled as a buffer. The negative input of the amplifier is via a resistor R5 connected to the output of the amplifier. Further, the positive input is connected to the voltage V1 via a resistor R6 and to the system ground via a capacitor C. The components R4, C form a low pass filter for suppression of transients while the resistor R6 is a so-called pull-up resistor for applying the voltage V1 to the positive input of the amplifier when no contact is being indicated. The power supply of the amplifier is performed by connecting it to the voltage V2, in the example +10V, and to the system ground. The output of the amplifier is transferred to an analog-digital convertor 23 emitting at its output a digital signal having a resolution of 8 bits, for exemple. This signal is led to a microcomputer 24.

In the example given the resistance path - (R1 + R2) of the strip and the resistor R3 can amount to 10 Kohm. The resistor R4 and R5 have been chosen to 33 Kohm and the resistor R6 to 1 Mohm. With the resistance values given and with V1 amounting to +5V voltages in the interval 0-2,5 V will be applied to the metal frame at a collision. The corresponding interval applied to the analog-digital converter is 0-5,0V and is converted at a resolution of 8 bits. The whole periphery (360°) of the robot can then be reproduced with, as a total, 128 levels. Then, the resolution will be 360/128 =



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slightly less than 3 degrees which is quite sufficient for the application given. In the microcomputer this means that words in excess of 128 represent "no collision".

In alternative applications the unit consisting of the strip 11 and the metal frame 10 can be mounted on a wall, a machine or an apparatus to be watched. A touch of the unit can be registered to start an alarm, for instance, or to operate a process control device.

In the example given the device is supplied from a D.C. source. However, it would also be possible to use an A.C. voltage.

In this case a rectifier device has to be added to the diagram of Fig. 3. Such a device can be connected between the terminal 13 and the resistor R4.

## Claims

1. A touch indicating device, **characterized** in that an elongated strip (11), or the like, made of an electrically resistive material is arranged at a distance from a metal frame (10), the strip together with the metal frame being supported by a carrier, for example an apparatus, a wall or a vehicle, the ends of the resistive strip (11) being connected to a voltage source, wherein the strip when touched being arranged to be resiliently moved against the metal frame (10) to apply to the frame a potential which depends on the position of the point of contact.

2. A device according to claim 1, **characterized** in that the electrically resistive material is an electrically conducting rubber material.

3. A device according to any of claims 1 and 2, **characterized** in that via an interface circuit (R4,R6,C, R5,22) the metal frame (10) is connected to an A/D converter (23) which converts the potential of the metal frame (10) developed upon a touch into digital form.

4. A device according to claim 3, **characterized** in that the voltage source emits a D.C. voltage, the interface circuit comprising an operational amplifier (22) coupled as a buffer, the metal frame (10) being connected to the positive input of the amplifier via a low-pass filter (R4,C).

5. A device according to any of the preceeding claims, **characterized** in that it is mounted on a mobil robot to cover the whole outer periphery of the robot like a bumper.



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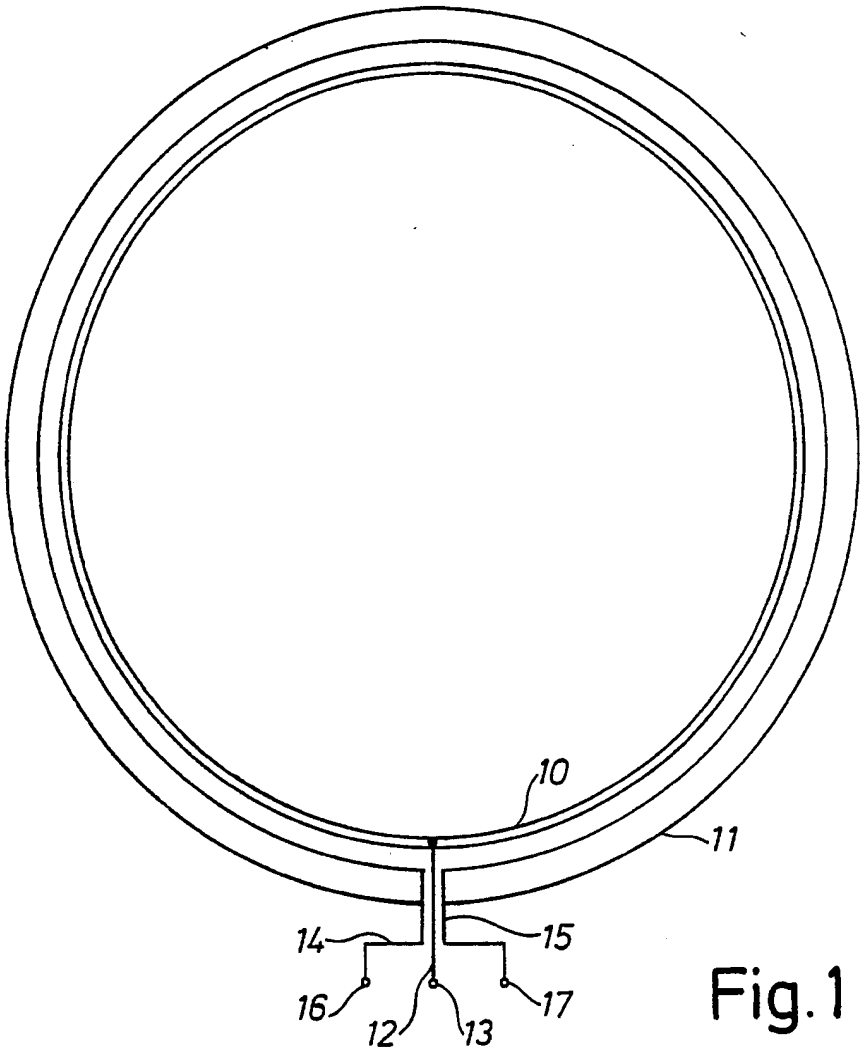



Fig. 1

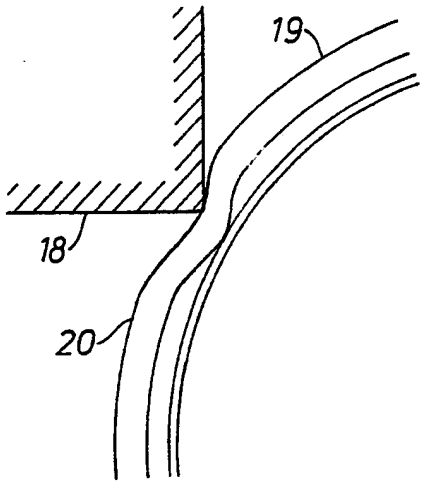



Fig. 2

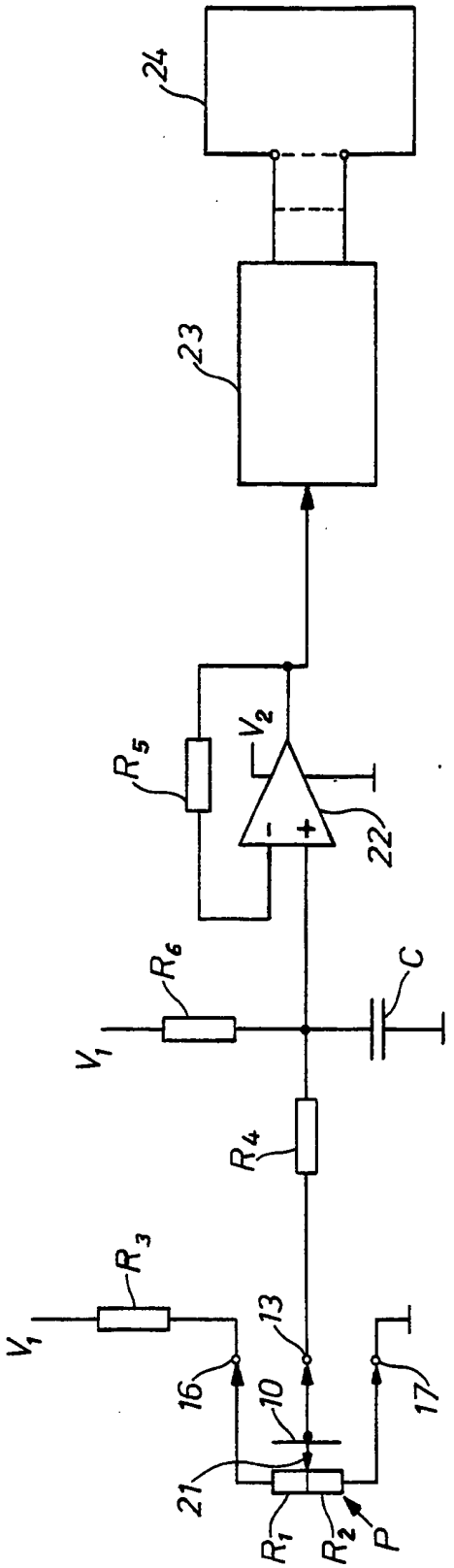



Fig.3

European Patent Office

# EUROPEAN SEARCH REPORT

Application number

## DOCUMENTS CONSIDERED TO BE RELEVANT

EP 86850407.7

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
|---|---|---|---|
| X | DE - B2 - 2 061 154 (METRITAPE)<br>* Column 4, line 57 - column 5, line 28; column 6, lines 15-46; fig. 1,3,11,14,15,17, 19,20 *<br>-- | 1,3 | G 01 D 5/16<br>H 01 B 7/10<br>B 25 J 13/08 |
| X | GB - A - 2 077 471 (FIBUN)<br>* Page 1, lines 72-93; fig. 1-3 *<br>-- | 1,2 | |
| A | EP - A1 - 0 054 406 (MOORE)<br>* Claim 1; fig. 1-5 *<br>---- | 1-3 | |

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

G 01 D 5/00
B 25 J
G 05 D 3/00
G 06 F 3/00
G 06 K 11/00
G 08 B 13/00
H 01 B 7/00
H 01 C 10/00
H 01 H

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| VIENNA | 19-03-1987 | KUTZELNIGG |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
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P : intermediate document

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E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO Form 1503 03.82

TCL EXHIBIT 1007

(19) Europäisches Patentamt
European Patent Office
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(11) Veröffentlichungsnummer: **0 353 706**
**A2**

# (12) EUROPÄISCHE PATENTANMELDUNG

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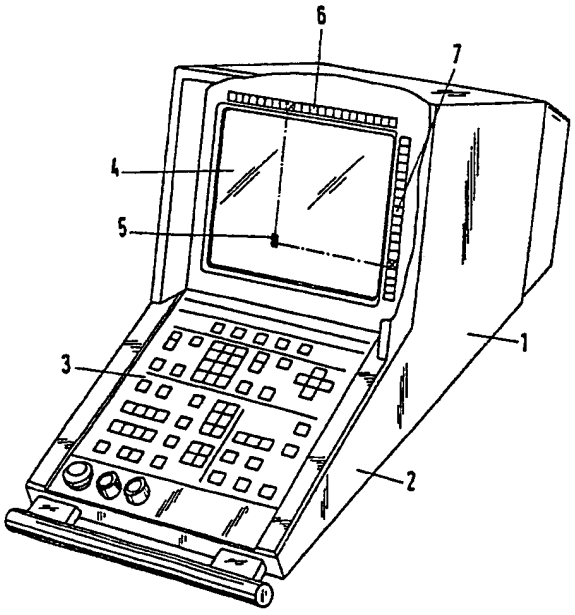
(74) Vertreter: **Patentanwälte Beetz sen. - Beetz jun. Timpe - Siegfried - Schmitt-Fumian-Mayr**
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## (54) Steuerpult für Werkzeugmaschinen.

(57) Gegenstand der Erfindung ist ein Steuerpult für Werkzeugmaschinen mit einem Tastenfeld (3), einem Bildschirm (4) und Bedienelementen für einen Cursor (5), die als zwei Touchleisten (6, 7) ausgebildet sind.

Je eine Touchleiste (6, 7) ist seitlich neben je einer Längs- und Schmalseite des Bildschirms (4) rechtwinklig zueinander angeordnet.

Fig.1




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# STEUERPULT FUR WERKZEUGMASCHINEN

Die Erfindung betrifft ein Steuerpult für Werkzeugmaschinen, das einem gemeinsamen Gehäuse ein zur Horizontalen geringfügig nach vorne geneigtes Tastenfeld und einen dahinter vertikal angeordneten Bildschirm mit Bedienelementen für einen Cursor aufweist.

Es ist bereits bekannt, bestimmte Punkte bzw. Stellen auf dem Bildschirm mit Hilfe eines Cursors, beispielsweise einer Maus, eines Pfeiles oder eines anderen Symbols, herauszugreifen um z.B. Unterprogramme eines PC's anzufahren und auf dem Bildschirm sichtbar zu machen. Die Positionierung des Cursors in dem gewünschten Bildschirmpunkt erfolgt bisher durch besondere Elemente, wie Griffel oder andere Handgeräte, deren Bedienung jedoch einige Fertigkeiten und Sorgfalt erfodert.

Aufgabe der Erfindung ist es, die Bedienung des Cursors bei einem Steuerpult für Werkzeugmaschinen zu vereinfachen.

Diese Aufgabe wird erfindungsgemäß dadurch gelöst, daß die Bedienungselemente als zwei Touchleisten ausgebildet sind, die rechtwinklig zueinander im gemeinsamen Gehäuse des Steuerpults angeordnet sein können.

Zweckmäßig sind die beiden Touchleisten seitlich auf dem Tastenfeld angeordnet. Es kann jedoch auch je eine Touchleiste an je einer Längs- und Schmalseite des Bildschirms vorgesehen sein. Vorzugsweise entspricht die Länge jeder Touchleiste der Länge ihrer zugeordneten Bildschirmseite.

Im folgenden werden Ausführungsbeispiele der Erfindung anhand der Zeichnung im einzelnen beschrieben. Es zeigen

Fig. 1 ein Steuerpult mit Tastenfeld, Bildschirm und Tastleisten in perspektivischer Darstellung;

Fig. 2 das Steuerpult nach Fig. 1 mit einer anderen Anordnung der Touchleisten.

Das dargestellte Steuerpult enthält ein gemeinsames Gehäuse 1 mit einem nach vorne weisenden Teil 2, auf dessen Oberseite ein zur Horizontalen unter einem geringen Winkel geneigtes Tastenfeld 3 angeordnet ist. Im hinteren Teil des Gehäuses 1 ist ein Bildschirm 4 zur Vertikalen geringfügig nach hinten geneigt angeordnet. Bestimmte Stellen bzw. Punkte auf dem Bildschirm 4 können mit einem Cursor 5 vom Bediener ausgewählt werden. Als Bedienungselemente zur Positionierung des Cursors 5 im gewünschten Bildschirmpunkt dienen zwei Touchleisten 6 und 7, von denen eine oberhalb der Längsseite und die andere seitlich neben der einen Schmalseite des Bildschirms 4 im Gehäuse 1 angordnet sind.

Bei der mit Fig. 1 weitgehend übereinstimmenden Ausführung nach Fig. 2 sind die beiden Touchleisten 6, 7 am oberen bzw. linken Rand des Tastenfeldes 3 rechtwinklig zueinander angeordnet.

Die Länge jeder Touchleiste 6 bzw. 7 sollte fit der Länge der ihr zugeordneten Bildschirmseite gleich sein.

Durch leichten Fingerdruck auf eine der Touchleisten 6 bzw. 7 wird die Position des Cursors 5 auf der entsprechenden Bildschirmkoordinate eingestellt, so daß durch wiederholten Fingerdruck auf der einen und der zweiten Touchleiste der Cursor 5 in jeden beliebigen Punkt auf dem Bildschirm gebracht werden kann.

## Ansprüche

1. Steuerpult für Werkzeugmaschinen mit einem Tastenfeld, einem Bildschirm und Bedienelementen für einen Cursor,
dadurch gekennzeichnet,
daß die Bedienelemente als zwei Touchleisten (6, 7) ausgebildet sind.

2. Steuerpult nach Anspruch 1,
dadurch gekennzeichnet,
daß je eine Touchleiste (6, 7) seitlich neben je einer Längs- und Schmalseite des Bildschirm (4) angeordnet ist.

3. Steuerpult nach Anspruch 1,
dadurch gekennzeichnet,
daß die Touchleisten (6, 7) rechtwinklig zueinander am Tastenfeld (3) angeordnet sind.

4. Steuerpult nach einem der Ansprüche 1 bis 3,
dadurch gekennzeichnet,
daß die Länge einer Touchleiste (6, 7) der Länge der zugehörigen Bildschirmseite entspricht.



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Fig.1

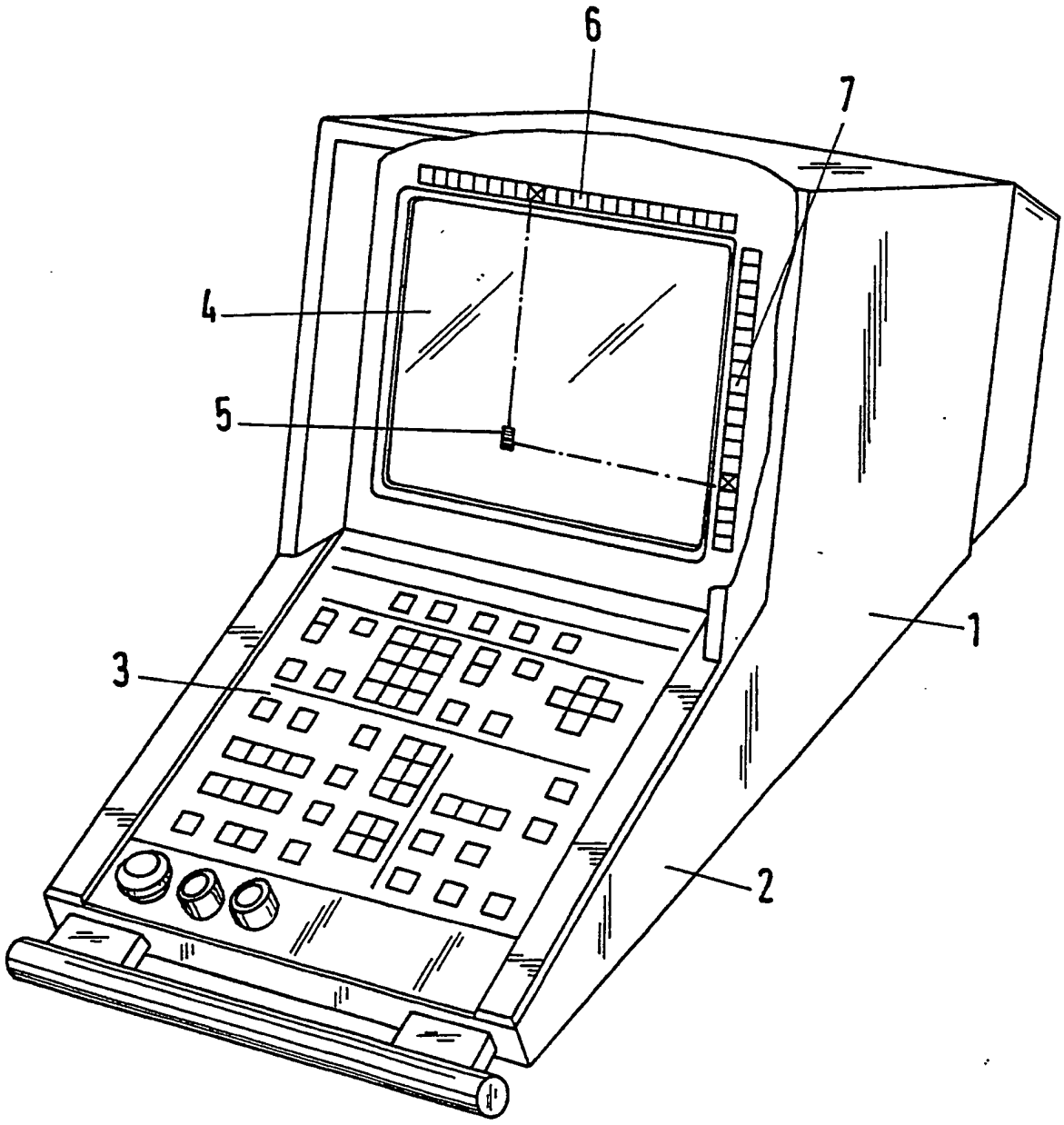
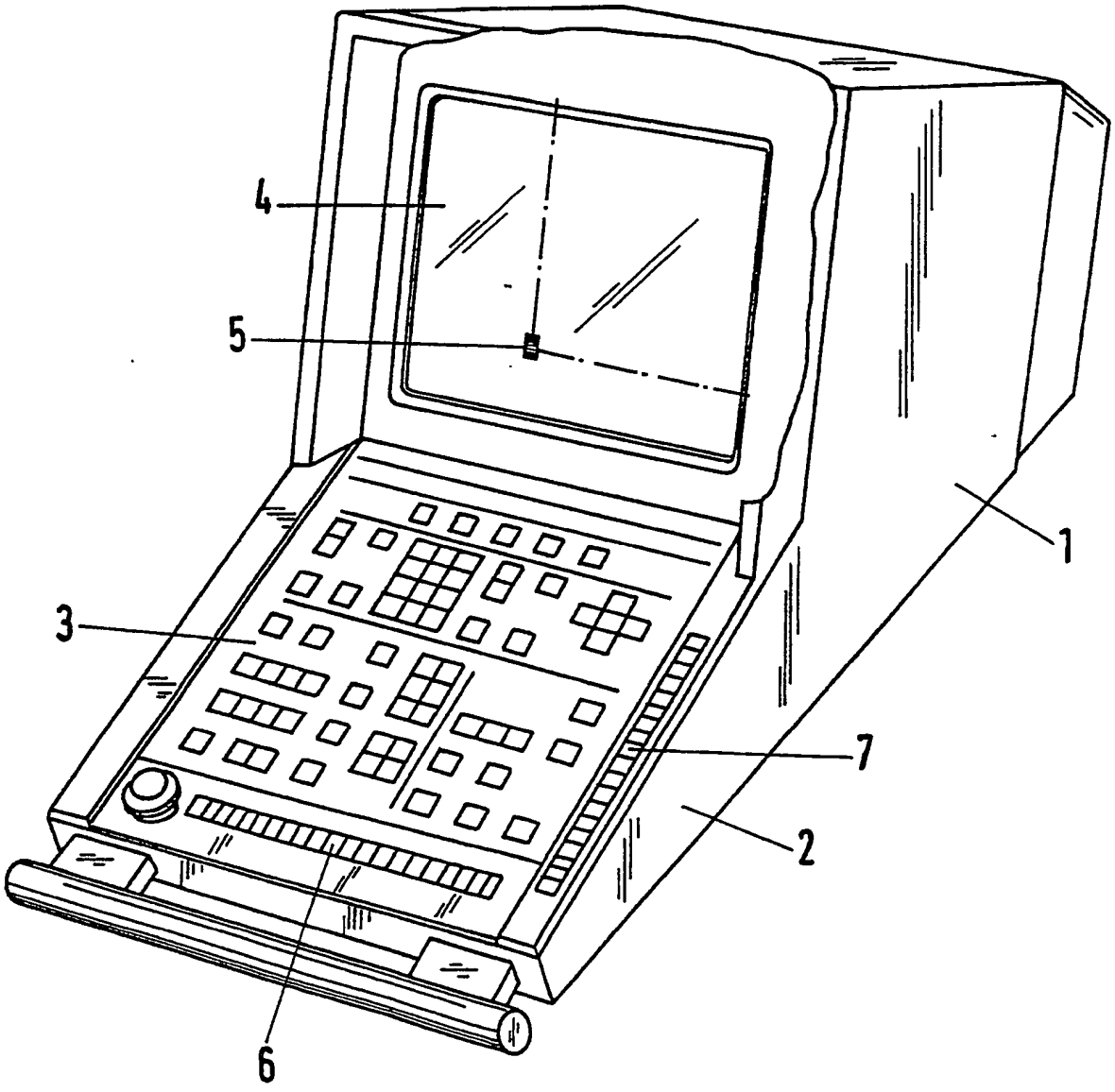


Fig.2



(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Numéro de publication: **0 395 469 A3**

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(21) Numéro de dépôt: **90400998.2**

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## (54) Micro-ordinateur portatif.

(57) Micro-ordinateur portatif destiné à être utilisé aussi bien comme un terminal de saisie d'infomations, que comme un véritable micro-ordinateur personnel interactif, notamment compatible avec d'autres micro-ordinateurs personnels, et pouvant donc exécuter les mêmes programmes d'applications (bureautique, gestion, calcul ... ), comprenant au moins un microprocesseur central (2), une mémoire vive centrale (3), un écran de visualisation (4), et une pluralité de périphériques (11, 12, 13 ... ) intégrés, caractérisé en ce qu'il comporte une surface tactile transparente (14) recouvrant l'écran de visualisation (4), et des moyens (15, 16, 17, 18, 19) électroniques d'émulation variable, au gré de l'utilisateur, de l'écran de visualisation (4) et de la surface tactile (14), permettant de gérer toute zone d'écran soit en tant que zone d'affichage d'informations, soit en tant que zone de visualisation de fonctions réalisées sur la surface tactile (14), et en ce que les moyens (15, 16, 17, 18, 19) électroniques d'émulation variable sont reliés à la surface tactile (14) d'une part pour pouvoir être eux-mêmes commandés à partir de cette surface tactile (14) et d'autre part pour en gérer l'émulation, de sorte qu'aucun clavier spécifique n'est nécessaire pour dialoguer avec le micro-ordinateur (1).

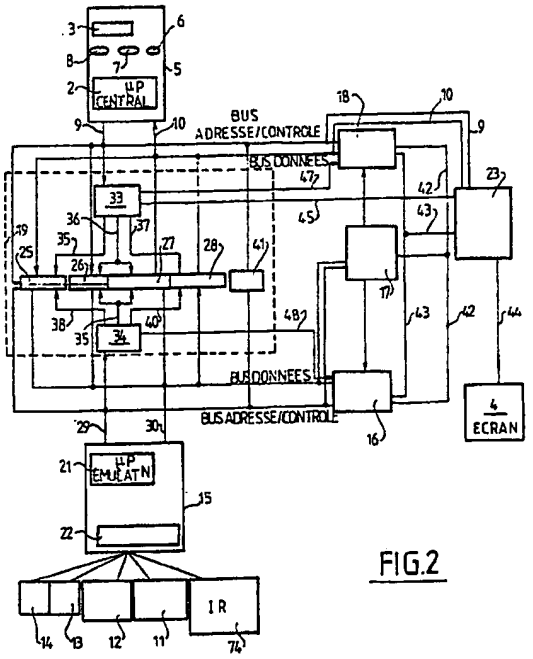



FIG.2

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# RAPPORT DE RECHERCHE EUROPEENNE

Numero de la demande

EP 90 40 0998

## DOCUMENTS CONSIDERES COMME PERTINENTS

| Catégorie | Citation du document avec indication, en cas de besoin, des parties pertinentes | Revendication concernée | CLASSEMENT DE LA DEMANDE (Int. Cl.5) |
|---|---|---|---|
| X<br>Y | WO-A-8 901 658 (RANDALL)<br>* Page 10, lignes 23-36; page 11, lignes 1-17,29-35; figures 1,2 * | 1,2,21, 23<br>5,6,8, 10,12, 13 | G 06 F 15/02 |
| X<br>Y | EP-A-0 053 061 (E.P.D. ENGINEERING PROJECT DEVELOPMENT LTD)<br>* Page 1, ligne 14 - page 2, ligne 11; page 2, lignes 21-31; page 5, lignes 4-12,28-30; page 11, lignes 19-26; figures 1,4 * | 1,2,21, 23<br>5,6,8, 10,12, 13 | |
| X | HEWLETT-PACKARD JOURNAL, vol. 37, no. 7, juillet 1986, pages 4-13, Amstelveen, NL; J.T. EATON et al.: "Design of HP's portable computer family"<br>* Page 4, lignes 17-26; figure 1; page 7, figure 2 * | 4 | DOMAINES TECHNIQUES RECHERCHES (Int. Cl.5)<br>G 06 F |
| Y | IDEM | 5,10,12 ,13 | |
| Y | COMPUTER DESIGN, vol. 27, no. 13, juillet 1988, pages 67-76, Littleton, MA, US; J.H. MAYER: "Keyboards shrink and other options emerge to boost portability"<br>* Page 74, lignes 28-36; figure * | 6,8 | |

-/-

~~Le présent rapport a été établi pour toutes les revendications~~

| Lieu de la recherche | Date d'achèvement de la recherche | Examinateur |
|---|---|---|
| LA HAYE | 08-08-1990 | NYGREN P.P. |

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## REVENDICATIONS DONNANT LIEU AU PAIEMENT DE TAXES

La présente demande de brevet européen comportait lors de son dépôt plus de dix revendications.

☐ Toutes les taxes de revendication ayant été acquittées dans les délais prescrits, le présent rapport de recherche européenne a été établi pour toutes les revendications.

☐ Une partie seulement des taxes de revendication ayant été acquittée dans les délais prescrits, le présent rapport de recherche européenne a été établi pour les dix premières revendications ainsi que pour celles pour lesquelles les taxes de revendication ont été acquittées,

à savoir les revendications:

☐ Aucune taxe de revendication n'ayant été acquittée dans les délais prescrits, le présent rapport de recherche européenne a été établi pour les dix premières revendications.

## x ABSENCE D'UNITE D'INVENTION

La division de la recherche estime que la présente demande de brevet européen ne satisfait pas à l'exigence relative à l'unité d'invention et concerne plusieurs inventions ou pluralités d'inventions,
à savoir:

Voir annexe -B-

☐ Toutes les nouvelles taxes de recherche ayant été acquittées dans les délais impartis, le présent rapport de recherche européenne a été établi pour toutes les revendications.

☐ Une partie seulement des nouvelles taxes de recherche ayant été acquittée dans les délais impartis, le présent rapport de recherche européenne a été établi pour les parties de la demande de brevet européen qui se rapportent aux inventions pour lesquelles les taxes de recherche ont été acquittées

à savoir les revendications:

☒ Aucune nouvelle taxe de recherche n'ayant été acquittée dans les délais impartis, le présent rapport de recherche européenne a été établi pour les parties de la demande de brevet européen qui se rapportent à l'invention mentionnée en premier lieu dans les revendications,

à savoir les revendications: 1-23

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# RAPPORT DE RECHERCHE EUROPEENNE

Numero de la demande

EP 90 40 0998

## DOCUMENTS CONSIDERES COMME PERTINENTS

| Catégorie | Citation du document avec indication, en cas de besoin, des parties pertinentes | Revendication concernée | CLASSEMENT DE LA DEMANDE (Int. Cl.5) |
|---|---|---|---|
| A | EP-A-0 271 280 (AMERICAN TELEPHONE & TELEGRAPH CO.)<br>* Colonne 2, lignes 43-55; colonne 3, lignes 1-28; colonne 14, lignes 11-43; figures 1,13 * | 1-23 | |

DOMAINES TECHNIQUES RECHERCHES (Int. Cl.5)

Le présent rapport a été établi pour toutes les revendications

| Lieu de la recherche | Date d'achèvement de la recherche | Examinateur |
|---|---|---|
| LA HAYE | 08-08-1990 | NYGREN P.P. |

CATEGORIE DES DOCUMENTS CITES

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A : arrière-plan technologique
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## ABSENCE D'UNITE D'INVENTION

La division de la recherche estime que la présente demande de brevet européen ne satisfait pas à l'exigence relative à l'unité d'invention et concerne plusieurs inventions ou pluralités d'inventions.
à savoir:

1. Revendications 1-23: Micro-ordinateur portatif avec écran-clavier tactile.

2. Revendications 24-27: Memoire de masse amovible.

3. Revendications 28,29: Liaison optique.

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 498 540 B1

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(45) Date of publication and mention of the grant of the patent:
**24.05.2000 Bulletin 2000/21**

(51) Int. Cl.[7]: **H03M 1/24**, G06K 11/18

(21) Application number: **92300527.6**

(22) Date of filing: **22.01.1992**

## (54) Mechanical detent simulating system and method

System und Verfahren zur mechanischer Feststellsimulation

Système et procédé de simulation d'arrêt mécanique

(84) Designated Contracting States:
**DE FR GB**

(30) Priority: **06.02.1991 US 651709**

(43) Date of publication of application:
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(56) References cited:
**EP-A- 0 414 900** **GB-A- 2 193 586**

- **IBM TECHNICAL DISCLOSURE BULLETIN. vol. 30, no. 1 , June 1987 , NEW YORK US pages 122 - 124 - 'Counter preset and modified index pulse for use in incremental encoder support robotic circuitry'**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 0 498 540 B1

## Description

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

[0001] This invention relates generally to rotary encoded switches, or manually operable encoders, used in electronic systems, and more specifically, to a system which simulates a mechanical detent to facilitate control of user input from a manually operable encoder to an electronic system.

#### 2. Statement of the Problem

[0002] Conventionally, manually operable rotary potentiometers using electrically resistive components have enabled users to provide input to electronic systems, such as oscilloscopes. Often, these rotary potentiometers have a physically detented center point representing a nominal center position of the potentiometer. This detented center position facilitates setting the potentiometer to the center position as the user encounters a noticeable impediment to rotation of the shaft when the potentiometer is rotated past the detented center position. This center position is hereinafter referred to as a preset point.

[0003] The use of microprocessors in electronic systems has led to the use of manually operable encoders, such as rotary encoded switches and rotary pulse generators, rather than potentiometers, as user input devices. An encoder, like a potentiometer, has a shaft connected to a rotatable element which rotates when a user turns the shaft or a knob attached to the shaft. Unlike a potentiometer, which is an analog device used for providing the associated electronic system with a variable resistive load, an encoder typically provides a passive digital indication of rotational position, which is read by a microprocessor to provide a signal indicative of a rotational displacement of the rotatable element. This signal is typically output to an associated electronic system to control a display or readout. A rotary pulse generator is similar to an encoder, but typically provides an active digital positional output signal, rather than a passive digital positional indication. The term "encoder" is hereinafter used to mean both "encoder" and "rotary pulse generator," unless "rotary pulse generator" is specifically indicated.

[0004] In further contrast to a potentiometer, there are no physical limits on the extent of rotation of the rotatable element in the encoder. The rotatable element can be rotated indefinitely in either direction without encountering a "stop". The rotatable element can be attached to a shaft, as in a rotary encoder, or it can be free to rotate in any direction, such as in the case of a "mouse," or a trackball, or a "joystick." The logical concept of a preset point still applies to encoders, however, and this document refers to the concept of a predetermined nominal encoder position indication as a "virtual" preset point.

[0005] The absence of physical rotational limits makes it difficult to quickly return to a preset point when using an encoder, as the user must typically focus on the readout or display associated with the encoder, while adjusting the encoder to the preset point in order, for example, to center the data being displayed via the readout. Since feedback from the readout to the user is visual, and since the displayed data may be changing or moving rapidly, then the user, trying to "zero in" on the preset point, often overshoots it, and goes through a series of iterations before setting the encoder exactly to the preset point. This problem is compounded when "acceleration" is used in the associated microprocessor controlling the input from the encoder to the electronic system.

[0006] Acceleration is a technique commonly used in electronic systems having encoders. Acceleration is used to allow an encoder to provide a large change in the encoder output with a relatively small rotational adjustment. When the encoder is rotated slowly, there is a one-to-one relationship between the rotational position of the encoder and the encoder output, which output is processed by the microprocessor before being sent to the associated electronic system. When the velocity of rotation of the encoder reaches a certain value, however, the microprocessor multiplies the encoder output by an acceleration factor, the value of which increases exponentially with the rotational velocity of the encoder shaft. This allows the user to effect a larger change in the output without having to rotate the encoder as far as would be necessary if the encoder were being rotated slowly.

[0007] IBM Technical Disclosure Bulletin, Vol. 30, No. 1, June 1987, pp 122-124 describes a technique whereby a counter preset and a modified index pulse is used in an incremental encoder support circuitry for robotics, An auxiliary switch provides a signal ("home flag") at an adjustable position ("home position") along the path measured by the encoder. An interrupt is generated when the home position is reached.

[0008] A light reflection-type rotary encoder is described in WO-A-90/04756 (see later published EP-A-414900) in which a ring-like magnet plate and a pulse plate are employed to generate a "click" feeling upon encoder rotation.

#### 3. Solution to the Problem

[0009] The apparatus and method of the present invention, as specified in the claims hereinafter, models the tactile feedback of a physical detent by temporarily freezing the encoder output when the encoder is rotated past the virtual preset point (hereinafter "preset point"). The preset point for a given encoder is typically a position of the encoder rotatable element which corresponds to a predetermined signal. The preset point is



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usually a system default value stored in the microprocessor, although the preset point is also typically adjustable by a system user. When the user rotates the encoder past the preset point, the present system employs a time delay, during which, the output from the encoder to the associated electronic system is maintained at the preset point value. This delay is long enough to cause the user to physically run out of wrist or arm movement after passing through the preset point. More specifically, when the user rotates the encoder past the preset point at a normal, or particularly, at a fast speed, the delay is such that the output from the encoder to the electronic system is "frozen" at the preset point for a length of time sufficient for the user to complete the particular physical adjustment of the encoder. After the delay has expired, the preset point value continues to be output to the electronic system until the user again moves or rotates the encoder. Therefore, the user, having moved the encoder past a preset point, normally completes a particular encoder adjustment before the delay expires, during which time a constant preset point signal to the electronic system is maintained in place of the actual encoder position indication.

**[0010]** In order for the electronic system to recognize that the user desires to adjust the encoder past the preset point, the user need only to continue to rotate the encoder after the preset point has been crossed. After the delay has expired, actual encoder output to the electronic system is resumed when further movement of the encoder occurs. Therefore, regardless of the speed of rotation of the encoder by the user, or the acceleration factor implemented in the controlling microprocessor, the electronic system, for a predetermined length of time, "sees" the encoder as being set to the preset point, even if the user adjusts the encoder past the preset point. If the user does, in fact, want to advance or adjust the encoder past the preset point, the delay will have expired by the time the user repositions his hand on the encoder knob or the trackball, or repositions the mouse, thus allowing the user to continue to adjust the encoder beyond the preset point.

**[0011]** The method of the present invention also allows greater degrees of acceleration to be added to the encoder output, without compromising the user's ability to quickly adjust the encoder to the preset point, as any overshooting of the preset point is effectively nullified by the imposed delay.

## BRIEF DESCRIPTION OF THE DRAWING

**[0012]**

FIG. 1 shows, in block diagram form, the architecture of the apparatus of the present invention;

FIG. 2 is a block diagram of the position encoding circuit.

FIG. 3 is a flow chart of the encoder processing function;

FIG. 4 is a flow chart showing the encoder monitoring function;

FIG. 5 is timing diagram showing the relationship between a typical encoder position signal and a relative displacement of the encoder rotatable element when the element is rotated past the preset point; and

FIG.6 is a flow chart of a monitoring circuit delay embodiment of the invention, showing both the encoder monitoring and encoder processing functions.

## DETAILED DESCRIPTION OF THE INVENTION

**[0013]** FIG. 1 shows a position encoding circuit 101 connected to an electronic system 110. The position encoding circuit 101 includes an encoder 100 which is connected to a microprocessor 112 by a plurality of lines 106. The encoder typically has a knob 102 located on a rotatable shaft 104, to which is attached a rotatable element 105. The rotatable element 105 provides a digital output on lines 106 which is a function of the position of the rotatable element 105. The electronic system 110 includes a target circuit 113 and a display or readout 114, such as a conventional analog meter, a cathode ray tube display, or a digital numeric display. Typically, the electronic system 110 is a piece of test equipment, but it is to be expressly understood that the present invention may be employed in other types of electronic systems 110.

**[0014]** Usually, the electronic system 110 has a plurality of encoders 100, each of which allows a user of the system to control a particular aspect of the display or readout 114. For example, if a signal wave form is being displayed on readout 114, the user may use one encoder to vertically center the waveform with respect to the readout 114, and another encoder to cause the waveform to move horizontally with respect to the readout 114.

**[0015]** For purposes of illustration, the encoder 100 contains a shaft 104, connected to a knob 102 which imparts rotation to a rotatable element 105 in the encoder 100 when the shaft 104 is rotated by a user (not shown). A typical encoder 100, such as, a Noble digital rotary encoder, part number 1B-TM-Y0001, contains a plurality of electrical contacts which are arranged such that they provide a digital binary bit pattern, hereinafter called "encoder position data," corresponding to the rotational position of the rotatable element 105 attached to the encoder shaft 104. The microprocessor 112 reads the encoder position data via a plurality of lines 106. The microprocessor 112 subsequently transmits over lead 109, to the associated electronic system 110, an encoder signal $V_o$ which is a function of the encoder displacement relative to the previous reading of the encoder position data. This signal $V_o$ is then typically used to control a readout 114 associated with the



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electronic system 110.

**[0016]** FIG. 2 illustrates, in block diagram form, the position encoding circuit 101. Referring to FIG. 2, the encoder monitoring circuit 202 accepts encoder position data input via a plurality of lines 106 from the encoder 100. Whenever the encoder monitoring circuit 202 detects a change in position of the encoder 100, as reflected in a change in encoder position data, the detected encoder position data is stored in a buffer 204 over line 212. The encoder processing circuit 206 periodically checks the buffer 204 via line 220 to determine whether any position encoder data has been placed therein. When the encoder processing circuit 206 finds encoder position data in the buffer 204, the data is processed according to predetermined parameters. For example, when the rotational velocity of the encoder shaft 104 reaches a predetermined value, an acceleration factor is included in the processing of the encoder position data. Typically, the acceleration factor is a stepped exponential function of the velocity of the encoder shaft 104. The processed encoder position data, hereinafter referred to as an "encoder position signal" $V_o$, is then transmitted over line 109 to a target circuit 113 in the associated electronic system 110. The target circuit 113 typically controls a display or readout 114 in the electronic system 110. The encoder position signal $V_o$ is maintained at a constant value until the encoder processing circuit 206 determines that the encoder position data in the buffer 204 indicates a change in rotational position of the encoder rotatable element 105.

**[0017]** The position encoding circuit 101 also contains data 205 indicative of the electronic system virtual preset point. If the encoder position data indicates that the encoder 100 has been rotated past the preset point, the microprocessor 112 sets a timer 208 via line 222, and encoder processing is suspended for a predetermined time interval, during which, a substituted signal $V_o$ indicative of the preset point is transmitted to the electronic system 110. After the time interval has elapsed, encoder processing is resumed.

## 1. Encoder Monitoring

**[0018]** FIG. 3 illustrates, in flow chart form, the encoder processing function. Referring to FIG. 3, at step 302, the microprocessor 112 reads the encoder position data output by the position encoder 100 over a plurality of lines 106 on a periodic basis, called a scan cycle, typically, every 2 milliseconds. The initial encoder position reading is stored in memory (not shown) accessible to the encoder monitoring circuit 202. Each time a new encoder position is read by the microprocessor 112, this new reading is compared, at step 304, with the previous stored reading to see whether the new reading is the same as the previous reading. If the new reading is the same as the previous reading, then at step 306, the microprocessor 112 waits until the next scan cycle to again compare encoder position readings. If, however, the new reading differs from the previous reading, the microprocessor 112 then stores data for the new reading, at step 308, in a buffer 204. Any difference between the new reading and the previous reading indicates that the encoder 100 has been rotated, and an entry in the buffer 204 is indicative of a change in rotational position of the encoder 100.

**[0019]** The encoder reading which is stored in the buffer 204 is determined by referring to the direction (left or right) in which the encoder 100 was last rotated, and the displacement relative to the previously read encoder position; therefore, the stored data for the encoder output reading indicates the relative displacement of the encoder rotatable element 105 between scan cycle intervals.

## 2. Encoder Processing

**[0020]** FIG. 4 shows the encoder processing logic of the present invention. It should be noted that encoder monitoring and encoder processing are asynchronous with respect to each other. At step 400, the microprocessor 112 reads the buffer 204 to determine if there is encoder position data in the buffer 204 to be processed. If it is determined, at step 402, that there is no data in the buffer 204, then the microprocessor 112 again reads the buffer 204 over line 220, at step 400, to determine whether any data has been placed therein. If, at step 402, encoder output data is found in the buffer 204, then, at step 404, an encoder position signal $V_o$, indicative of the buffer data, is generated on line 109. The encoder position signal $V_o$ is a function of both the position and the rotational velocity of the encoder shaft 104, and methods of generating the position signal $V_o$, given encoder position data, are well known in the art.

**[0021]** The generated position signal $V_o$ is then compared to the stored preset point value read over line 218, at step 406. If it is determined- that the encoder shaft 104 was not rotated to or rotated past the preset point, then, at step 408, the generated position signal $V_o$ is output to the target circuit 113, and the microprocessor 112 again reads the buffer 204, looking for more encoder position data, at step 400. If, however, the generated encoder position signal $V_o$ is equal to the preset value, or if it is determined that the encoder shaft 104 was rotated past the preset point, then, at step 410, the generated encoder position signal $V_o$ is adjusted to equal the stored preset value 205, and at step 412, the generated preset point signal is output via lead 109 to the target circuit 113.

**[0022]** At step 414, a timer 208 is set via line 222, and the processing function is delayed, or suspended, for approximately 300 milliseconds, during which period of time, the encoder position signal $V_o$ remains at the preset point value. This delay is sufficient to allow the user of the electronic system 110 to recognize, via visual feedback from the readout 114, that the preset point



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has bean reached or passed, and mince the microprocessor 112 sets the encoder position signal $V_o$ to the preset point, the user does not have to position the encoder shaft 104 to an exact physical position in order to locate the preset point. After the delay, as produced by the timer 208, has expired, all of the data in the buffer 204 is deleted, at step 416, so that when the encoder processing function is resumed, spurious data is not processed.

**[0023]** The microprocessor 112 again reads the buffer 204, at step 400, in order to detect further encoder position data. After the buffer 204 data is deleted and the delay has expired, the user must further rotate the encoder shaft 104 before the encoder position signal $V_o$ is again processed. Therefore, after expiration of the delay, the encoder position signal $V_o$ remains fixed at the preset point value until the user further rotates the encoder shaft 104, since there is no data in the buffer 204 for the encoder processing circuit 206 to process until further rotation of the encoder shaft 104 is effected.

## 3. Waveform Diagram

**[0024]** FIG. 5 shows the relationship, for explanatory purposes, between the actual displacement 510 of the encoder rotatable element 105, relative to the virtual preset point, and the displacement 520 of the rotatable element 105 as sent to the target circuit 113. The displacement 520 represents the processed encoder position signal $V_o$ transmitted from the position encoding circuit 101 to the target circuit 113 via lead 109.

**[0025]** Initially, from time t1 to time t2, the encoder position signal $V_o$ tracks the encoder element 105 displacement with a linear correspondence therebetween, assuming, for purposes of illustration, that no acceleration has been applied to the encoder displacement. At time t2, the encoder 100 crosses the virtual preset point, and $delay_1$ is effected. It can be seen that, although the encoder element 105 continues to be rotated during the delay, the encoder position signal $V_o$ remains at the preset point for the duration of the delay. By the expiration of the delay, at time t3, rotation of the encoder element 105 has stopped, typically, because the user has observed that the associated display has, for example, been centered. The encoder position signal $V_o$ remains thus constant until, at time t4, the encoder element 105 is again moved. Between time t4 and time t5, the encoder element 105 is moved away from, and then at time t4.5, back toward, the preset point, during which time, the encoder position signal $V_o$ again tracks the encoder element 105 displacement. At time t5, the preset point is again crossed, and $delay_2$ is effected, during which, the encoder position signal $V_o$ is again "frozen" at the preset point, even though the encoder element 105 continues to be rotated. After the delay has expired, the encoder position signal $V_o$ will continue to track the displacement of the encoder element 105, until a further preset crossing occurs.

## 4. Monitoring Circuit Delay

**[0026]** An alternative embodiment of the present invention employs a delay in the encoder monitoring circuit 202, rather than in the encoder processing circuit 206. Referring to FIG. 6, at step 602, the microprocessor 112 reads the encoder position on a periodic basis, typically, every 2 milliseconds. The initial encoder position reading is stored in memory (not shown) accessible to the encoder monitoring circuit 202. Each time a new encoder position is read by the microprocessor 112, this new reading is compared, at step 604, with the previous stored reading to see whether the new reading is the same as the previous reading. If the new reading is the same as the previous reading, at step 606, the microprocessor 112 again monitors the encoder position, looking for new encoder position data, at step 602. Note that steps 602, 604, and 606 correspond to steps 302, 304, and 306, respectively. If the new reading differs from the previous reading, then, at step 607, the new reading is compared to the stored preset point value. If it is determined that the encoder shaft 104 was not rotated to or rotated past the preset point, then, at step 610, the encoder position data is read over line 224 by the encoder monitoring circuit 202 and is stored in a buffer 204 via line 212. If, however, the computed encoder position signal $V_o$ is equal to the preset value, or if it is determined that the encoder shaft 104 was rotated past the preset point, then, at step 612, data equal to the stored preset data value 205 is read over line 224. The preset point data 205 is then stored in the buffer 204, and at step 614, a timer 208 is set via line 216, and the encoder monitoring function is delayed, or suspended, for approximately 300 milliseconds. This delay is sufficient to allow the user of the electronic system 110 to recognize, via visual feedback from the readout 114, that the preset point has been reached or passed. The microprocessor 112 again monitors the encoder position, looking for new encoder position data, at step 602.

**[0027]** The encoder position data processing circuit processes data in the buffer 204 asynchronously with respect to encoder monitoring 602 to determine an output position signal $V_o$ and outputs the processed encoder position signal $V_o$ to the target circuit 113.

## Claims

1. An apparatus which locates a virtual preset point in a manually-adjustable position encoder (100), which apparatus comprises:

   a position encoding circuit (101) including said position encoder (100), and
   a target circuit (113) of an electronic system (110), said target circuit (113) being connected to said position encoding circuit (101) and being used to control a function associated with



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said electronic system (110);

said position encoder (100) having a rotatable element (105) capable of being continuously rotated through an angle of greater than 360 degrees in either direction, said position encoding circuit (101) transmitting, to said target circuit (113), an encoder position signal $V_0$ indicative of said rotational displacement of said rotatable element (105), said position encoding circuit (101) having data (205) indicative of a virtual preset point, said virtual preset point being a rotational position of said rotatable element (105) corresponding to a predetermined encoder position signal; said apparatus additionally comprising:

means (206) which compares said encoder position signal $V_0$ with said data (205) indicative of said virtual preset point; and

means (205,206) which sets, for a predetermined time interval, said encoder position signal $V_0$ equal to an encoder position signal indicative of said virtual preset point, when said comparing means (206) determines that said rotatable element (105) in said position encoder (100) has been rotated past said virtual preset point.

2. An apparatus according to claim 1, further comprising:

means (206,208) which suspends for said predetermined time interval, said transmitting of said encoder position signal $V_0$ indicative of said rotational displacement of said rotatable element (105).

3. An apparatus according to claim 1, wherein:

said adjustable position encoder (100) is a rotary digital encoder.

4. A method of locating a virtual preset point in a manually-adjustable position encoder (100), said position encoder (100) being included in a position encoding circuit (101) which is connected to a target circuit (113) of an electronic system (110), said position encoding circuit (101) transmitting an encoder position signal $V_0$ to said target circuit (113) to control a function associated with said electronic system (110), said position encoder (100) having a rotatable element (105) capable of being continuously rotated in either direction, said position encoding circuit (101) having stored data (205) indicative of a virtual preset point, said virtual preset point being a rotational position of said rotatable element (105) corresponding to a predetermined encoder position signal; said method comprising the steps of:

monitoring (302,304,306) a position of said rotatable element (105) to determine a rotational displacement, from a previously monitored position, of said rotatable element (105);

storing (308), in a buffer (204), data indicative of said rotational displacement;

generating (400,402,404), from said data in said buffer (204), said encoder position signal $V_0$ indicative of said rotational displacement;

comparing (406) said encoder position signal $V_0$ with said data (205) indicative of said virtual preset point;

transmitting (408) to said target circuit (113), said encoder position signal $V_0$ indicative of said displacement, when said step of comparing (406) determines that said rotatable element (105) has not been rotated past said virtual preset point;

suspending (414), for a predetermined time interval, said step of generating (400,402,404) when said step of comparing (406) determines that said rotatable element (105) has been rotated past said virtual preset point;

transmitting (412) to said target circuit (113), for said predetermined time interval when said step of suspending (414) is effected, said encoder position signal $V_0$ indicative of said virtual preset point; and deleting (416) all of said encoder position data in said buffer (204), when said step of suspending (414) has been effected, after said predetermined time interval has expired.

5. A method according to claim 4, wherein said step of suspending (414) suspends said step of generating (400,402,404) when it is determined that said rotatable element (105) in said position encoder (100) has been rotated to said virtual preset point.

6. A method according to claim 4, which comprises providing said adjustable position encoder (100) as a rotary digital encoder.

7. A method according to claim 4, which comprises providing said adjustable position encoder (100) as a rotary pulse generator.

8. A method according to claim 4, which comprises providing said adjustable position encoder (100) as a trackball, a mouse, or a joystick.

9. A method according to claim 4, which includes:

rotating said position encoder rotatable element (105) through an angle greater than 360 degrees.

10. A method of locating a virtual preset point in a man-



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ually-adjustable position encoder (100), said position encoder (100) being included in a position encoding circuit (101) which is connected to a target circuit (113) of an electronic system (110), said position encoding circuit (101) transmitting an encoder position signal $V_0$ to said target circuit (113) to control a function associated with said electronic system (110), said position encoder (100) having a rotatable element (105) capable of being continuously rotated in either direction, said encoder position signal being $V_0$ indicative of a rotational displacement of said rotatable element (105), said position encoding circuit (101) having associated stored data (205) indicative of a virtual preset point, said virtual preset point being a rotational position of said rotatable element (105) corresponding to a predetermined encoder position signal, said method comprising the steps of:

monitoring (602,604,606) a position of said rotatable element (105) of said position encoder (100) to determine a rotational displacement, from a previously monitored position, of said rotatable element (105);
comparing (607,608) said rotational displacement with said data (205) indicative of said virtual preset point;
storing (610) in a buffer (204), data indicative of said rotational displacement, when said step of comparing (607,608) determines that said rotatable element (105) has not been rotated past said virtual preset point;
storing (612) in said buffer (204), data (205) indicative of said virtual preset point, when said step of comparing (607,608) determines that said rotatable element (105) has been rotated past said virtual preset point;
suspending, (614) for a predetermined time interval, said step of monitoring (602,604,606) when said step of storing (612) said virtual preset point data (205) is initially effected; and
generating (206) said encoder position signal $V_0$ from said stored data in said buffer.

**Patentansprüche**

1. Eine Vorrichtung, die einen virtuellen voreingestellten Punkt bei einem manuell einstellbaren Stellungscodierer (100) lokalisiert, mit folgenden Merkmalen:

einer Stellungscodierungsschaltung (101), die den Stellungscodierer (100) aufweist; und

einer Zielschaltung (113) eines Elektroniksystems (110), wobei die Zielschaltung (113) mit der Stellungscodierungsschaltung (101) verbunden ist und verwendet wird, um eine Funktion zu steuern, die dem Elektroniksystem (110) zugeordnet ist;

wobei der Stellungscodierer (100) ein drehbares Element (105) aufweist, daß um einen Winkel von mehr als 360 Grad in beiden Richtungen durchgehend gedreht werden kann, wobei die Stellungscodierungsschaltung (101) zu der Zielschaltung (113) ein Codiererstellungssignal $V_0$ überträgt, das die Drehverstellung des drehbaren Elements (105) anzeigt, wobei die Stellungscodierungsschaltung (101) Daten (205) aufweist, die einen virtuellen voreingestellten Punkt anzeigen, wobei der virtuelle voreingestellte Punkt eine Drehstellung des drehbaren Elements (105) ist, die einem vorbestimmten Codiererstellungssignal entspricht; wobei die Vorrichtung zusätzlich folgende Merkmale aufweist:

eine Einrichtung (206), die das Codiererstellungssignal $V_0$ mit den Daten (205) vergleicht, die den virtuellen voreingestellten Punkt anzeigen; und

eine Einrichtung (205, 206), die für ein vorbestimmtes Zeitintervall das Codiererstellungssignal $V_0$ gleich dem Codiererstellungssignal, das den virtuellen voreingestellten Punkt anzeigt, einstellt, wenn die Vergleichseinrichtung (206) bestimmt, daß das drehbare Element (105) in dem Stellungscodierer (100) an dem virtuellen voreingestellten Punkt vorbei gedreht worden ist.

2. Eine Vorrichtung gemäß Anspruch 1, die ferner folgendes Merkmal aufweist:

eine Einrichtung (206, 208), die für das vorbestimmte Zeitintervall die Übertragung des Codiererstellungssignals $V_0$, das die Drehverstellung des drehbaren Elements (105) anzeigt, unterbricht.

3. Eine Vorrichtung gemäß Anspruch 1, bei der

der einstellbare Stellungscodierer (100) ein digitaler Drehcodierer ist.

4. Eine Verfahren zum Lokalisieren eines virtuellen voreingestellten Punkts bei einem manuell einstellbaren Stellungscodierer (100), wobei der Stellungscodierer (100) in einer Stellungscodierungsschaltung (101) umfaßt ist, die mit einer Zielschaltung (113) eines Elektroniksystems (110) verbunden ist, wobei die Stellungscodierungsschaltung (101) ein Codiererstellungssignal $V_0$ zu der Zielschaltung (113) überträgt, um eine Funktion zu



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steuern, die dem Elektroniksystem (110) zugeordnet ist, wobei der Stellungscodierer (100) ein drehbares Element (105) aufweist, das in jeder Richtung durchgehend gedreht werden kann, wobei die Stellungscodierungsschaltung (101) gespeicherte Daten (205) aufweist, die einen virtuellen voreingestellten Punkt anzeigen, wobei der virtuelle voreingestellte Punkt eine Drehstellung des drehbaren Elements (105) ist, die einem vorbestimmten Codiererstellungssignal entspricht, wobei das Verfahren folgende Schritte aufweist:

Überwachen (302, 304, 306) einer Stellung des drehbaren Elements (105), um eine Drehverstellung von einer zuvor überwachten Stellung des drehbaren Elements (105) zu bestimmen;

Speichern von Daten, die die Drehverstellung anzeigen, in einem Puffer (204);

Erzeugen (400, 402, 404) des Codiererstellungssignals $V_0$, das die Drehverstellung anzeigt, aus den Daten in dem Puffer (204);

Vergleichen (406) des Codiererstellungssignals $V_0$ mit den Daten (205), die den virtuellen voreingestellten Punkt anzeigen;

Übertragen (408) des Codiererstellungssignals $V_0$, das die Verstellung anzeigt, zu dem Zielschaltung (113), wenn der Schritt des Vergleichens (406) bestimmt, daß das drehbare Element (105) nicht an dem virtuellen voreingestellten Punkt vorbei gedreht worden ist;

Unterbrechen (414) des Schritts des Erzeugens (400, 402, 404) für ein vorbestimmtes Zeitintervall, wenn der Schritt des Vergleichens (406) bestimmt, daß das drehbare Element (105) an dem virtuellen voreingestellten Punkt vorbei gedreht worden ist;

Übertragen (412) des Codiererstellungssignals $V_0$, das den virtuellen voreingestellten Punkt anzeigt, zu der Zielschaltung (113) für das vorbestimmte Zeitintervall, wenn der Schritt des Unterbrechens (414) bewirkt wird, und Löschen (416) aller Codiererstellungsdaten in dem Puffer (204), nachdem das vorbestimmte Zeitintervall abgelaufen ist, wenn der Schritt des Unterbrechens (414) bewirkt worden ist.

5. Ein Verfahren gemäß Anspruch 4, bei dem der Schritt des Unterbrechens (414) den Schritt des Erzeugens (400, 402, 404) unterbricht, wenn bestimmt wird, daß das drehbare Element (105) in dem Stellungscodierer (100) bis zu dem virtuellen voreingestellten Punkt gedreht worden ist.

6. Ein Verfahren gemäß Anspruch 4, das das Bereitstellen des einstellbaren Stellungscodierers (100) als einen digitalen Drehcodierer aufweist.

7. Ein Verfahren gemäß Anspruch 4, das das Bereitstellen des einstellbaren Stellungscodierers (100) als einen Drehpulsgenerator aufweist.

8. Ein Verfahren gemäß Anspruch 4, das das Bereitstellen des einstellbaren Stellungscodierers (100) als einen Trackball, eine Maus oder einen Joystick aufweist.

9. Ein Verfahren gemäß Anspruch 4, das folgenden Schritt aufweist:

Drehen des drehbaren Stellungscodiererelements (105) um einen Winkel von mehr als 360 Grad.

10. Eine Verfahren zum Lokalisieren eines virtuellen voreingestellten Punkts bei einem manuell einstellbaren Stellungscodierer, wobei der Stellungscodierer (100) in einer Stellungscodierungsschaltung (101) umfaßt ist, die mit einer zielschaltung (113) eines Elektroniksystems (110) verbunden ist, wobei die Stellungscodierungsschaltung (101) ein Codiererstellungssignal $V_0$ zu der Zielschaltung (113) überträgt, um eine Funktion zu steuern, die dem Elektroniksystem (110) zugeordnet ist, wobei der Stellungscodierer (100) ein drehbares Element (105) aufweist, das in jeder Richtung durchgehend gedreht werden kann, wobei das Codiererstellungssignal $V_0$ eine Drehverstellung des drehbaren Elements (105) anzeigt, wobei die Stellungscodierungsschaltung (101) zugeordnete gespeicherte Daten (205) aufweist, die einen virtuellen voreingestellten Punkt anzeigen, wobei der virtuelle voreingestellte Punkt eine Drehstellung des drehbaren Elements (105) ist, die einem vorbestimmten Codiererstellungssignal entspricht, wobei das Verfahren folgende Schritte aufweist:

Überwachen (602, 604, 606) einer Stellung des drehbaren Elements (105) des Stellungscodierers (100), um eine Drehverstellung von einer zuvor überwachten Stellung des drehbaren Elements (105) zu bestimmen;

Vergleichen (607, 608) der Drehverstellung mit den Daten (205), die den virtuellen voreingestellten Punkt anzeigen;

Speichern (610) von Daten, die die Drehverstellung anzeigen, in einem Puffer (204), wenn der Schritt des Vergleichens (607, 608) bestimmt, daß das drehbare Element (105) nicht an dem virtuellen voreingestellten Punkt



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vorbei gedreht worden ist;

Speichern (612) der Daten (205), die den virtuellen voreingestellten Punkt anzeigen, in dem Puffer (204), wenn der Schritt des Vergleichens (607, 608) bestimmt, daß das drehbare Element (105) an dem virtuellen voreingestellten Punkt vorbei gedreht worden ist;

Unterbrechen (614) des Schritts des überwachens (602, 604, 606) für ein vorbestimmtes Zeitintervall, wenn der Schritt des Speicherns (612) der Daten (205) des virtuellen voreingestellten Punkts anfänglich bewirkt wird; und

Erzeugen (206) des Codiererstellungssignals $V_0$ aus den gespeicherten Daten in dem Puffer.

**Revendications**

1. Un appareil qui localise un point préétabli virtuel dans un codeur (100) de position, réglable manuellement, appareil qui comprend:

un circuit de codage (101) de position qui inclut ledit codeur (100) de position, et
un circuit cible (113) d'un système électronique (110), ledit circuit cible (113) étant connecté audit circuit de codage (101) de position et étant utilisé pour commander une fonction associée audit système électronique (110);
ledit codeur (100) de position incluant un élément tournant (105) qui peut être tourné en continu d'un angle supérieur à 360 degrés dans un sens ou l'autre, ledit circuit de codage (101) de position transmettant, audit circuit cible (113), un signal $V_0$ de position de codeur indicatif dudit déplacement de rotation dudit élément tournant (105), ledit circuit de codage (101) de position disposant de données (205) indicatives d'un point préétabli virtuel, ledit point préétabli virtuel étant une position de rotation dudit élément tournant (105) qui correspond à un signal prédéterminé de position de codeur; ledit appareil comprenant en outre:
un moyen (206) qui compare ledit signal $V_0$ de position de codeur auxdites données (205) indicatives dudit point préétabli virtuel; et
un moyen (205, 206) qui établit, pour un intervalle de temps prédéterminé, ledit signal $V_0$ de position de codeur égal à un signal de position de codeur indicatif dudit point préétabli virtuel, lorsque ledit moyen de comparaison (206) détermine que ledit élément tournant (105) dudit codeur (100) de position a été tourné au-delà dudit point préétabli virtuel.

2. Un appareil selon la revendication 1, qui comprend en outre un moyen (206, 208) qui suspend pendant un intervalle prédéterminé ladite transmission dudit signal $V_0$ de position de codeur indicatif dudit déplacement de rotation dudit élément tournant (105).

3. Un appareil selon la revendication 1, dans lequel ledit codeur réglable (100) de position est un codeur numérique rotatif.

4. Un procédé de localisation d'un point préétabli virtuel dans un codeur (100) de position réglable manuellement, ledit codeur (100) de position étant inclus dans un circuit de codage (101) de position qui est connecté à un circuit cible (113) d'un système électronique (110), ledit circuit de codage (101) de position transmettant un signal $V_0$ de position de codeur audit circuit cible (113) pour commander une fonction associée audit système électronique (110), ledit codeur (100) de position incluant un élément tournant (105) qui peut être tourné en continu dans un sens ou l'autre, ledit circuit de codage (101) de position disposant de données. mémorisées (205) indicatives d'un point préétabli virtuel, ledit point préétabli virtuel étant une position de rotation dudit élément tournant (105) qui correspond à un signal prédéterminé de position de codeur; ledit procédé comprenant les étapes consistant à:

contrôler (302, 304, 306) une position dudit élément tournant (105) afin de déterminer un déplacement de rotation dudit élément tournant (105) à partir d'une position précédemment contrôlée;
mémoriser (308), dans un tampon (204), des données indicatives dudit déplacement de rotation;
engendrer (400, 402, 404) à partir desdites données dudit tampon (204) ledit signal $V_0$ de position de codeur indicatif dudit déplacement de rotation;
comparer (406) ledit signal $V_0$ de position de codeur auxdites données (205) indicatives dudit point préétabli virtuel;
transmettre (408) audit circuit cible (113) ledit signal $V_0$ de position de codeur indicatif dudit déplacement lorsque ladite étape de comparaison (406) détermine que ledit élément (105) tournant n'a pas été tourné au-delà dudit point préétabli virtuel;
suspendre (414) pendant un intervalle de temps prédéterminé ladite étape de génération (400, 402, 404) lorsque ladite étape de comparaison (406) détermine que ledit élément tournant (105) a été tourné au-delà dudit point préétabli virtuel;
transmettre (412) audit circuit cible (113), pen-



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dant ledit intervalle de temps prédéterminé où ladite étape de suspension (414) est effectuée, ledit signal $V_0$ de position de codeur indicatif dudit point préétabli virtuel; et annuler (416) toutes les données de position de codeur dans ledit tampon (204) lorsque ladite étape de suspension (414) a été effectuée, après l'expiration dudit intervalle de temps prédéterminé.

5. Un procédé selon la revendication 4, dans lequel ladite étape de suspension (414) suspend ladite étape de génération (400, 402, 404) lorsqu'il est déterminé que ledit élément tournant (105) dudit codeur (100) de position a été tourné audit point préétabli virtuel.

6. Un procédé selon la revendication 4, qui comprend l'étape consistant à agencer ledit codeur réglable (100) de position sous la forme d'un codeur numérique rotatif.

7. Un procédé selon la revendication 4 qui comprend l'étape consistant à agencer ledit codeur réglable (100) de position sous la forme d'un générateur rotatif à impulsions.

8. Un procédé selon la revendication 4 qui comprend l'étape consistant à agencer ledit codeur réglable (100) de position sous la fenêtre d'une boule roulante, d'une souris ou d'une manette tous azimuts.

9. Un procédé selon la revendication 4, qui inclut l'étape consistant à tourner ledit élément tournant (105) de codeur de position d'un angle supérieur à 360 degrés.

10. Un procédé de localisation d'un point préétabli virtuel dans un codeur (100) de position réglable manuellement, ledit codeur (100) de position étant inclus dans un circuit de codage (101) de position qui est connecté à un circuit cible (113) d'un système électronique (110), ledit circuit de codage (101) de position transmettant audit circuit cible (113) un signal $V_0$ de position de codeur afin de commander une fonction associée audit système électronique (110), ledit codeur (100) de position incluant un élément tournant (105) susceptible d'être tourné en continu dans un sens ou l'autre, ledit signal $V_0$ de position de codeur étant indicatif d'un déplacement de rotation dudit élément tournant (105), ledit circuit de codage (101) de position incluant des données mémorisées associées (205) indicatives d'un point préétabli virtuel, ledit point préétabli virtuel étant une position de rotation dudit élément tournant (105) qui correspond à un signal prédéterminé de position de codeur, ledit procédé comprenant les étapes consistant à:

contrôler (602, 604, 606) une position dudit élément tournant (105) dudit codeur (100) de position afin de déterminer un déplacement de rotation dudit élément tournant (105), à partir d'une position précédemment contrôlée;

comparer (607, 608) ledit déplacement de rotation auxdites données (205) indicatives dudit point préétabli virtuel;

mémoriser (610), dans un tampon (204), des données indicatives dudit déplacement de rotation lorsque ladite étape de comparaison (607, 608) détermine que ledit élément tournant (105) n'a pas été tourné au-delà dudit point préétabli virtuel;

mémoriser (612), dans ledit tampon (204), des données (205) indicatives dudit point préétabli virtuel lorsque ladite étape de comparaison (607, 608) détermine que ledit élément tournant (105) a été tourné au-delà dudit point préétabli virtuel;

suspendre (614) pendant un intervalle de temps prédéterminé ladite étape de contrôle (602, 604, 606) lorsque ladite étape de mémorisation (612) desdites données (205) du point préétabli virtuel est effectuée initialement; et

engendrer (206) ledit signal $V_0$ de position de codeur à partir desdites données mémorisées dans ledit tampon.



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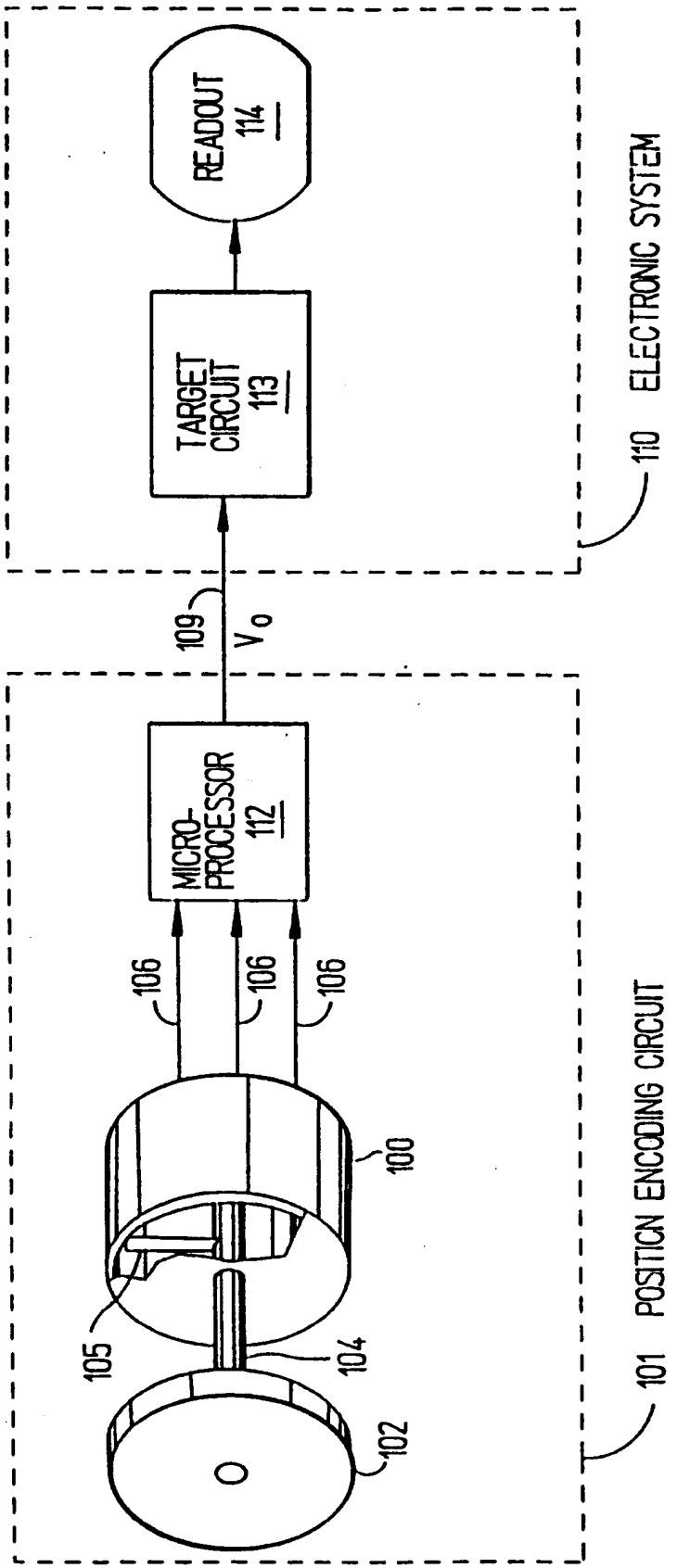



FIG 1



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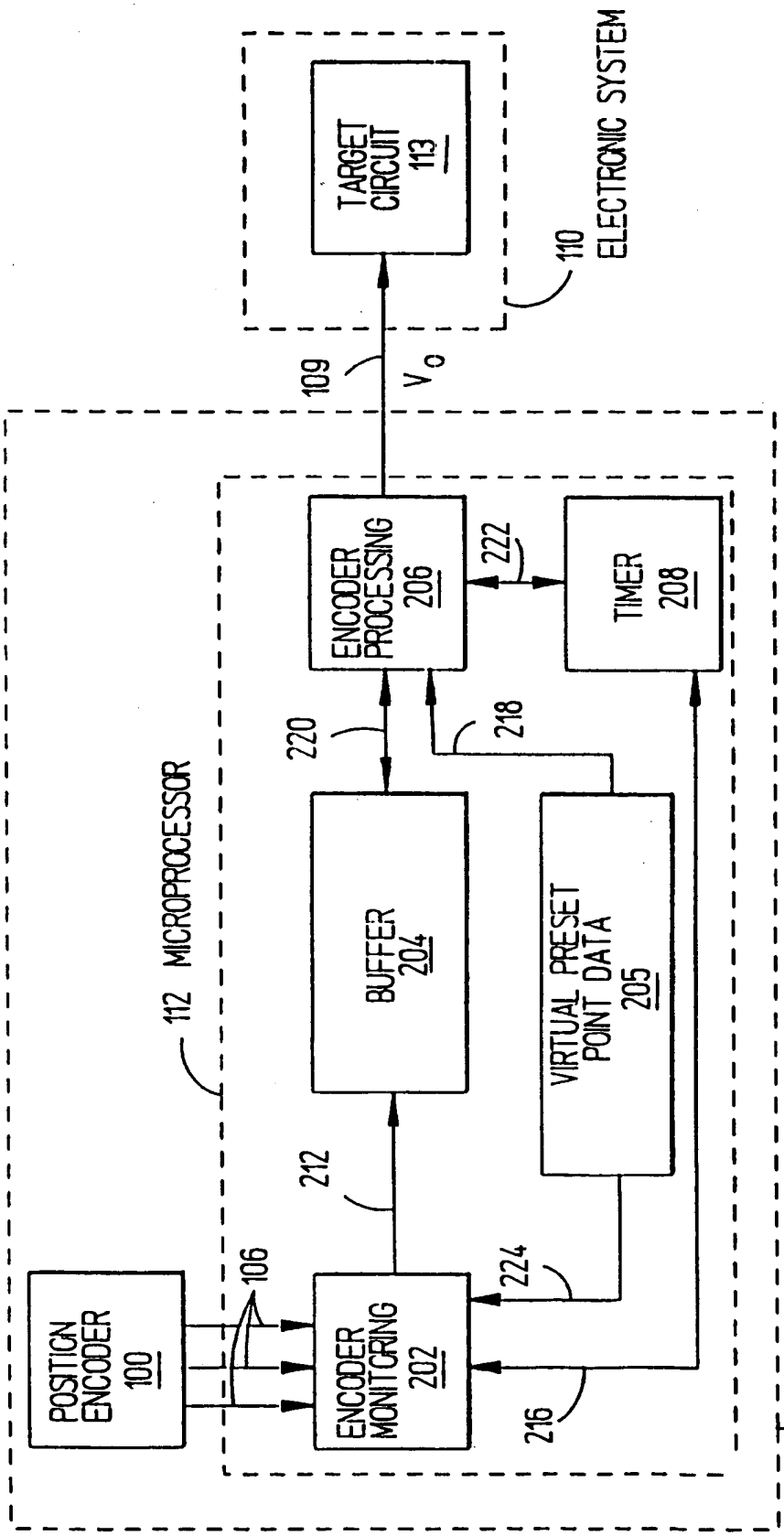
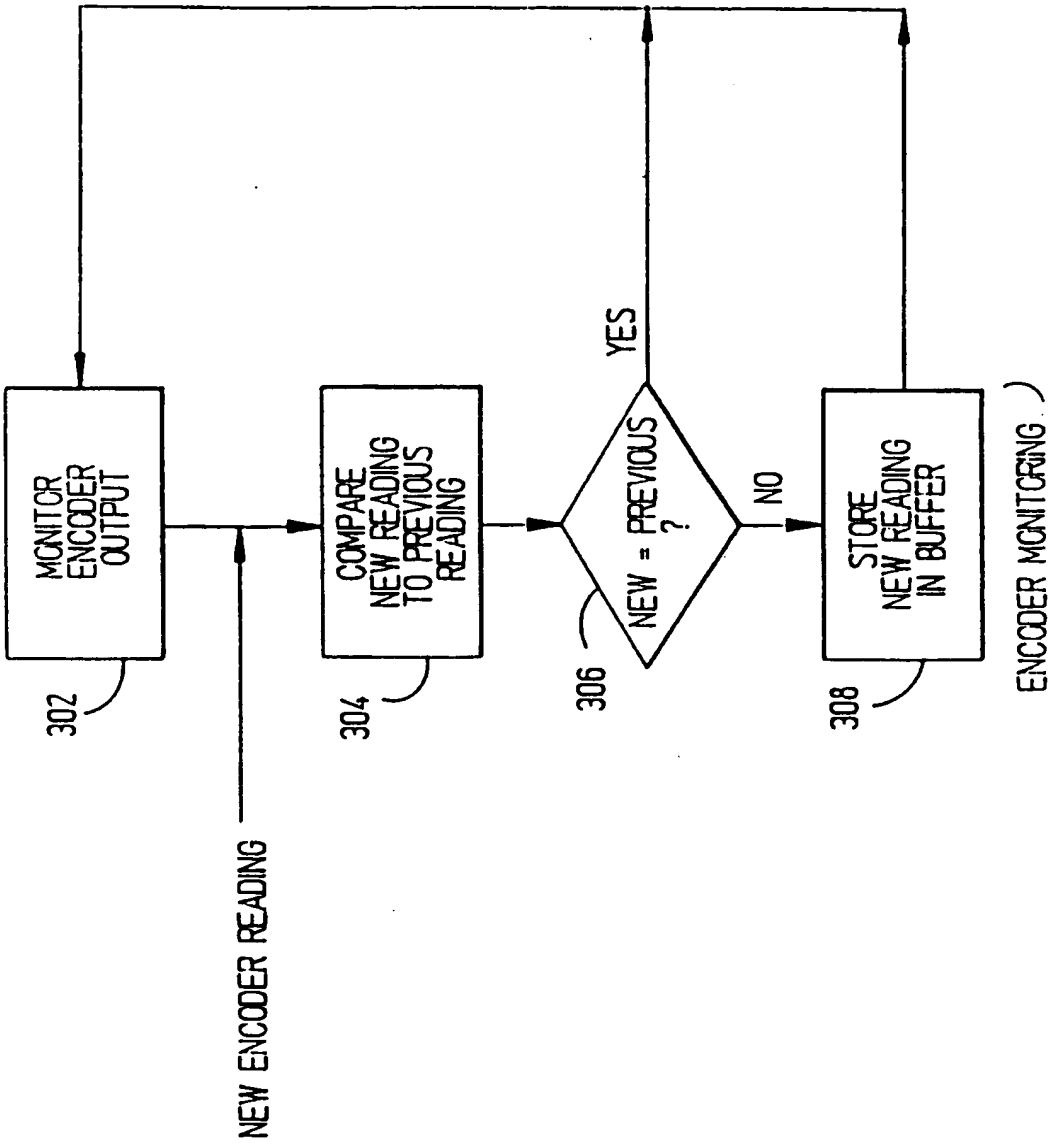



FIG 2



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FIG 3






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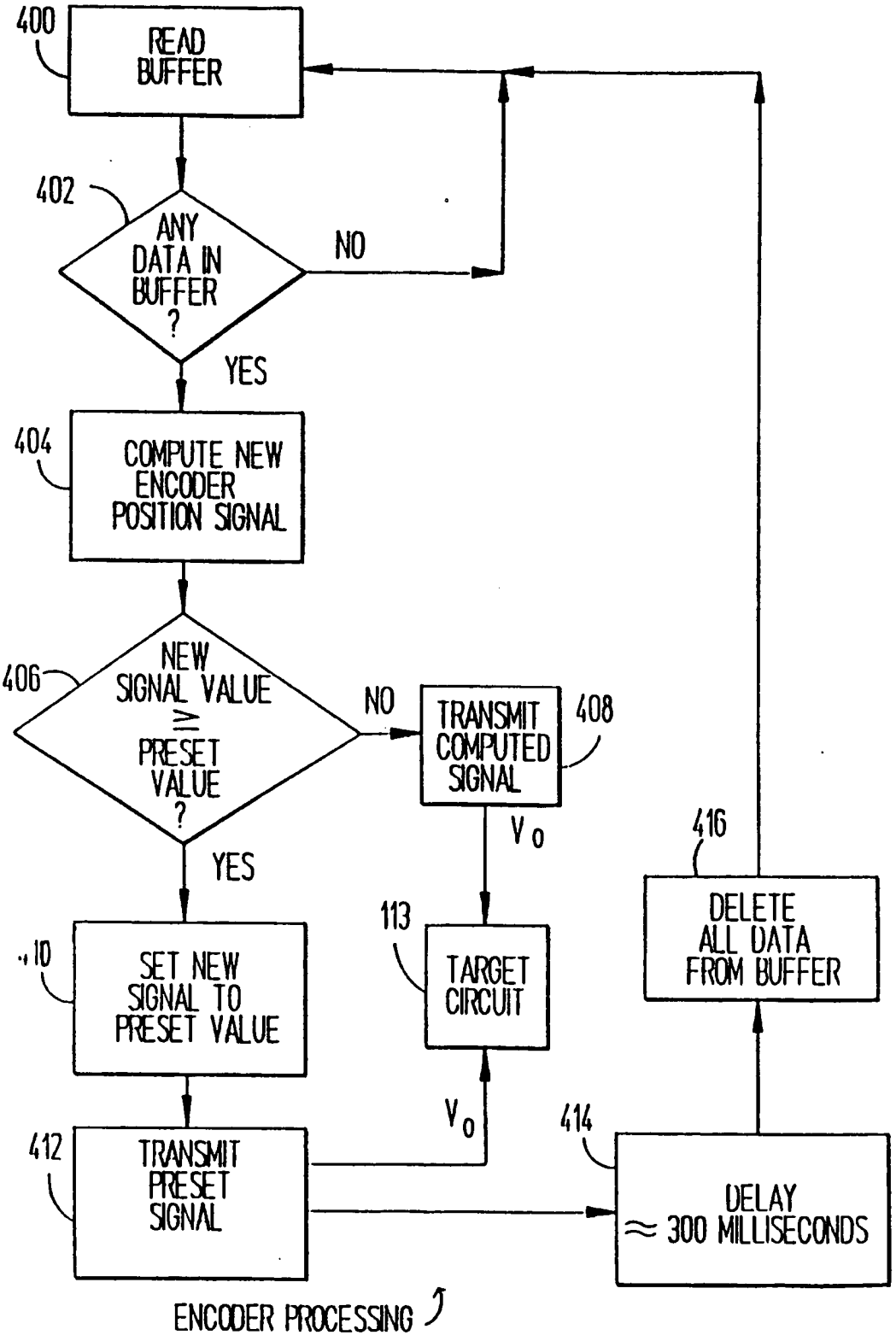



FIG 4



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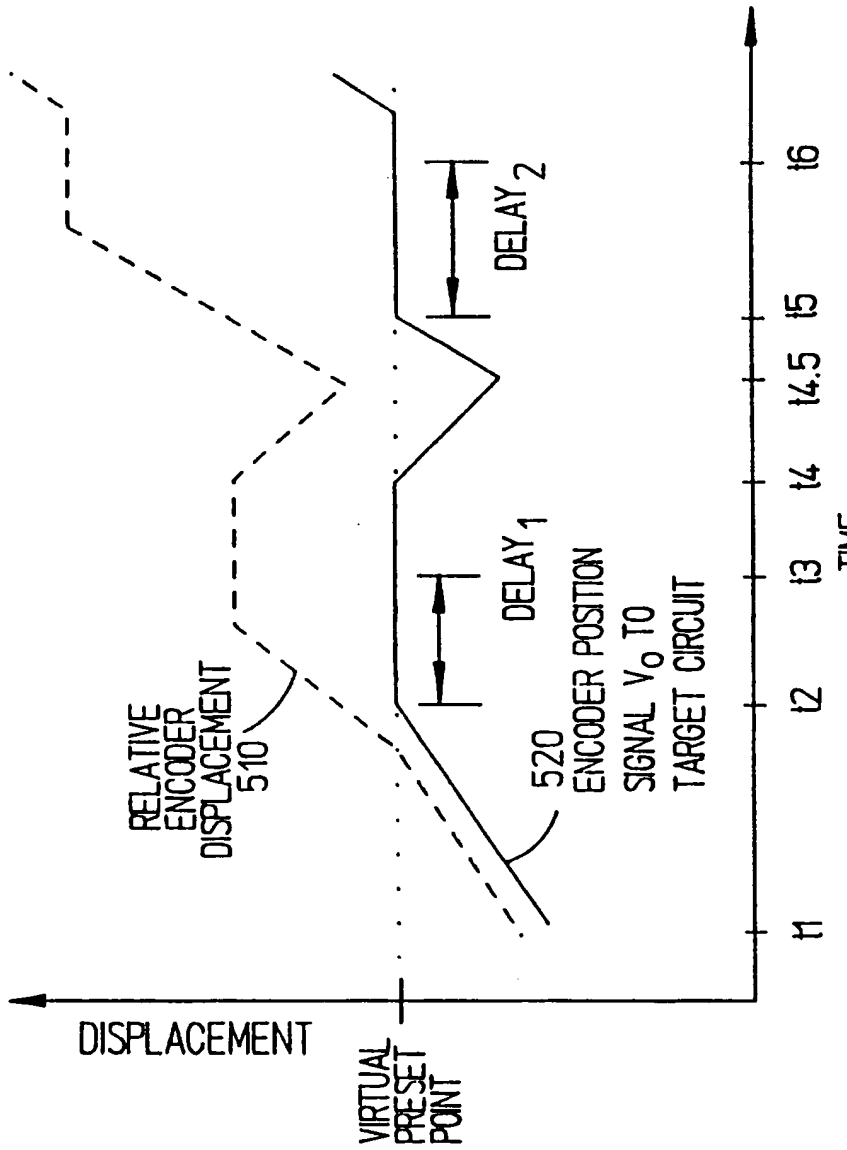



FIG 5



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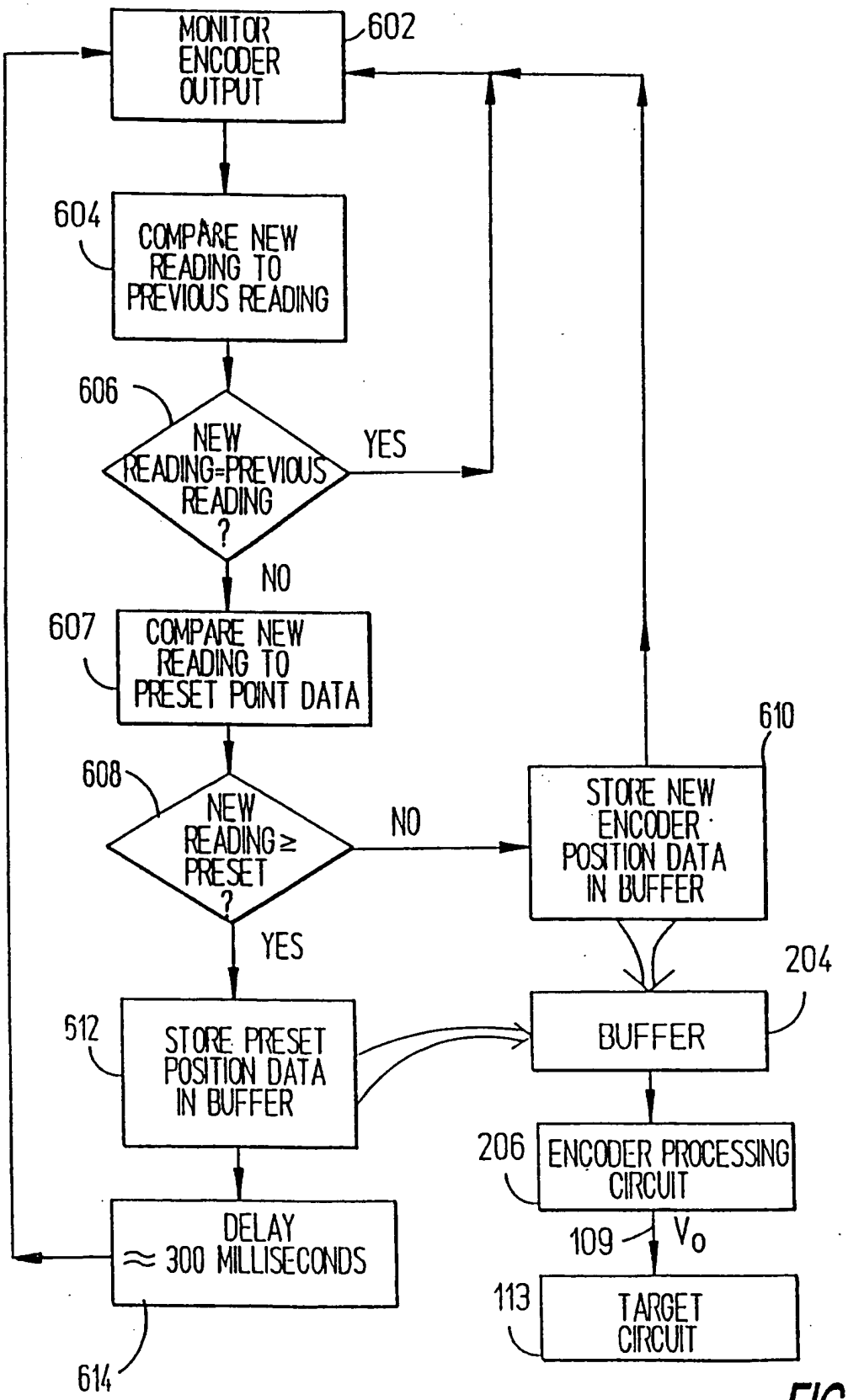



FIG 6



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**EP-A- 0 250 931**
**DE-A- 3 039 713**
**US-A- 4 224 615**
**PATENT ABSTRACTS OF JAPAN, vol. 8, no. 101 (P-273)[1538], 12 mai 1984, page 151 P 273; & JP-A-59 14 040 (CANON K.K.) 24-01-1984**

(56) Documents cités :
**PATENT ABSTRACTS OF JAPAN, vol. 8, no. 101 (P-273)[1538], 12 mai 1984, page 151 P 273; & JP-A-59 14 039 (CANON K.K.) 24-01-1984**
**IBM TECHNICAL DISCLOSURE BULLETIN, vol. 23, no. 1, juin 1980, pages 278-281, New York, US; E.L. WALKER: "Unified read/write panel"**

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**EP 0 340 096 B1**

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## Description

La présente invention concerne un afficheur, par exemple à cristaux liquides, à surface tactile incorporée, notamment pour la réalisation d'un terminal de communication, du type permettant à un opérateur de transmettre ou de recevoir des informations, par exemple dans le cadre d'un échange convivial avec un processeur.

D'une manière générale, on sait que dans le but de réaliser de tels terminaux, il a déjà été proposé de disposer sur une surface d'affichage, notamment sur l'écran d'un tube cathodique, une plage tactile transparente telle que par exemple un clavier transparent à contacts ou un système de commutation capacitif, inductif ou équivalent. Le document EP A 0 250 931 décrit notamment une plage tactile de ce genre permettant de détecter la proximité d'un élément conducteur, par effet capacitif.

Dans ce cas, la surface d'affichage peut alors servir à visualiser au travers de la plage tactile des motifs servant à délimiter des zones d'appui de cette plage faisant office de touches, selon la composition désirée. La surface d'affichage peut en outre servir à associer à ces zones d'appui des symboles ou des légendes indiquant leur fonction. Bien entendu, la position et la forme des surfaces d'appui ainsi que les légendes qui leur sont associées peuvent varier selon le mode de fonctionnement du processeur et de son programme d'application.

Or l'un des inconvénients de cette solution consiste en ce que les informations lumineuses fournies par la surface d'affichage sont inévitablement atténuées par le dispositif tactile et ne sont bien visibles que si l'axe de vision de l'opérateur se trouve bien orienté par rapport à cette surface d'affichage.

Cet inconvénient est considérablement amplifié dans le cas où la surface d'affichage est celle d'un afficheur à cristaux liquides fonctionnant par transmission ou par réflexion ou combinaison des deux effets.

On a également proposé, notamment par le brevet EP A 0 189 950,un afficheur faisant intervenir une cellule d'affichage comprenant, entre deux couches, une couche de cristal liquide apte à rendre visible une partie de sa surface sous l'effet d'une excitation électrique, un premier réseau d'électrodes disposées sur l'une des faces de ladite couche et au moins une contre- électrode disposée sur l'autre face de ladite couche. Cette contre-électrode est connectée à des moyens électroniques de mesure aptes à détecter des perturbations de capacitance au niveau de ladite contre-électrode, par suite d'une pression exercée sur la cellule. Toutefois, cet afficheur n'effectue pas de détection de proximité électrique.

L'invention a donc plus particulièrement pour but de résoudre ces problèmes en intégrant un dispositif de détection de proximité de type capacitif à la cellule de l'afficheur à cristaux liquides.

A cet effet, elle propose un afficheur à surface tactile incorporée faisant intervenir une cellule d'affichage du type comprenant, entre deux plaques rigides dont l'une au moins est en matière transparente, une couche réalisée en un ou plusieurs matériaux présentant des propriétés électro-optiques aptes à rendre visible tout ou partie de sa surface, sous l'effet d'une excitation électrique, un réseau d'électrodes disposées sur l'une des faces de ladite couche, et sur chacune desquelles peut être appliquée une tension électrique de manière à provoquer la visualisation d'un élément d'image, et une pluralité de contre-électrodes disposées sur l'autre face de ladite couche, et connectées à des circuits électroniques de mesure aptes à détecter des perturbations d'un signal électrique appliqué à ces contre-électrodes, par suite d'une sollicitation effectuée par un opérateur.

Selon l'invention, cet afficheur est caractérisé en ce que les contre-électrodes sont portées à un potentiel commun par l'intermédiaire de résistances respectives, et sont connectées à un circuit multiplexeur piloté par un calculateur de manière à distribuer séquentiellement, sur ces contre-électrodes, des paquets d'impulsions haute fréquence produits par un générateur, en ce qu'il comprend un circuit de mesure du courant absorbé lors de l'émission de chacun des paquets d'impulsions, ce circuit de mesure étant conçu de manière à transmettre au calculateur un signal en réponse à la détection d'une variation d'impédance significative de la présence d'un élément conducteur à proximité d'une contre-électrode, mais sans contact direct avec celui-ci, et en ce que l'application de la tension alternative à haute fréquence sur les contre-électrodes est synchronisée mais décalée par rapport à l'application sur les électrodes, de la tension électrique servant à provoquer la visualisation des éléments d'image.

Avantageusement, le principe de détection de proximité du doigt de l'opérateur sur une ou plusieurs contre-électrodes consistera en l'application à ces zones d'une tension haute fréquence, et par détection du courant haute fréquence dérivé à la suite de la proximité d'un doigt de l'opérateur.

Par ailleurs, la gestion des plages de détection tactile et en particulier la détermination des zones d'appui de cette plage associées à des fonctions est assurée par un calculateur.

Des modes de réalisation de l'invention seront décrits ci-après, à titre d'exemples non limitatifs, avec référence aux dessins annexés dans lesquels :

La figure 1 est une coupe transversale schématique d'un afficheur du type à matrice active, à surface tactile selon l'invention ;

La figure 2 est une vue de dessus de la métallisation servant à la fois de commun de la cellule à cristaux liquides et d'élément sensible de la surface tactile de l'afficheur représenté sur la figure 1 ;



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La figure 3 est un schéma de principe d'un circuit de commande d'un afficheur à surface tactile du type de celui représenté sur la figure 1 ;

La figure 4 est un diagramme représentatif des tensions utilisées dans le circuit représenté figure 3.

Tel que représenté sur la figure 1, l'afficheur à surface tactile présente une structure similaire à celle d'une cellule à cristaux liquides classique et comprend en conséquence, entre deux plaques en matière transparente 1, 2 une couche de cristal liquide 3, la face interne de la plaque 2 portant une pluralité d'électrodes 4, alimentées par les éléments de commande 9, disposées selon une configuration matricielle (matrice active) tandis que la face interne de la plaque 1 porte une "métallisation" 5 comparable au "commun" d'une cellule classique à cristaux liquides.

Bien entendu, selon une telle structure, l'affichage peut être obtenu soit par réflexion, soit par transmission, ou combinaison des deux effets, par l'utilisation de moyens connus : éclairage, réflecteur, etc...

Conformément à l'invention, la "métallisation" 5 est en outre utilisée en tant qu'élément sensible de manière à conférer à la plaque la fonction de surface tactile.

A cet effet, comme ceci est visible sur la figure 2, cette "métallisation" 5 est divisée en une pluralité de zones 6 respectivement reliées à des plots de connexion périphériques 7 par des plages conductrices 8. Il est clair que le nombre de zones 6 sera déterminé en fonction de la résolution de détection souhaitée. La conformation et la disposition de ces zones 6 ainsi que des plages conductrices 8 et des plots de connexion 7 peuvent être très variées.

L'exemple représenté figure 2 n'est qu'un mode d'exécution permettant d'obtenir une résolution satisfaisante.

Bien entendu, les interstices entre les zones 6 seront aussi faibles que possible de manière à ne pas diminuer la résolution de l'afficheur. Ils seront de préférence situés en regard des zones "interpixel" de cet afficheur (espacement entre les électrodes 4).

Dans l'exemple représenté sur la figure 3, l'application d'une tension d'activation sur les électrodes 4 de la matrice active est assurée par des transistors à effet de champ 9, de préférence situés à l'intérieur de la cellule. Il convient de noter à ce sujet que, bien évidemment, tout autre type d'élément de commande pourrait également être utilisé dès l'instant où il peut posséder un état haute impédance similaire. Ces transistors 9 reçoivent, sur leur gâchette, une tension de commande $V_G$ (tensions de lignes de la matrice) et sur leur source, une tension de source $V_S$ (tensions de colonnes de la matrice), ces deux tensions étant délivrées par un générateur d'alimentation des éléments d'image 15 piloté par un signal de synchronisation élaboré (bloc 16) à partir d'un calculateur 12. Parallèlement, sur chacune des zones 6 du "commun" est appliqué un potentiel commun de valeur moyenne $V_1$.

Dans cet exemple, le procédé de détection de proximité du doigt de l'opérateur sur une ou plusieurs plages consiste :

- à appliquer en outre séquentiellement sur chacune des zones 6 un potentiel alternatif haute fréquence $V_2$, de préférence à nombre entier d'alternances, déterminé de telle façon qu'il n'altère pas la valeur moyenne du potentiel $V_1$ et ne perturbe pas le milieu cristallin de la cellule,
- à mesurer le courant haute fréquence dérivé consécutif à une variation d'impédance de la charge, (ou à effectuer la mesure de cette variation),
- à assurer un pilotage de la surface tactile au moyen d'un dispositif ayant pour rôle, outre la commande, de réaliser et d'interpréter la mesure de courant pour en déduire la zone de détection sollicitée.

A cet effet, les n zones 6 de la "métallisation" 5 sont reliées, d'une part, à un potentiel commun $V_1$ à travers n résistances R et, d'autre part, à un circuit multiplexeur, par exemple analogique, 11 piloté par le calculateur 12, et dont le rôle est de distribuer des paquets d'impulsions ou d'ondes haute fréquence produits par un générateur 13 à une cadence et une périodicité appropriées.

Un circuit de mesure 14 du courant absorbé lors de l'émission de chacun des paquets d'impulsions transmet alors au calculateur 12 un signal lui permettant de déterminer une zone 6 sollicitée et qui a, de ce fait, engendré une variation significative du courant détecté.

On comprendra aisément que, bien que liés par construction, les deux systèmes (affichage/détection tactile) doivent être alimentés de façon telle que l'un des systèmes ne vienne pas perturber l'autre.

A cet effet, comme ceci se trouve illustré sur la figure 4, l'application du potentiel $V_2$ (visible sur la courbe $V_{com}$ qui correspond à la tension appliquée à une électrode 6 située au-dessus d'une zone de pixels sélectables par les lignes 1 et 2 de la matrice) est synchronisée sur le signal de commande $V_G$ des transistors 9, de telle façon qu'aucun transistor 9 situé sous une zone 6 ne soit activé, et soit à l'état haute impédance lors de l'application de la tension $V_2$ à cette zone. De cette façon, il n'y a pas de modification du champ électrique dans les condensateurs constitués par les électrodes 4 et les zones 6, les transistors 9 situés sous une zone 6 étant à l'état ouvert lors de l'émission de la tension $V_2$ sur cette zone 6.

Dans cet exemple, la tension de commande $V_G$ d'une ligne de n pixels se présente sous la forme d'un signal périodique à créneaux rectangulaires de période $t_1$, tandis que la tension $V_S$ appliquée à la source des transistors 9 présente une forme crénelée à trois niveaux de tensions $V_1$, $2V_1$ et 0.



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Ces deux signaux sont alors agencés de manière à ce que l'activation d'un pixel puisse être obtenue grâce à la mise en phase de $V_G$ sur les niveaux 0 et $2V_1$ de $V_S$, de manière à obtenir sur l'électrode 4 correspondante un signal crénelé $V_E$ d'amplitude $2V_1$ et de période déterminée par le nombre de lignes à sélecter (ce signal $V_E$ correspondant ici à la tension présente sur l'électrode 4 sélectée par activation de la ligne No 1 par le signal $V_G$).

Dans ce cas, la différence de potentiel $V_1 - V_E$ (signal de tension $V_{LCD}$) entre cette électrode 4 et la zone 6 se présentera sous la forme d'un signal alternatif d'amplitude + ou - $V_1$ et de période $2t_1$ qui assure l'excitation du pixel.

Par contre, lorsque les signaux $V_G$ et $V_S$ sont en phase sur les niveaux $V_1$ de $V_S$, la différence de potentiel $V_1 - V_E$ entre cette électrode 4 et la zone 6 correspondante se maintiendra à une valeur nulle de sorte que le pixel sera inactivé.

Il est clair que l'afficheur à cristaux liquides et à surface tactile incorporé tel que celui précédemment décrit peut être utilisé dans de nombreuses applications.

Ainsi, il pourra notamment servir à la réalisation d'un terminal de communication à composition variable pouvant, par exemple, comprendre au moins une aire d'affichage capable d'afficher des informations sous la forme de symboles, d'image ou de texte, et au moins une région permettant à l'opérateur de transmettre des informations, cette région incluant alors des plages tactiles pouvant comprendre une ou plusieurs zones de détection 6, délimitées et, éventuellement, identifiées par des motifs obtenus par une excitation appropriée des pixels de la cellule à cristaux liquides.

L'aire d'affichage et les plages tactiles de ladite région pourront en outre être délimités par une grille amovible pouvant être choisie parmi une pluralité de grilles de conformation différente. Dans ce cas, ce terminal pourra comprendre des moyens d'identification de la grille et des moyens permettant de configurer automatiquement la ou les aires d'affichage et/ou les plages tactiles en fonction de la grille utilisée.

## Revendications

1. Afficheur à surface tactile incorporée faisant intervenir une cellule d'affichage du type comprenant, entre deux plaques rigides dont l'une au moins est en matière transparente, une couche (3) réalisée en un ou plusieurs matériaux présentant des propriétés électro-optiques aptes à rendre visible tout ou partie de sa surface, sous l'effet d'une excitation électrique, un réseau d'électrodes disposées sur l'une des faces de ladite couche, et sur chacune desquelles peut être appliquée une tension électrique de manière à provoquer la visualisation d'un élément d'image,et une pluralité de contre-électrodes (6) disposées sur l'autre face de ladite couche et connectées à des circuits électroniques de mesure aptes à détecter des perturbations d'un signal électrique ($V_2$) appliqué à ces contre-électrodes (6), par suite d'une sollicitation effectuée par un opérateur, caractérisé en ce que les contre-électrodes (6) sont portées à un potentiel commun par l'intermédiaire de résistances respectives (R), et sont connectées à un circuit multiplexeur (11) piloté par un calculateur (12) de manière à distribuer séquentiellement, sur ces contre-électrodes, des paquets d'impulsions haute fréquence ($V_2$) produits par un générateur (13), en ce qu'il comprend un circuit de mesure (14) du courant absorbé lors de l'émission de chacun des paquets d'impulsions, ce circuit de mesure (14) étant conçu de manière à transmettre au calculateur (13) un signal en réponse à la détection d'une variation d'impédance significative de la présence d'un élément conducteur à proximité d'une contre-électrode (6), mais sans contact direct avec celui-ci, et en ce que l'application de la tension alternative à haute fréquence ($V_2$) sur les contre-électrodes (6) est synchronisée mais décalée par rapport à l'application sur les électrodes (4), de la tension électrique servant à provoquer la visualisation des éléments d'image.

2. Afficheur selon la revendication 1, caractérisé en ce que la susdite cellule d'affichage est de type à cristaux liquides, en ce que la susdite couche est une couche de cristal liquide (3), et en ce que les susdites contre-électrodes (6) sont portées à un potentiel commun ($V_1$).

3. Afficheur selon l'une des revendications 1 et 2, caractérisé en ce que la couche de cristal liquide (3) est disposée entre deux plaques (1, 2) en matière transparente, la face interne de l'une de ces plaques (2) portant les susdites électrodes (4), et la face interne de l'autre plaque (1) portant une "métallisation" (5) divisée en une pluralité de zones constituant chacune une contre-électrode (6).

4. Afficheur selon la revendication 3, caractérisé en ce que les interstices entre les contre-électrodes (6) sont situés en regard des zones comprises entre les éléments d'image déterminés par les électrodes (4) du premier réseau.

5. Afficheur selon l'une des revendications 1 à 4, caractérisé en ce que la tension électrique, appliquée à une électrode en vue de provoquer la visualisation d'un élément d'image, est transmise



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par au moins un élément de commande (9) intégré ou non à la cellule, et capable d'isoler ladite électrode.

6. Afficheur selon l'une des revendications précédentes,
caractérisé en ce que le calculateur (12) commande le générateur (13), de façon à ne délivrer les paquets d'impulsions ($V_2$) sur une contre-électrode (6) que lorsque tous les éléments de commande (9) des électrodes (4) situées sous cette contre-électrode (6) sont, à cet instant, à l'état haute impédance.

7. Afficheur selon la revendication 1,
caractérisé en ce que le calculateur (12) assure la synchronisation du circuit multiplexeur (11), et d'un générateur d'alimentation des éléments d'image (15).

**Patentansprüche**

1. Anzeigegerät mit integrierter Tastoberfläche, das eine Anzeigezelle von der Art verwendet, die zwischen zwei steifen Platten, von denen mindestens eine aus einem transparentem Material ist, eine Schicht (3) aus einem oder mehreren Werkstoffen mit elektro-optischen Eigenschaften, welche unter der Wirkung einer elektrischen Erregung ihre ganze oder einen Teil ihrer Oberfläche sichbar machen, ein Netz von Elektroden, die auf einer der Seiten der Schicht angeordnet sind und an jede von denen eine elektrische Spannung angelegt werden kann, um die Sichtbarmachung eines Bildelements zu bewirken, und eine Vielzahl von Gegenelektroden (6) aufweist, die auf der anderen Seite der Schicht angeordnet und an elektronische Meßkreise angeschlossen sind, welche Störungen eines an diese Gegenelektroden (6) angelegten elektrischen Signals ($V_2$) aufgrund einer Beanspruchung durch eine Bedienungsperson erfassen können, dadurch gekennzeichnet, daß die Gegenelektroden (6) je über Widerstände (R) auf ein gemeinsames Potential gebracht werden und mit einer Multiplexschaltung (11) verbunden sind, die von einem Rechner (12) gesteuert wird, um sequentiell auf diese Gegenelektroden von einem Generator (13) erzeugte Impulspakete hoher Frequenz ($V_2$) zu verteilen, daß es einen Meßkreis (14) des bei der Aussendung jedes der Impulspakete absorbierten Stroms aufweist, wobei dieser Meßkreis (14) so gestaltet ist, daß er zum Rechner (13) ein Signal als Antwort auf die Erfassung einer Impedanzveränderung überträgt, die das Vorhandensein eines leitenden Elements in der Nähe einer Gegenelektrode (6), aber ohne direkten Kontakt mit diesem bedeutet, und daß das Anlegen der Wechselspannung hoher Frequenz ($V_2$) an die Gegenelektroden (6) synchronisiert, aber in Bezug auf das Anlegen der zur Sichtbarmachung der Bildelemente dienenden elektrischen Spannung an die Elektroden (4) verschoben ist.

2. Anzeigegerät nach Anspruch 1, dadurch gekennzeichnet, daß die Anzeigezelle von der Art mit Flüssigkristallen ist, daß die Schicht eine Flüssigkristallschicht (3) ist, und daß die Gegenelektroden (6) auf ein gemeinsames Potential ($V_1$) gebracht sind.

3. Anzeigegerät nach einem der Ansprüche 1 und 2, dadurch gekennzeichnet, daß die Flüssigkristallschicht (3) zwischen zwei Platten (1, 2) aus transparentem Material angeordnet ist, wobei die Innenseite einer dieser Platten (2) die Elektroden (4) trägt und die innere Seite der anderen Platte (1) eine "Metallisierung" (5) trägt, die in eine Vielzahl von Zonen eingeteilt ist, die je eine Gegenelektrode (6) bilden.

4. Anzeigegerät nach Anspruch 3, dadurch gekennzeichnet, daß die Lücken zwischen den Gegenelektroden (6) sich gegenüber den Zonen befinden, die von den durch die Elektroden (4) des ersten Netzes bestimmten Bildelementen eingeschlossen werden.

5. Anzeiger nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß die elektrische Spannung, die an eine Elektrode zur Sichtbarmachung eines Bildelements angelegt wird, durch mindestens ein Steuerelement (9) übertragen wird, das in die Zelle integriert ist oder nicht und die Elektrode isolieren kann.

6. Anzeigegerät nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der Rechner (12) den Generator (13) steuert, um die Impulspakete ($V_2$) erst dann an eine Gegenelektrode (6) zu liefern, wenn alle Steuerelemente (9) der Elektroden (4), die sich unter dieser Gegenelektrode (6) befinden, in diesem Augenblick im Zustand hoher Impedanz sind.

7. Anzeigegerät nach Anspruch 1, dadurch gekennzeichnet, daß der Rechner (12) die Synchronisierung der Multiplexschaltung (11) und eines Speisegenerators der Bildelemente (15) bewirkt.

**Claims**

1. A display device incorporating a touch-sensitive surface using a display cell of the type compris-



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ing, between two rigid plates of which at least one is in transparent material, a layer (3) made from one or more materials having electro-optical properties capable of rendering visible all or part of its surface, under the effect of an electrical excitation, a network of electrodes disposed on one of the sides of said layer, and to each of which can be applied an electrical voltage so as to cause a visualization of a pixel, and a plurality of counter-electrodes (6) disposed on the other side of said layer, and connected to electronic measuring circuits capable of detecting perturbations of an electrical signal ($V_2$) applied to these counter-electrodes (6), subsequent to a solicitation on the part of the operator,
characterized in that the counter-electrodes (6) are brought up to a common potential through respective resistors (R), and are connected to a computer-piloted (12) multiplexing circuit (11) so as to sequentially distribute, to these counter-electrodes, packets of high-frequency pulses ($V_2$) produced by a generator (13), in that it comprises a circuit (14) for measuring the current absorbed when each of the packets or pulses is emitted, said measuring circuit (14) being designed so as to transmit to the computer (12) a signal in response to the detection of an impedance variation signifying the presence of a conductive element near a counter-electrode (6), though without direct contact with the latter, an in that the applying of a high-frequency alternating voltage ($V_2$) to the counter-electrodes (6) is synchronized though offset with regard to the applying to the electrodes (4) of the electrical voltage serving to cause the visualizing of the pixels.

2. The display device as claimed in claim 1, characterized in that said display cell is of the liquid crystal type, in that said layer is a layer of liquid crystal (3), and in that said counter-electrodes (6) are brought up to a common potential ($V_1$).

3. The display device as claimed in either claim 1 or 2,
characterized in that said layer of liquid crystal (3) is disposed between two plates (1, 2) in transparent material, the inner side of one of said plates (2) bearing said electrodes (4), and the inner side of said other plate (1) bearing a "metallization" (5) divided into a plurality of zones each constituting a counter-electrode (6).

4. The display device as claimed in claim 3,
characterized in that the gaps between said counter-electrodes (6) are situated opposite zones included between the pixels determined by the electrodes (4) of the first network.

5. The display device as claimed in any one of claims 1 to 4,
characterized in that said electrical voltage, applied to an electrode with a view to causing visualization of a pixel, is transmitted by at least one control element (9) integrated in said cell or not, and capable of insulating said electrode.

6. The display device as claimed in any one of the previous claims,
characterized in that said computer (12) commands the generator (13), so as to only supply said packets of pulses ($V_2$) to a counter-electrode (6) when all said control elements (9) of said electrodes (4) situated below said counter-electrode (6) are, at that instant, in the high impedance state.

7. The display device as claimed in claim 1, characterized in that said computer (12) ensures the synchronization of said multiplexing circuit (11), and of a generator of power to the pixels (15).



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FIG.1

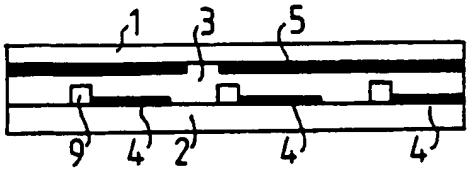



FIG.2

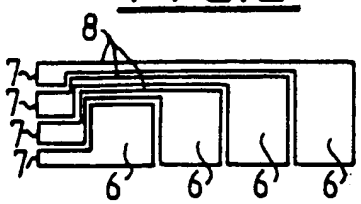
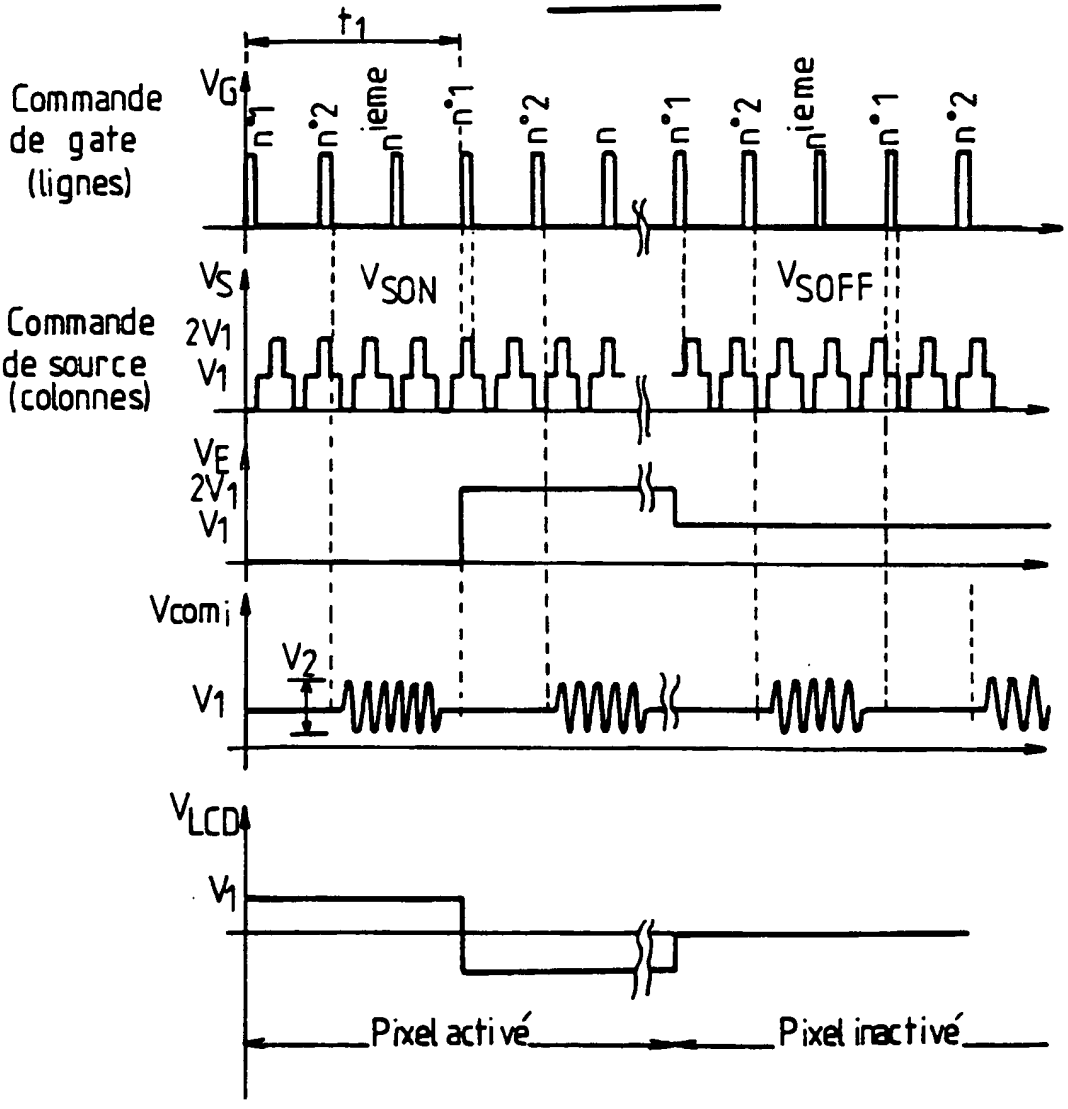


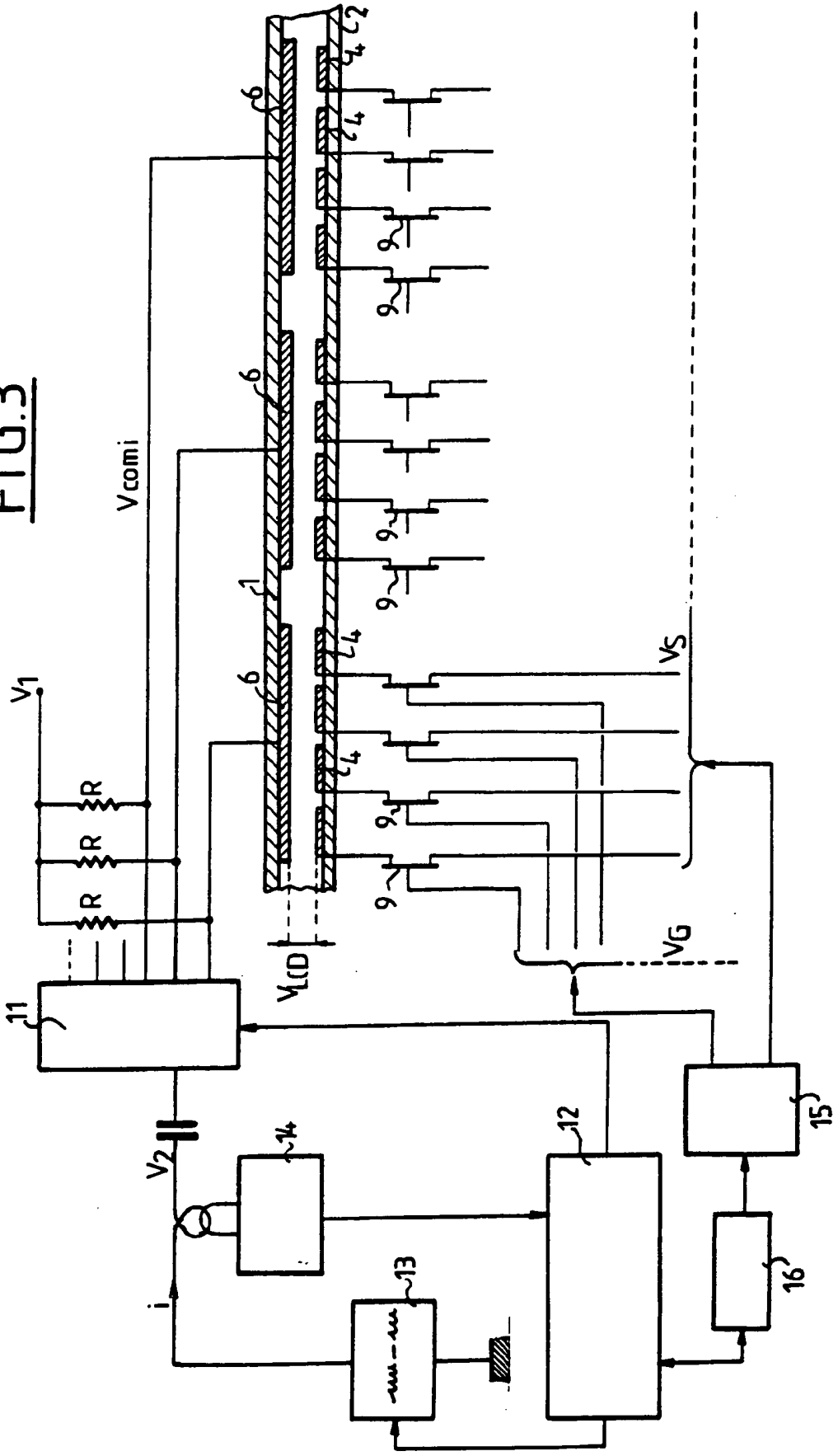

FIG.4






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FIG.3






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## (54) Apparatus and method for marking text on a display screen in a personal communication device

(57) Provided is a personal communications device having a touch sensitive display screen, in which text may be marked by a user to be used with different applications. In particular, to begin marking, a user has to maintain his touch at a location on the screen for a short predetermined period of time until the system detects that the position is held over the same character for a delayed period, at which time the system beeps to provide an indication that there has been a change of operation mode. The marking mode continues in operation until the user removes his contact from the touch screen. Thus, text over which the contact point passes after the initiation of the marking mode is marked, until the user removes his contact point from the touch screen. A second beep is sounded to alert the user of the termination of the marking mode, and the appearance of a menu of operations on the screen. The menu of operations echoes the marked text for user confirmation. The marked text may be used by the user in a number of applications, among which include a calling application whereby the marked text is used to place a call.

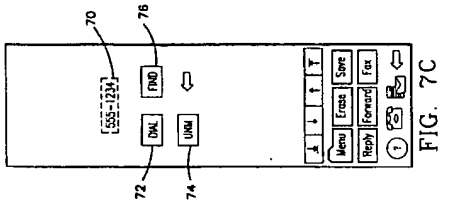



FIG. 7C

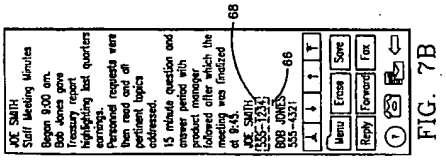



FIG. 7B

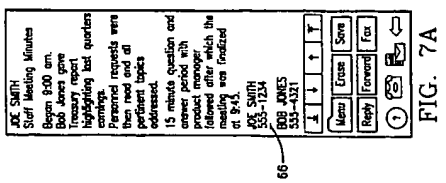



FIG. 7A

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## Description

### FIELD OF THE INVENTION

The present invention relates to data processing system and more particularly to a personal data processing and communications system that has a touch sensitive display screen.

### BACKGROUND OF THE INVENTION

This invention relates to a co-pending application entitled "Field Programming Apparatus and Method for Updating Programs in a Personal Communications Device" assigned to the same assignee of the instant application. The disclosure of the just noted application is incorporated by reference herein.

As disclosed in the just noted application, a personal communications device SIMON, announced by the IBM Corporation in 1994, includes many features for facilitating personal communications. As shown in Figs. 1 and 2, the SIMON personal communications device 2 includes the facilities of a cellular telephone and of an electronic pager. In addition, it is capable of facsimile transmission and reception, as well as electronic mail sending and receiving. Moreover, a computer note pad, address book and calendar are all provided within the system 2.

As shown, system 2 has a speaker 4, an on and off switch 6, volume adjust switches 8a and 8b, a touch sensitive screen 10, a PCMCIA card receptacle slot 12, a PCMCIA card release switch 14, a battery pack 16, an input/output connector 18 and a microphone 20. Also provided with the system is a stylus 22, which may be used to interact with touch sensitive screen 10. It should be noted, however, that in place of stylus 22, a user can also use his finger. To act as a cellular device, an antenna 24 is extendable from the body of the device 2.

Inasmuch as data is stored in the SIMON device (for example in the address book) and the device itself is capable of receiving different types of messages via fax and E-mail messages, to be useful, it becomes incumbent that the data can easily be retrieved by the user. This is particularly true in instances where telephone numbers are to be referenced from the display screen. A need therefore arises for a user to be able to efficiently extract and use relevant information from either the received messages or previously stored data directly from the display screen.

### SUMMARY OF THE INVENTION

In a first aspect, the present invention provides, in a computer system having a display screen responsive to contact thereto, a method of marking information displayed on said display screen for selective applications comprising the steps of: (a) sensing contact to said screen to establish a start position; (b) sensing said contact being maintained at said start position for a predetermined period of time to initiate a mark mode; (c) marking the information displayed on said screen over which said contact traverses from said start position after initiation of said mark mode; (d) terminating said mark mode when said contact is removed from said screen.

In a second aspect, the invention provides a computer system comprising: a touch sensitive display screen; means for responding to contact with a first location on said screen; means for initiating a mark mode when said contact with said first location on said screen exceeds a predetermined period of time; means for marking the data displayed on the areas of said screen over which said contact is moved from said first location after initiation of said mark mode, said mark mode being terminated when said contact is removed from said screen.

According to a preferred embodiment of the invention, to be able to efficiently retrieve particular data being displayed, a user can mark the number or text that he desires by initiating a mark mode on the touch overlay membrane of the display. To initiate the mark mode, the user has to touch the screen so as to bring the cursor directly under the point of contact. Thereafter, the cursor becomes responsive to the touch on the display. If the user at this time touches the screen and then slides his finger (stylus), the cursor will follow the movement of the sliding contact point. To mark text (which includes letters, numbers and spaces), the user needs to point to the beginning of the text that he wants to mark. Once the cursor is at the start of the desired text, the user would continue to touch the same position for a short period of time (which for this invention may for example be approximately 0.5 to 1.0 second). At the end of which time the system changes from a cursor sliding operation mode to a cursor mark mode. The device then sounds a beep to indicate that it has entered the mark mode.

Upon initiation of the mark mode, text over which the finger moves is marked and a character count thereof is stored. When the user reaches the end of the text he wishes to mark, he releases his contact point with the display. At this time a beep having a second tone that is different from the first beep sounds from the device to indicate to the user that the marked text is accepted (i.e. the termination of the mark mode). A menu of operations, represented by either function keys or icons, now appears on the display. At or about the same time, the marked text is displayed in a pop-up window to enable the user to verify that the desired text has been marked correctly. Upon confirmation of the marked text, the user can press any one of the function keys or icons to begin an application that utilizes the marked text. When an activated application is the call application and the marked text is a telephone number, a call is made to the telephone number through the communications interface incorporated within the device.

The present invention thus provides a user with an efficient method of marking desired text on a touch sensitive screen.

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The present invention preferably provides a user with the ability to retrieve displayed information for use in any one of a number of applications. The present invention preferably also provides a user with the ability of marking text from received messages and previously stored data.

The present invention will now be described in more detail by way of example with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a personal communications device according to the invention;

Figure 2 is a plan view of the Figure 1 device;

Figure 3 is an enlarged view of one of the available display screens of the Figure 1 device;

Figure 4 is another example display screen of the Figure 1 device;

Figure 5 is a simplified block diagram of the different components of the Figure 2 device which are relevant to the instant invention;

Figure 6 is a broad overview, via different display screens, illustrating an embodiment of the instant invention;

Figures 7A-7C illustrate the process of marking desired text on a display screen; and

Figure 8 is a flow chart identifying the different processing steps of the instant invention method.

## DETAILED DESCRIPTION OF THE INVENTION

With reference to Fig. 3, the display 10 of the personal communications device of the instant invention can be selected to have a phone screen, by the user pressing the phone icon 26 at the bottom of the screen, which enables the user to use device 2 as a cellular telephone. A more detailed discussion of the touch sensitive display is given in patent applications entitled "Personal Communicator Having Improved Contrast Control For A Liquid Crystal, Touch Sensitive Display" and "Personal Communicator Having Improved Zoom and Pan Functions for Editing Information on Touch Sensitive Display", both assigned to the same assignee of the instant invention and filed on November 1, 1993. The respective disclosures of those applications are incorporated herein by reference.

When icon 28 is touched at the bottom of the screen, the mobile office screen shown in Fig. 4 is displayed. As can be seen, there are a number of different applications which the data processing system of device 2 is capable of. For example, device 2 has its own calendar and note pad, as well as a filer and an address book. In addition, it is capable of E-mail operation via the icon entitled "Mail" and a facsimile operation via the icon entitled "Fax".

To enable the device to perform the variety of communications, different communications links besides the radio link provided by the cellular telephone are also integrated to device 2. These different types of communication links are described in the above referenced co-pending application.

A more detailed discussion of the integrated communications interface subsystem incorporated within device 2 is given in part, or all, in the following co-pending applications: "Integrated FAX Send/Receive on Cellular and PSTN" (IBM Docket No. BC9-94-099), "Consistent User Interface for Cellular and PSTN Environments" (BC9-94-097), and "Modem Ring Indicate Signal From Either PSTN or Cellular System" (BC89-94-101). All of the just noted applications are assigned to the same assignee as the instant invention and their respective disclosures are incorporated by reference to the instant disclosure.

Fig. 5 is a simplified block diagram of device 2 of the instant invention which illustrates components only relevant to the instant invention. (A more detailed illustration of the different components of device 2 may be gleaned from the first referenced so-pending application). As shown, connect to the system bus 30 of the instant invention system is a processing unit 32. A number of different types of memories such as RAM 34, EPROM 36 and additional memory 38 are also connected to system bus 30. Memory 38 may be in the form of a PCMCIA (personal computer memory card international association) standard card inserted to receptacle slot 12 of device 2. See Fig. 1. Memory 38 may include extra RAM or ROM for storing additional data to be used in the system. EPROM 36 has stored therein a number of applications among which are the ones mentioned and referenced as icons in the mobile office screen of Fig. 4. RAM 34 is the working memory for CPU 32.

Also connected to system bus 30 and being controlled by CPU 32 is a touch screen controller 40 whose function is influenced by a counter 42, which may actually be the system clock. Being controlled by touch screen controller 40 is a tone generator 44. Further connected to touch screen controller 40 is a screen touch overlay 46 (referenced in the aforenoted applications filed on November 1, 1993) that senses pressurized contact, i.e. contacts made on display 10. A LCD display 10, superimposed by touch overlay 46, is also connected to bus 30 to be controlled by CPU 32.

Further connected to system bus 30 is an integrated cellular and PSTN interface 50 which, for the discussion of this invention, comprises a cellular link as exemplified by antenna 52, a conventional type of serial port, conventional telephone jacks and a modem for data/fax communication. A more detailed discussion of the various features of the communications subsystem of device 2 is given the first referenced co-pending application.

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The operation of the instant invention system is discussed with reference to Fig. 6, which shows an exemplar E-mail message received by the system. As shown, screen 6A of Fig. 6 displays the main menu representing the "Mail" icon shown in the mobil office screen of Fig. 4. Note that this screen is retrieved from system memory EPROM 36 and provides the user the option of viewing three different types of messages, namely the "Received Messages", the "Ready to Send" messages and the "Saved Messages". Screen 6B shows the three E-mail messages that have been received by device 2. To retrieve screen 6B from screen 6A, the function key entitled "Received Messages" was pressed by the user.

When the user wants to view a particular message, he presses the block that outlines the message. For example, when the user presses the block with heading "Joe Smith", the message relating to Joe Smith is displayed, such as for example in screen 6C. As shown, screen 6C is divided into two areas, namely a text area 62 and a function area 64. Text which includes numbers, letters and spaces are displayed in area 62, whereas a number of function keys and icons are displayed in area 64. Thus, by touching the back arrow icon, the display of device 2 would revert from screen 6C to screen 6B. In the same vein, if the telephone icon is pressed, the phone screen illustrated in Fig. 3 appears. Likewise, if the mobile office icon (shown to include an envelope in front of a pad) is pressed, the mobile office screen shown in Fig. 4 would appear. The question mark icon, if pressed, provides for queries. The shown function and the arrow keys are believed to be self-explanatory.

Because of the communications nature of device 2, to be able to mark a particular portion of the information displayed on the text area would be useful. This ability to mark text is of particular import for E-mail and other types of written notes such as those in the "Note Pad". It is moreover desirable to be able to key in particular text from messages without having to jot it down on paper. Prior to the instant invention, if a user wants to dial a phone number displayed on a screen, he would first need to jot down the number. Thereafter he has to return to the phone screen. It was only after then would the user be able to dial the number. This was found to be inefficient.

For the instant invention, instead of having to copy the desired text, the user can directly mark the text on the screen for further application. The inventive method is discussed with reference to Fig. 7a-7c.

As shown in Fig. 7a, appended to the bottom of Joe Smiths' staff meeting minutes are the telephone numbers for both Joe Smith and Bob Jones, the person who gave the treasury report highlights. If the user wants to find out additional information in regard to the staff meeting, he would naturally want to call up either Joe Smith or Bob Jones. Suppose he wants to talk to Joe Smith. He can easily accomplish this by first positioning the cursor 66 on the screen to the start position of the text that he wants to mark, which in this instance is the phone number of Joe Smith. This he does by touching the screen and moving his finger (or stylus) to the first number of Joe Smiths' telephone number, as at this time the system is in the cursor sliding mode and is programmed to follow the contact point on the screen. As shown in Fig. 7A, cursor 66 is positioned underneath the first "5" of Joe Smiths' telephone number. At this time, the system remains in the cursor sliding mode, that is, the cursor is responsive to and continues to follow the movement of the user's finger.

Because the user wants to mark the telephone number for later use, he needs to initiate the "marking mode" of the system. This he does by holding his finger at the same location of the screen for a predetermined period of time. For the instant invention embodiment, this period of time is taken to be approximately 0.5 to 1.0 second. In the system, this time is provided by counter 42 (or the system clock) of Fig. 5. In other words, counter 42 acts as a timer which reports to touch screen controller 40, which in turn is receiving from the sensor overlay 46 an input that the screen is being touched by the user.

Once it has been determined that the user's finger has been held still at the same location of the screen for the requisite amount of time, screen controller 40 would activate tone generator 44 to sound a beep, which tells the user that the system has now entered into the marking mode.

Upon hearing the marking mode beep, the user can move his finger on the screen to mark the desired text. It should be appreciated that contact should continuously be made by the user to the screen after the initiation of the mark mode in order for the mark mode to continue. Thus, as shown in Fig. 7B, the user has moved cursor 66 to the last number "4" of Joe Smiths' telephone number. As cursor 66 is moved along the desired text, the text over which the contact point is moved, or over which cursor 66 traverses, are accentuated, either highlighted or set in reverse video, as indicated by the dotted box outline 68.

The marking mode continues as long as the user maintains his finger on the screen. Thus, the marked text can vary anywhere from one character to the entire text area 62. The marking mode is terminated when the user removes his finger from the screen. The end of the marking mode is signified by tone generator 44 generating a second beep that is different from the beep that signifies the initiation of the mark mode.

At the end of the marking mode the marked text is displayed in a pop-up window 70 as shown in Fig. 7C. The pop-up screen provides the user with a confirmation that the correct text has been marked. In addition to pop-up screen 70, a number of function keys also appear on the screen. The different function keys each provide an option to be taken with respect to the marked text. For example, if the user determines that the correct text has been marked, as for example the telephone number of Joe Smith, he can next instruct the system to dial that number by pressing the "Dial" function key 72. Alterna-

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tively, if he changes his mind, he can un-mark the text by touching function key 74. Furthermore, he can cancel the marked text by pressing the back arrow icon. Thus, for the instant invention, without having to jot down anything, the user can directly call someone by simply marking the desired telephone number and then pressing the "Dial" function key.

In addition to marking telephone numbers, the present invention also is capable of marking other text. For example, if the user wants to find out the number of times Bob Jones has appeared on the text, he only needs to mark "Bob Jones" and then press the "Find" function key 76. The "Find" function can be extended to the various messages stored in the "Mail" directory as well as other files kept at the different directories, such as the "Note Pad" and the "Address Book" directories.

Even though the dialling of a phone number is discussed with reference to the marking of a telephone number, in a co-pending application entitled "Apparatus and Method Therefor of Intelligently Searching for Information in a Personal Communications Device" (BC8-94-0282), assigned to the same assignee of the instant invention, the marked text does not have to be the telephone number. Briefly, in the just noted co-pending application, by marking an appropriate abbreviated search term, the telephone number of Joe Smith may be directly dialled without any direct reference to his telephone number. Moreover, the marked text may be used in a number of applications aside from the application in which the text is being viewed and marked. For example, the marked telephone number illustrated in Figs. 7A-7C may be inserted to the address book, and particularly into the Joe Smith address. Or, for that matter, the marked text may be routed to the "To Do" directory file for future calling of Joe Smith, if the user deems it more appropriate to call Joe Smith at a later time.

In any event, the marked number is sent to the integrated cellular and PSTN communications interface 50 to dial the call number.

The operation of marking the text and then dialling it is given in the flow chart of Fig. 8. As shown, the operation starts with the scan screen service routine, which is one of the routines stored in EPROM 36 of the system, and is used by most, if not all, of the applications that run on the device. Putting it simply, scan screen service monitors the buttons (or the function keys) and the icons displayed on area 64 and the text displayed on area 62 of the screen. Whether or not one of the function keys or icons is pressed is determined in button press routine 802. Whether the text area, such as 62 in Fig. 6, is pressed is determined in block 804. If the text area is pressed, the cursor is moved to the pressed position per block 806A. At the same time, a timer, which may be counter 42 or the system clock, is set at block 806B. Thereafter, a further determination is made in block 808 on whether or not the text area is pressed. If not, the process returns to block 802 to determine whether any of the function keys and/or icons have been pressed.

If indeed the text area is pressed, a determination is made on whether there is a new cursor position per block 810. If there is a new cursor position, the processor determines the system as remaining in the cursor sliding mode and the process returns to blocks 806a and 806b to move the cursor to a new position and reset the timer. If it is determined that the cursor position has not been moved, i.e. the user has kept his finger on the same location of the screen, then a determination is made by the processor per block 812 on whether or not a predetermined time period has elapsed. If it has not, the system would again determine whether or not the text area continues to be touched per block 808 and whether the user has moved his finger per block 810.

If it is determined that a predetermined period of time has passed with the cursor being maintained at the same location, the process proceeds to the marking mode by sounding a beep, generated by tone generator 44, per block 814. The system continues to scan the touch sensitive display to determine whether the text area continues to be touched in block 816. If it is, the area of the screen from the point where the marking mode begins to the contact point is marked, by either accentuating the marked text or by reverse video of the same, in block 818. This process continues until the system senses that the text area no longer is being touched, i.e. the user ceases pressing the display screen. With the removal of the contact, a second beep is provided by tone generator 44 per block 820, to notify the user that the mark mode is now terminated.

At the same time, the pointer designating the beginning of the marked text and the number of character counts, i.e. the text that was marked, are provided to a storage such as RAM 34, for use in the different applications.

As was mentioned previously, one of the applications is the calling application which is illustrated in Fig. 7C. With the beginning of the calling application, as the marked number is displayed in the pop-up window 70, yet another beep, which is different from the beeps output at blocks 814 and 820, is provided by tone generator 44, per block 822a. The pop-up window 70 is deemed to be a confirmation in block 822b. A confirmation is next made by the system in block 824 on whether the marked text is correct. If it is, key 72 is touched per block 826 to call the confirmed telephone number. If not, the marked text can be unmarked by the user touching the unmarked button 74 per block 828. Thereafter, the system returns to the call scan screen service per block 830.

**Claims**

1. In a computer system having a display screen responsive to contact thereto, a method of marking information displayed on said display screen for selective applications comprising the steps of:

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(a) sensing contact to said screen to establish a start position;

(b) sensing said contact being maintained at said start position for a predetermined period of time to initiate a mark mode;

(c) marking the information displayed on said screen over which said contact traverses from said start position after initiation of said mark mode;

(d) terminating said mark mode when said contact is removed from said screen.

2. A method according to claim 1, wherein one of said applications comprises a communications application and wherein, when said marked information is representative of a call number, the method further comprises:

sending said marked information to a communications interface means incorporated in the system, which interface means enables communication with other communication systems, thereby to initiate a call to said call number.

3. A method according to claim 2, wherein said call is initiated only after a step of confirming that said marked information is representative of a desired call number.

4. A method according to claim 2 or claim 3, wherein the operation of sending marked information to a communication interface is initiated by a user touching a predetermined area on said screen.

5. A method according to any of claims 1 to 4, wherein information displayable on said screen includes text and icons; and

wherein said step of marking displayed information over which the contact traverses includes the step of displaying said marked information as highlighted or reverse video text.

6. A method according to claim 5, further comprising the steps of:

contacting one of said icons on said screen to initialize an application;

utilizing said marked text in said application.

7. A method according to any one of the preceding claims, including:

providing a tone when said mark mode is initiated;

providing a second tone when said mark mode is terminated.

8. A computer system comprising:

a touch sensitive display screen;

means for responding to contact with a first location on said screen;

means for initiating a mark mode when said contact with said first location on said screen exceeds a predetermined period of time;

means for marking the data displayed on the areas of said screen over which said contact is moved from said first location after initiation of said mark mode, said mark mode being terminated when said contact is removed from said screen.

9. A computer system according to claim 8, further comprising:

communications interfacing means;

means for sending said marked data to said communications interfacing means for effecting communication to a call number corresponding to said marked data.

10. A computer system according to claim 8 or claim 9, further comprising:

means for generating at least a first tone when said mark mode is initiated and a second tone when said mark mode is terminated.

11. A computer system according to any one of claims 8 to 10, which is adapted to display said marked data as highlighted or reverse video text.

12. A system according to any one of claims 8 to 11, wherein said communications interface means is capable of providing both cellular and PSTN communications.

13. A system according to any one of claims 8 to 12, wherein said display screen is divided into at least a first area where text is displayed and a second area where function keys or icons representative of different applications are displayed; and

wherein, after text is marked in said first area, touching of a call function key or a call application icon in said second area activates said communications interface means to call said call number.

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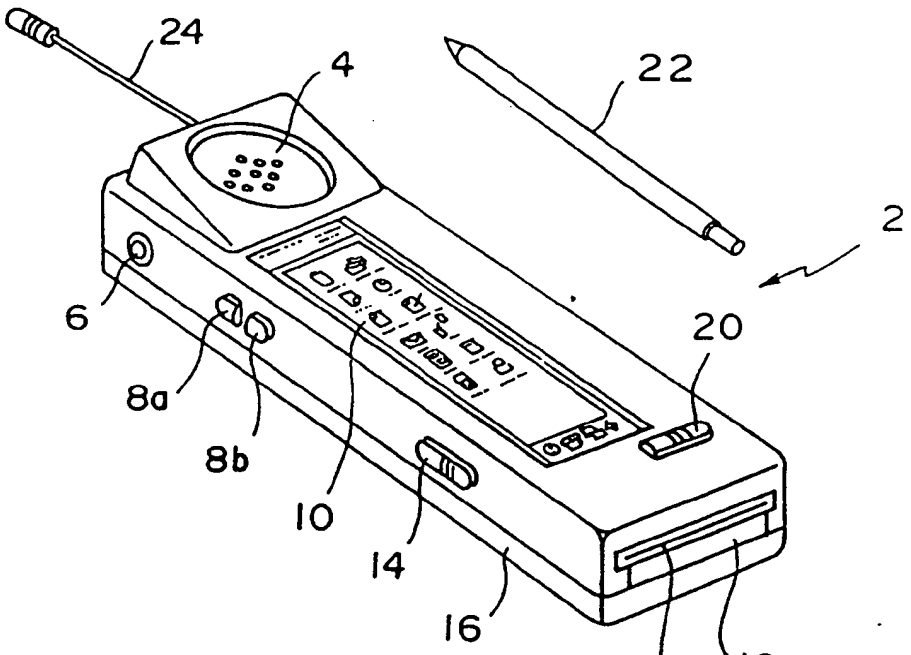



FIG. 1

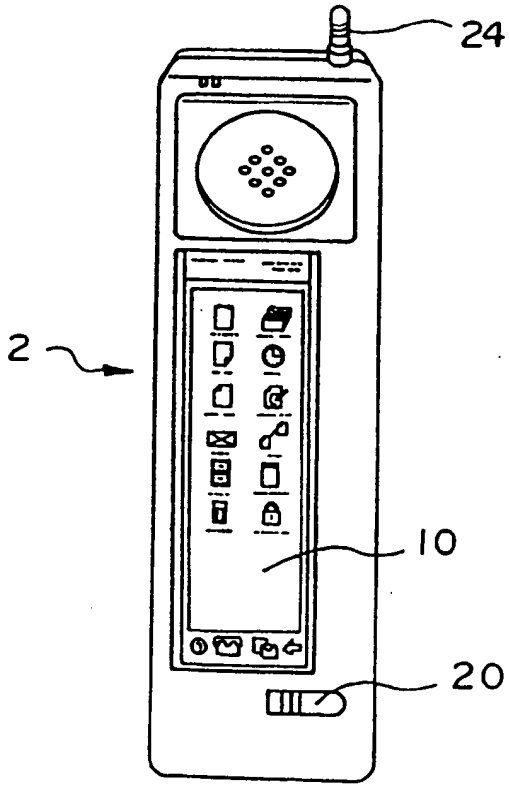
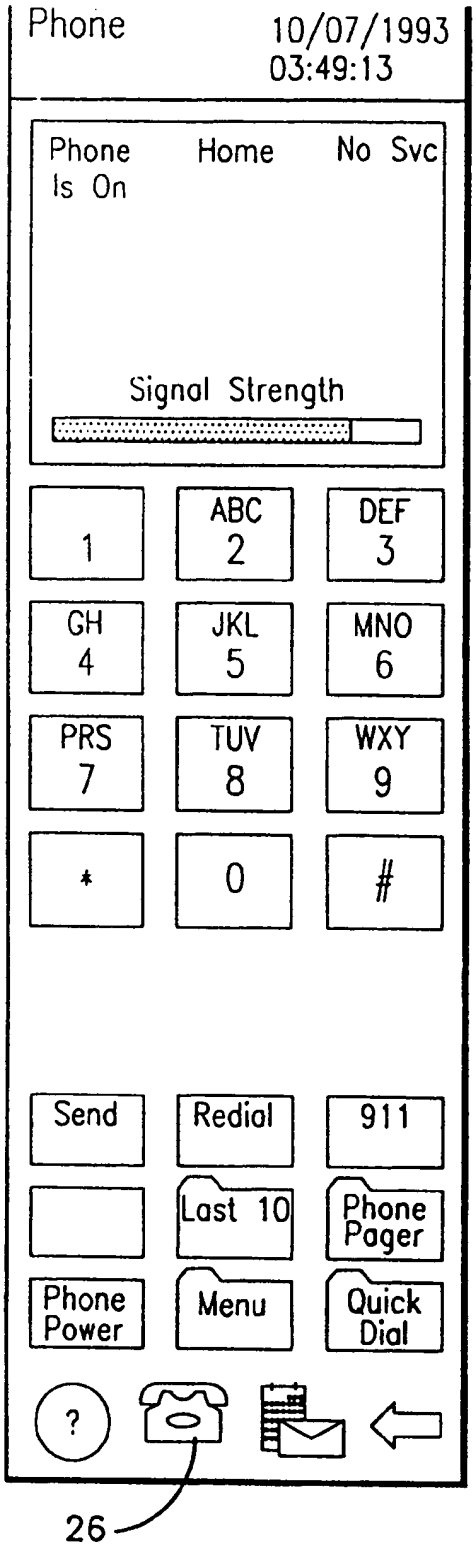
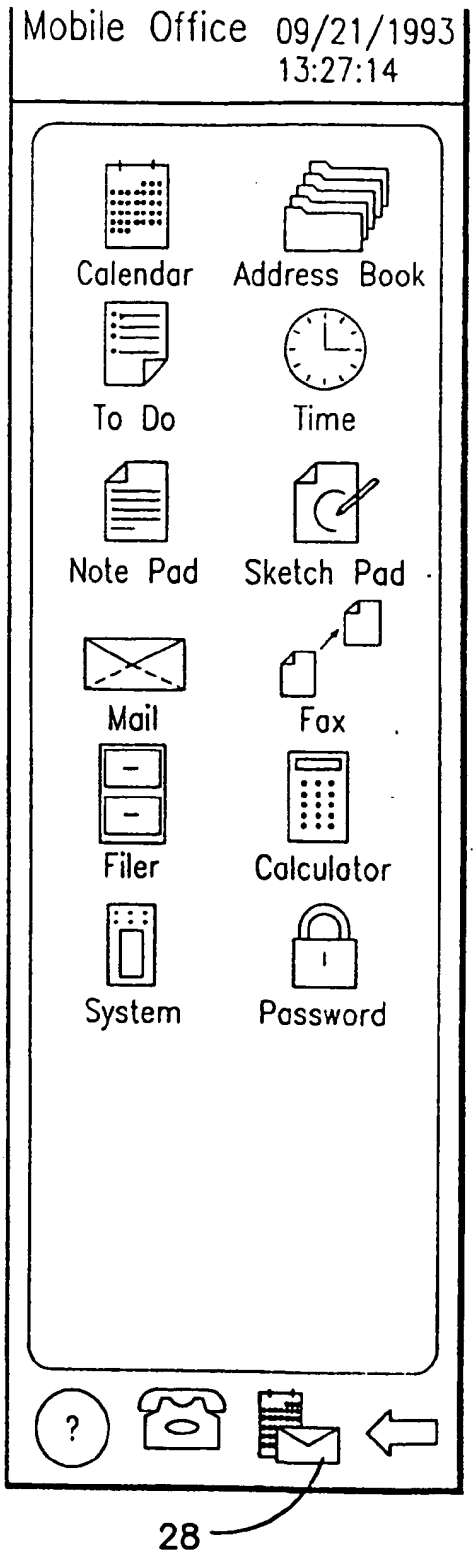



FIG. 2




The Phone Screen

FIG. 3




The Mobile Office Screen

FIG. 4

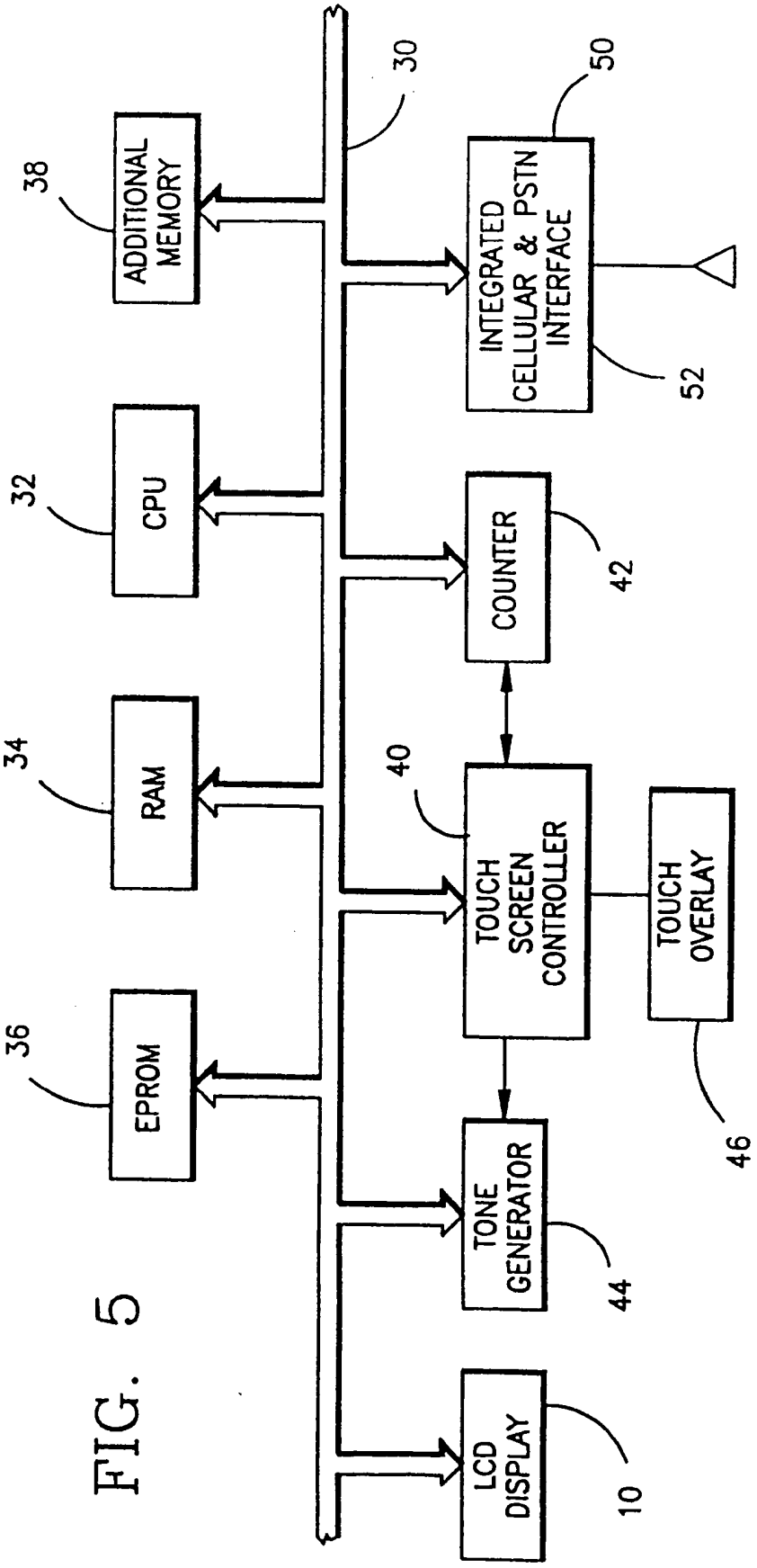

30
38
ADDITIONAL MEMORY
50
INTEGRATED CELLULAR & PSTN INTERFACE
52
32
CPU
COUNTER
42
34
RAM
40
TOUCH SCREEN CONTROLLER
TOUCH OVERLAY
46
36
EPROM
TONE GENERATOR
44
LCD DISPLAY
10

FIG. 5

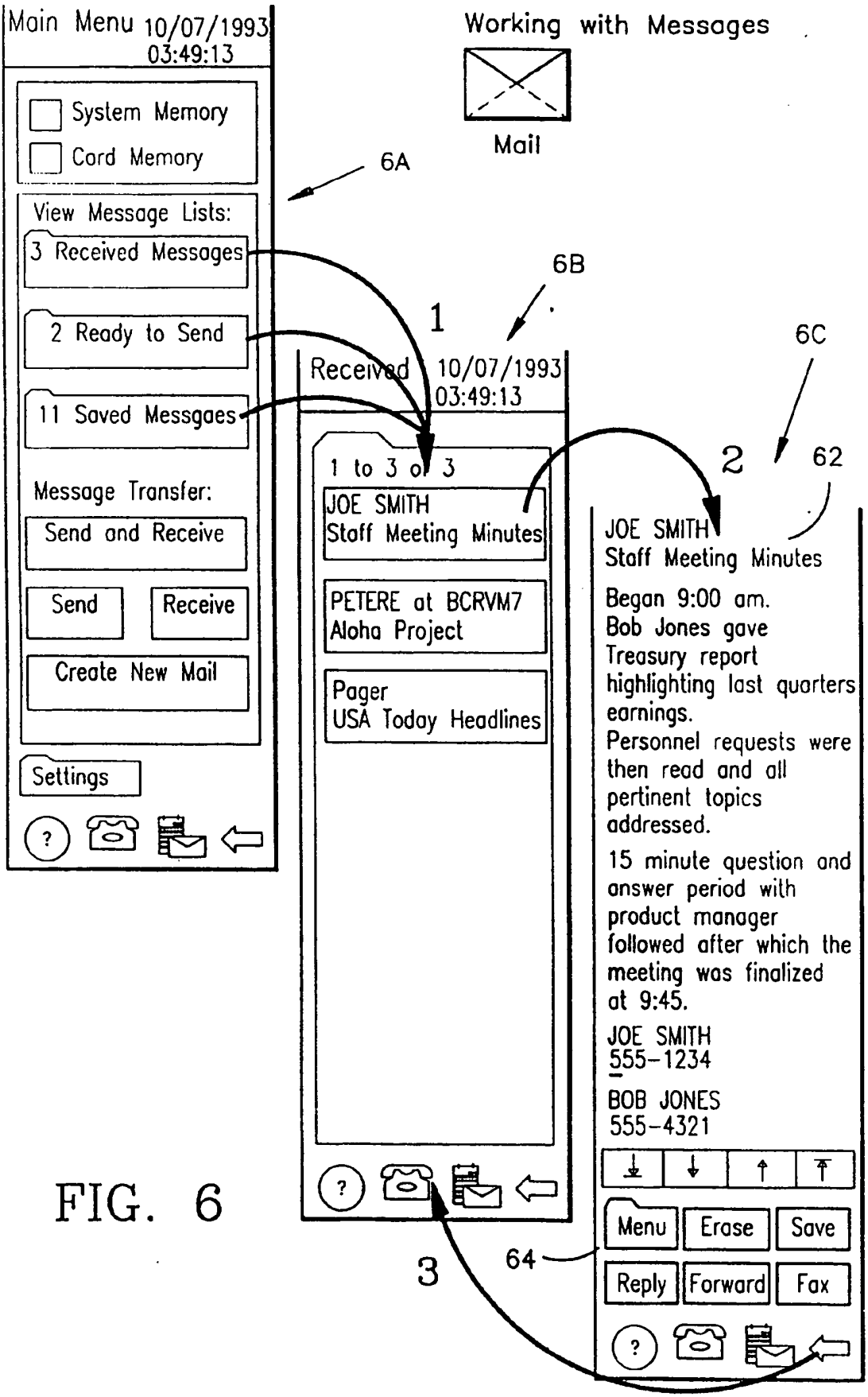

Main Menu 10/07/1993 03:49:13
System Memory
Cord Memory
View Message Lists:
3 Received Messages
2 Ready to Send
11 Saved Messgaes
Message Transfer:
Send and Receive
Send
Receive
Create New Mail
Settings
Working with Messages
Mail
6A
6B
6C
1
2
3
62
64
Received 10/07/1993 03:49:13
1 to 3 of 3
JOE SMITH
Staff Meeting Minutes
PETERE at BCRVM7
Aloha Project
Pager
USA Today Headlines
JOE SMITH
Staff Meeting Minutes
Began 9:00 am.
Bob Jones gave Treasury report highlighting last quarters earnings.
Personnel requests were then read and all pertinent topics addressed.
15 minute question and answer period with product manager followed after which the meeting was finalized at 9:45.
JOE SMITH
555-1234
BOB JONES
555-4321
Menu
Erase
Save
Reply
Forward
Fax

FIG. 6

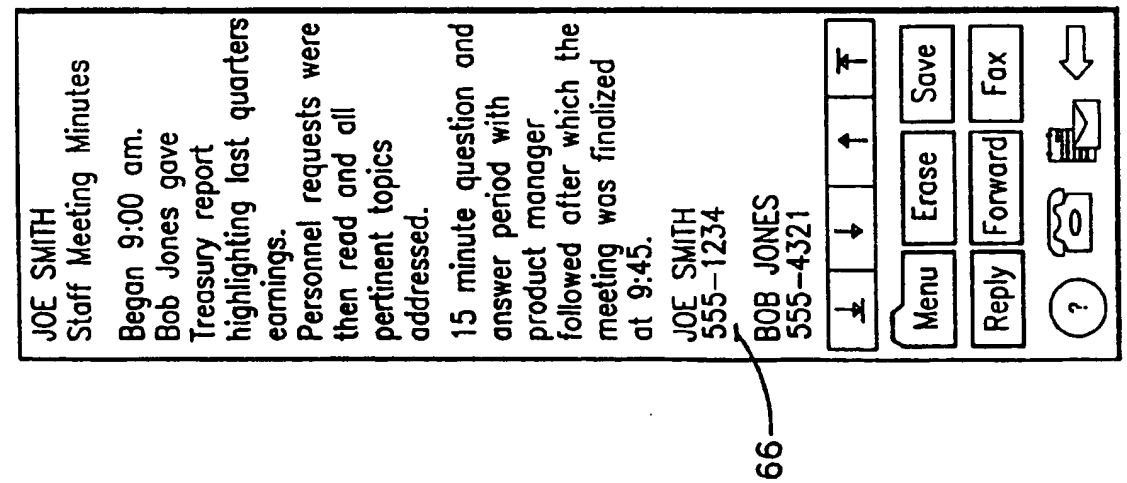



FIG. 7A

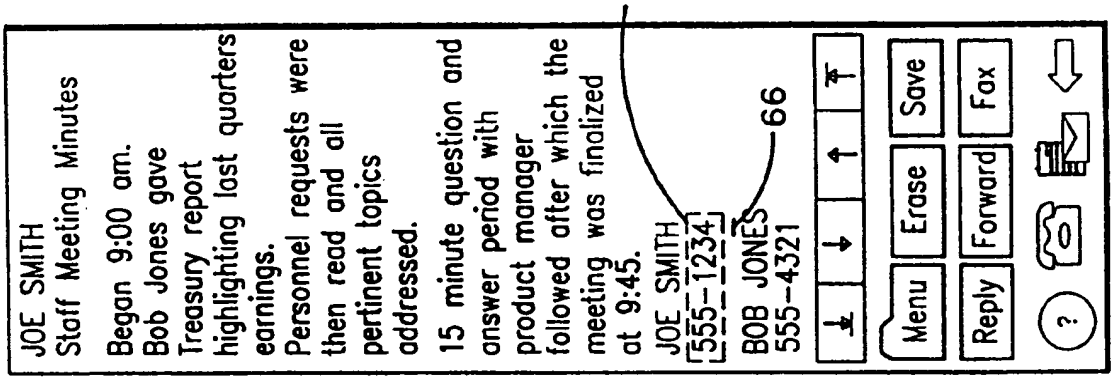



FIG. 7B

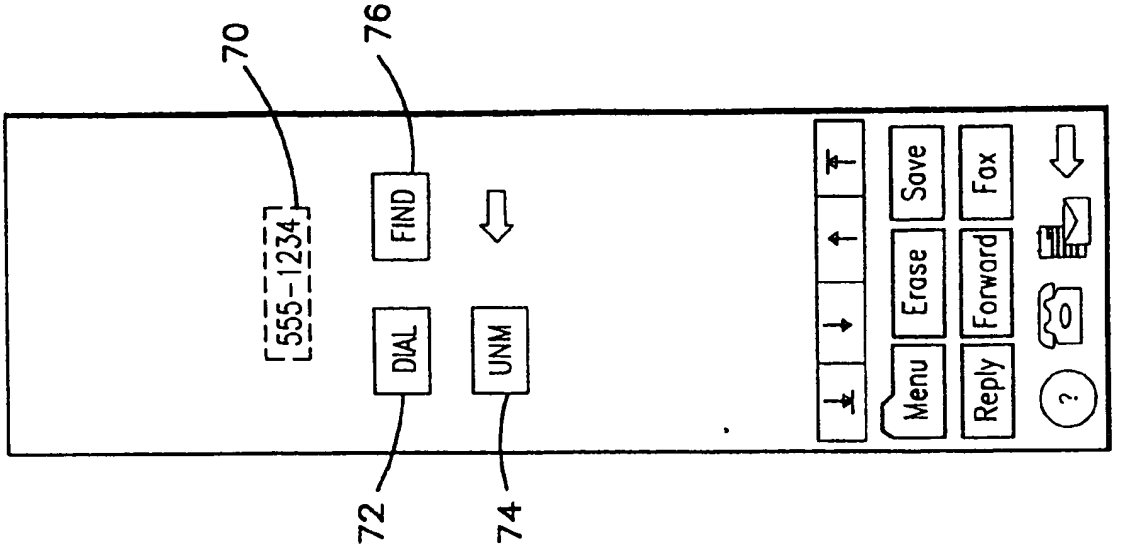



FIG. 7C

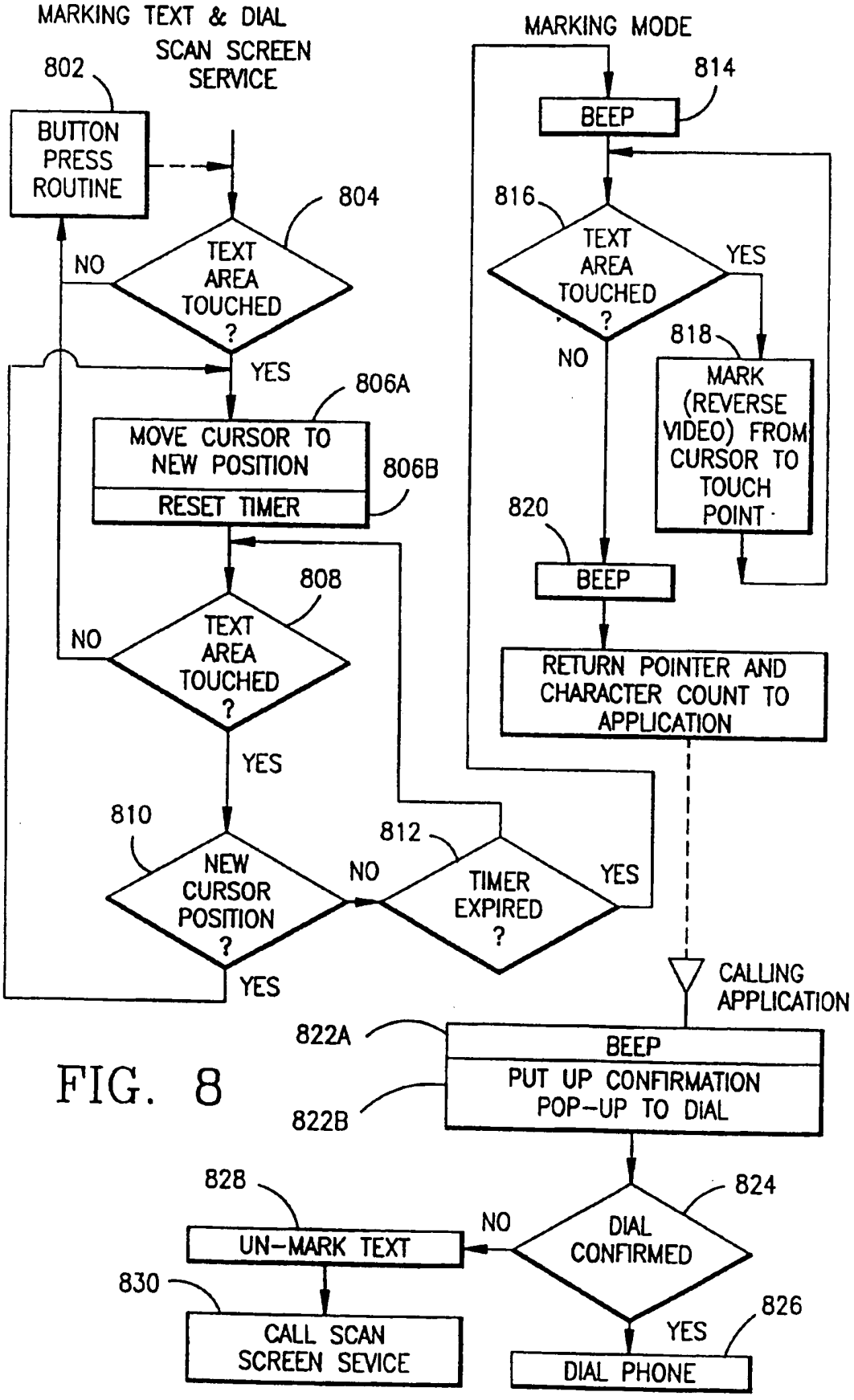

MARKING TEXT & DIAL SCAN SCREEN SERVICE
802
BUTTON PRESS ROUTINE
804
TEXT AREA TOUCHED ?
NO
YES
806A
MOVE CURSOR TO NEW POSITION
806B
RESET TIMER
808
TEXT AREA TOUCHED ?
NO
YES
810
NEW CURSOR POSITION ?
NO
YES
812
TIMER EXPIRED ?
YES
MARKING MODE
814
BEEP
816
TEXT AREA TOUCHED ?
YES
NO
818
MARK (REVERSE VIDEO) FROM CURSOR TO TOUCH POINT
820
BEEP
RETURN POINTER AND CHARACTER COUNT TO APPLICATION
CALLING APPLICATION
822A
BEEP
822B
PUT UP CONFIRMATION POP-UP TO DIAL
824
DIAL CONFIRMED
NO
YES
826
DIAL PHONE
828
UN-MARK TEXT
830
CALL SCAN SCREEN SEVICE

FIG. 8

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 95 30 5185

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
|---|---|---|---|
| Y | JP-A-04 326 451 (SHARP)<br>& US-A-5 376 945 (TAKENAKA ET AL)<br>* column 3, line 18 - column 4, line 62 *<br>* claims 1-8; figures 2-5 * | 1,5,6,8, 11 | G06F3/033<br>G06F15/02 |
| Y | EP-A-0 536 715 (FUJITSU LTD.)<br>* column 1, line 40 - column 2, line 28 *<br>* column 4, line 1 - column 5, line 40 *<br>* claims 1,2; figures 5,6 * | 1,5,6,8, 11 | |
| A | IBM TECHNICAL DISCLOSURE BULLETIN, vol. 37, no. 6a, June 1994 NEW YORK, US, pages 449-453, 'Personal communicator configurations'<br>* the whole document * | 1-13 | |
| A | US-A-5 258 748 (JONES)<br>* abstract *<br>* column 3, line 23 - column 4, line 23 *<br>* figure 3 * | 1,8 | TECHNICAL FIELDS SEARCHED (Int.Cl.6)<br>G06F |
| A | US-A-3 854 131 (VANDERHEIDEN ET AL)<br>* abstract *<br>* claims 1-5 * | 1,8 | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 23 November 1995 | McDonagh, F |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 707 257 A1

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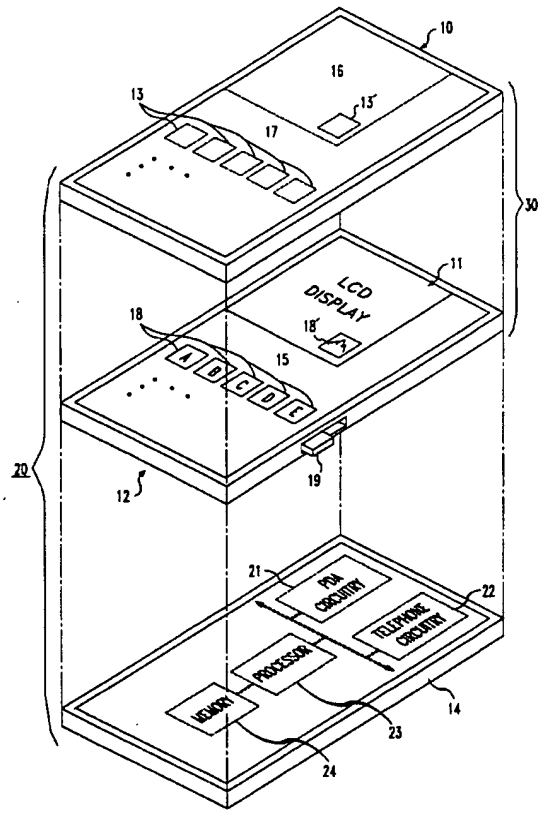
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## (54) Touch-sensitive screen with mechanical selectable label-displays

(57) A multi-function device such as a combined PDA and wireless display telephone (20) uses a display and input device (30) that includes a touch-sensitive membrane (10) underlayed by a manually-operated mechanical label-display arrangement (15) to display different sets of touch-area labels (18) that correspond to the different functions. A display screen (11) is retained as the underlay for a portion of the touch-sensitive membrane to display touch-area labels that must be changed automatically and dynamically, and to display output information. Each set of labels (18) is defined by a different physical display surface, each formed from a plurality of movable aligned surface portions. A linkage translates operation of a manual actuator (19) into motion of the surface portions such that, in each predefined position of the actuator, the surface portions of a different surface are aligned with each other and face the touch-sensitive membrane in front of the surface portions of the other surfaces.

*FIG. 1*




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## Description

### Technical Field

The invention relates to a display and input device that is used as a user interface for equipment having a plurality of different functions.

### Background of the Invention

Conventional electronic equipment, such as wireless telephones and portable computers, has until recently been constructed and used as discrete and independent individual devices. However, with current advances in technology, combined equipment which incorporates multiple functions in a single device is now coming into practical use. An illustrative example thereof is the AT&T/EO personal digital assistant (PDA), which combines the functions of a cellular telephone and a notebook computer in a single portable device.

As electronic devices expand in functionality while also shrinking in size, the number of conventional push-buttons or keys that are needed to operate these devices grows while the area available on the devices for mounting these push-buttons or keys shrinks. Hence, the push-buttons and keys are shrinking in size to fit the available mounting areas. But the size of fingers of the user of these devices remains the same, with the net result being that the keys and push-buttons are getting too small to be used effectively.

Some solutions to this problem already exist. One solution uses pen input instead of a keyboard, as is already being done on many PDAs. Another approach underlays a touch-sensitive membrane with a display screen that displays the labels of the touch areas of the touch-sensitive membrane, to form a touch-sensitive screen. The touch areas are actuators defined by the touch-sensitive membrane. At any time, the touch-sensitive membrane's touch areas are reconfigured under program control to correspond to only the particular control and input functions required at that time, and the labels displayed by the display screen are changed accordingly at the same time. Hence, only a subset of the full set of actuators is presented to the user at any one time. An illustrative example of this latter approach is described in U. S. Pat. No. 4,896,223.

However, both of the above approaches have serious flaws. On one hand, it is very difficult to get the same level of input accuracy, and hence also control accuracy, with a pen as with a keyboard. This has been a major reason behind the limited acceptance in the marketplace of pen-based PDAs until now. On the other hand, display-screen underlays for touch-sensitive membranes are quite expensive, because the display screen must normally be as large as the touch-sensitive membrane, and display screens are usually an order of magnitude more expensive than touch-sensitive membranes of the same size.

### Summary of the Invention

This invention is directed to solving these and other problems and disadvantages of the prior art. Illustratively according to the invention, a display and input device provides the functionality of a touch-sensitive membrane underlayed with a display, but does so in a cost-effective manner by replacing some or all of the underlay display screen that is used by the prior art with a mechanical underlay display arrangement. A display screen is preferably retained to display those touch-area labels that must be changed dynamically and automatically, as well as to present output information to the user. But these functions typically require a display screen that is small in size relative to the total area of the touch-sensitive membrane. The mechanical display arrangement can be made simple, and consequently can be much less expensive than a display screen of comparable size. And while the mechanical display arrangement may not be as versatile as the display screen in terms of the number of different images that it can display, it relies on and takes advantage of the fact that many applications of display and input devices need only a limited, small, number of fixed sets of labels and hence do not require the full versatility of the display screen.

Generally according to the invention, a multi-functional device comprises: circuitry for effecting a plurality of functions, each function having a different display image corresponding thereto; a plurality of physical display surfaces cooperating to define the display images, at least some of the surfaces being movable to make any selected one of the images visible to a user of the device while others of the images are obscured from the user; an actuator operable by the user coupled to the surfaces such that operation of the actuator results in movement of at least some of the surfaces, the actuator having a plurality of positions each corresponding to a different one of the functions wherein in each of the positions the one of the images that corresponds to the function to which the position also corresponds is visible to the user while the others of the images are obscured from the user, and transition of the actuator from one of the positions to another of the positions results in the image that is visible to the user in the one position becoming obscured from the user and further results in the image that is visible to the user in the other position becoming visible to the user; and a controller coupled to the circuitry to cause the circuitry to effect the selected one of the functions.

Illustratively, a multi-functional device comprises: circuitry for effecting a plurality of functions, each function having a different display image corresponding thereto; a plurality of physical display surfaces each bearing a different one of the images, at least some of the surfaces being movable to make any selected one of the surfaces visible to a user of the device while others of the surfaces are obscured from the user; an actuator operable by the user, coupled to the surfaces such that operation of the actuator results in movement of at least

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some of the surfaces, the actuator having a plurality of positions each corresponding to a different one of the functions wherein in each of the positions the one of the surfaces bearing the image that corresponds to the function to which the position also corresponds is visible to the user while the others of the surfaces are obscured from the user, and transition of the actuator from one of the positions to another of the positions results in the surface that is visible to the user in the one position becoming obscured from the user and further results in the surface that is to be visible to the user in the other position becoming visible to the user; and a controller coupled to the circuitry to cause the circuitry to effect the selected one of the functions.

Even though the multi-function device is an electrical or electronic device, it nevertheless employs a mechanical image-display arrangement controlled by a user-operated actuator to supplement its electrical or electronic functions so as to obtain the various advantages offered by the mechanical arrangement. These advantages are not only limited to lower cost, but include no electrical energy consumption, reliability, ruggedness, visibility in bright light, etc.

Preferably, the controller comprises an arrangement, such as an electrical switch that is a part of the actuator, that responds to the actuator being placed in any one of the positions by automatically causing the circuitry to effect the function corresponding to that position. The displayed image and the selected function of the device are thus automatically synchronized by means of the user's operation of the actuator.

Also preferably, the multi-functional device further comprises a touch-sensitive membrane defining touch areas (e.g., actuators) for the plurality of functions, and each image comprises labels for the touch areas defined by the touch-sensitive membrane for a different one of the functions. The multi-function device -- such as a combined PDA and wireless telephone, for example -- thus gains the benefits of the display and input device characterized above.

These and other advantages and features of the present invention will become more apparent from the following description of an illustrative embodiment of the invention taken together with the drawing.

## Brief Description of the Drawing

FIG. 1 is an exploded view of a block representation of a multi-function device that embodies an illustrative example of the invention;

FIGS. 2a-c are an architectural diagram of a first illustrative embodiment of the label-display arrangement of the device of FIG. 1;

FIGS. 3a-c are an architectural diagram of a second illustrative embodiment of the label-display arrangement of the device of FIG. 1;

FIG. 4 is an example of an image presented by the device of FIG. 1 when functioning as a telephone; and

FIG. 5 is an example of an image presented by the device of FIG. 1 when functioning as a PDA.

## Detailed Description

FIG. 1 shows an exploded view of a block representation of a multi-function device 20. Multi-function device 20 illustratively combines the functions of both a conventional personal digital assistant (PDA), such as personal-computer and electronic notebook functions, and a wireless telephone. Accordingly, device 20 includes a base portion 14 which carries conventional PDA circuitry 21 and conventional wireless telephone circuitry 22. Mounted on top of base portion 14 is a display and input device 30 that functions as a user input and output (I/O) interface to device 20 and that is constructed according to the principles of the invention. Device 30 is a touch-sensitive screen. It is made up of an input portion 10 that is underlayed by an output portion 12. Input portion 10 is a conventional touch-sensitive membrane. Output portion 12 comprises a conventional liquid-crystal display (LCD) screen 11 and a mechanical label-display arrangement 15. Touch-sensitive membrane 10 is transparent, so that both LCD screen 11 and label-display arrangement 15 are visible therethrough. LCD screen 11 displays the outputs of the functions of device 20 to the user, in a conventional manner. LCD screen 11 also cooperates with portion 16 of touch-sensitive membrane 10 in a conventional manner to display labels 18' of touch areas 13' that are defined in portion 16 of touch-sensitive membrane 10 by a processor 23. This type of cooperation is described, for example, in U. S. Pat. No. 4,896,223. Label-display arrangement 15 cooperates with portion 17 of touch-sensitive membrane 10 to display multiple selectable sets of labels 18 for touch areas 13 that are defined in portion 17 of touch-sensitive membrane 10 by processor 23. All portions of device 20 except for label-display arrangement 15 operate under control of processor 23, which executes control programs out of a memory 24, all in a conventional manner. Processor 23 and memory 24 are also contained in base portion 14.

According to the invention, label-display arrangement 15 is mostly a mechanical device that displays labels 18, such as alpha-numeric characters, words, or icons, for corresponding touch areas 13 of portion 17 of touch-sensitive membrane 10. Label-display arrangement 15 also includes an actuator 19, such as a lever/switch combination, by means of which a user manually both selects one or the other of the functions of device 20 (i.e., either the PDA function or the telephone function) and changes the set of labels presently displayed by arrangement 15 to correspond to the touch areas 13 defined by device 20 for the selected function. The switch portion of actuator 19 electrically signals to processor 23 which one of the functions has been selected, in a conventional manner. In response, processor

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23 activates the corresponding set of circuitry 21 or 22 and reconfigures touch-sensitive screen 10 to correspond to the selected function, also in a conventional manner. The lever portion of actuator 19 mechanically changes the set of labels displayed by arrangement 15. For an understanding of how that is accomplished, refer to FIGS. 2 and 3 and their accompanying description below.

FIGS. 2 and 3 show two alternative architectures for arrangement 15. The architecture of FIG. 2 uses a sliding mechanism, while the architecture of FIG. 3 uses a rotating mechanism; both are mechanical as opposed to electronic in nature. Both architectures also use the same mechanical principles. In each case, the set of labels corresponding to each different function is defined by a different physical display surface (e.g., 201 or 202 in FIG. 2, and 311, or 312 in FIG. 3). Each display surface is formed from a plurality of surface portions (e.g., 203 or 204 in FIG. 2, and 302 or 303 or 304 in FIG. 3), at least some of which are movable. The surface portions form a display surface when they are properly aligned with each other (e.g., as in FIG. 2a or 2c, and as in FIG. 3a or 3c). A linkage (e.g., 205 in FIG. 2, and 305 and 306 in FIG. 3) connects actuator 19 to at least some of the surface portions and translates operation of actuator 19 into motion of at least some of those surface portions such that, in each one of a plurality of predefined positions of actuator 19 (e.g., 240 and 241 in FIG. 2, and 340 and 341 in FIG. 3), the surface portions that form a different one of the display surfaces are aligned with each other and face touch-sensitive membrane 10 in front (relative to membrane 10) of the surface portions that form the other display surfaces.

The architecture of FIG. 2 uses two display surfaces, or layers, 201 and 202 of surface portions, or plates, 203 and 204, respectively. The plates 203 and 204 of the two layers are interleaved, and the plates 203/204 of each layer 201/202 slightly overlap each other like rows of roof shingles. This is best seen in FIG. 2b. The plates 203 of one layer 201 are stationary, while the plates 204 of the other layer 202 are movable with respect to the plates 203 of layer 201 by means of a linkage 205, but are stationary relative to each other. In other words, plates 204 of layer 202 move in unison. The plates 203/204 of each layer 201/202 define on their top surfaces a different set of touch-area labels. For example, the plates 203 of layer 201 carry the labels for the PDA function of device 20, while the plates 204 of layer 202 carry the labels for the telephone function. While actuator 19 is in a first position 240, the PDA function is selected, and plates 203 and 204 are in the relative position shown in FIG. 2a. In this position, plates 204 of layer 202 are obscured by (hidden underneath) plates 203 of layer 201, so that only the plates 203 and the labels carried thereby are visible through touch-sensitive membrane 10. When the user decides to switch from the PDA function to the telephone function, the user slides actuator 19 from the first position 240 to a second position 241. Actuator 19 is attached to plates 204 of layer 202 by a linkage such as a rod 205 so that the motion of actuator 19 from position 240 to position 241 slides plates 204 from under plates 203 and over plates 203 as shown in FIG. 2b. When actuator 19 is in the second position 241, the telephone function is selected, and plates 203 and 204 are in the relative position shown in FIG. 2c. In this position, plates 203 of layer 201 are hidden underneath plates 204 of layer 202, so that only the plates 204 and the labels carried thereby are visible through touch-sensitive membrane 10.

The architecture of FIG. 3 uses rotatable members 301 having a triangular cross section, so that each member 301 defines three surface portions 302-304. The members 301 are mounted to rotate in unison around their axis under the influence of a linkage 305 and 306, as shown in FIG. 3b. At least two sets of the surface portions 302, 303, and 304 constitute the surface portions of different display surfaces and define different sets of touch-area labels. For example, the surface portions 302 carry the labels for the PDA function of device 20, while the surface portions 303 carry the labels for the telephone function. While actuator 19 is in the first position 340, the PDA function is selected and members 301 are in the position shown in FIG. 3a. In this position, surface portions 302 are aligned to form a display surface 311. Surface portions 302 face touch-sensitive membrane 10 and hence the set of labels carried thereby is visible through touch-sensitive membrane 10, while surface portions 303 and 304 are hidden from view. When the user decides to switch from the PDA function to the telephone function, the user rotates actuator 19 from the first position 340 to the second position 341. Actuator 19 is attached to members 301 by a linkage illustratively comprising pulleys 306 and drive belt 305, so that the motion of actuator 19 from position 340 to position 341 rotates the members 301, as shown in FIG. 3b. When actuator 19 is in the second position 341, the telephone function is selected, and surface portions 304 of members 301 are aligned to form a display surface 312. Surface portions 304 face touch-sensitive membrane 10 and hence the set of labels carried thereby is visible through touch-sensitive membrane 10, while surface portions 302 and 303 are hidden from view, as shown in FIG. 3c.

FIGS. 4 and 5 show examples of the images that a device 20 configured as described above may present to the user. FIG. 4 shows an illustrative image presented for the telephone function, while FIG. 5 shows an illustrative image presented for the PDA function.

Of course, various changes and modifications to the illustrative embodiment described above will be apparent to those skilled in the art. For example, the display surfaces that bear the labels may be fixedly positioned with respect to each other and overlayed by a movable display surface comprising an array of stamped lenses. The lenses make only a selected one of the sets of labels visible, depending upon the position of the lenses relative to the surfaces. Or, the display surfaces may comprise a single opaque surface overlayed by a movable

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transparent surface (e.g., a sheet of film), both of which are imprinted with a pattern of light and dark areas. As the opaque surface and the transparent surface are moved with respect to each other, the light and dark areas align and combine to reveal distinct images in each of the distinct actuator positions. Also, the touch-sensitive membrane need not be a physical membrane, but may be a virtual membrane defined, for example, by cooperation of an array of optical emitters and sensors, as is known in the art. Such changes and modifications can be made without departing from the spirit and the scope of the invention and without diminishing its attendant advantages. It is therefore intended that such changes and modifications be covered by the following claims.

**Claims**

1. A device (20) comprising

circuitry (21-24) for effecting a plurality of functions, each function having a different display image (18) corresponding thereto, and
a controller (23) coupled to the circuitry to cause the circuitry to effect a selected one of the functions, CHARACTERISED BY
a plurality of physical display surfaces (201, 202; 311, 312) cooperating to define the display images (18), at least some of the surfaces (202; 311, 312) being movable to make any selected one of the images visible to a user of the device while others of the images are obscured from the user;
an actuator (19) operable by the user, coupled to the surfaces such that operation of the actuator results in movement of at least some of the surfaces, the actuator having a plurality of positions (240, 241; 340, 341) each corresponding to a different one of the functions wherein in each of the positions the one of the images that corresponds to the function to which the position also corresponds is visible to the user while the others of the images are obscured from the user, and transition of the actuator from one of the positions to another of the positions results in the image that is visible to the user in the one position becoming obscured from the user and further results in the image that is visible to the user in the other position becoming visible to the user.

2. The device of claim 1 wherein:

the controller comprises means responsive to the actuator being in any one of the positions, for automatically causing the circuitry to effect the function corresponding to that position.

3. The device of claim 1 further comprising

a touch-sensitive membrane (10) defining touch areas (13) for the plurality of functions; wherein each image comprises labels (18) for the touch areas defined by the touch-sensitive membrane for a different one of the functions.

4. The device of claim 3 wherein:

the touch-sensitive membrane is transparent; and
the plurality of physical display surfaces underlie the touch-sensitive membrane such that said selected one of the images is visible to the user through the touch-sensitive membrane while others of the images are obscured from the user.

5. The device of claim 1 wherein:

the plurality of physical display surfaces each bears a different one of the images, and the movable surfaces are movable to make any selected one of the surfaces visible to the user while others of the surfaces are obscured from the user; and
in each of the positions of the actuator, the one of the surfaces bearing the image that corresponds to the function to which the position also corresponds is visible to the user while the others of the surfaces are obscured from the user, and transition of the actuator from the one of the positions to the other of the positions results in the surface that is visible to the user in the one position becoming obscured from the user and further results in the surface that is visible to the user in the other position becoming visible to the user.

6. The device of claim 1 further comprising

a display screen (11) for displaying outputs of the functions to the user, and
a transparent touch-sensitive membrane (10) for receiving from the user inputs for the functions, the touch-sensitive membrane defining at least one actuator (13) for each of the functions, the at least one actuator for one function either (a) having a different corresponding label (18) for the one function than for another function, or (b) being a different actuator from the at least one actuator for another function; wherein
the plurality of physical display surfaces (201, 202; 311, 312) form a label-display arrangement (15) underlying the touch-sensitive membrane for displaying the labels (18) of the actuators (13) for the plurality of functions through the

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touch-sensitive membrane to the user, the plurality of physical display surfaces cooperating to define the labels for the actuators for the functions, the movable surfaces being movable to make the labels for the at least one actuator for any selected one of the functions visible to a user of the device through the touch-sensitive membrane while the labels for the actuators for others of the functions are obscured from the user,

each of the plurality of the positions of the actuator (19) also corresponds to a different positioning of the surfaces relative to the touch-sensitive membrane such that the labels for the at least one actuator for a function are made visible to the user through the touch-sensitive membrane while the labels for the actuators for the other functions are obscured from the user when the actuator is in the position that corresponds to said function, and

the controller (23) is responsive to each position of the actuator for configuring the touch-sensitive membrane to define the actuators that correspond to the function that corresponds to the position of the actuator and for causing the circuitry to effect the function that corresponds to the position of the actuator.

**7.** The device of claim 5 or 6 wherein:

each physical display surface (201; 202; 311; 312) comprises

a plurality of surface portions (203; 204; 302; 303; 304) forming the surface when aligned with each other; and

the label display arrangement further comprises a linkage (205; 305, 306) connecting the actuator to at least some of the surface portions, the linkage translating operation of the actuator into motion of said at least some of the surfaces such that, in each of the positions of the actuator, the surface portions that form a different one of the surfaces are aligned with each other and face the touch-sensitive membrane in front, relative to the touch-sensitive membrane, of the surface portions that form the other surfaces.

**8.** The device of claim 5 or 6 wherein:

each physical display surface (201; 202) comprises

a plurality of surface portions (203; 204) positioned substantially adjacent each other and together forming the surface, each said surface portion having a surface portion counterpart among the surface portions of each of the other surfaces, and constituting with the surface portion counterparts a set of surface portions; and

the label display arrangement further comprises a linkage (205) connecting the surface portions (204) of at least some of the surfaces (202) to the actuator, the linkage translating operation of the actuator into motion of at least some of the surface portions of each set relative to each other such that, in each of the positions of the actuator, all but a different one of the surface portions of each set is positioned behind, relative to the touch-sensitive membrane, either (a) said one surface portion of said set or (b) a surface portion of another set, such that said different one surface portion of each set is visible through the touch-sensitive membrane and all of the other surface portions of each set are obscured.

**9.** The device of claim 5 or 6 wherein

each physical display surface (311; 312) comprises

a plurality of surface portions (302; 303; 304) forming the surface when positioned substantially adjacent each other; and

the label display arrangement comprises

a plurality of rotatable members (301) each comprising a different one of the plurality of surface portions of each one of the surfaces, and

a linkage (305, 306) connecting the rotatable members to the actuator, the linkage translating operation of the actuator into rotation of the rotatable members such that, in each of the positions of the actuator, each of the members faces toward the touch-sensitive membrane the surface portion of a different one of the surfaces and faces away from the membrane the surface portions of the other surfaces.

**10.** The device of claim 6 wherein:

the plurality of physical display surfaces comprise

a plurality of physical display surfaces (201, 202; 311, 312) each bearing the labels (18) for the at least one actuator (13) for a different one of the functions, at least some of the surfaces (202; 311, 312) being movable to display any selected one of the surfaces through the touch-sensitive membrane to the user while others of the surfaces are obscured from the user; and

the actuator comprises

an actuator (19) manually operable by the user, coupled to the surfaces such that operation of the actuator translates into movement of at least some of the surfaces, the actuator having a plurality of positions (240, 241; 340, 341) each corresponding to a different one of the functions

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and each of the plurality of positions also corresponding to a different positioning of the surfaces relative to the touch-sensitive membrane such that the surface bearing the labels corresponding to a function is positioned to display its labels to the user through the touch-sensitive membrane while the labels borne by the other surfaces are obscured from the user when the actuator is in the position that corresponds to said function.

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Page 791 of 1144

*FIG. 1*

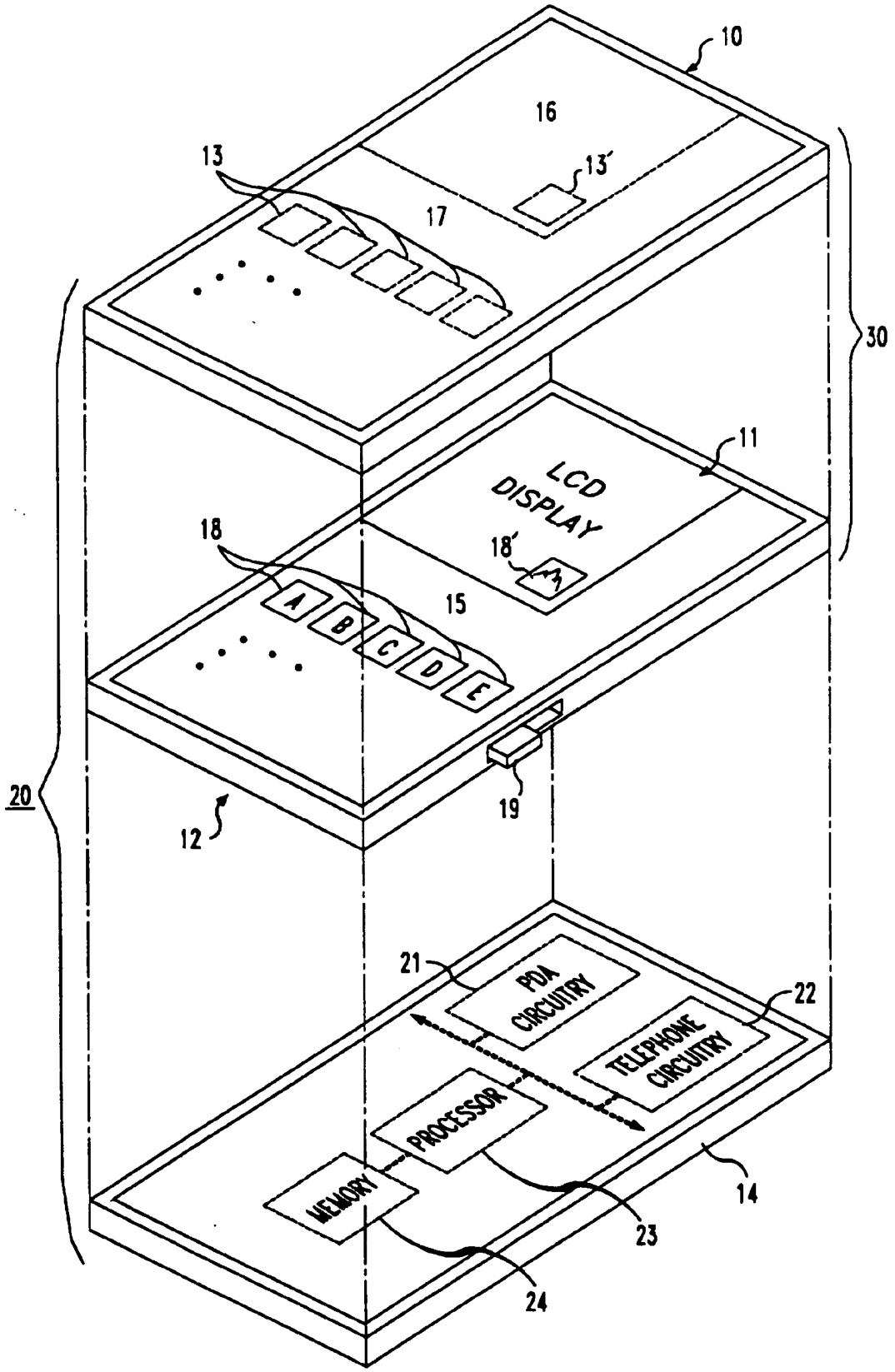

10
16
13
13'
17
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18'
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A
B
C
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E
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21
PDA
CIRCUITRY
22
TELEPHONE
CIRCUITRY
PROCESSOR
MEMORY
14
23
24

FIG. 2A

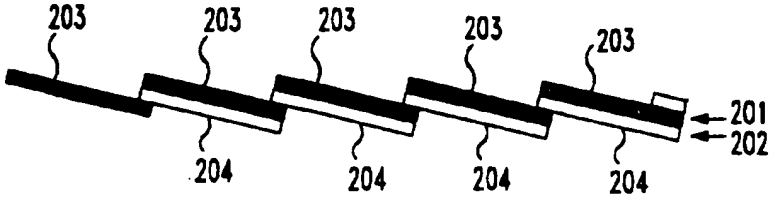



FIG. 2B

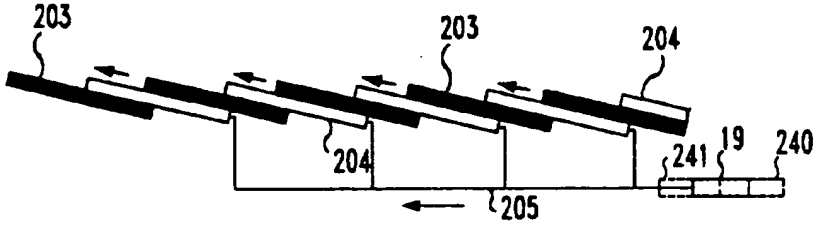



FIG. 2C

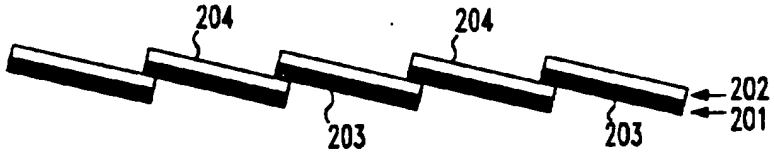



FIG. 3A

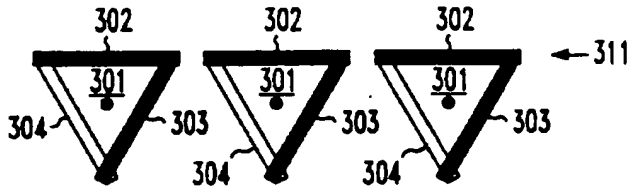



FIG. 3B

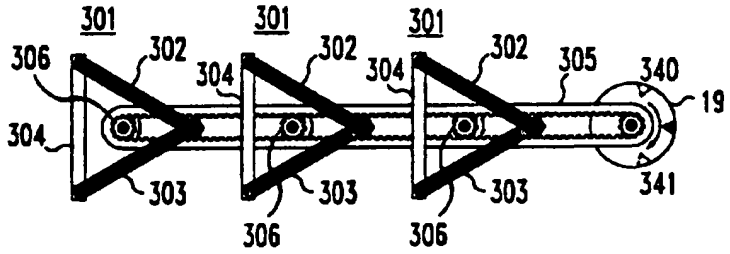



FIG. 3C

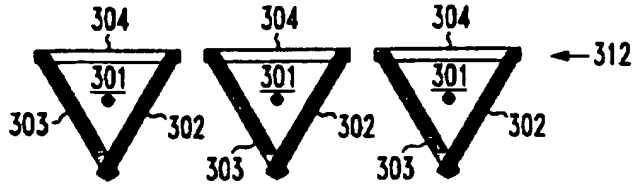


FIG. 5

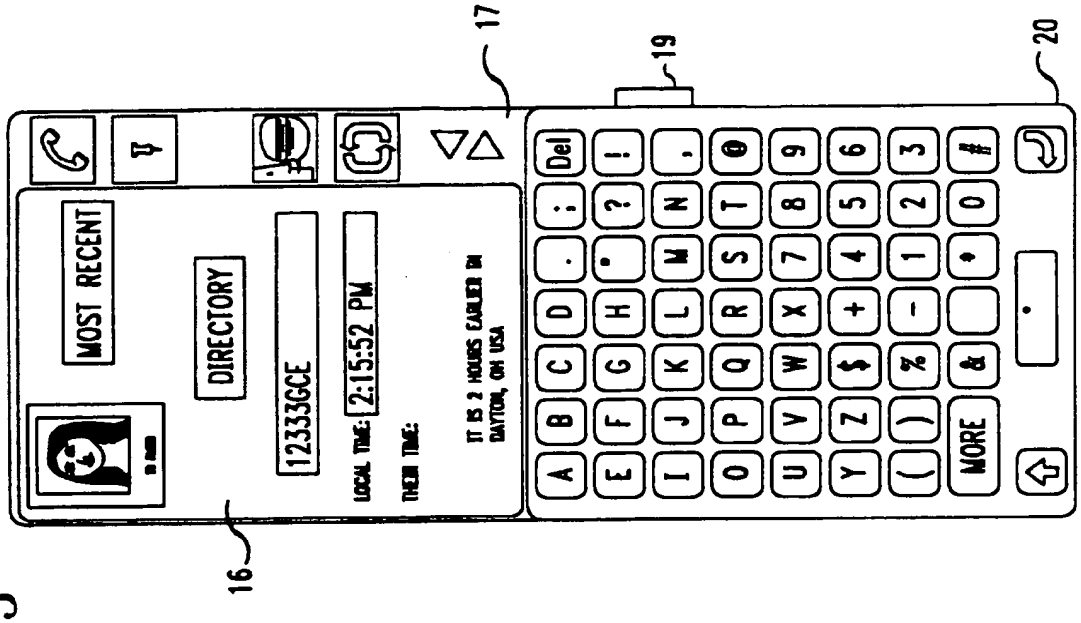
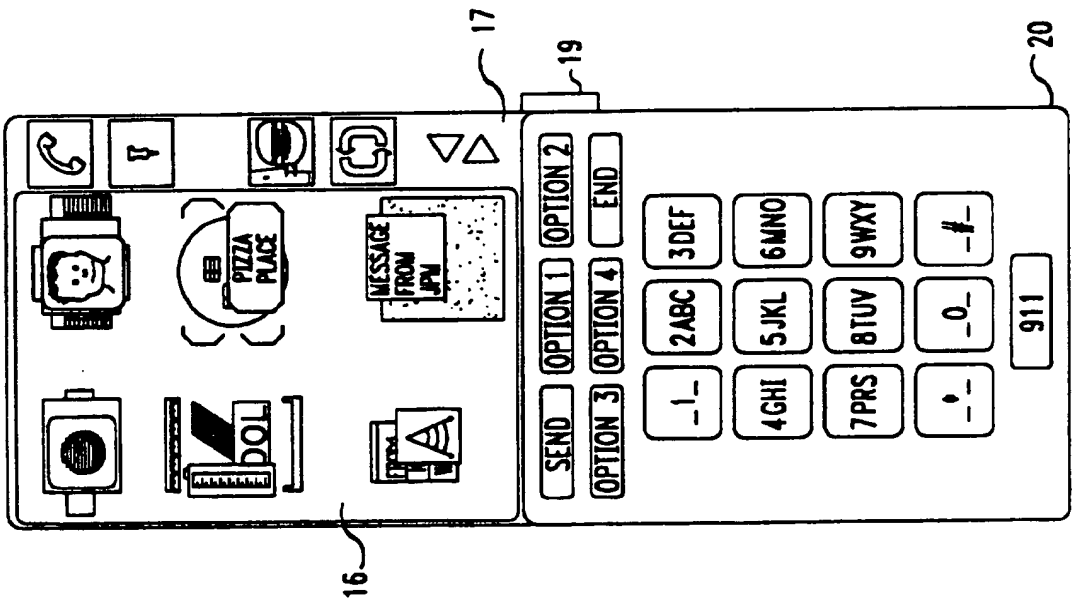

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FIG. 4


PIZZA PLACE
MESSAGE FROM LPN
DOL
SEND
OPTION 1
OPTION 2
OPTION 3
OPTION 4
END
_1_
2ABC
3DEF
4GHI
5JKL
6MNO
7PRS
8TUV
9WXY
*_
_0_
_#_
911
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European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 95 30 7015

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
|---|---|---|---|
| X | US-A-4 336 530 (KOIKE MAMORU ET AL) 22 June 1982<br>* column 2, line 29 - line 55 *<br>* column 3, line 32 - line 36 *<br>* column 3, line 55 - line 59; claims 1-6; figures 2,5,7 * | 1,2,5 | G06F3/023 |
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| A | IBM TECHNICAL DISCLOSURE BULLETIN,<br>vol. 19, no. 5, October 1976 NEW YORK US, pages 1544-1545,<br>MAGURA P. 'PROGRAMMABLE ILLUMINATED TYPEWRITER KEYBOARD'<br>* the whole document * | 9 | TECHNICAL FIELDS SEARCHED (Int.Cl.6)<br>G06F |
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The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 26 January 1996 | Bailas, A |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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(51) Int Cl.[6]: **H04M 1/02**, H04M 1/23

(84) Designated Contracting States:
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## (54) Touch screen keyboard

(57) A removable cover for use with a personal communicator of the type having a touch screen display includes a plurality of key members which can be depressed by a user such that the underlying portions of the touch screen display are activated while simultaneously giving the user the feel and accuracy of an actual mechanical switching mechanism.

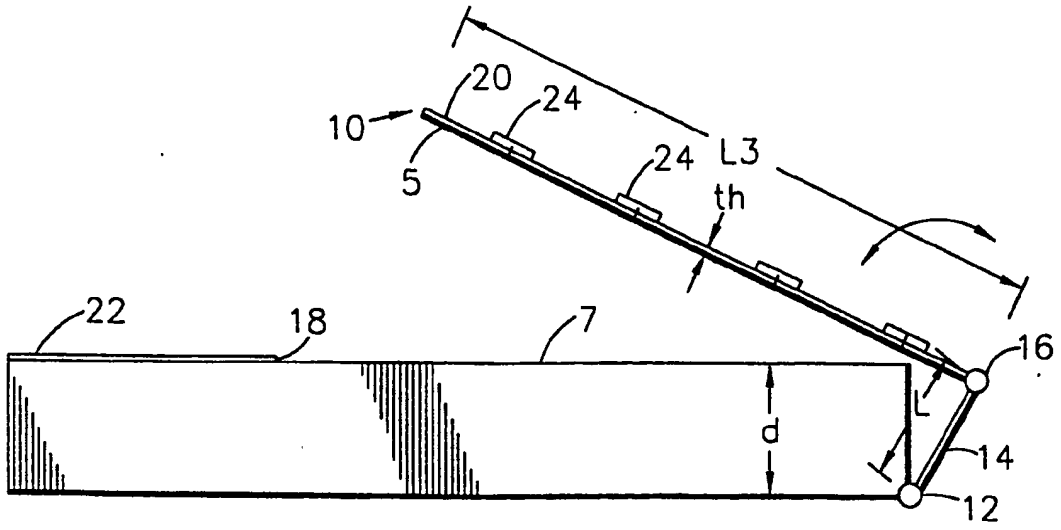



FIG. 2

EP 0 813 328 A3

European Patent Office

# EUROPEAN SEARCH REPORT

Application Number
EP 97 30 4166

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int.Cl.6) |
|---|---|---|---|
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| X | US 5 414 444 A (BRITZ DAVID M) 9 May 1995<br>* column 3, line 5 - line 23 *<br>* column 3, line 54 - line 58 *<br>* figures 1,2,6 * | 1,3,8-11 | |
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| P,X | GB 2 297 662 A (MOTOROLA INC)<br>7 August 1996<br>* page 7, line 4 - page 8, line 14 *<br>* page 12, line 4 - line 6 *<br>* figures 2,3,7 * | 1,3,<br>8-11,13 | |
| E | EP 0 802 659 A (LUCENT TECHNOLOGIES INC)<br>22 October 1997<br>* column 3, line 20 - line 32 *<br>* column 4, line 23 - line 51 *<br>* column 5, line 17 - column 6, line 11 *<br>* figures 2-4,7-9 * | 1,3,<br>8-11,13 | |

TECHNICAL FIELDS SEARCHED (Int.Cl.6)
H04M

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 12 February 1999 | Fragua, M |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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(19) Europäisches Patentamt
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(11) EP 0 780 865 B1

# (12) FASCICULE DE BREVET EUROPEEN

(45) Date de publication et mention de la délivrance du brevet:
**21.04.1999 Bulletin 1999/16**

(51) Int Cl.[6]: **H01H 13/70**, H03K 17/96

(21) Numéro de dépôt: **96402771.8**

(22) Date de dépôt: **17.12.1996**

## (54) Dispositif à touche sensitive

Berührungsempfindliche Vorrichtung

Touch sensitive device

(84) Etats contractants désignés:
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(30) Priorité: **19.12.1995 FR 9515058**

(43) Date de publication de la demande:
**25.06.1997 Bulletin 1997/26**

(73) Titulaire: **COMPAGNIE EUROPEENNE POUR L'EQUIPEMENT MENAGER CEPEM**
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**US-A- 4 056 699**
**US-A- 4 090 229**
**US-A- 4 584 444**

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EP 0 780 865 B1



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## Description

**[0001]** La présente invention concerne les dispositifs à touche sensitive par effet capacitif utilisés notamment dans les claviers numériques, par exemple pour une table de cuisson.

**[0002]** Il est connu que de tels dispositifs permettent de détecter la présence d'un élément (doigt d'un utilisateur ou objet électriquement conducteur, par exemple une casserole métallique) à travers un corps électriquement isolant du type plaque de verre ou de vitrocéramique.

**[0003]** Plus précisément, le fait de placer le doigt ou un objet sur la plaque dans une zone en regard avec une touche sensitive engendre une variation de capacité. La touche est reliée électriquement à un circuit électronique qui détecte cette variation de capacité et la transforme en état actif ou non actif.

**[0004]** De nombreux modes de réalisation de touches fonctionnant selon le principe rappelé ci-dessus ont déjà été proposés.

**[0005]** Nous nous intéressons dans la suite aux modes de réalisation particuliers selon lesquels la touche et les composants formant notamment le circuit électronique de détection de l'activation de la touche sont portés par un support électriquement isolant placé derrière la plaque.

**[0006]** Dans un premier mode de réalisation connu, ce support électriquement isolant est composé de deux plaquettes de circuit imprimé maintenues à distance l'une en regard de l'autre, l'une des deux plaquettes portant essentiellement les touches obtenues par gravure, et l'autre portant essentiellement les composants électroniques. Dans un tel mode de réalisation, les difficultés d'assemblage des deux plaquettes en vue d'assurer leurs liaisons mécanique et électrique viennent grever considérablement les coûts de fabrication. En outre, le moindre défaut de planéité de la plaquette portant les touches, qui est appliquée contre la surface interne de la plaque transparente, entraîne la présence de lames d'air entre certaines touches et la plaque transparente. Il en résulte des dysfonctionnements dus à des différences de sensibilité entre les touches composant le clavier, voire à des insensibilités totales de certaines touches.

**[0007]** Pour pallier les inconvénients précédents, un deuxième mode de réalisation connu propose un support électriquement isolant constitué d'une plaquette de circuit imprimé unique portant simultanément les touches et les composants électroniques. Chaque touche comporte une tête électriquement conductrice reliée mécaniquement à la plaquette de circuit imprimé par un premier organe susceptible de se déplacer transversalement par rapport à la plaquette de circuit imprimé sous l'action d'un second organe constitué par un ressort électriquement conducteur. Le ressort permet d'une part, d'assurer la liaison électrique entre la tête de la touche et le circuit électronique, et d'autre part, le déplacement transversal du premier organe de façon à ce que la tête soit en appui contre la plaque transparente. Une telle réalisation est décrite dans le document FR-A-2.704.332. Elle permet de s'affranchir du problème des lames d'air évoqué précédemment, mais le nombre de pièces distinctes destinées à réaliser la touche reste élevé. Ces pièces doivent être fabriquées indépendamment les unes des autres, ce qui augmente le coût global de fabrication, et l'assemblage de ces pièces reste compliqué. Par ailleurs, les risques de défaut dans les contacts électriques sont élevés.

**[0008]** La présente invention a pour but de proposer un nouveau dispositif à touche sensitive par effet capacitif dans lequel la réalisation de la touche et son assemblage avec les autres éléments du dispositif sont considérablement simplifiés.

**[0009]** Plus précisément, la présente invention a pour objet un dispositif à touche sensitive par effet capacitif pour détecter la présence d'un élément à travers une plaque électriquement isolante, la touche étant portée par une plaquette de circuit imprimé sensiblement parallèle à ladite plaque et étant reliée électriquement à un circuit électronique de détection porté par ladite plaquette de circuit imprimé, caractérisé en ce que la touche est constituée par une pièce unique réalisée par une lame ressort en matériau électriquement conducteur présentant une embase fixée sur la plaquette de circuit imprimé et reliée par l'intermédiaire d'une partie médiane à une partie supérieure sensiblement plane formant une surface de détection destinée à être plaquée contre la surface inférieure de la plaque, la partie médiane permettant une flexibilité de la pièce en sorte que la surface de détection soit en appui élastique contre la surface inférieure de la plaque quels que soient les défauts de parallélisme entre la plaque et la plaquette de circuit imprimé.

**[0010]** Grâce à l'invention, une pièce unique permet d'assurer les trois fonctions indispensables à la transmission d'information, à savoir :

- la fonction touche grâce à la surface de détection en regard de laquelle l'utilisateur peut placer son doigt ou un objet ;
- la fonction ressort pour plaquer la surface de détection contre la plaque, quels que soient les défauts de cette dernière ;
- la connexion électrique entre la surface de détection et les composants portés par la plaquette de circuit imprimé.

**[0011]** Dans un mode de réalisation préférentiel de l'invention, la lame ressort est repliée en forme de Z. L'embase de la lame, sensiblement plane, forme avec la partie supérieure, les deux parties extrêmes du Z, la partie médiane étant constituée par la partie oblique du Z.

**[0012]** D'autres avantages vont apparaître au vu de la description d'un exemple de réalisation préférentiel

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de la pièce unique faite en référence aux figures annexées dans lesquelles :

- les figures 1 et 2 sont des vues en perspective respectivement par le dessus et par le dessous, d'une pièce unique constituant la touche selon l'invention ;
- la figure 3 est une coupe en élévation montrant la mise en place de la touche sur la plaquette de circuit imprimé et sous la plaque.

**[0013]** Comme représentée sur les figures, la pièce unique constituant la touche selon l'invention et portant la référence 1 est réalisée par une lame ressort en matériau électriquement conducteur repliée en forme de Z, et présentant une embase 10, une partie supérieure 11, et une partie oblique 12 formant la partie médiane et reliant l'embase 10 et la partie supérieure 11.

**[0014]** L'embase 10 et la partie supérieure 11 sont sensiblement planes, et la partie oblique 12 est telle qu'elle permet une flexibilité de la pièce, notamment le long de l'axe XX'.

**[0015]** La pièce 1 est fixée sur la plaquette 2 de circuit imprimé au niveau de son embase 10, par exemple par l'intermédiaire de trois picots 13, 14 et 15 prolongeant l'embase sensiblement perpendiculairement et placés dans trois trous 20 correspondants de la plaquette 2 de circuit imprimé.

**[0016]** On peut souder ou braser tout ou partie des picots 13, 14 et 15 directement sur une piste conductrice reliée au circuit électronique de détection (non représentés). Ainsi, les picots permettent non seulement le maintien mécanique de la pièce 1, mais aussi sa connexion électrique avec le circuit électronique de détection porté par la plaquette.

**[0017]** Les picots sont avantageusement au nombre de trois, deux premiers picots 13 et 14 étant par exemple prévus à l'extrémité libre de l'embase 10, le troisième picot 15 étant prévu à l'extrémité opposée de l'embase, sensiblement à égale distance des deux premiers picots.

**[0018]** De préférence, chaque picot comprend un épaulement 16 qui vient en butée contre la surface supérieure de la plaquette 2 de circuit imprimé. De cette manière, on maintient un espacement $e$ entre l'embase 10 et la plaquette 2. Des composants électroniques sont par conséquent susceptibles d'être implantés sur la plaquette et sous l'embase. Cet espacement peut également contribuer à l'amélioration d'une éventuelle opération de lavage de la plaquette 2 après soudage des composants électroniques et de la pièce 1 sur la plaquette 2.

**[0019]** Lorsque la plaquette 2 supportant la pièce 1 est placée sous la plaque 3 en matériau électriquement isolant et de préférence transparente, la partie supérieure 11 est plaquée contre la surface inférieure de cette plaque 3. Cette partie supérieure 11 constitue directement la surface de détection en regard de laquelle un utilisateur peut poser son doigt ou un objet. La partie oblique 12 permet une flexibilité de la pièce 1 en sorte que cette surface de détection soit en appui élastique contre la surface inférieure de la plaque, quels que soient les défauts de parallélisme entre la plaque 3 et la plaquette 2 de circuit imprimé.

**[0020]** La partie oblique 12 comporte de préférence un évidement central 17 sur toute sa longueur. Ainsi, la souplesse de la lame ressort 1 est ajustée afin qu'elle n'applique pas un effort trop important sur la plaque transparente 3 et sur la plaquette 2. Outre l'ajustement de l'effort de la lame ressort, l'évidement permet, à la compression de la pièce, de maintenir la surface supérieure 11 plane grâce à une rigidité supérieure à celle de la partie oblique.

**[0021]** Le matériau utilisé pour réaliser la pièce unique doit être électriquement conducteur, soudable à l'étain et élastique. On utilise par exemple du cuivre ou un alliage de cuivre.

**[0022]** La conception de la touche selon l'invention regroupe les avantages suivants :

- Une pièce unique regroupant toutes les fonctions nécessaires au fonctionnement de la touche minimise le coût de fabrication.
- L'assemblage de la pièce unique sur la plaquette de circuit imprimé fait appel à un processus industriel standard comprenant l'insertion de picots dans des trous de la plaquette et la soudure de ces picots.
- L'interconnexion par soudure directe simplifie et fiabilise celle-ci.
- Le fonctionnement de la touche est assuré quels que soient les défauts de parallélisme entre la plaquette de circuit imprimé et la plaque transparente.
- Dans l'exemple de réalisation préférentiel décrit ci-dessus, la forme des picots permet de surélever l'embase par rapport à la plaquette de circuit imprimé, ce qui laisse la possibilité d'implanter des composants sous l'embase. L'encombrement est de ce fait optimisé.
- Le poids de la pièce unique est faible, surtout lorsque la partie oblique comporte un évidement central, ce qui permet de plaquer la surface de détection contre la plaque transparente sans pour autant exercer une force trop importante sur cette plaque et sur la plaquette de circuit imprimé.

## Revendications

1. Dispositif à touche sensitive par effet capacitif pour détecter la présence d'un élément à travers une plaque (3) électriquement isolante, la touche étant portée par une plaquette de circuit imprimé (2) sensiblement parallèle à ladite plaque (3) et étant reliée électriquement à un circuit électronique de détection porté par ladite plaquette (2) de circuit imprimé,

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caractérisé en ce que la touche est constituée par une pièce unique (1) réalisée par une lame ressort en matériau électriquement conducteur présentant une embase (10) fixée sur la plaquette de circuit imprimé et reliée par l'intermédiaire d'une partie médiane (12) à une partie supérieure (11) sensiblement plane formant une surface de détection destinée à être plaquée contre la surface inférieure de la plaque (3), la partie médiane (12) permettant une flexibilité de la pièce en sorte que la surface de détection (11) soit en appui élastique contre la surface inférieure de la plaque (3) quels que soient les défauts de parallélisme entre la plaque (3) et la plaquette (2) de circuit imprimé.

2. Dispositif à touche selon la revendication 1, caractérisé en ce que la lame ressort est repliée en forme de Z, avec une embase (10) sensiblement plane constituant, avec la partie supérieure (11), les deux extrémités du Z, et la partie médiane (12) étant constituée par la partie oblique du Z.

3. Dispositif à touche selon la revendication 2, caractérisé en ce que la partie oblique (12) de la pièce en forme de Z possède un évidement central (17) sur toute sa longueur.

4. Dispositif à touche selon l'une quelconque des revendications précédentes, caractérisé en ce que ladite pièce (1) est fixée à la plaquette (2) de circuit imprimé au niveau de l'embase (10) par l'intermédiaire de picots (13, 14, 15) qui prolongent ladite embase (10) sensiblement perpendiculairement, placés dans des trous (20) de la plaquette (2) de circuit imprimé et soudés à celle-ci de manière à permettre le maintien mécanique de la pièce et la liaison électrique entre la surface de détection (11) et le circuit électronique de détection.

5. Dispositif à touche selon la revendication 4, caractérisé en ce que les picots comprennent un épaulement (16) qui vient en butée contre la surface supérieure de la plaquette (3) de circuit imprimé de manière à maintenir un espacement (e) entre l'embase (10) et ladite plaquette pour la mise en place éventuelle de composants sous l'embase.

6. Dispositif à touche selon l'une quelconque des revendications 4 et 5, caractérisé en ce que les picots sont au nombre de trois.

7. Dispositif à touche selon la revendication 6, caractérisé en ce que deux premiers picots (13, 14) sont prévus à l'extrémité libre de l'embase (10), un troisième picot (15) étant prévu à l'extrémité opposée, sensiblement à égale distance des deux premiers picots.

8. Dispositif à touche selon l'une quelconque des revendications précédentes, caractérisé en ce que le matériau utilisé pour la pièce unique comporte du cuivre.

**Patentansprüche**

1. Vorrichtung mit durch kapazitive Wirkung sensitiver Taste zum Erfassen des Vorhandenseins eines Elementes durch eine elektrisch isolierende Platte (3) hindurch, wobei die Taste von einer Leiterplatte (2) getragen ist, die im wesentlichen parallel zu der Platte (3) und elektrisch mit einer auf der Leiterplatte (2) angeordneten elektronischen Erfassungsschaltung verbunden ist, dadurch gekennzeichnet, daß die Taste aus einem einzigen Bauteil (1) besteht, das durch ein Federblatt aus elektrisch leitfähigem Material verwirklicht ist, das eine Grundplatte (10) aufweist, die auf der Leiterplatte befestigt und über einen mittleren Teil (12) mit einem oberen Teil (11) verbunden ist, der im wesentlichen eben ist und eine Erfassungsfläche bildet, die gegen die untere Fläche der Platte (3) gedrückt werden kann, wobei der mittlere Teil (12) dem Bauteil eine solche Flexibilität gibt, daß die Erfassungsfläche unabhängig von Abweichungen der Parallelität zwischen der Platte (3) und der Leiterplatte (2) elastisch an der unteren Fläche der Platte (3) abgestützt ist.

2. Vorrichtung mit Taste nach Anspruch 1, dadurch gekennzeichnet, daß das Federblatt in Form eines Z gebogen ist, mit einer im wesentlichen ebenen Grundplatte (10), die mit dem oberen Teil (11) die beiden Enden des Z bildet, wobei der mittlere Teil (12) durch den schrägen Teil des Z gebildet ist.

3. Vorrichtung mit Taste nach Anspruch 2, dadurch gekennzeichnet, daß der schräge Teil (12) des Bauteils in Form eines Z auf seiner gesamten Länge eine zentrale Aussparung (17) aufweist.

4. Vorrichtung mit Taste nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß das Bauteil (1) auf Höhe der Grundplatte (10) an der Leiterplatte (2) über Spitzen (13, 14, 15) befestigt ist, die die Grundplatte (10) im wesentlichen senkrecht verlängern und die in Löchern (20) der Leiterplatte (2) angeordnet und mit dieser verlötet sind, so daß das Bauteil mechanisch gehalten ist und die elektrische Verbindung zwischen der Erfassungsfläche (11) und der elektronischen Erfassungsschaltung besteht.

5. Vorrichtung mit Taste nach Anspruch 4, dadurch gekennzeichnet, daß die Spitzen einen Absatz (16) aufweisen, der an die obere Fläche der Leiterplatte (3) in Anlage gelangen, so daß zwischen der



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Grundplatte (10) und der Leiterplatte ein Abstand (e) vorliegt, um eventuell Bauteile unter der Grundplatte anzubringen.

6. Vorrichtung mit Taste nach einem der Ansprüche 4 und 5, dadurch gekennzeichnet, daß drei Spitzen vorgesehen sind.

7. Vorrichtung mit Taste nach Anspruch 6, dadurch gekennzeichnet, daß die beiden ersten Spitzen (13, 14) am freien Ende der Grundplatte (10) vorgesehen sind und daß eine dritte Spitze (15) am gegenüberliegenden Ende, im wesentlichen im gleichen Abstand von den beiden ersten Spitzen, vorgesehen ist.

8. Vorrichtung mit Taste nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß das für das einzige Bauteil verwendete Material Kupfer aufweist.

**Claims**

1. Capacitive-effect touch pad device for detecting the presence of an element through an electrically insulating plate (3), the pad being carried by a printed-circuit board (2) substantially parallel with the said plate (3) and being linked electrically to an electronic detection circuit carried by the said printed-circuit board (2), characterized in that the pad consists of a single part (1) made as a sprung strip of electrically conducting material having a base (10) fixed to the printed-circuit board and linked by way of a middle portion (12) to a substantially plane upper portion (11) forming a detection surface intended to be applied flat against the lower surface of the plate (3), the middle portion (12) allowing flexibility of the part so that the detection surface (11) bears elastically against the lower surface of the plate (3) irrespective of any lack of parallelism between the plate (3) and the printed-circuit board (2).

2. Pad device according to Claim 1, characterized in that the sprung strip is bent into a Z shape, with a substantially plane base (10) constituting, together with the upper portion (11), the two ends of the Z, and the middle portion (12) consisting of the oblique portion of the Z.

3. Pad device according to Claim 2, characterized in that the oblique portion (12) of the Z-shaped part possesses a central recess (17) over the whole of its length.

4. Pad device according to any one of the preceding claims, characterized in that the said part (1) is fixed to the printed-circuit board (2) in the vicinity of the base (10) by way of prongs (13, 14, 15) which extend the said base (10) substantially perpendicularly, are placed in holes (20) in the printed-circuit board (2) and are soldered to the latter so as to allow mechanical retention of the part and electrical linking between the detection surface (11) and the electronic detection circuit.

5. Pad device according to Claim 4, characterized in that the prongs comprise a shoulder (16) which abuts against the upper surface of the printed-circuit board (3) in such a way as to maintain a gap (e) between the base (10) and the said board for the possible installing of components under the base.

6. Pad device according to either one of Claims 4 and 5, characterized in that there are three prongs.

7. Pad device according to Claim 6, characterized in that two first prongs (13, 14) are provided at the free end of the base (10), a third prong (15) being provided at the opposite end, substantially equidistant from the two first prongs.

8. Pad device according to any one of the preceding claims, characterized in that the material used for the single part comprises copper.

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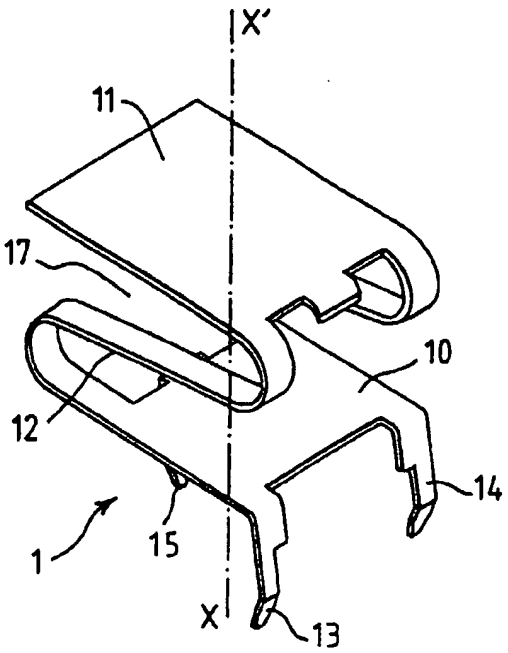



FIG.1

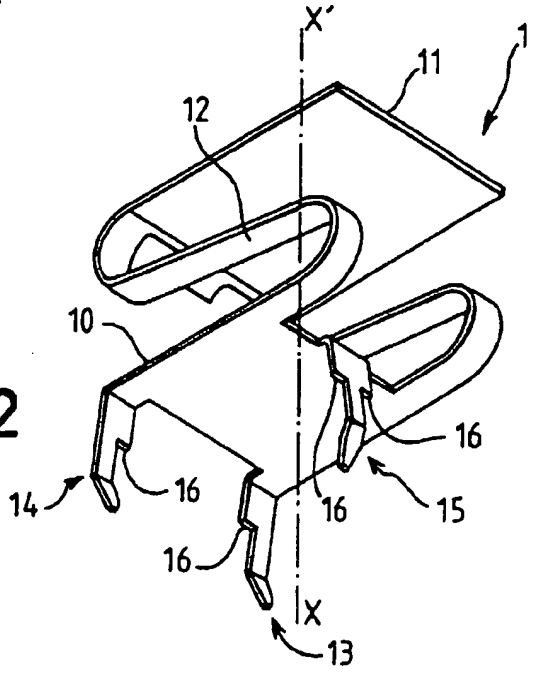



FIG.2

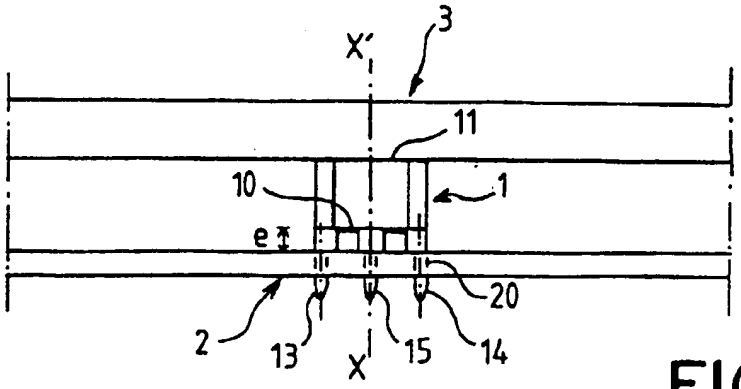



FIG.3



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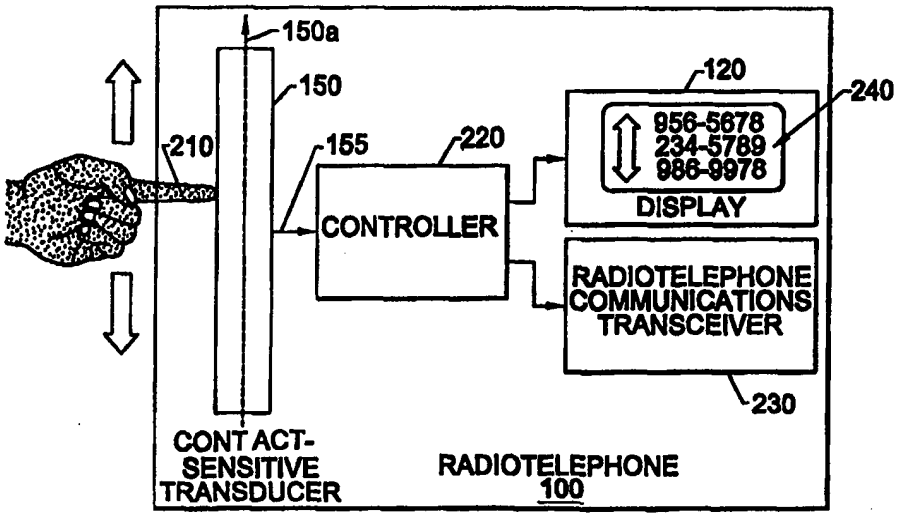
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(54) Title: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

(57) Abstract

A radiotelephone includes a housing, and a radiotelephone communications transceiver and display are attached to the housing. A contact-sensitive transducer such as a resistive transducer, a capacitive transducer or a semiconductive transducer, is attached to the housing and produces an output signal that characterizes contact with a contact-sensitive surface of the contact-sensitive transducer. A controller is responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, and controls at least one of the display and the radiotelephone communications transceiver according to the output signal of the contact-sensitive transducer. The controller, responsive to the contact-sensitive transducer, may determine a position of contact along an axis of the contact-sensitive transducer. A graphical object is selectively displayed based on the determined position of contact to thereby identify the graphical object, e.g., by highlighting one of a plurality of displayed graphical objects or by displaying a cursor that indicates one of a plurality of displayed graphical objects. In yet another embodiment, the controller is configured to cause the display or the radiotelephone communications transceiver to perform a plurality of actions. An action of the plurality of actions may be associated with an identified graphical object, and the controller may initiate the action associated with the identified graphical object in response to, for example, detection of a momentary contact of an object with the contact-sensitive transducer.




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# RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

## Field of the Invention

The present invention relates to radiotelephones and methods of operation thereof, and more particularly, to apparatus and methods for providing user input to radiotelephones.

## Background of the Invention

Radiotelephone terminals typically include a radio transceiver integrated with a user interface mechanism within a handheld case. The user interface typically includes a plurality of keys similar to those provided on conventional wireline telephones, as well as additional function keys for controlling functions associated with radiotelephone operations. The keys provide a means for entering commands, telephone numbers or other data for processing by the radiotelephone. A display may be used to display information a user has entered at the keys, e.g., telephone numbers, menu selections, and the like, as well as to display messages or other information received from a radiotelephone system with which the radiotelephone is communicating. The display may also be used to display information stored in memory located in the radiotelephone.

Commonly, the display is configured to display one or more graphical objects, e.g., a list of commands in a command menu or a list of telephone numbers that are stored in the radiotelephone memory that the user may select for communication. The graphical objects may be selectively displayed, for example, by displaying a selected number of entries in a list of telephone numbers or command options. The list may be "scrolled" in response to a user input to allow a large list to be displayed on a small display.

In some conventional radiotelephones, control of the scrolling of graphical objects on the display may be controlled by one or more keys, the operation of which may be similar to the "arrow" keys provided on computer keyboard. Other keys may be provided to invoke particular selections. In other conventional radiotelephone

designs, a wheel-like input device may be mounted on the radiotelephone case that may be turned by a user to effect scrolling of graphical objects on the display. The wheel device may also be configured to select items on the display in response to user application of radial pressure to the wheel.

Each of these conventional techniques for control of a radiotelephone display has its limitations. Keys for scrolling and invoking display selections may be awkward to use, and may consume valuable space on the keypad of the radiotelephone. A wheeled input device may provide faster and more intuitive scrolling control, but such a device may take up an inordinate amount of space and require moving parts which may be more prone to failure. Accordingly, there is a need for improved input devices for radiotelephones.

## Summary of the Invention

In light of the foregoing, it is an object of the present invention to provide radiotelephones and methods of operation thereof which provide reliable, intuitive and efficient display control.

This and other objects, features and advantages are provided according to the present invention by radiotelephones and methods of operation thereof in which control of a radiotelephone's display and/or radiotelephone communications transceiver is effected using a contact-sensitive transducer such as a resistive or capacitive touch strip mounted on the radiotelephone. The contact-sensitive transducer produces an output signal that characterizes contact, e.g., contact of an object such as a user's finger, with a surface of the transducer. The output signal may be processed by a controller to control display of information on the display and to initiate actions associated with displayed items. For example, the contact-sensitive transducer may be used to control display of graphical objects such as rows or columns on the display, and initiation of functions associated with the graphical objects. Preferably, the contact-sensitive transducer comprises an elongate strip and produces an output signal that characterizes contact with the strip along its elongate axis. In one embodiment, two of such elongate strips are mounted on respective sides of the radiotelephone. In another embodiment, an elongate strip is mounted on a front face of the radiotelephone.

Using a contact-sensitive transducer to control a radiotelephone offers several advantages. Because a contact-sensitive transducer may be configured to have a thin profile, the transducer may be mounted at a surface of the radiotelephone without taking up an inordinate amount of valuable space. Because characteristic types of contact with the transducer can be detected, such as swiping motions or taps, the transducer may be used to perform display movements such as scrolling or cursor movement, as well as for selection of items displayed on the display. In addition, because a contact-sensitive transducer may be fabricated without moving parts, reliability may be improved.

In particular, according to an aspect of the present invention, a radiotelephone includes a frame. The frame supports a radiotelephone communications transceiver and a display. A contact-sensitive transducer such as a resistive transducer, a capacitive transducer or a semiconductive transducer, is supported by the frame, e.g., mounted at a surface of a housing, and produces an output signal that characterizes contact along a contact-sensitive surface of the contact-sensitive transducer. A controller is responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, and controls at least one of the display and the radiotelephone communications transceiver according to the output signal of the contact-sensitive transducer.

In an embodiment of the present invention, the controller is configured to selectively display an image, e.g., a graphical object such as a row of alphanumeric characters, on the display responsive to the output signal of the contact-sensitive transducer. The controller may include means for displaying of a plurality of graphical objects on the display, and means, responsive to the contact sensitive transducer, for identifying one of the displayed plurality of graphical objects based on the output signal of the contact-sensitive transducer.

According to another embodiment, the controller comprises means, responsive to the contact-sensitive transducer, for determining a position of contact along the axis of the contact-sensitive transducer. Means are also provided, responsive to the means for determining a position of contact, for selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object,

e.g., by highlighting one of a plurality of displayed graphical objects or by displaying a cursor that indicates one of a plurality of displayed graphical objects.

In yet another embodiment of the present invention, the controller is configured to cause the display or the radiotelephone communications transceiver to perform a plurality of actions. An action of the plurality of actions may be associated with an identified graphical object, and the controller may further comprise means, responsive to the contact-sensitive transducer, for initiating the action associated with the identified graphical object. The means for initiating an action may include means, responsive to the contact-sensitive transducer, for detecting a momentary contact with the transducer. Means may be provided, responsive to the means for detecting a momentary contact, for initiating the action associated with the identified graphical object. The means for initiating an action may include means for initiating the action in response to detection of a predetermined number of momentary contacts occurring within a predetermined time interval.

According to another embodiment of the present invention, the controller includes means, responsive to the contact-sensitive transducer, for scrolling displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer. The means for scrolling may include means, responsive to the output signal of contact-sensitive transducer, for detecting moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and means, responsive to the means for detecting moving contact, for scrolling displayed rows along the axis of the display based on the detected movement.

In yet another embodiment of the present invention, the controller has a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer. The radiotelephone further comprises means for placing the controller in one of the first mode or the second mode in response to an input from a user.

Another embodiment according to the present invention includes a power supply electrically connected to the contact-sensitive transducer. The controller comprises a first control circuit, responsive to the contact-sensitive transducer, which controls the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer, and a second control circuit,

responsive to the contact-sensitive transducer, which controls power transfer from the power supply to the first control circuit according to the output signal from the contact-sensitive transducer. The first control circuit may include a microcontroller, and the second control circuit may control power transfer from the power supply to the microcontroller according to the output signal of the contact-sensitive transducer.

In another embodiment according to the present invention, the radiotelephone frame includes a housing and the contact-sensitive transducer comprises an elongate contact-sensitive strip mounted at a surface of the housing. The housing may have a front face and an adjoining first side, the display may be mounted at the front face, and the elongate contact-sensitive strip may be mounted at the first side adjoining the front face. A second contact-sensitive strip may be mounted at a second side of the radiotelephone housing, adjoining the front face and opposite the first side. According to another embodiment, a contact-sensitive transducer may be mounted at the front face of the housing.

According to method aspects of the present invention, user input is provided to a radiotelephone using a contact-sensitive transducer that produces an output signal that characterizes contact of an object on a contact-sensitive surface of the contact-sensitive transducer. At least one of a radiotelephone communications transceiver and a display of the radiotelephone may be controlled according to the output signal of the contact-sensitive transducer. An image may be selectively displayed on the radiotelephone display according to the output signal of the contact-sensitive transducer. Improved user interfaces for radiotelephones are thereby provided.

## Brief Description of the Drawings

FIG. 1 illustrates a radiotelephone according to an embodiment of the present invention.

FIG. 2 is a schematic diagram illustrating a radiotelephone according to an embodiment of the present invention.

FIG. 3 illustrates a radiotelephone with dual contact-sensitive strips according to another embodiment of the present invention.

FIG. 4 is a schematic diagram illustrating a circuit for controlling a display using a contact-sensitive transducer according to another embodiment of the present invention.

FIG. 5 is a flowchart illustration of operations for determining a position of contact of an object with a contact-sensitive transducer according to an aspect of the present invention.

FIG. 6 is a schematic diagram illustrating a circuit for controlling power supply to a radiotelephone using a contact-sensitive transducer according to another embodiment of the present invention.

FIGs. 7A-7C illustrate operations for scrolling displayed items and selecting functions associated with a displayed item according to another aspect of the present invention.

FIG. 8 is a flowchart illustration of operations for detecting a swiping contact with a contact-sensitive transducer according to another aspect of the present invention.

FIGs. 9-10 are flowchart illustrations of operations for detecting contacts with a contact-sensitive transducer according to aspects of the present invention.

FIG. 11 illustrates a radiotelephone with a horizontally mounted contact-sensitive strip according to another embodiment of the present invention.

## Detailed Description of Preferred Embodiments

The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which embodiments of the invention are shown. Those skilled in the art will appreciate that the invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. In the drawings, like numbers refer to like elements throughout. It will be understood that when a first object, e.g., a contact-sensitive transducer strip, is referred to as mounted "at" a surface of a second object, e.g., a housing or the like, the first object may be mounted directly on the surface of the second object, on a structural element or frame underlying the surface of the second object which allows a surface of the first object accessible through an opening in the surface of the second object, and the like.

FIG. 1 illustrates a radiotelephone **100** in which the apparatus and methods according to an embodiment of the present invention may be embodied. The

radiotelephone includes a frame, here shown as including a housing **110**. The housing **110** supports a display **120** and a plurality of keys **130**. Those skilled in the art will appreciate that also included but not illustrated are a radiotelephone communications transceiver for communicating with a radiotelephone system, e.g., transmitter, receiver and associated control circuits for communicating with a cellular system via an antenna **140**. The radiotelephone communications transceiver and the display **120** are controlled by a contact-sensitive transducer **150** mounted at a side surface of the radiotelephone housing **110**, adjacent the display **120**. It will be appreciated that the contact-sensitive transducer **150** may be attached to the housing **110** in a variety of different ways. For example, the transducer **150** may be attached to an outer surface of the housing **110**, attached to a boss or similar structure attached to an outer surface of the housing **110**, attached to a circuit board or similar structure mounted within the housing **110** and extending through an opening in a surface of the housing **110**, or the like.

Referring now to FIG. 2, the contact-sensitive transducer **150** produces an output signal **155** that characterizes contact of an object, such as a user's finger **210**, along an axis **150a** of the transducer **150**. A controller **220** is responsive to the output signal **155** and operatively associated with the display **120** and a radiotelephone communications transceiver **230**. The controller **220** selectively display an image, such as one or more rows **240** of alphanumeric characters, on the display **120** based on the output signal **155** produced by the contact-sensitive transducer **150**. The controller also controls the radiotelephone communications transceiver **230** according to the output signal **155**. The contact-sensitive transducer **150** may comprise a variety of different contact-sensitive devices, including resistive, capacitive or semiconductive strips. For example, the contact-sensitive transducer **150** may be implemented using a semiconductive pad-type transducer of the type manufactured by Interlink Corp.

Fig. 3 illustrates an embodiment of the present invention, in which dual contact sensitive strips **150a**, **150b** are attached on opposite sides of a radiotelephone housing **110**, adjacent the display **120**. By providing strips on both sides of the radiotelephone housing **110**, the radiotelephone **100** may be used in either a right-handed or left-handed fashion. Preferably, only one of the strips **150a**, **150b** is active at any given time, i.e., one of the strips is inactivated to prevent inadvertent generation

of signals to the controller caused by gripping of the radiotelephone. The active strip may be indicated by, for example, displaying an icon **125** near the edge of the display **120** closest the active strip **150a**.

FIG. 4 illustrates an exemplary embodiment of the controller **220** that includes a circuit connected to nodes $R_1$, $R_2$, $R_c$, $L_1$, $L_2$, $L_c$ of the transducers **150a**, **150b**. Voltages between the nodes $R_1$ and $R_c$ and nodes $L_1$ and $L_c$ are sampled under the control of a microcontroller **410** which controls multiplexers **420a**, **420b** and a discharge switch **430**, selectively applying the voltages at the nodes $R_1$, $R_2$, $R_c$, $L_1$, $L_2$, $L_c$ to capacitor **C**. A comparator **440**, in conjunction with a counter **450**, determines the time required to charge the capacitor **C** to a threshold voltage $V_T$ after a node of one of the transducers **150a**, **150b** is connected to the capacitor **C**. A trio of charge times is sampled for a given transducer, providing a measure of a position of contact of an object with the transducer, as will be described in detail below. The counts produced by the counter **150**, representing contact position samples, are latched into a register **460**, and in turn conveyed to the microcontroller **410** for further processing.

Those skilled in the art will appreciate that a wide variety of apparatus other than the illustrated embodiment of FIG. 4 may be used with the present invention. For example, a different type of contact-sensitive transducer may be employed which utilizes a different kind of controller circuitry to processes output signals produced by the contact-sensitive transducer. In general, it will be appreciated that a controller **220** for processing output signals produced by a contact-sensitive transducer and for controlling a display **120** and a radiotelephone communications transceiver **230** according to the output signal, as described with respect to FIG. 2, may be implemented using special purpose hardware, software or firmware running on general-purpose or special-purpose computing apparatus, or combinations thereof.

The flowchart illustration of FIG. 5 illustrates methods and apparatus for determining a position of contact with a contact-sensitive transducer according to an aspect of the present invention. It will be understood that blocks of the flowchart illustration, and combinations of blocks in the flowchart illustration, can be implemented by computer program instructions which may be loaded onto a computer or other programmable data processing apparatus to produce a machine such that the instructions which execute on the computer or other programmable data processing

apparatus create means for implementing the functions specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart block or blocks. Accordingly, blocks of the flowchart illustration support combinations of means for performing the specified functions and combinations of steps for performing the specified functions. It will also be understood that each block of the flowchart illustrations, and combinations of blocks in the flowchart illustration, can be implemented by special purpose hardware which performs the specified functions or steps, or combinations of special purpose hardware such as the microcontroller **410** of FIG. 4, microprocessors, digital signal processing (DSP) chips, application-specific integrated circuits (ASICS) or the like, which execute computer instructions.

FIG. 5 illustrates exemplary detailed operations (Block **500** et seq.) for determining a position of contact of an object with the left contact strip **150a** of FIG. 3. The discharge switch **430** is closed to discharge the capacitor **C** (Block **505**). The power supply voltage $V_{cc}$ is then applied to the $L_1$ node (Block **510**), and the $L_c$ node is connected to the capacitor **C** (Block **515**). The discharge switch **430** is then opened to charge the capacitor **C** (Block **520**), and a first capacitor charge time $T_1$ is measured (Block **525**). The capacitor **C** is then discharged by closing the switch **430** again (Block **530**). The power supply voltage $V_{cc}$ is next applied to the $L_2$ node (Block **535**), and the $L_c$ node is connected to the capacitor **C** (Block **540**). The discharge switch **430** is then opened (Block **545**), and a second capacitor charge time $T_2$ is measured (Block **550**). The capacitor **C** is discharged once again by closing the discharge switch **430** (Block **555**). The power supply voltage $V_{cc}$ is then applied to the $L_1$ node (Block **560**), and the $L_2$ node is connected to the capacitor **C** (Block **565**). The discharge switch **430** is opened (Block **570**), and a third capacitor charge time $T_3$ is measured (Block **575**). The first, second and third capacitor charge times $T_1$, $T_2$, $T_3$ are then used to determine a position of contact with the transducer **520b** (Block **580**).

In particular, three equations are applicable to the measurements described with respect to FIG. 5:

$$T_1 = k(R_{L_1} + R_{L_c});$$

$$T_2 = k(R_{L_2} + R_{L_c}); \text{ and}$$

$$T_3 = k(R_{L_1} + R_{L_2}), \text{ where}$$

$$k = -C\ln(1 - V_t / V_{cc}).$$

These equations may be solved for $\mathbf{R}_{L_1}$, $\mathbf{R}_{L_2}$ and $\mathbf{R}_{L_c}$, and the position of contact **P** can be determined as:

$$P = \frac{R_{L_1}}{R_{L_1} + R_{L_2}}.$$

Those skilled in the art will appreciate that similar operations may be performed to determine a position of contact with the right contact strip **150a**. It will also be understood that by application of appropriate control signals to the multiplexers **420a**, **420b**, either one of the transducers **150a**, **150b** may be disconnected from the capacitor **C**, effectively preventing input from the disconnected transducer.

FIG. 6A illustrates another embodiment of the present invention, specifically a circuit which may be used in conjunction with the control circuit illustrated in FIG. 4 to control power transfer from a power supply, e.g., a battery supplying a battery voltage $\mathbf{V_{bat}}$, to the microcontroller **410** and/or other circuits in a radiotelephone based on input signals from a contact-sensitive transducer. Additional switches **610a-610d** may be provided in the signal paths connecting the nodes $\mathbf{R_c}$, $\mathbf{L_c}$, $\mathbf{R_1}$, $\mathbf{L_1}$. These switches may be used to connect the associated nodes to the control input for the switch **620** via diodes $\mathbf{D_1}$, $\mathbf{D_2}$ (in the case of nodes $\mathbf{R_c}$, $\mathbf{L_c}$) and to the battery voltage $\mathbf{V_{bat}}$ (in the case of nodes $\mathbf{R_1}$, $\mathbf{L_1}$) in an "off" state, as shown. In the off state, a power switch **620** disconnects the battery voltage $\mathbf{V_{bat}}$ from a regulator **630** that provides a regulated power supply voltage $\mathbf{V_{cc}}$ to the microcontroller **410**.

When either of the right or the left strips **150a**, **150b** is pressed such that a voltage is produced sufficient to overcome the drop across the associated diode $\mathbf{D_1}$,$\mathbf{D_2}$ and the input activation voltage of the power switch **620**, the power switch **620** closes and applies the battery voltage $\mathbf{V_{bat}}$ to the regulator **630**. Power is thus provided to

into a sustained "on" state by driving a third diode $D_3$ and by applying control signals to the switches **610a-610d** to connect the nodes $R_c$, $L_c$, $R_1$, $L_1$ the appropriate multiplexers as illustrated in FIG. 4. The microcontroller **410** may return the power switch **620** to the "off" state by inverting the logic on the line driving the third diode $D_3$. Because a specific voltage is needed to activate the power switch **620**, accidental activation of the radiotelephone can be prevented. According to another embodiment illustrated in FIG. 6B, the circuit of FIG. 6A may be modified such pressure on both of the strips **150a, 150b** is required to power up the regulator **630**. When the right strip **150b** is pressed, the battery voltage $V_{bat}$ is applied from $R_1$ and $R_c$ to $L_1$. If the left strip **150a** is simultaneously pressed, the voltage is also applied to the control input of the power switch **620** through $D_2$. Otherwise, the operation of the circuit of FIG. 6B is similar to that described with respect to the circuit of FIG. 6A.

The conceptual illustrations of FIGs. 7A-7B and the flowchart illustrations of FIGs. 8-10 illustrate methods and apparatus for determining contact with a contact-sensitive transducer to identify graphical objects on a display and for initiating functions associated with the identified objects. It will be understood that blocks of the flowchart illustrations, and combinations of blocks in the flowchart illustrations, can be implemented by computer program instructions which may be loaded onto a computer or other programmable data processing apparatus to produce a machine such that the instructions which execute on the computer or other programmable data processing apparatus create means for implementing the functions specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart block or blocks. Accordingly, blocks of the flowchart illustrations support combinations of means for performing the specified functions and combinations of steps for performing the specified functions. It will also be understood that each block of the flowchart illustrations, and combinations of blocks in the flowchart illustration, can be implemented by special purpose hardware which performs the specified functions or steps, or combinations of special purpose hardware such as microcontrollers, microprocessors, digital signal processing (DSP)

chips, application-specific integrated circuits (ASICS) or the like, which execute computer instructions.

FIGs. 7A-7C illustrate operations for controlling display of an image on a radiotelephone display according to another aspect of the present invention, in particular, operations for "scrolling" graphical objects, here shown as rows, on a radiotelephone display **120**, and for initiating a function associated with a graphical object identified on the display **120**. At least one graphical object is displayed on a radiotelephone display **120**. As illustrated in FIG. 7B, a user makes a swiping or displacement motion in contact with a contact-sensitive strip **150** mounted on a side of the radiotelephone **100**, causing the display rows to "scroll" along the direction of the user's movement. Those skilled in the art will appreciate that "scrolling" in a generic sense refers to selective display of a row on the display **120**, and may be encompass a number of different graphical operations. For example, as depicted in FIGs. 7A-7C, a plurality of rows may be displayed on the display **120**, and a selected one of displayed rows may be highlighted or otherwise identified in response to the user input. Different rows may be sequentially displayed on the display **120**, giving the appearance of a scrolling movement. In addition, actions such as scrolling by sequentially highlighting rows or other graphical objects or moving a cursor to sequentially indicate rows or other graphical objects responsive to a swiping motion on the transducer **150** may also be employed.

As illustrated in FIG. 7C, a function associated with an item identified by, for example, highlighting or cursor positioning, is initiated with the user performs a predetermined number of momentary contacts or taps on the contact-sensitive transducer **150**, as illustrated in FIG. 7C. These momentary contacts or taps may occur anywhere along the contact-sensitive transducer **150**. Those skilled in the art will appreciate that a number of variations on the above-described operations may be performed within the scope of the present invention. For example, instead of providing multi-graphical object display, the display **120** may be configured to display only one row at a time, sequentially displaying rows stored in memory to give the appearance of scrolling.

FIG. 8 illustrates exemplary operations for detecting a swiping contact with a contact-sensitive transducer (Blocks **800** et seq.). The transducer output signal is sampled (Block **805**). If the sample indicates contact of an object with the transducer,

a starting position $P_{start}$ of contact is next determined (Blocks **810-815**). The transducer output signal is again sampled (Block **820**), and if contact is still detected, an ending position $P_{end}$ is determined (Blocks **825-830**). A distance **D** is then determined from the starting and ending positions $P_{start}$, $P_{end}$ (Block 835). If the magnitude of the distance **D** is less than a minimum distance $D_{min}$, the movement is disregarded and another sample obtained (Blocks **840-820**). If the distance **D** is sufficiently large, however, the controller determines the direction of the movement by looking at the sign of the distance **D** (Block **845**). If the distance **D** is negative, the display is scrolled in a first direction (Block **850a**); if the distance **D** is positive, however, the display is scrolled in a second direction (Block **850b**). The ending position is then used as a new starting position (Block **855**).

FIG. 9 illustrates exemplary operations (Blocks **900** et seq.) for detecting a momentary contact or tap on a contact-sensitive transducer according to another aspect of the present invention. Generally speaking, a momentary contact or tap is detected by satisfaction of a series of three conditions: (1) absence of contact with the contact-sensitive transducer; (2) contact with the contact-sensitive transducer; and (3) termination of contact with the contact-sensitive transducer within a predetermined time period. In the exemplary operations shown, a timer $T_1$ (for example, a software timer implemented in the microcontroller **410** of FIG. 4) is initialized (Block **905**). The output signal from a contact-sensitive transducer is sampled (Block **910**). If the sampled output signal indicates that an object is in contact with the transducer, the output signal is repeatedly sampled until contact is not detected (Blocks **910-915**). Once no contact is detected, the first condition for a tap is satisfied. A second round of sampling is then initiated, with the output being sampled until contact is again detected (Blocks **920-925**). Once contact is again detected, the second condition for a tap is satisfied. The timer $T_1$ is then started (Block **930**). As long as contact continues and the time measured by the timer $T_1$ is less than a predetermined maximum time interval $T_{max}$, the output of the transducer is repeatedly sampled (Blocks **935-945**). If contact ceases before the timer $T_1$ exceeds the maximum time $T_{max}$, the third condition for a tap has been satisfied, and a valid single tap has been detected (Block **550**). However, if the timer $T_1$ exceeds the maximum time $T_{max}$ before contact ceases, the timer $T_1$ is reinitialized (Block **905**) and the detection process begins anew.

FIG. 10 illustrates operations (Block **1000** et seq.) for detecting a double tap on the contact-sensitive transducer. A second timer $T_2$ is initialized (Block **1010**). Once a valid single tap is detected, the second timer $T_2$ is started (Blocks **1015-1020**). As long as the time measured by the second time $T_2$ remains less than a second maximum time interval $T_{2max}$, and no contact with the transducer is detected, the transducer is repeatedly sampled (Blocks **1025-1035**). If the timer has yet to expire when contact is detected, it is next determined whether the contact constitutes a valid single tap (Block **1040**). If a valid single tap is detected, a valid double tap has occurred (Block **1045**). If not, the second timer $T_2$ is reinitialized (Block **1005**), starting the detection process anew.

FIG. 11 illustrates another embodiment according to the present invention, a radiotelephone **100'** which includes a horizontally-arranged contact-sensitive transducer **150c**, here shown mounted on a front fact of the radiotelephone housing **110**, near the display **120**. In a manner similar to that described with respect to the side-mounted transducers of FIG. 3, the transducer **150c** may be used to selectively display column-organized graphical objects on the display **120** based on contact of an object, e.g., a finger or stylus, with the contact-sensitive transducer **150c**. For example, as illustrated in FIG. 11, icons **1110** may be displayed in columns on the display **120**, and may be selectively identified according to contact with the contact sensitive transducer **150c**, using apparatus and operations similar to those described with respect to FIGs. 4-10. An icon may be identified by several techniques, such as by highlighting or by displaying a cursor **1120** adjacent the identified icon. A function associated with the identified icon may be selected using apparatus and operations manner similar to those described with respect to FIGs. 7A-7C. Those skilled in the art will also appreciate that other embodiments may include side-mounted contact-sensitive strips such as those illustrated in FIG. 3 in combination with a horizontally-mounted contact-sensitive strip as illustrated in FIG. 11 to provide both row and column-oriented controls for the display **120**.

In the drawings and specification, there have been disclosed typical embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims.

## THAT WHICH IS CLAIMED IS:

1. A radiotelephone, comprising:

a frame;

a radiotelephone communications transceiver, supported by said frame;

a display, supported by said frame;

a contact-sensitive transducer, supported by said frame, which produces an output signal that characterizes contact of an object along a contact-sensitive surface of said contact-sensitive transducer; and

a controller, responsive to said output signal and operatively associated with said display and said radiotelephone communications transceiver, which controls at least one of said display and said radiotelephone communications transceiver according to said output signal of said contact-sensitive transducer.

2. A radiotelephone according to Claim 1, wherein said controller is configured to selectively display an image on said display according to said output signal of said contact-sensitive transducer.

3. A radiotelephone according to Claim 2, wherein said controller is configured to selectively display a graphical object on said display according to said output signal of said contact-sensitive transducer.

4. A radiotelephone according to Claim 3, wherein said controller is configured to selective display a row on said display according to said output signal of said contact-sensitive transducer.

5. A radiotelephone according to Claim 3, wherein said controller comprises:

means for displaying a plurality of graphical objects on said display; and

means, responsive to said contact sensitive transducer, for identifying one of said displayed plurality of graphical objects based on said output signal of said contact-sensitive transducer.

6. A radiotelephone according to Claim 3, wherein said controller comprises:

means, responsive to said contact-sensitive transducer, for determining a position of contact of an object along said axis of said contact-sensitive transducer; and

means, responsive to said means for determining a position of contact, for selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object.

7. A radiotelephone according to Claim 6, wherein said means for selectively displaying comprises means for highlighting one of a plurality of displayed graphical objects.

8. A radiotelephone according to Claim 6, wherein said means for selectively displaying comprises means for displaying a cursor that indicates one of a plurality of displayed graphical objects.

9. A radiotelephone according to Claim 6, wherein said controller is configured to cause at least one of said display or said radiotelephone communications transceiver to perform a plurality of actions, wherein an action of said plurality of actions is associated with the identified graphical object, and wherein said controller further comprises means, responsive to said contact-sensitive transducer, for initiating the action associated with the identified graphical object.

10. A radiotelephone according to Claim 9, wherein said means for initiating an action comprises:

means, responsive to said contact-sensitive transducer, for detecting a momentary contact with said contact-sensitive transducer; and

means, responsive to said means for detecting a momentary contact, for initiating the action associated with the identified graphical object.

11. A radiotelephone according to Claim 10, wherein said means for initiating an action comprises means for initiating the action in response to detection of a predetermined number of momentary contacts occurring within a predetermined time interval.

12. A radiotelephone according to Claim 3, wherein said controller comprises means, responsive to said contact-sensitive transducer, for scrolling displayed rows along an axis of said display based on the output signal of said contact-sensitive transducer.

13. A radiotelephone according to Claim 12, wherein said means for scrolling comprises:

means, responsive to said output signal of contact-sensitive transducer, for detecting moving contact with said contact-sensitive transducer along said axis of said contact-sensitive transducer; and

means, responsive to said means for detecting moving contact, for scrolling displayed rows along said axis of said display based on the detected movement.

14. A radiotelephone according to Claim 1, wherein said controller has a first mode wherein said controller is responsive to contact with said contact-sensitive transducer and a second mode wherein said controller is unresponsive to contact with said contact-sensitive transducer, and wherein the radiotelephone further comprises means for placing said controller in one of said first mode or said second mode in response to an input from a user.

15. A radiotelephone according to Claim 1, further comprising a power supply electrically connected to said contact-sensitive transducer, and wherein said controller comprises:

a first control circuit, responsive to said contact-sensitive transducer, which controls said radiotelephone communications transceiver and said display according to said output signal of said contact-sensitive transducer; and

a second control circuit, responsive to said contact-sensitive transducer, which controls power transfer from said power supply to said first control circuit according to said output signal from said contact-sensitive transducer.

16. A radiotelephone according to Claim 15, wherein said first control circuit comprises a microcontroller, and wherein said second control circuit controls power transfer from said power supply to said microcontroller according to said output signal of said contact-sensitive transducer.

17. A radiotelephone according to Claim 1, wherein said frame comprises a housing, and wherein said contact-sensitive transducer comprises an elongate contact-sensitive strip mounted at a surface of said housing.

18. A radiotelephone according to Claim 17:
wherein said housing has a front face and an adjoining first side;
wherein said display is mounted at said front face; and
wherein said elongate contact-sensitive strip is mounted at said first side adjoining said front face.

19. A radiotelephone according to Claim 18, wherein said housing has a second side adjoining said front face opposite said first side, and wherein said contact-sensitive transducer further comprises a second contact-sensitive strip mounted at said second side.

20. A radiotelephone according to Claim 19, comprising a first contact-sensitive transducer and a second contact-sensitive transducer, said first and second contact-sensitive transducers producing respective first and second output signals, wherein said controller has a first mode wherein said controller is responsive to said first contact-sensitive transducer and unresponsive to said second contact-sensitive transducer, and a second mode wherein said controller is responsive to said second contact-sensitive transducer and unresponsive to said first contact-sensitive transducer, and further comprising means for placing said controller in one of said first mode or said second mode.

21. A radiotelephone according to Claim 17:
wherein said housing has a front face;
wherein said display is mounted at said front face; and
wherein said elongate contact-sensitive strip is mounted at said front face.

22. A radiotelephone according to Claim 1, wherein said contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

23. A radiotelephone, comprising:
a frame;
a display, supported by said frame;
a contact-sensitive transducer, supported by said frame, which produces an output signal that characterizes contact of an object along a contact-sensitive surface of said contact-sensitive transducer; and
a controller, responsive to said output signal and operatively associated with said display, which is configured to control said display according to said output signal of said contact-sensitive transducer.

24. A radiotelephone according to Claim 23, wherein said controller is configured to selectively display an image on said display according to said output signal of said contact-sensitive transducer.

25. A radiotelephone according to Claim 24, wherein said controller is configured to selectively display a graphical object on said display according to said output signal of said contact-sensitive transducer.

26. A radiotelephone according to Claim 25, wherein said controller is configured to selectively display a row on said display according to said output signal of said contact-sensitive transducer.

27. A radiotelephone according to Claim 25, wherein said controller comprises:

means for displaying a plurality of graphical objects on said display; and

means, responsive to said contact sensitive transducer, for identifying one of said displayed plurality of graphical objects based on said output signal of said contact-sensitive transducer.

28. A radiotelephone according to Claim 25, wherein said controller comprises:

means, responsive to said contact-sensitive transducer, for determining a position of contact along said axis of said contact-sensitive transducer; and

means, responsive to said means for determining a position of contact, for selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object.

29. A radiotelephone according to Claim 28, wherein said means for selectively displaying comprises means for highlighting one of a plurality of displayed graphical objects.

30. A radiotelephone according to Claim 28, wherein said means for selectively displaying comprises means for displaying a cursor that indicates one of a plurality of displayed graphical objects.

31. A radiotelephone according to Claim 30, wherein said controller comprises means, responsive to said contact-sensitive transducer, for scrolling displayed rows along an axis of said display responsive to the output signal of said contact-sensitive transducer.

32. A radiotelephone according to Claim 31, wherein said means for scrolling comprises:

means, responsive to said output signal of contact-sensitive transducer, for detecting moving contact with said contact-sensitive transducer along said axis of said contact-sensitive transducer; and

means, responsive to said means for detecting moving contact, for scrolling displayed rows along said axis of said display based on the detected movement.

33. A radiotelephone according to Claim 23, wherein said frame comprises a housing, and wherein said contact-sensitive transducer comprises an elongate contact-sensitive strip mounted at a surface of said housing.

34. A radiotelephone according to Claim 33:

wherein said housing has a front face and an adjoining side;

wherein said display is mounted on said front face; and

wherein said elongate contact-sensitive strip is mounted at said side adjoining said front face.

35. A radiotelephone according to Claim 33, wherein said housing has a second side adjoining said front face opposite said first side, and wherein said contact-sensitive transducer further comprises a second contact-sensitive strip mounted at said second side.

36. A radiotelephone according to Claim 33:

wherein said housing has a front face;

wherein said display is mounted on said front face; and

wherein said elongate contact-sensitive strip is mounted at said front face.

37. A radiotelephone according to Claim 23, wherein said contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

38. In a radiotelephone, a method of providing user input comprising the step of:

providing user input to the radiotelephone using a contact-sensitive transducer, the transducer being operable to produce an output signal that characterizes contact with a contact-sensitive surface of the contact-sensitive transducer.

39. A method according to Claim 38, wherein the radiotelephone includes a radiotelephone communications transceiver and a display, and wherein said step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

40. A method according to Claim 39, wherein said step of controlling comprises the step of selectively displaying an image on the display according to the output signal of the contact-sensitive transducer.

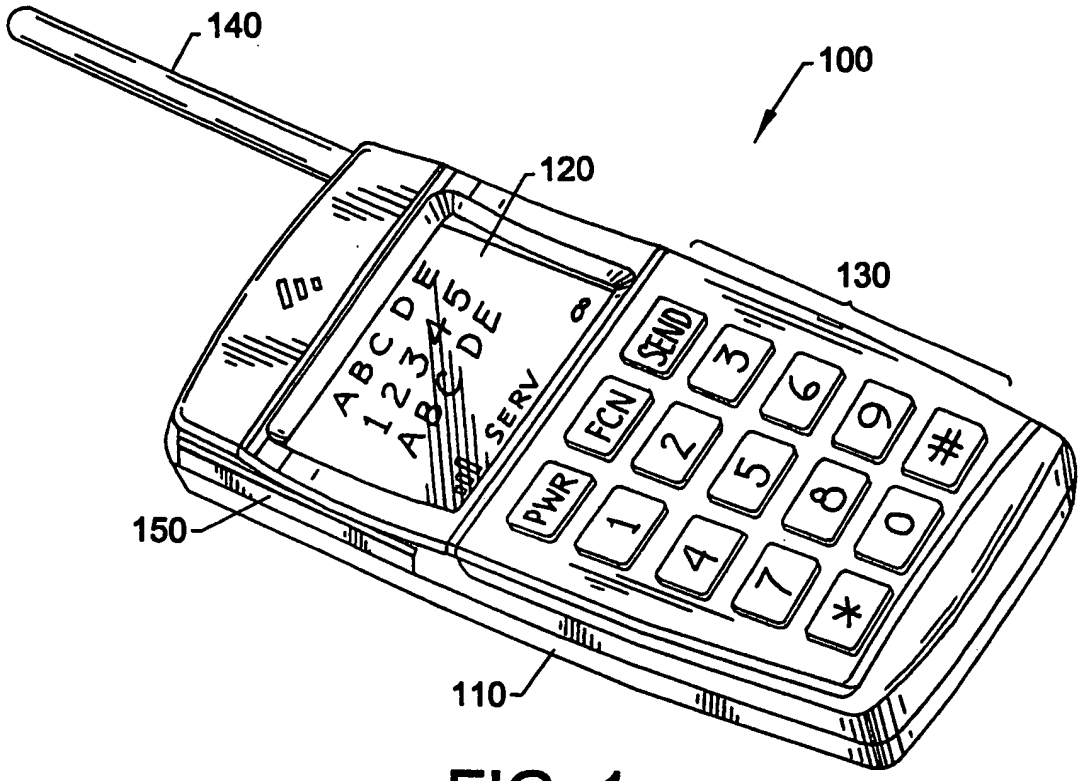

140
100
120
130
150
110
SEND
FCN
PWR
SERV

FIG. 1.

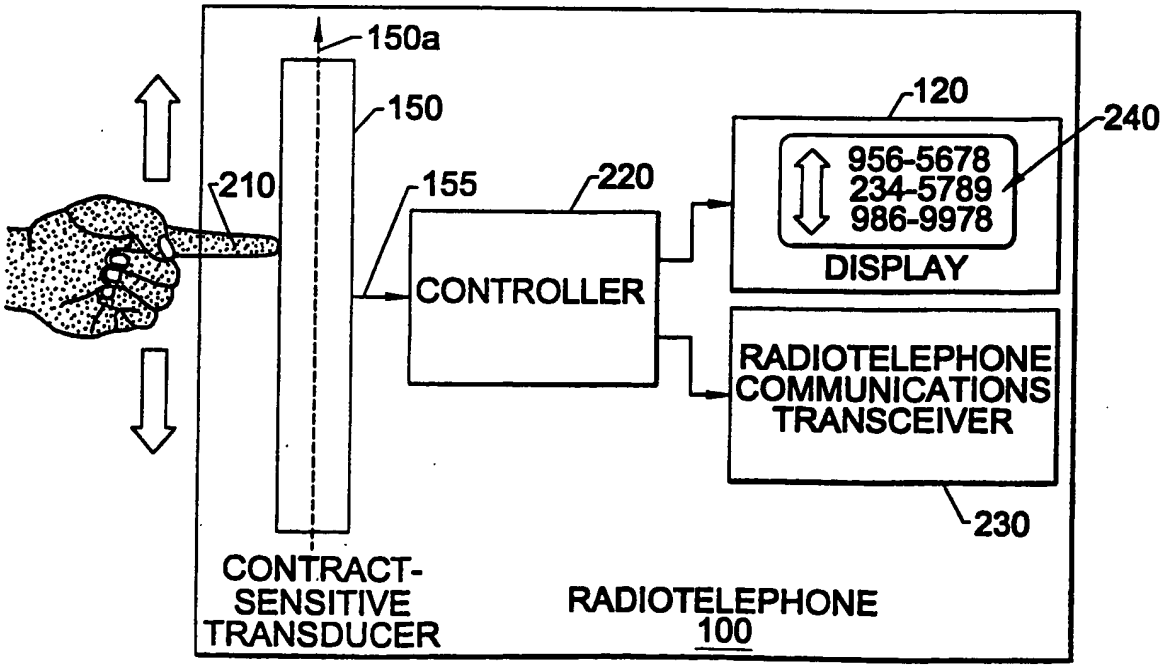

150a
150
210
155
220
120
240
956-5678
234-5789
986-9978
DISPLAY
CONTROLLER
RADIOTELEPHONE
COMMUNICATIONS
TRANSCEIVER
230
CONTRACT-
SENSITIVE
TRANSDUCER
RADIOTELEPHONE
100

FIG. 2.

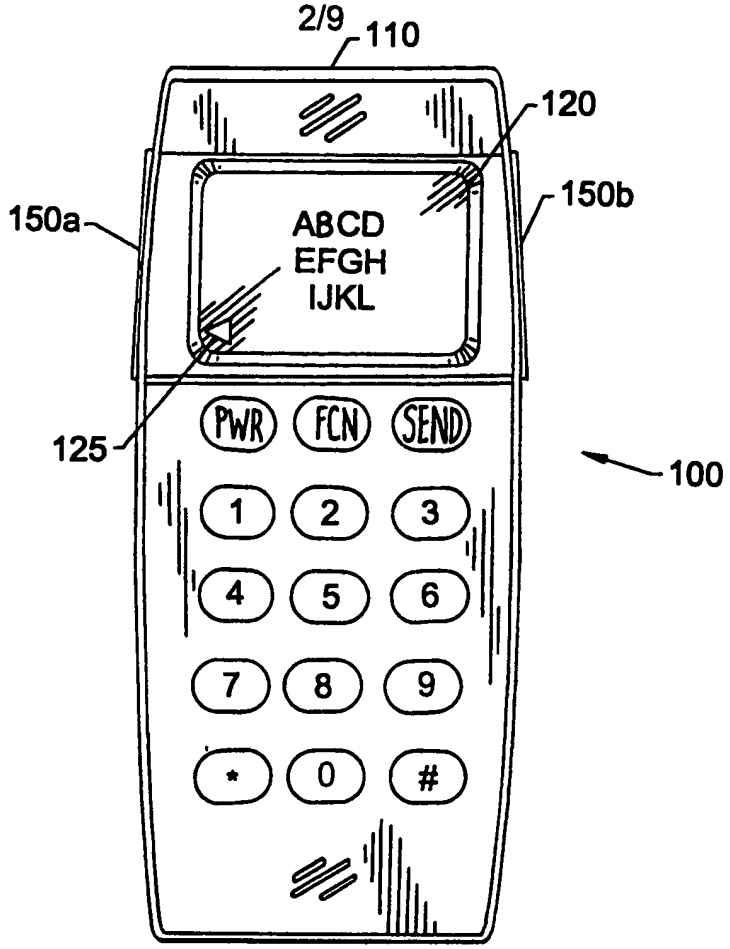

110
120
150a
150b
ABCD
EFGH
IJKL
125
PWR
FCN
SEND
100
1
2
3
4
5
6
7
8
9
*
0
#

FIG. 3.

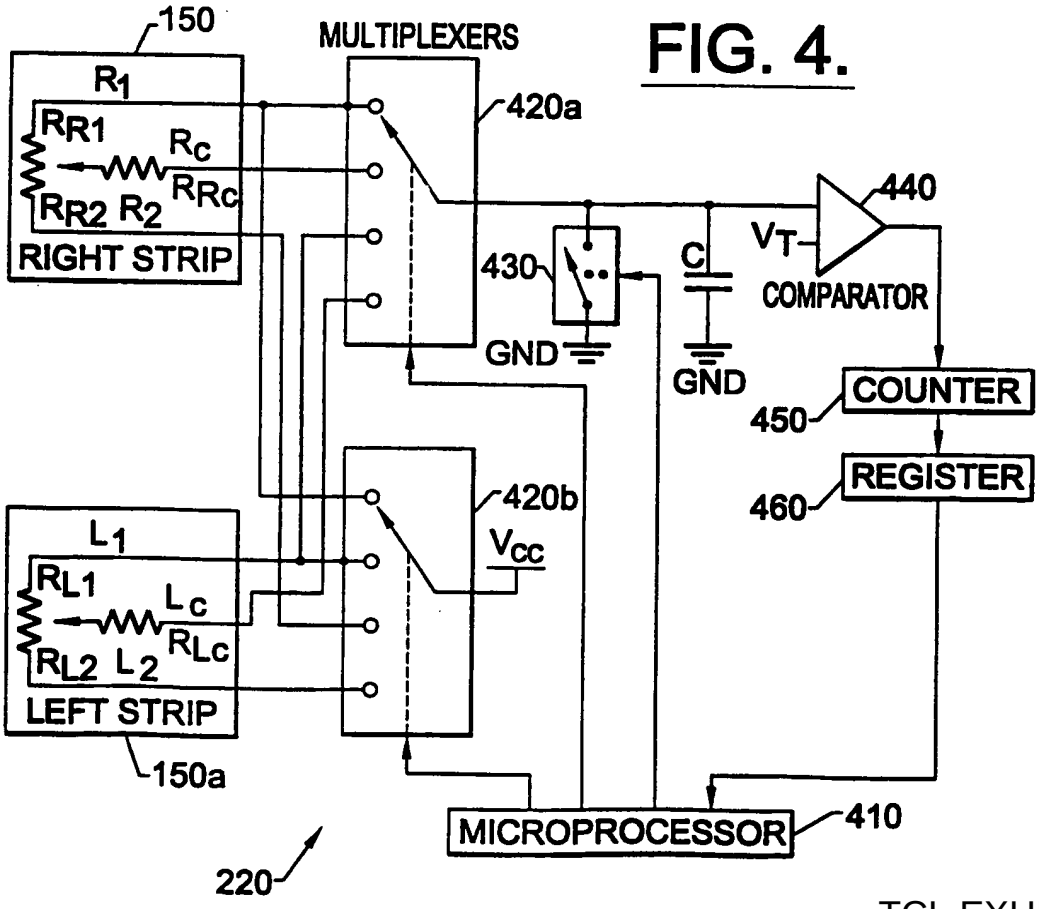

150
MULTIPLEXERS
R1
RR1
Rc
RRc
RR2 R2
RIGHT STRIP
420a
440
VT
COMPARATOR
430
C
GND
GND
COUNTER
450
REGISTER
460
420b
Vcc
L1
RL1
Lc
RLc
RL2 L2
LEFT STRIP
150a
MICROPROCESSOR
410
220

FIG. 4.

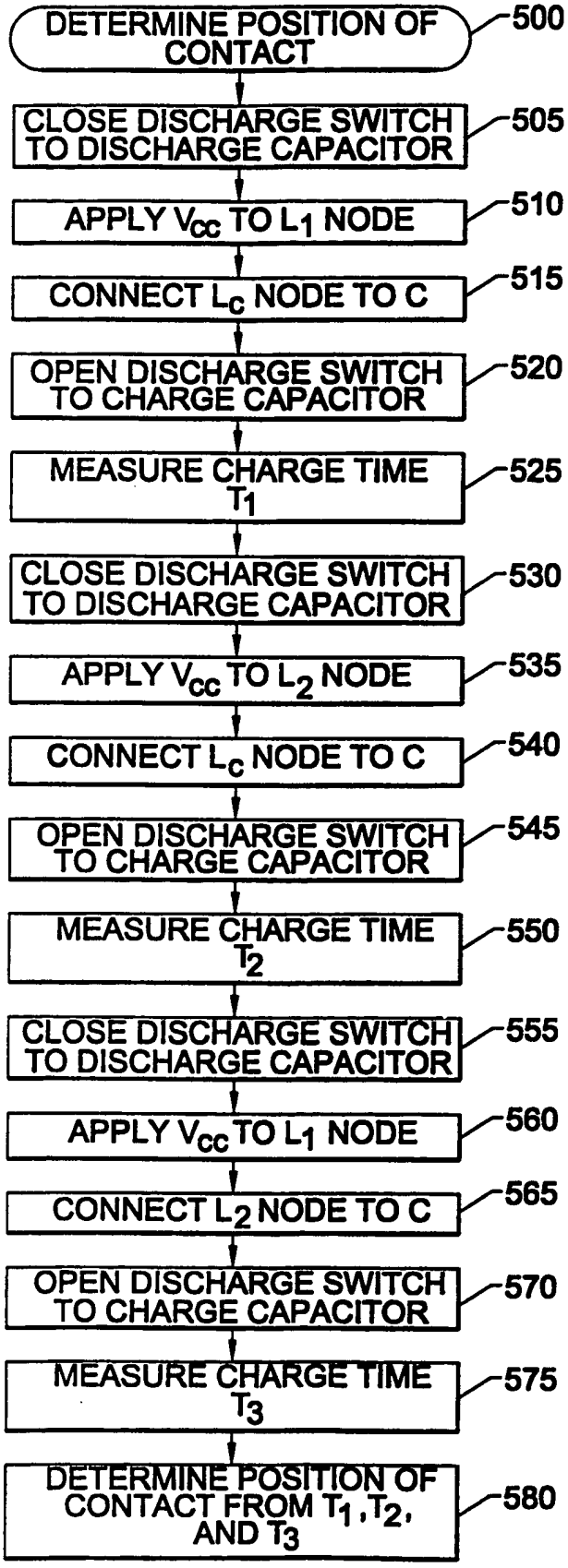

DETERMINE POSITION OF CONTACT
500
CLOSE DISCHARGE SWITCH TO DISCHARGE CAPACITOR
505
APPLY $V_{CC}$ TO $L_1$ NODE
510
CONNECT $L_C$ NODE TO C
515
OPEN DISCHARGE SWITCH TO CHARGE CAPACITOR
520
MEASURE CHARGE TIME $T_1$
525
CLOSE DISCHARGE SWITCH TO DISCHARGE CAPACITOR
530
APPLY $V_{CC}$ TO $L_2$ NODE
535
CONNECT $L_C$ NODE TO C
540
OPEN DISCHARGE SWITCH TO CHARGE CAPACITOR
545
MEASURE CHARGE TIME $T_2$
550
CLOSE DISCHARGE SWITCH TO DISCHARGE CAPACITOR
555
APPLY $V_{CC}$ TO $L_1$ NODE
560
CONNECT $L_2$ NODE TO C
565
OPEN DISCHARGE SWITCH TO CHARGE CAPACITOR
570
MEASURE CHARGE TIME $T_3$
575
DETERMINE POSITION OF CONTACT FROM $T_1$, $T_2$, AND $T_3$
580

FIG. 5.

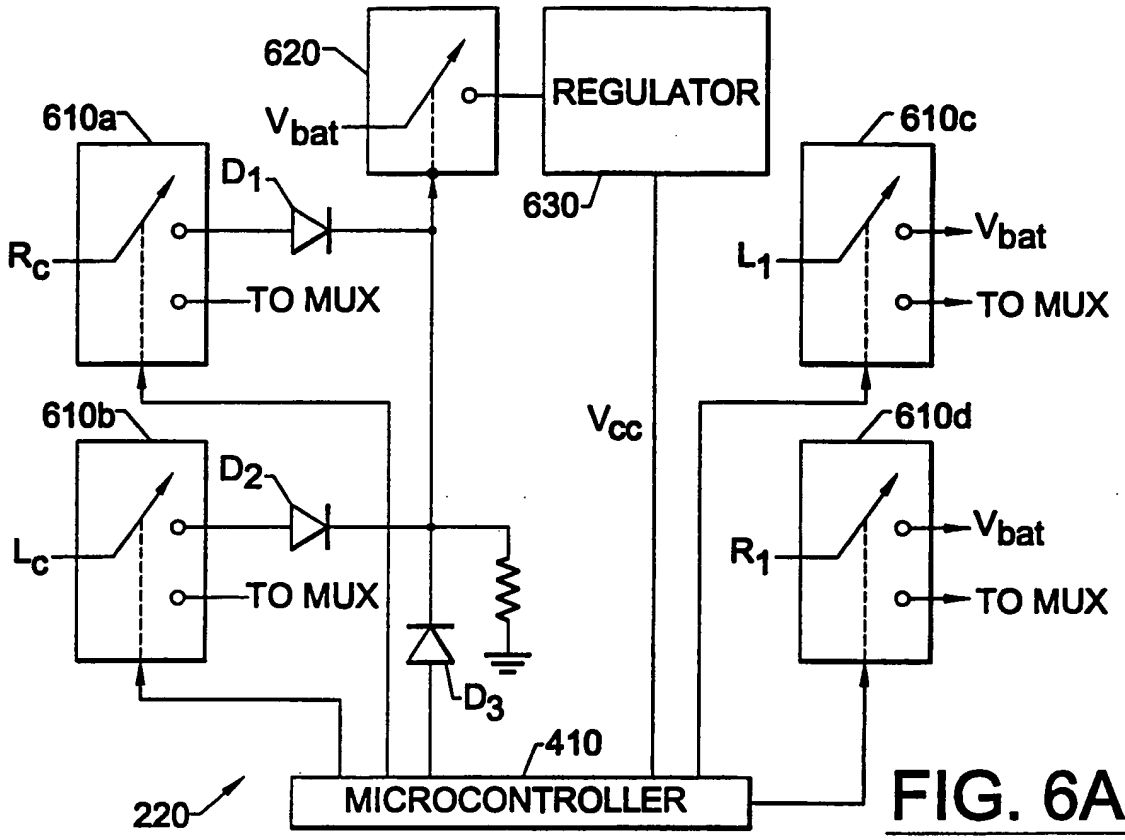

620
REGULATOR
$V_{bat}$
610a
$D_1$
630
610c
$R_c$
TO MUX
$L_1$
$V_{bat}$
TO MUX
610b
$V_{cc}$
610d
$D_2$
$L_c$
$R_1$
$V_{bat}$
TO MUX
TO MUX
$D_3$
410
220
MICROCONTROLLER

FIG. 6A.

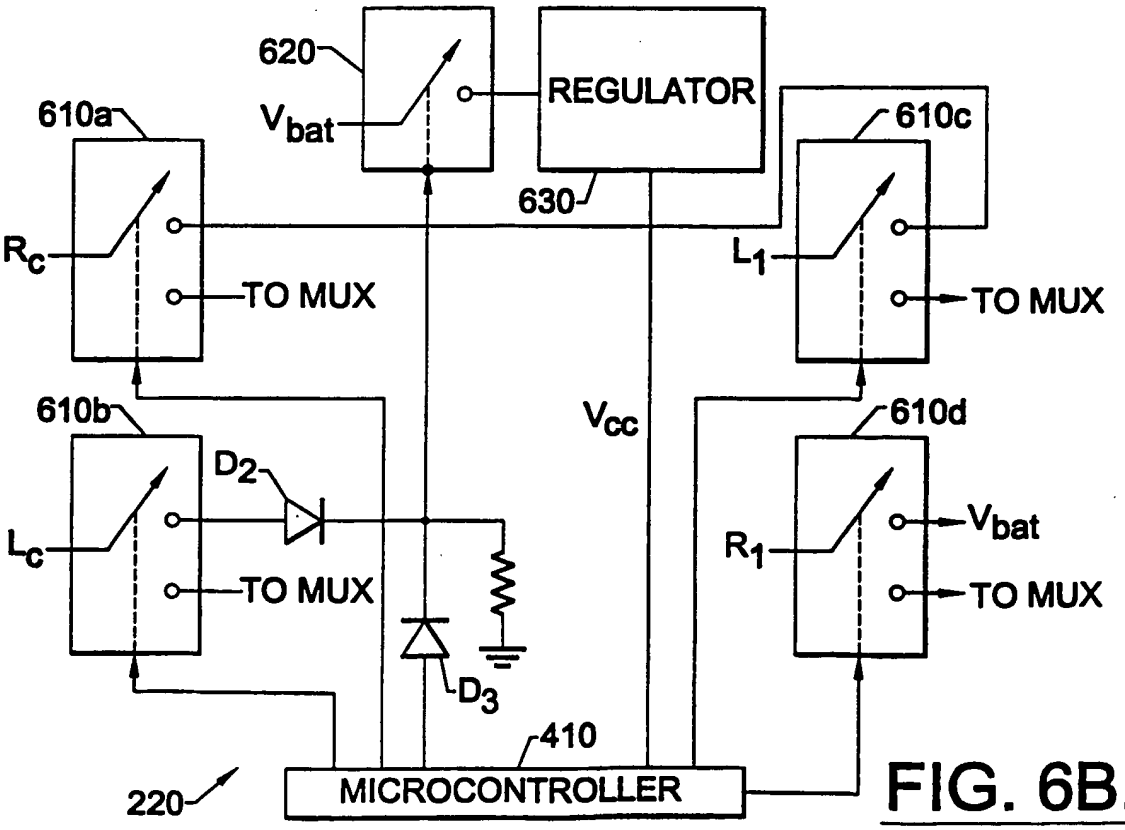

620
REGULATOR
$V_{bat}$
610a
630
610c
$R_c$
TO MUX
$L_1$
TO MUX
610b
$V_{cc}$
610d
$D_2$
$L_c$
$R_1$
$V_{bat}$
TO MUX
TO MUX
$D_3$
410
220
MICROCONTROLLER

FIG. 6B.

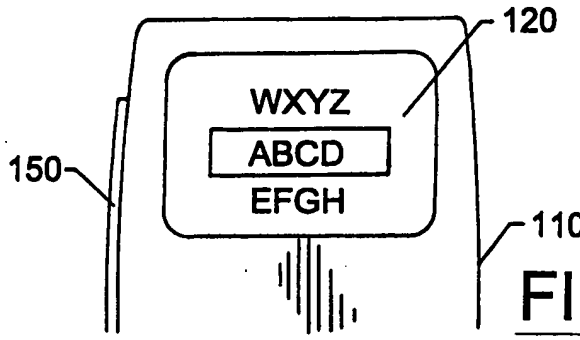



FIG. 7A.

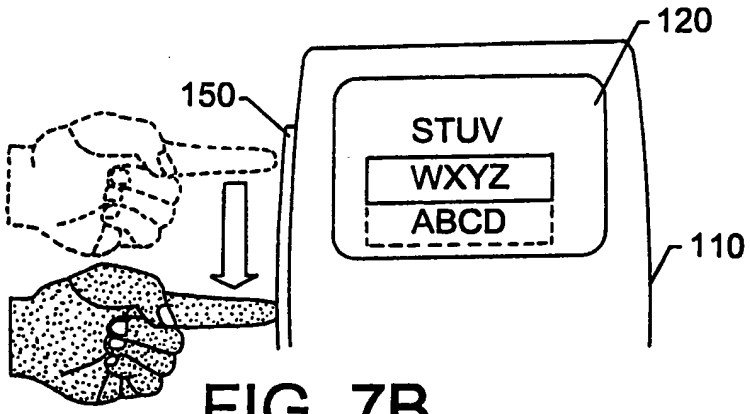



FIG. 7B.

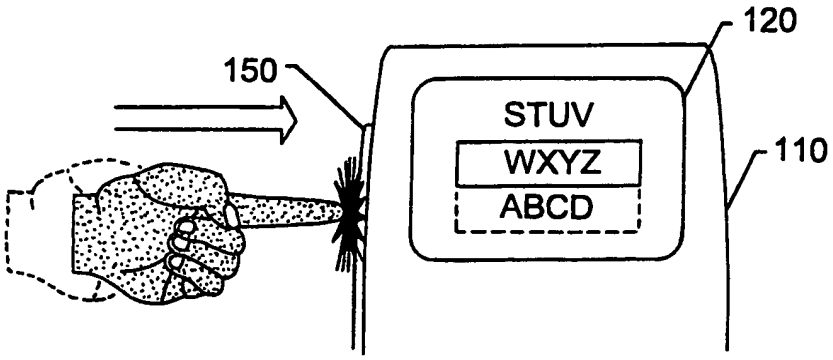



FIG. 7C.

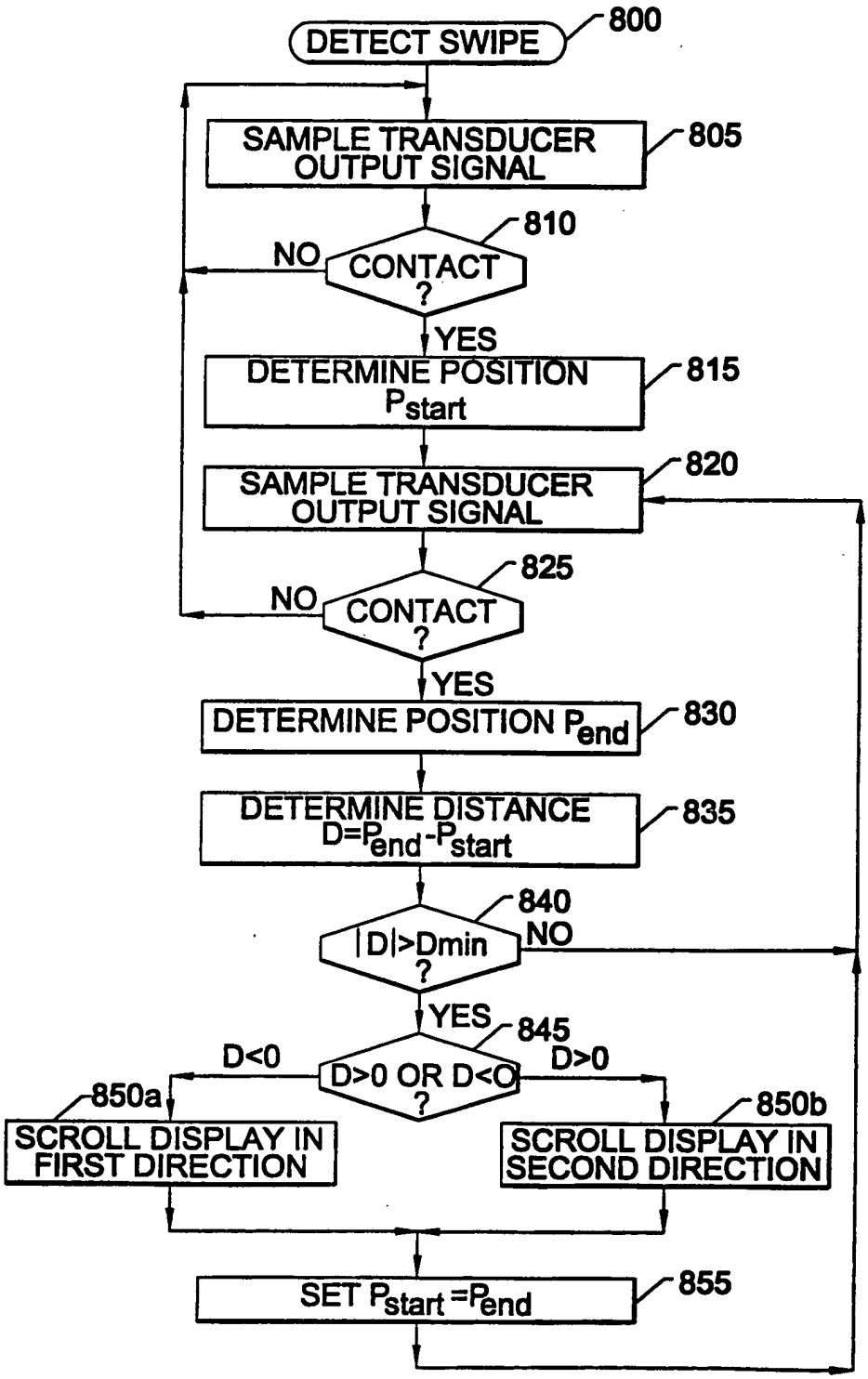

DETECT SWIPE
800
SAMPLE TRANSDUCER OUTPUT SIGNAL
805
CONTACT ?
810
NO
YES
DETERMINE POSITION Pstart
815
SAMPLE TRANSDUCER OUTPUT SIGNAL
820
CONTACT ?
825
NO
YES
DETERMINE POSITION Pend
830
DETERMINE DISTANCE D=Pend-Pstart
835
|D|>Dmin ?
840
NO
YES
D>0 OR D<0 ?
845
D<0
D>0
SCROLL DISPLAY IN FIRST DIRECTION
850a
SCROLL DISPLAY IN SECOND DIRECTION
850b
SET Pstart =Pend
855

FIG. 8.

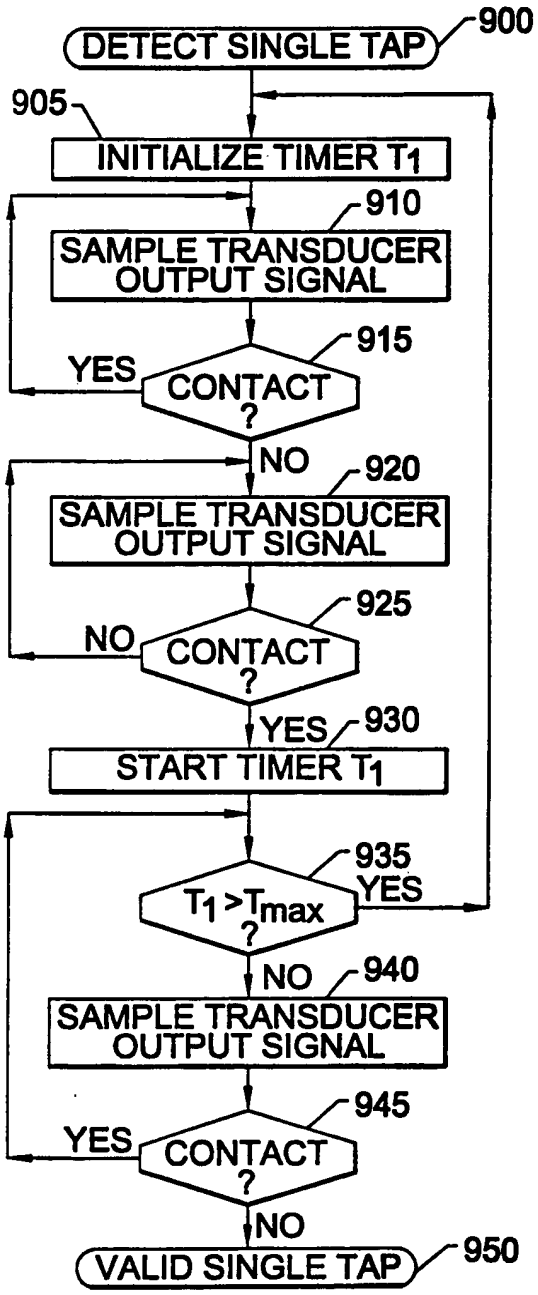

DETECT SINGLE TAP
900
905
INITIALIZE TIMER T1
910
SAMPLE TRANSDUCER OUTPUT SIGNAL
915
YES
CONTACT ?
NO
920
SAMPLE TRANSDUCER OUTPUT SIGNAL
925
NO
CONTACT ?
YES
930
START TIMER T1
935
T1 > Tmax ?
YES
NO
940
SAMPLE TRANSDUCER OUTPUT SIGNAL
945
YES
CONTACT ?
NO
VALID SINGLE TAP
950

FIG. 9.

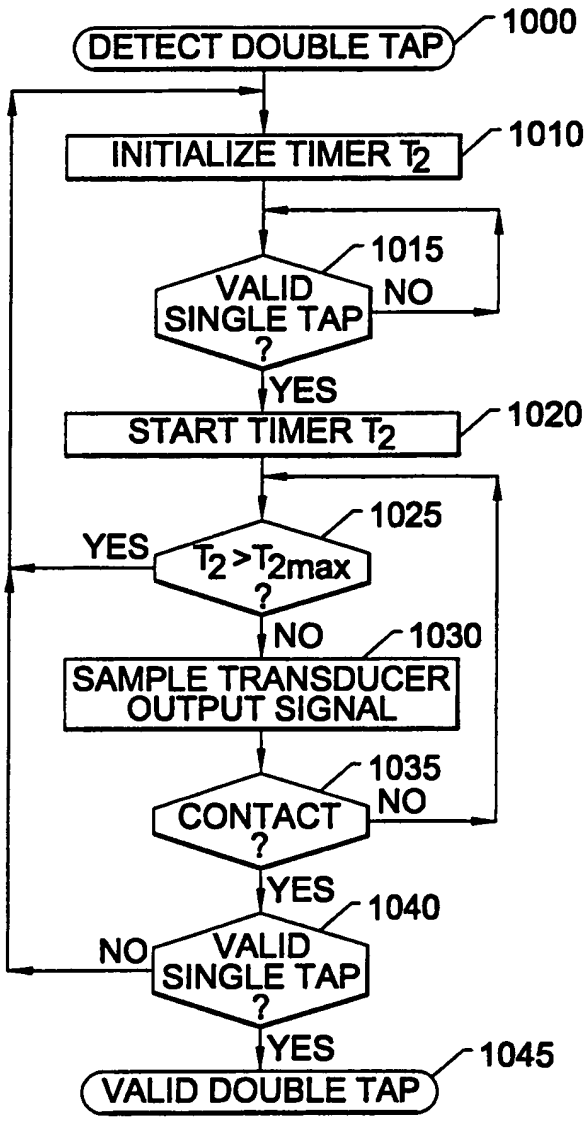

DETECT DOUBLE TAP
1000
INITIALIZE TIMER $T_2$
1010
VALID SINGLE TAP ?
1015
NO
YES
START TIMER $T_2$
1020
$T_2 > T_{2max}$ ?
1025
YES
NO
SAMPLE TRANSDUCER OUTPUT SIGNAL
1030
CONTACT ?
1035
NO
YES
VALID SINGLE TAP ?
1040
NO
YES
VALID DOUBLE TAP
1045

FIG. 10.

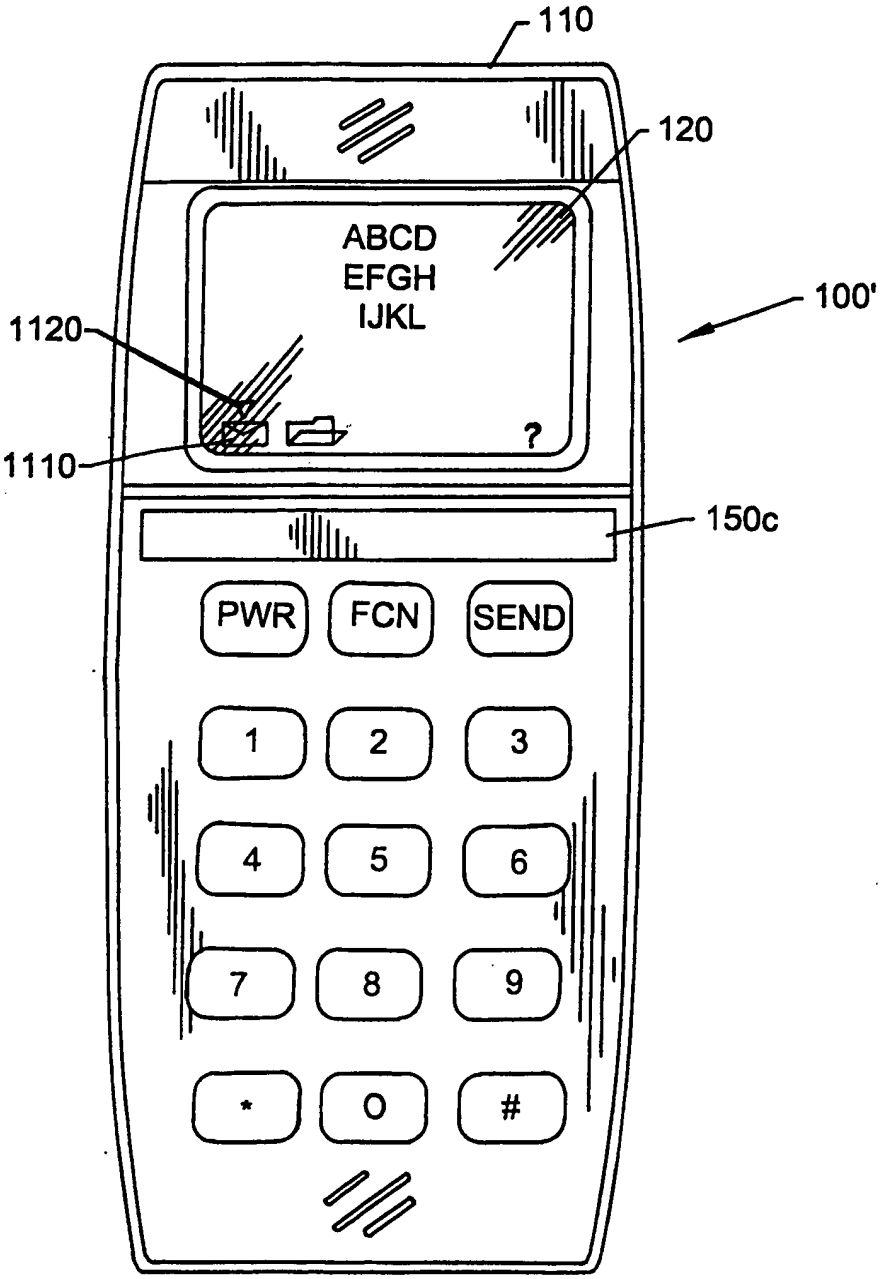

110
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ABCD
EFGH
IJKL
100'
1120
1110
?
150c
PWR
FCN
SEND
1
2
3
4
5
6
7
8
9
*
0
#

FIG. 11.

# INTERNATIONAL SEARCH REPORT

Inte Jonal Application No
PCT/US 98/27042

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H04M1/00 G06F3/033 G06K11/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 H04M G06F G06K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X | EP 0 698 845 A (IBM) 28 February 1996 | 1-10, 23-30, 38-40 |
| A | see column 1, line 10 - line 37; figures 1,2<br>see column 3, line 38 - column 8, line 50; figures 3-8 | 14,22,37 |
| | --- | |
| X | US 5 184 120 A (SCHULTZ ) 2 February 1993 | 38-40 |
| Y | see column 2, line 18 - column 6, line 21; figures 1-5 | 1,2, 17-19, 21-24, 33-37 |
| A | | 3-7, 9-12, 25-29,31 |
| | --- | |
| | -/-- | |

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 29 April 1999 | 11/05/1999 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Delangue, P |

3

TCL EXHIBIT 1007

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication,where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | US 5 452 240 A (CRANFORD ET AL)<br>19 September 1995 | 1,2,<br>17-19,<br>21-24,<br>33-37 |
| A | see column 4, line 8 - column 8, line 58;<br>figures 1-9 | 3-7,<br>9-13,<br>25-29,<br>31,32 |
| | --- | |
| X | PATENT ABSTRACTS OF JAPAN<br>vol. 009, no. 004 (E-288), 10 January 1985<br>& JP 59 153342 A (TOUYOU TSUUSHINKI KK),<br>1 September 1984 | 38,39 |
| A | see abstract | 1,23 |
| | --- | |
| A | PATENT ABSTRACTS OF JAPAN<br>vol. 098, no. 007, 31 March 1998<br>& JP 08 030378 A (HEWLETT PACKARD ),<br>2 February 1996<br>see abstract | 1-3,<br>23-26 |
| | --- | |
| A | EP 0 707 257 A (AT & T CORP) 17 April 1996<br>see column 4, line 5 - column 6, line 48;<br>figures 1-5 | 1-3,<br>23-26,<br>38-40 |
| | ----- | |



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Page 838 of 1144

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| EP 0698845 A | 28-02-1996 | CN 1129889 A | 28-08-1996 |
| | | JP 8125724 A | 17-05-1996 |
| | | US 5815142 A | 29-09-1998 |
| US 5184120 A | 02-02-1993 | NONE | |
| US 5452240 A | 19-09-1995 | AU 1173395 A | 13-06-1995 |
| | | EP 0730761 A | 11-09-1996 |
| | | WO 9514964 A | 01-06-1995 |
| | | US 5739744 A | 14-04-1998 |
| EP 0707257 A | 17-04-1996 | CN 1131761 A | 25-09-1996 |
| | | JP 9146677 A | 06-06-1997 |
| | | SG 33487 A | 18-10-1996 |

(12) DEMANDE INTERNATIONALE PUBLIÉE EN VERTU DU TRAITÉ DE COOPÉRATION EN MATIÈRE DE BREVETS (PCT)

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Bureau international

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17 mai 2001 (17.05.2001)

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(25) Langue de dépôt: français

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(30) Données relatives à la priorité:
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(72) Inventeurs; et

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(81) États désignés *(national)*: JP, KR, US.

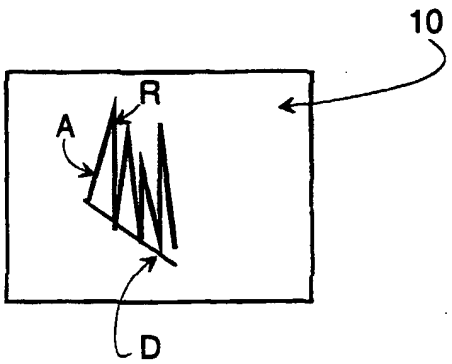
(84) États désignés *(régional)*: brevet européen (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

**Publiée:**
— *Avec rapport de recherche internationale.*

*En ce qui concerne les codes à deux lettres et autres abréviations, se référer aux "Notes explicatives relatives aux codes et abréviations" figurant au début de chaque numéro ordinaire de la Gazette du PCT.*

(54) Title: METHOD FOR CONTROLLING A TOUCHPAD

(54) Titre: PROCEDE DE COMMANDE D'UNE SURFACE TACTILE




(57) Abstract: The invention concerns a method for controlling a touch-sensitive surface, said touchpad (10) being adapted to interpret any succession of movements of a control member along specific directions, into a succession of movement controls of a cursor along those same directions. The method is characterised in that it further consists in considering a succession of movements as a succession of movement controls in a common direction and in accordance with a predetermined increment, when said succession of movements consist of to-and-fro movements (A/R) between two substantially opposite directions and when said movements are continuously linked. The inventive method is more particularly designed to be installed in a motor vehicle.

(57) Abrégé: La présente invention concerne un procédé de commande d'une surface tactile, ladite surface (10) étant adaptée pour interpréter toute succession de déplacements d'un organe de commande selon des directions données, en une succession de commandes de déplacement d'un curseur selon ces mêmes directions, ledit procédé étant caractérisé en ce qu'il consiste en outre à considérer une succession de déplacements comme une succession de commande de déplacements dans un même sens et selon un incrément déterminé, lorsque cette succession de déplacements est constituée de mouvements allers retours (A/R) entre deux directions sensiblement opposées et lorsque ces mouvements sont enchaînés en continuité. Le procédé selon l'invention est plus particulièrement destiné à être mis en place dans un véhicule automobile.

WO 01/35204 A1

TCL EXHIBIT 1007
Page 840 of 1144

# Procédé de commande d'une surface tactile

La présente invention concerne un procédé de commande d'une surface tactile. Plus exactement, il s'agit d'une surface tactile mise en place dans un véhicule automobile.

Il est déjà connu d'utiliser une surface tactile en tant qu'organe d'entrée de commande pour un véhicule automobile (voir à cet effet la demande de brevet FR 9911409 au nom de la demanderesse). Une telle surface tactile (couramment appelée «touch pad») est pratique car elle permet de commander tous les dispositifs électroniques situés à l'intérieur de l'habitacle du véhicule à partir d'un même organe de commande. Cependant, les vibrations et conditions de circulations rencontrées lors de la conduite d'un véhicule automobile sont telles qu'il est impossible d'utiliser cette surface tactile sans adaptations.

En effet, lorsque la surface tactile est utilisée dans un lieu stable (sur une table, par exemple), il est relativement facile de faire déplacer un curseur sur un écran d'affichage en déplaçant son doigt sur la surface tactile. Dans un véhicule, la précision requise est trop importante et le déplacement du doigt peut être incertain.

Pour pallier cet inconvénient, chaque mouvement du doigt d'un utilisateur est considéré comme un déplacement selon la direction privilégiée la plus proche. Deux mouvements successifs doivent être séparés par une pause.

Ainsi, lorsque le curseur doit se déplacer dans une direction donnée de quelques cases, il est nécessaire de tracer plusieurs segments successifs dans cette direction, chacun de ces segments étant séparé par une pause temporelle. Lorsqu'un grand nombre de mouvements successifs (déplacement de huit cases dans une même direction par exemple) est nécessaire, l'utilisateur ne peut pas les tracer sur la surface tactile en continuité, car il sort de cette surface. A chaque fois, l'utilisateur doit reporter son doigt de l'autre côté de l'écran et recommencer. On conçoit que ce type de manipulation soit possible lorsque la surface tactile est implantée dans un lieu fixe. Par contre, dans un véhicule automobile en mouvement, ce type de déplacement accapare trop l'attention du conducteur.

Le but de la présente invention est de réaliser de manière simple et rapide un déplacement d'un curseur de plusieurs cases dans une même direction en utilisant une surface tactile comme organe de commande. Ce déplacement doit se faire sans accaparer l'attention du conducteur.

A cet effet, la présente invention concerne un procédé de commande d'une surface tactile, la dite surface étant adaptée pour interpréter toute succession de déplacements d'un organe de commande selon des directions données, en une succession de commandes de déplacement d'un curseur selon

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ces mêmes directions, le dit procédé étant caractérisé en ce qu'il consiste en outre à considérer une succession de déplacements comme une succession de commande de déplacements dans un même sens et selon un incrément déterminé, lorsque cette succession de déplacements est constituée de mouvements allers retours entre deux directions sensiblement opposées et lorsque ces mouvements sont enchaînés en continuité.

Ainsi, un aller et retour rapide du doigt de l'utilisateur sur la surface tactile indique au curseur qu'il doit se déplacer d'une case dans la direction globale de l'aller effectué. Si plusieurs allers et retours rapides sont enchaînés, cela signifie que le curseur doit se déplacer de plusieurs cases dans la direction globale des trajets allers du doigt.

On notera que le nombre d'allers et retours pouvant être effectués sans sortir de la surface tactile est illimité. En effet, ces allers et retours sont effectués «sur place » et donc le doigt de l'utilisateur ne sort pas de l'écran.

En outre, la réalisation de ces allers et retours ne requiert que très faiblement l'attention du conducteur.

Avantageusement, le procédé selon l'invention comporte une étape de filtrage de la dérive du doigt. Ainsi, même si le conducteur effectue une pluralité d'allers et retours en dérivant sur l'écran, cette dérive du doigt est prise en compte et la commande est tout de même correctement interprétée.

Bien entendu l'organe d'entrée de données peut être le doigt de l'utilisateur mais également un dispositif de commande du type souris électronique, stylo optique ou analogue.

D'autres objets, caractéristiques et avantages de la présente invention ressortiront d'ailleurs de la description qui suit, à titre d'exemple non limitatif, et en référence aux dessins annexés dans lesquels :

- **la figure 1** est une vue schématique d'un poste de conduite de véhicule automobile muni d'une surface tactile,
- **la figure 2** est une vue schématique d'un écran d'affichage commandé par la surface tactile,
- **la figure 3** est une vue représentant les déplacements d'un doigt sur la surface tactile mettant en œuvre le procédé de commande selon l'invention, et
- **La figure 4** est une vue schématique illustrant le filtrage de la dérive du doigt selon la présente invention.

Le procédé selon la présente invention, utilise une surface tactile 10 (encore appelée « touch pad ») comme organe de commande des dispositifs électroniques embarqués dans un véhicule automobile.

Cette surface tactile est disposée, par exemple, sur la partie centrale du volant. Elle se trouve ainsi aisément accessible par le conducteur, même si celui-ci ne regarde pas le volant directement.

Pour commander la mise en marche de l'auto-radio (par exemple) le conducteur déplace son doigt sur la surface tactile de manière à déplacer de manière correspondante un curseur 11 sur un écran d'affichage 12 (figure 2). Si le curseur est en face de la position repérée zéro (0) et qu'il est nécessaire de le déplacer dans la position 4 pour mettre en marche l'auto-radio, le conducteur doit déplacer son doigt quatre fois vers le haut pour atteindre cette position. Cependant, en agissant ainsi, il se peut que son doigt sorte de la surface tactile (cette surface est relativement petite de l'ordre de 100 $cm^2$).

Pour pallier cet inconvénient, le procédé de commande selon la présente invention propose au lieu de réaliser quatre déplacements rectilignes vers le haut de réaliser quatre allers retours rapides (A / R) avec le doigt, comme le montre la figure 3. Chaque aller / retour est alors considéré comme une commande de déplacement du curseur 11 de la valeur de l'incrément (en général cet incrément correspond à une case). Un aller retour est détecté chaque fois que deux déplacements de direction sensiblement opposées sont enchaînés rapidement (en continuité).

Ainsi, une succession de mouvements rectilignes dans une direction donnée est remplacée par une même succession d'allers et retours. L'intérêt d'un tel mode de commande réside dans le fait qu'en réalisant des allers et retours le doigt revient à peu près au même endroit (à son point de départ) et ne risque pas de sortir de la surface tactile quel que soit le nombre de mouvements rectilignes à effectuer.

Il est à noter que la succession d'allers et retours sera considérée comme une demande de mouvement pas à pas uniquement si cette succession d'allers retours est réalisée rapidement, c'est-à-dire si ces mouvements sont enchaînés en continuité. Ainsi, le temps s'écoulant entre un aller et un retour devra être inférieur à une valeur seuil, par exemple, d'une demi-seconde. Si le temps séparant un mouvement aller et un mouvement retour est supérieur à cette valeur seuil, alors les mouvements du doigt seront interprétés comme une demande de déplacement vers le haut suivie d'une demande de déplacement vers le bas.

Cependant, en réalisant une succession d'allers et retours, il est pratiquement impossible (surtout si ces déplacements sont réalisés sans regarder la surface tactile et tout en conduisant) de rester strictement et exactement dans la même zone de la surface tactile. Comme le montre la figure 3, le doigt a tendance à dériver par exemple selon une ligne de dérive D.

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Le procédé selon la présente invention utilise une étape de filtrage de la dérive du doigt qui permet de tenir compte de cette dérive et d'analyser correctement les déplacements de doigt réalisés par le conducteur.

A cet effet, le point initial d'impact du doigt (-0- figure 4) est mémorisé. Une zone morte Z de dimension et de taille déterminée est établie autour de ce point initial d'impact. Lorsqu'un mouvement aller / retour est détecté, le procédé selon l'invention mémorise le point (1) ou un second mouvement aller retour est initialisé. Si ce point se situe dans la zone morte antérieure (c'est à dire celle du point initial), alors la zone morte initiale est décalée et est recentrée autour de ce nouveau point (1), et ainsi de suite pendant toute la durée de la succession d'allers retours.

Ainsi, même si le doigt du conducteur dépasse la position initiale (0), ce dépassement (1) n'est pas interprété comme une demande de nouveau déplacement (vers le bas à la figure 4 entre le point 0 et le point 1).

Il est à noter que dans la description ci-dessus, le doigt du conducteur peut être remplacé par tout organe de commande analogue comme par exemple une souris électronique, un stylo optique, etc...

Bien entendu, la présente invention n'est pas limitée au mode de mise en œuvre décrit et englobe toute variante à la portée de l'homme de l'art. Ainsi, des allers / retours réalisés de manière perpendiculaire à ceux présentés aux figures 3 et 4 peuvent également être utilisés pour provoquer des déplacements successifs vers la droite ou vers la gauche (sur les dessins). De même, des allers et retour tracés de manière oblique signifie que l'on désire que le curseur se déplace selon cette direction oblique (une ou plusieurs fois).

**REVENDICATIONS**

1. Procédé de commande d'une surface tactile, la dite surface (10) étant adaptée pour interpréter toute succession de déplacements d'un organe de commande selon des directions données, en une succession de commandes de déplacement d'un curseur selon ces mêmes directions, le dit procédé étant caractérisé en ce qu'il consiste en outre à considérer une succession de déplacements comme une succession de commande de déplacements dans un même sens et selon un incrément déterminé, lorsque cette succession de déplacements est constituée de mouvements allers retours(A / R) entre deux directions sensiblement opposées et lorsque ces mouvements sont enchaînés en continuité.

2. Procédé selon la revendication 1 caractérisé en ce que chaque aller retour est considéré comme une commande de déplacement du curseur de la valeur de l'incrément.

3. Procédé selon la revendication 1 ou 2, caractérisé en ce qu'on détermine, autour d'un point de premier impact (0) du dispositif de commande, une zone morte (Z) de forme et de dimension prédéterminées.

4. Procédé selon la revendication 3, caractérisé en ce qu'on réalise un filtrage de la dérive du dispositif de commande au cours d'une succession d'allers et retours.

5. Procédé selon la revendication 4, caractérisé en ce que le filtrage consiste à créer une nouvelle zone morte autour du point ou un nouvel aller et retour est détecté, si ce point se trouve dans la zone morte antérieure.

6. Procédé selon l'une quelconque des revendications 1 à 5, caractérisé en ce que deux mouvements sont considérés comme étant enchaînés en continuité lorsqu'ils sont effectués avec moins d'une demi-seconde d'écart temporel entre eux.

7. Procédé selon l'une quelconque des revendications précédentes, caractérisé en ce que le dispositif de commande est constitué par le doigt d'un utilisateur ou par une souris électronique ou par un stylo optique.

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# 1 / 1

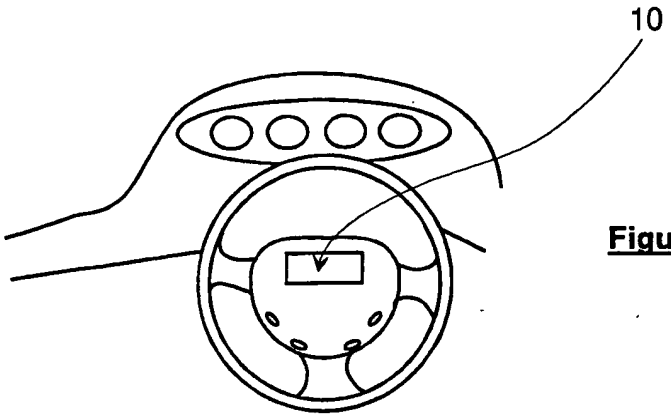



Figure 1

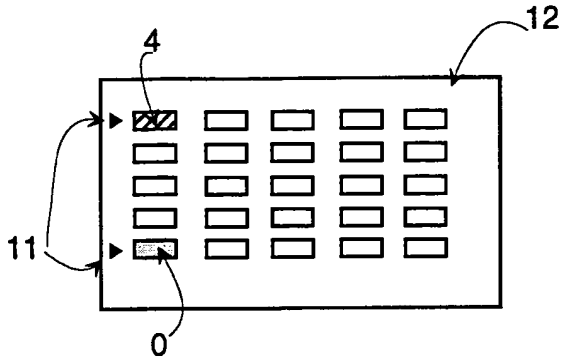



Figure 2

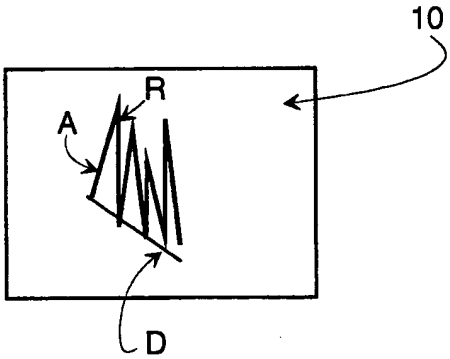



Figure 3

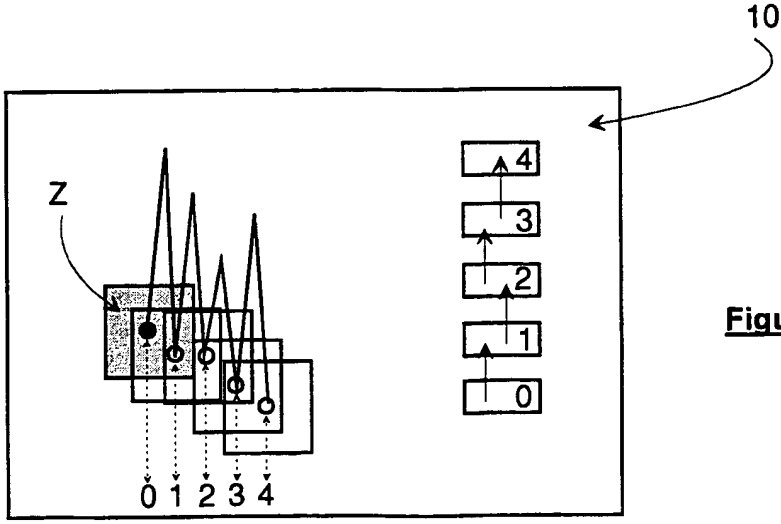



Figure 4

# INTERNATIONAL SEARCH REPORT

Int tional Application No
PCT/EP 00/11042

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F3/033

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G06F G06K B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, IBM-TDB, INSPEC, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | GB 2 319 591 A (ALPS ELECTRIC CO. LTD.)<br>27 May 1998 (1998-05-27)<br>abstract; figures 2,4,5 | 1,6,7 |
| P,A | EP 0 992 878 A (HEWLETT-PACKARD CO.)<br>12 April 2000 (2000-04-12)<br>column 3, line 30 -column 5, line 8;<br>figure 2 | 1,6,7 |
| A | US 5 729 219 A (ARMSTRONG ET AL.)<br>17 March 1998 (1998-03-17)<br>column 3, line 48 -column 4, line 1<br>column 4, line 40 - line 67; figures 1-6 | 1,6,7 |

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 16 January 2001 | 24/01/2001 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL – 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Taylor, P |

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Int ational Application No
PCT/EP 00/11042

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category ° | Citation of document, with indication,where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| A | EP 0 395 469 A (TELEMATIQUE VIDEOTEX FRANCAISE T.V.F.)<br>31 October 1990 (1990-10-31)<br>column 11, line 12 -column 12, line 3;<br>figure 1 | 1,7 |



TCL EXHIBIT 1007

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
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| EP 992878 A | 12-04-2000 | NONE | |
| US 5729219 A | 17-03-1998 | AU 3810397 A | 25-02-1998 |
| | | BR 9710782 A | 17-08-1999 |
| | | CN 1227014 A | 25-08-1999 |
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| | | WO 9806176 A | 12-02-1998 |
| EP 395469 A | 31-10-1990 | FR 2645990 A | 19-10-1990 |
| | | AU 632112 B | 17-12-1992 |
| | | AU 5361990 A | 18-10-1990 |
| | | CA 2014594 A | 14-10-1990 |
| | | JP 3094390 A | 19-04-1991 |

# RAPPORT DE RECHERCHE INTERNATIONALE

De de internationale No
PCT/EP 00/11042

**A. CLASSEMENT DE L'OBJET DE LA DEMANDE**
CIB 7 G06F3/033

Selon la classification internationale des brevets (CIB) ou à la fois selon la classification nationale et la CIB

**B. DOMAINES SUR LESQUELS LA RECHERCHE A PORTE**

Documentation minimale consultée (système de classification suivi des symboles de classement)
CIB 7 G06F G06K B60R

Documentation consultée autre que la documentation minimale dans la mesure où ces documents relèvent des domaines sur lesquels a porté la recherche

Base de données électronique consultée au cours de la recherche internationale (nom de la base de données, et si réalisable, termes de recherche utilisés)
EPO-Internal, IBM-TDB, INSPEC, WPI Data, PAJ

**C. DOCUMENTS CONSIDERES COMME PERTINENTS**

| Catégorie ° | Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents | no. des revendications visées |
|---|---|---|
| A | GB 2 319 591 A (ALPS ELECTRIC CO. LTD.)<br>27 mai 1998 (1998-05-27)<br>abrégé; figures 2,4,5 | 1,6,7 |
| P,A | EP 0 992 878 A (HEWLETT-PACKARD CO.)<br>12 avril 2000 (2000-04-12)<br>colonne 3, ligne 30 -colonne 5, ligne 8;<br>figure 2 | 1,6,7 |
| A | US 5 729 219 A (ARMSTRONG ET AL.)<br>17 mars 1998 (1998-03-17)<br>colonne 3, ligne 48 -colonne 4, ligne 1<br>colonne 4, ligne 40 - ligne 67; figures<br>1-6 | 1,6,7 |

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[X] Voir la suite du cadre C pour la fin de la liste des documents

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| Date à laquelle la recherche internationale a été effectivement achevée | Date d'expédition du présent rapport de recherche internationale |
|---|---|
| 16 janvier 2001 | 24/01/2001 |

| Nom et adresse postale de l'administration chargée de la recherche internationale | Fonctionnaire autorisé |
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| Office Européen des Brevets, P.B. 5818 Patentlaan 2<br>NL – 2280 HV Rijswijk<br>Tel. (+31–70) 340–2040, Tx. 31 651 epo nl,<br>Fax (+31–70) 340–3016 | Taylor, P |

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C.(suite) DOCUMENTS CONSIDERES COMME PERTINENTS

| Catégorie ° | Identification des documents cités, avec,le cas échéant, l'indicationdes passages pertinents | no. des revendications visées |
|---|---|---|
| A | EP 0 395 469 A (TELEMATIQUE VIDEOTEX FRANCAISE T.V.F.)<br>31 octobre 1990 (1990-10-31)<br>colonne 11, ligne 12 -colonne 12, ligne 3;<br>figure 1<br>----- | 1,7 |



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Page 851 of 1144

Renseignements relatifs aux membres de familles de brevets

De. de internationale No
PCT/EP 00/11042

| Document brevet cité au rapport de recherche | Date de publication | Membre(s) de la famille de brevet(s) | Date de publication |
|---|---|---|---|
| GB 2319591 A | 27-05-1998 | US 5995083 A | 30-11-1999 |
| | | DE 19751262 A | 28-05-1998 |
| | | JP 10149254 A | 02-06-1998 |
| EP 992878 A | 12-04-2000 | AUCUN | |
| US 5729219 A | 17-03-1998 | AU 3810397 A | 25-02-1998 |
| | | BR 9710782 A | 17-08-1999 |
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| | | EP 0917763 A | 26-05-1999 |
| | | WO 9806176 A | 12-02-1998 |
| EP 395469 A | 31-10-1990 | FR 2645990 A | 19-10-1990 |
| | | AU 632112 B | 17-12-1992 |
| | | AU 5361990 A | 18-10-1990 |
| | | CA 2014594 A | 14-10-1990 |
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(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 238 325 B1

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(51) Int Cl.[7]: **G06F 1/16**, G06F 3/02, H04M 1/02, B41J 5/10, G09F 9/30

(86) International application number:
**PCT/FI00/00995**

(87) International publication number:
**WO 01/042891 (14.06.2001 Gazette 2001/24)**

(54) **USER INTERFACE**

BENUTZER-SCHNITTSTELLE

INTERFACE D'UTILISATEUR

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR**

(30) Priority: **08.12.1999 FI 992636**

(43) Date of publication of application:
**11.09.2002 Bulletin 2002/37**

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**P.O. Box 981**
**00101 Helsinki (FI)**

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- **PATENT ABSTRACTS OF JAPAN vol. 2000, no. 08, 6 October 2000 (2000-10-06) & JP 2000 132122 A (FUJI PHOTO FILM CO LTD), 12 May 2000 (2000-05-12)**
- **PATENT ABSTRACTS OF JAPAN vol. 017, no. 460 (E-1419), 23 August 1993 (1993-08-23) & JP 05 109342 A (NEC CORP;OTHERS: 01), 30 April 1993 (1993-04-30)**

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 238 325 B1

TCL EXHIBIT 1007

## Description

**[0001]** The invention relates to user interfaces, and relates especially to minimising the size of user interfaces.

**[0002]** During the last two decades different types of small electronic input devices have been developed, especially for mobile telecommunication. These devices generally have a keypad comprising either a set of buttons typically used on a telephone handset or a small keyboard in the QWERTY format.

**[0003]** It is common in such electronic input devices to provide a display to let a user see information which has been entered via the keypad or keyboard and to provide the user with other information such as received messages, instructions or other information. Developments in electronic and battery technologies have allowed manufacture of ever smaller devices having ever greater functionality. This improvement in functionality has enabled users to interact with electronic input devices in more ways, which has led to more menu options being available. Consequently, electronic input devices generally require a relatively large display and a large number of input keys. It is now common for users to carry their electronic input devices with them most of the time. This increased mobility generally limits the size of electronic input devices to a handheld size. Furthermore, since they are now often carried about, they need to be robust. There is thus a conflict between the need to have a large display and a large keyboard to allow ease of use and the need to have a small portable electronic input device.

**[0004]** In order to keep the size of electronic input devices small, it is known to provide browsing menus to display only a small number of available options and/or information at any one time and to reduce the size of keyboard keys. However, user interfaces of newer and more complicated devices, such as mobile telephones and Personal Digital Assistants, often have a computer-like functionality, and so require a display which is capable of displaying text (having a number of rows) and graphics. QWERTY format keyboards are often provided. An example of such a device is the Nokia® 9000 Communicator. This is in the form of a two-part mobile station comprising a complete QWERTY format keyboard in one part and a display having 640 x 200 pixels in the other part. The two parts are joined together by a hinge.

**[0005]** Document JP 06-164440 discloses a portable information communication equipment with a radio communication state and an electronic notebook state. The electronic device comprises three sections that are hinged together so that a first and a second part are hinged on a short horizontal side of the device, which when opened brings the device into the radio communication state revealing microphone, speaker, keypad and display. Further the second and third sections are hinged on a long vertical side of the device, and when opened brings the device into the electronic notebook state revealing display and keypad. At a time only the first or the third section is opened so that the device is either in the radio communication state or in the electronic notebook state.

**[0006]** Document EP 860 969 (and corresponding US 6,311,076) discloses a mobile communication device that has a housing containing battery and electronic component compartments. Located along a central axis of the housing is a spring mounted roller to which is attached a flexible liquid crystal display. The housing contains a compartment between the roller and the outer wall of the housing for storing the display in a retracted position. An elongate slot extends axially along the housing such that the display can be pulled through the slot by a user to a withdrawn position in which the display is visible to the user. The display may be provided with one or more touch sensitive elements or 'buttons' which are accessible to the user when the display is withdrawn.

**[0007]** Now a user interface for an electronic input device has been invented, which input device has an input means extractable from a storage space of the device into an extended state and retractable back into the storage space into a retracted state. Thus, the size of the data input device can conveniently be made smaller for transport whilst the input means is protected in the storage space. The electronic input device can subsequently be put into a larger size when the input means is to be used.

**[0008]** According to a first aspect of the invention there is provided an electronic input device comprising:

a flexible input means for receiving user input; and
a housing defining a space for accommodating said input means;
said input device has a first state, a second state and a third state; wherein
the input device adopts a compact spatial configuration in the first state, a partly extended spatial configuration in the second state, and a fully extended spatial configuration in the third state,

characterised in that
the input device is configured to be moved from the first state into the second state by movement of a first portion of the device in relation to a second portion of the device in a first direction, and the device is configured to be moved from the second state into the third state by a sliding movement of a third portion of the device in a second direction being different than the first direction, and

**[0009]** in the second state the input means adopts a compacted spatial configuration and at least part of the functionality of the electronic input device is available for a user, and in the third state input means adopts an extended spatial configuration and the available functionality is extended.



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**[0010]** Preferably, the input means has an input surface having touch sensitive areas.

**[0011]** Preferably, the compacted state is non-planar. All or part of the input means may adopt the compacted spatial configuration. In this way, a smaller input area, or no input area at all, is provided to the user.

**[0012]** Preferably, the extended spatial configuration is planar. All or part of the input means may adopt the extended spatial configuration. In this way, the input means provides an input area to a user.

**[0013]** Advantageously, the size of the electronic input device can be reduced, for example by gathering the input means either partially or entirely into the housing, and increased to reveal a convenient large input means, for example by letting out the input means either partially or entirely from the housing.

**[0014]** Preferably, in the second configuration the input means is wound into a roll. Alternatively, it may be folded. In one embodiment, it is a concertina arrangement.

**[0015]** Preferably, said device comprises means for moving said input means between said first and second configurations.

**[0016]** Preferably, said input means is a keyboard. In an embodiment in which the input means is a keyboard its size can be changed considerably thus allowing construction of a small device with full keyboard functionality. It is an advantage of a full keyboard that the user can quickly and easily type text, and yet the input device can be compacted to a convenient small size to be easy to carry with the user during transportation.

**[0017]** Preferably, said input means is a display. Preferably, part of the display is arranged to display a key to implement a soft key the function of which can be varied by software. This has an advantage of combining an input and output means so that the same surface can be used both for displaying information to the user and for reading user input, and thus it is not necessary to provide a separate display at all.

**[0018]** Preferably, the electronic input device according to a second aspect of the invention comprises:

a flexible output means for outputting information; and

a housing defining a space for accommodating said output means; said input device has a first state, a second state and a third state; wherein

the input device adopts a compact spatial configuration in the first state, a partly extended spatial configuration in the second state, and a fully extended spatial configuration in the third state,

**characterised** in that

the input device is configured to be moved from the first state into the second state by movement of a first portion of the device in relation to a second portion of the device in a first direction, and the device is configured to be moved from the second state into the third state by a sliding movement of a third portion of the device in a second direction being different than the first direction, and

in the second state the output means adopts a compacted spatial configuration and at least part of the functionality of the electronic input device is available for a user, and in the third state output means adopts an extended spatial configuration and the available functionality is extended.

**[0019]** Preferably, said flexible output means is a display.

**[0020]** Advantageously, the size of the display can be changed to a high extent. This allows construction of a small device with a large enough display to show a large amount of information at any one time, for example a WWW (World Wide Web) page or e-mail.

**[0021]** Preferably said output means and said input means are arranged so that the input device has two states corresponding to the first and second states of both input means and output means. In the first state both the input means and the output means are compacted and in the second state both the input means and the output means are extended. This provides the advantage of either simultaneous extension or simultaneous compaction of both the input means and the output means.

**[0022]** Preferably, the electronic input device comprises a hinge for foldingly connecting the housing defining the space for accommodating said flexible output means to the housing defining a space for accommodating said input means. This provides an electronic input device, which has a relatively large display, and a relatively large input means and yet can be packed into a compact configuration. This is particularly useful in reducing the size of an electronic input device that is always carried by a user.

**[0023]** Preferably, the electronic input device is a telecommunications device. The telecommunications device may have a data terminal mode in its extended spatial configuration and a telephone mode in its compacted spatial configuration.

**[0024]** Preferably, the electronic input device comprises:

two elements, which are foldable about a hinge between an open configuration and a closed configuration,

a speaker located in one element, and

a microphone in another element.

**[0025]** The telecommunications device is unfoldable to separate the microphone and the speaker. In this way the speaker may be located conveniently close to a user's mouth and the microphone may be located conveniently close to the user's ear. Advantageously the elements can be folded together to reduce thei size of the electronic input device.

**[0026]** Preferably, the electronic input device further



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comprises:

a stop to prevent the device being opened beyond a certain maximum opening angle, and
a means for changing the maximum opening angle when the configuration of the device is changed between the compacted spatial configuration and the extended spatial configuration. This provides different maximum opening angles for when the device is to be used in a telephone mode and when it is to be used in a data terminal mode. For example, it is possible to reduce the opening of the device to a convenient viewing angle for the data terminal mode. In the telephone mode, the mobile station can be further opened to increase the distance of the microphone and the speaker from each other.

**[0027]** According to a third aspect of the invention there is a method of operating an electronic input device having a user interface, comprising the steps of:

storing a flexible input means in a compacted spatial configuration within a housing of the electronic input device;
moving the input device from a first state into a second state by moving a first portion of the device in relation to a second portion of the device in a first direction, wherein the input device adopts a compact spatial configuration in the first state and a partly extended spatial configuration in the second state;
moving the input device from the second state into a third state by sliding a third portion of the device in a second direction being different than the first direction, the sliding comprising extending the flexible input means out of the housing into an extended spatial configuration for receiving user input, wherein the input device adopts a fully extended spatial configuration in the third state;
allowing a user to access at least part of the functionality of the electronic input device when in the second state; and
extending the available functionality of the electronic input device when in the third state; and
allowing the input device to be moved from the third state into the second state by retrieving the flexible input means again into the compacted spatial configuration within the housing.

**[0028]** The invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view from the front of a mobile station in a transport mode;
Figure 2 shows a side view of the mobile station of Figure 1 in a telephone mode;
Figure 3 shows a perspective view from the front of the mobile station of Figure 1 in a telephone mode;
Figure 4 shows a perspective view from the front of the mobile station of Figure 1 in a data terminal mode;
Figure 5 shows an example of a support mechanism;
Figure 6 shows a front view of the mobile station of Figure 1 in a partially extended mode;
Figure 7 shows a cross section of the mobile station of Figure 6 along line A-A'; and
Figure 8 shows enlarged detail of Figure 6.

**[0029]** Figure 1 shows a mobile station MS in a retracted configuration, which is suitable for transportation and to be carried by a user, for example in a pocket. It can be seen that in this retracted, or folded-up, configuration the mobile station is basically of a cylindrical shape. The mobile station comprises four elements 10, 11, 12, and 13, which have outwardly facing curved surfaces defining the cylindrical shape. The elements are a lower storage element 10, an upper storage element 11, a battery element 12 and an electronics housing element 13. The battery element 12 contains a battery for operating the mobile station. The electronics housing element 13 contains mobile station electronics to enable the mobile station to be used as, among other things, a mobile telephone and as a data terminal.

**[0030]** Referring now to Figures 2 and 3 it can be seen that elements 11 and 10 and elements 13 and 12 are hinged together with hinges 18. The elements 10 and 12 are adjacent to each other and form a first hinged entity. The elements 11 and 13 are correspondingly adjacent to each other and form a second hinged entity. Both of the hinged entities each move about the hinges as a unit. The mobile station is provided with a latch (not shown) to resist it being accidentally opened. Alternatively, friction means may be provided for this purpose.

**[0031]** Figure 3 shows a perspective view from the front of the mobile station of Figure 1 in an opened, that is telephone, configuration. The first and second entities have been moved relatively with respect to each other about the hinges 18 and are disposed at an angle of about 115°. This is a comfortable angle for the mobile station to be used as a telephone or as a data terminal as will be described below. The opened configuration reveals a telephone speaker 20 located close to the upper end of the electronics housing element 13 and a microphone 21 located close to the lower end of the battery element 12. A telephone keypad 22 can be seen on a surface of the battery element 12, which surface faces a corresponding surface of the lower storage element 10. In another embodiment of the invention, the user may give verbal input rather than pressing keys with the input being recognised by speech recognition.

**[0032]** Of course, the angle does not have to be exactly 115° but may be arbitrarily chosen. The angle may be either freely adjustable or it may be adjustable in certain steps. There may only be two possible angles at



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which the mobile station may be fixed: in a completely closed configuration, where the angle is 0°, and in an open configuration, where the angle is typically within a range of 90 to 270 degrees, preferably less than 180 degrees. Alternatively, there may be a third fixed angle so that there are different angles for telephone use and for data terminal use, as described later in this document.

**[0033]** Figure 4 shows a perspective of the mobile station of Figure 1 in an extended, data terminal, configuration. Pairs of elements forming each of the first and second hinged entities, that is elements 10 and 12 and elements 11 and 13 are connected to each other by a flexible keyboard 14 and a flexible display 15 respectively. The upper storage element 11 provides a storage space into which the keyboard 14 can be wound and the lower storage element 10 provides a storing space into which the display 15 can be wound. Both the keyboard 14 and the display 15 are arranged to be wound into their respective storage spaces so that the mobile station is in a suitable configuration for transportation or to be used as a telephone. This can be arranged by using any suitable means such as a springloaded or an electrically driven roller. In case of electrically driven winding, the battery can be connected to a miniature sized electrical motor in the lower storage element 10 with flexible wires extending beneath the keyboard 14. The elements 13 and 12 are provided with grips, which a user can grasp to pull the elements in respective pairs 10 and 12 and 11 and 13 away from each other. When these pairs are being separated, the keyboard 14 and the display 15 become removed from their storage spaces and unwound partially or to their full extents. The keyboard 14 and the display 15 are electrically coupled to the electronics within the electronics housing element 13. The device also comprises a flexible flat cable (not shown) extending across the hinges 18 to couple the battery, the keypad and the keyboard 14 to the electronics in the electronics housing element 13. Thus the electronics drives the display 15 and receives input from the keyboard 14.

**[0034]** Since the keyboard 14 and the display 15 are flexible and can be wound, they do not need to be sharply folded. Alternatively, the keyboard 14 and the display 15 may be stored in their respective storage spaces in a concertina type arrangement having a suitable mechanism to retract them.

**[0035]** In the extracted configuration, the keyboard 14 and the display 15 are parallel in the direction of their longest side, although they do not necessarily share the same plane.

**[0036]** In one embodiment of the invention the keyboard 14 is a touch pad arrangement for sensing touch by a finger or by a touch pen 17 which is provided for this purpose. In this embodiment, the pen 17 is located in an end of the lower storage element 10. It is convenient to locate the pen 17 on, or adjacent to, an axis about which the keyboard 14, is wound. In this way, the pen 17 may be located inside the keyboard 14 when it is wound. The keyboard 14 is made of an EMFi film, as is known to a person skilled in the art. A set of keys 16 is printed on the keyboard 14 to indicate to a user where to press. In another embodiment, the keys of the keyboard are not printed but instead the keyboard is capable of displaying virtual keys 16, that is soft keys, which are to be pressed. Using soft keys allows dynamic mapping and thus enhances the variability of the keyboard so that it can be adapted to receive input of different kinds in different circumstances. For example, the mobile station can show legends for shortcut keys (such as CTRL A) adjacent to certain keys. These legends may be customised by different applications. In another embodiment, rather than providing a keyboard, a touch pad is provided which can be used as a drawing surface for a drawing application or used as a general input device. For example, it could be used to extend the display area to provide an expanded view to a document or an image.

**[0037]** The display 15 is a paper-like display element. Manufacturers for such display elements comprise E-Ink Inc. & Massachusetts Institute of Technology and Rank Xerox Corporation. Rank Xerox has described one type of paper-like displays called "gyricon": "A gyricon sheet is a thin layer of transparent plastic in which millions of small beads, somewhat like toner particles, are randomly dispersed. The beads, each contained in an oil-filled cavity, are free to rotate within those cavities. The beads are 'bichromal', with hemispheres of contrasting color (e.g. black and white), and charged so they exhibit an electrical dipole. Under the influence of a voltage applied to the surface of the sheet, the beads rotate to present one colored side or the other to the viewer. A pattern of voltages can be applied to the surface in a bitwise fashion to create images such as text and pictures. The image will persist until new voltage patterns are applied to create new images.' ...' For applications requiring more rapid and direct electronic update, the gyricon material might be packaged with a simple electrode structure on the surface and used more like a traditional display. Gyricon is described at http://www.parc.xerox.com/dhl/projects/epaper/.

**[0038]** The first hinged entity is relatively massive compared to the second hinged entity so that the first entity can lie flat upon a surface when the mobile station is opened. This applies even when the second hinged entity is disposed at an angle to the first hinged entity of more than 90°. In this way, the mobile station is self-supporting when in a data terminal mode. Therefore, the mobile station can be placed on a desk and not topple over. This stability can be provided by locating heavy parts of the mobile station, such as the battery, in the battery housing element 12. Alternatively, it can be provided by locating the majority of the weight in the battery housing element 12 away from the hinges 18 and the majority of the weight in the electronics housing element 13 close to the hinges 18.

**[0039]** The mobile station may also comprise a frame



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located beneath the keyboard 14 and the display 15. The frame holds the mobile station in the extended configuration. The frame is extendable and retractable. The frame also provides support to the back faces of the keyboard 14 and the display 15 to enable the mobile station to be used on an uneven surface or in the hands of a user. In any case, whether or not a frame is provided, winding of the keyboard 14 and the display 15 can be arranged to occur only in response to user initiation so that the mobile station can be laid on a desk or other such flat surface and stay in the extended configuration.

**[0040]** Figure 5 shows an example of a frame provided to support the keyboard. The frame comprises three sets of folding support bars 52. Each set has four support bars which pivot about pivots 56 at both ends. The support bars 52 of each set are maintained in a parallel configuration with corresponding support bars 52 in the other sets. The support bars 52 mechanically connect the battery housing element 12 with the lower storage element 10. The mechanism further comprises three intermediate bars 58, which connect the three sets together. The intermediate bars 58 force corresponding support bars 52 from each set to stay parallel when the mobile station is extended or retracted. In an embodiment in which the support bars 52 comprise conductive material, they can be used electrically to couple the keyboard and battery housing elements 10 and 12. Alternatively, one of these sets can support an electrical lead coupling these elements. A similar frame arrangement can be used to support the display 15.

**[0041]** Figure 6 shows a front view of the mobile station in a partially extended mode. The battery housing element 12 and the electronics housing element 13 are provided with a stop mechanism. The stop mechanism uses a stud 62 provided on the upper storing element 11.

**[0042]** Figure 7 shows a cross section of the view of the mobile station in Figure 6 along the line A-A'. This embodiment has three fixed opening angles. On a wall facing towards the upper storage element 11, the electronics housing element 13 has a recess 74 on its side at its lower end, close to the hinge 18.. The recess has a form of a sector of approximately 45 degrees. The hinged end of the electronics housing element forms the first straight side or radius of the sector.

**[0043]** The battery housing element 12 has a wall that faces towards the lower storage element 10. This wall has an extending flange 72. The flange is basically an extension of the wall going beyond the end of the battery housing element 12. The flange has a sector shape in side view. The flange has an arc extending from the lower side of the battery housing element. The arc extends over an angle of about 60 degrees and terminates at a straight side connecting the arc to the upper side of the battery housing element. The narrow apex of the flange is thus towards the hinge. The flange is aligned in proportion to the hinge so that it enters the recess when the mobile station is opened about the hinges. At a certain first opening angle, the flange fills the entire recess and a leading edge 73 meets the end 77 of the recess.

**[0044]** In order to provide two different opening angles, there is a stop 76. The stop is an extension of the wall of the electronics housing element 13, which faces towards the upper storage element. The stop follows the plane of this wall and extends a few millimetres over the recess 74. The stop and the flange are both aligned to the level of the outer surfaces of the electronics housing element 13 and battery housing element 12. In other words, the stop 76 and the flange 72 occupy a common plane. The flange has two configurations, a relaxed and a bent configuration. In the bent configuration, the flange is slightly bent sideways. The recess is dimensioned deeply enough so that there is space behind the stop for the flange to slide, when the flange is in the bent configuration.

**[0045]** There are three abutment surfaces. The flange 72 has the first abutment surface 73 that is its leading edge. This surface prevents further opening of the mobile station beyond a certain opening angle. The recess 74 has an inner wall (the second direct wall of the sector) defining the second abutment surface 77, which defines the first opening angle. This first opening angle defines the maximum opening angle when the mobile station is being used as a telephone. The stop 76 provides a third abutment surface which faces roughly towards the hinged end of the electronics housing element. When the mobile station is being used as a data terminal that is in the extracted configuration, the stud 62 is far from the flange, the flange moves along the plane of the side walls of the battery and electronics housing elements, and at a certain point engages with the stop.

**[0046]** The operation of the stop mechanism will now be described referring to Figures 6, 7 and 8. The flange 72 has a relaxed configuration in which it is not pressed upon by the stud 62. This is shown in Figure 6. In this configuration, when the flange engages the stop 76, further opening movement is prevented, and thus the maximum opening angle for the data terminal mode is defined. Additionally, the flange has a compressed configuration, in which the stud 62 presses the flange 72 into the recess. This happens when the mobile station is set into the telephone mode, that is the upper storage element 11 is brought next to the electronics housing element 13. In this compressed configuration, the first abutment surface 73 of the flange 72 can avoid the stop 76, and the flange slides through the gap. Thus, the mobile station can open until the flange is fully received by the recess 74, that is until the first abutment surface 73 engages the third abutment surface 77 of the recess. When the abutment surfaces are in contact, the battery housing element 12 and the electronics housing element 13 are stopped from opening any further.

**[0047]** The present invention provides several advantages over the prior art. A mobile station according to the invention occupies in its transportation mode a fraction of its fully opened size. In addition, it also has an intermediate configuration provided to enable the mo-



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bile station to be used for telephony. The invention can be applied to mobile telephones, personal digital assistants and small laptop computers to provide a screen of a presentation size. Alternatively it can be used for interactive posters in exhibitions, electronic games, user interfaces of various types of home and business electronics like hi-fi-sets, car audio systems, and multimedia devices used, for example, in aeroplanes.

**[0048]** This paper presents the implementation and embodiments of the invention with the help of examples. It is obvious to a person skilled in the art, that the invention is not restricted to details of the embodiments presented above, and that the invention can be implemented in another embodiment without deviating from the characteristics of the invention. The invention was here described using the most complex embodiment as an example, but naturally the invention can also be implemented in a device comprising merely a retracting keyboard without neither display properties nor mobile telephone functionality etc.

## Claims

1. An electronic input device (MS) comprising:

   a flexible input means (14) for receiving user input; and
   a housing (10) defining a space for accommodating said input means;
   said input device has a first state (Figure 1), a second state (Figure 3) and a third state (Figure 4); wherein
   the input device adopts a compact spatial configuration in the first state, a partly extended spatial configuration in the second state, and a fully extended spatial configuration in the third state,

   **characterised in that**

   the input device is configured to be moved from the first state into the second state (Figure 3) by movement of a first portion of the device in relation to a second portion of the device in a first direction, and the device is configured to be moved from the second state into the third state (Figure 4) by a sliding movement of a third portion of the device in a second direction being different than the first direction, and

   in the second state the input means adopts a compacted spatial configuration and at least part of the functionality of the electronic input device is available for a user, and in the third state input means adopts an extended spatial configuration and the available functionality is extended.

2. An electronic input device (MS) according to claim 1, wherein the input means (14) has an input surface having touch sensitive areas (16).

3. An electronic input device (MS) according to claim 1 or 2, wherein the extended spatial configuration is planar.

4. An electronic input device (MS) according to any preceding claim, wherein the compacted spatial configuration is non-planar.

5. An electronic input device (MS) according to any preceding claim, wherein in the compacted spatial configuration the input means (14) is wound into a roll.

6. An electronic input device (MS) according to any preceding claim, comprising means (11, 12) for moving said input means (14) between said first and second configurations.

7. An electronic input device (MS) according to any of preceding claims, wherein said input means is a keyboard (14).

8. An electronic input device (MS) according to any of preceding claims, wherein said input means (14) is also a display.

9. An electronic input device (MS) according to claim 1, wherein the device is configured to pull the third portion in the second direction.

10. An electronic input device (MS) according to claim 9, wherein the device comprises a first (10) and a second (12) element which are configured to be grasped by the user in order to pull the first and the second element away from each other.

11. An electronic input device (MS) according to claim 10, wherein the first element (10) comprises a storing space in which a flexible input means is stored when the device is in the second state, and from which the flexible input means (14) is extracted when the device is moved into the third state.

12. An electronic input device (MS) comprising:

   a flexible output means (15) for outputting information; and
   a housing (11) defining a space for accommodating said output means; said input device has a first state (Figure 1), a second state (Figure 3) and a third state (Figure 4); wherein
   the input device adopts a compact spatial configuration in the first state, a partly extended spatial configuration in the second state, and a fully extended spatial configuration in the third state,



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**characterised in that**

the input device is configured to be moved from the first state into the second state (Figure 3) by movement of a first portion of the device in relation to a second portion of the device in a first direction, and the device is configured to be moved from the second state into the third state (Figure 4) by a sliding movement of a third portion of the device in a second direction being different than the first direction, and

in the second state the output means adopts a compacted spatial configuration and at least part of the functionality of the electronic input device is available for a user, and in the third state output means adopts an extended spatial configuration and the available functionality is extended.

**13.** An electronic input device (MS) according to claim 12, wherein said output means is a display (15).

**14.** An electronic input device (MS) according to claim 12 or 13, wherein said output means is arranged parallel with said input means so that the input device has two states corresponding to the first and second states of both input means and output means.

**15.** An electronic input device (MS) according to any of claims 12 to 14, comprising a hinge (18) for foldingly connecting the housing (11) defining the space for accommodating said output means to the housing (10) defining a space for accommodating input means.

**16.** An electronic input device (MS) according to any preceding claim, wherein the electronic input device is a telecommunications device.

**17.** An electronic input device (MS) according to claim 16 comprising:

two elements (10 and 12,11 and 13), which are foldable about a hinge (18) between an open configuration and a closed configuration;
a speaker (20) located in one element, and
a microphone (21) in another element so that the electronic input device can be unfolded to separate the microphone and the speaker.

**18.** An electronic input device (MS) according to claim 17 comprising:

a stop (76) to resist opening the two elements (10 and 12,11 and 13) of the input device over a certain maximum opening angle, and
means for changing the maximum opening angle when the configuration of the device is changed between the compacted spatial configuration and the extended spatial configuration.

**19.** An electronic input device (MS) according to claim 1, wherein the device is configured to pull the third portion in the second direction.

**20.** An electronic input device (MS) according to claim 9, wherein the device comprises a first (10) and a second (12) element which are configured to be grasped by the user in order to pull the first and the second element away from each other.

**21.** An electronic input device (MS) according to claim 10, wherein the first element (10) comprises a storing space in which a flexible output means is stored when the device is in the second state, and from which the flexible output means (14) is extracted when the device is moved into the third state.

**22.** A method of operating an electronic input device having a user interface, comprising the steps of:

storing a flexible input means in a compacted spatial configuration within a housing of the electronic input device;
moving the input device from a first state into a second state by moving a first portion of the device in relation to a second portion of the device in a first direction, wherein the input device adopts a compact spatial configuration in the first state and a partly extended spatial configuration in the second state;
moving the input device from the second state into a third state by sliding a third portion of the device in a second direction being different than the first direction, the sliding comprising extending the flexible input means out of the housing into an extended spatial configuration for receiving user input, wherein the input device adopts a fully extended spatial configuration in the third state;
allowing a user to access at least part of the functionality of the electronic input device when in the second state; and
extending the available functionality of the electronic input device when in the third state; and
allowing the input device to be moved from the third state into the second state by retrieving the flexible input means again into the compacted spatial configuration within the housing.

**Patentansprüche**

**1.** Elektronische Eingabevorrichtung (MS), die umfaßt:



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ein flexibles Eingabemittel (14), das eine Anwendereingabe empfängt; und
ein Gehäuse (10), das einen Raum für die Aufnahme des Eingabemittels definiert;

wobei die Eingabevorrichtung einen ersten Zustand (Fig. 1), einen zweiten Zustand (Fig. 3) und einen dritten Zustand (Fig. 4) besitzt; wobei

die Eingabevorrichtung im ersten Zustand eine kompakte räumliche Konfiguration besitzt, im zweiten Zustand eine teilweise ausgedehnte räumliche Konfiguration besitzt und im dritten Zustand eine vollständig ausgedehnte räumliche Konfiguration besitzt,

**dadurch gekennzeichnet, daß**

die Eingabevorrichtung so konfiguriert ist, daß sie durch Bewegen eines ersten Abschnitts der Vorrichtung in bezug auf einen zweiten Abschnitt der Vorrichtung in einer ersten Richtung aus dem ersten Zustand in den zweiten Zustand bewegt wird (Fig. 3) und die Vorrichtung durch eine Gleitbewegung eines dritten Abschnitts der Vorrichtung in einer von der ersten Richtung verschiedenen zweiten Richtung aus dem zweiten Zustand in den dritten Zustand bewegt wird (Fig. 4), und

in dem zweiten Zustand das Eingabemittel eine kompakt gemachte räumliche Konfiguration besitzt und wenigstens ein Teil der Funktionalität der elektronischen Eingabevorrichtung für einen Anwender verfügbar ist und im dritten Zustand das Eingabemittel eine ausgedehnte räumliche Konfiguration besitzt und die verfügbare Funktionalität erweitert ist.

2. Elektronische Eingabevorrichtung (MS) nach Anspruch 1, bei der das Eingabemittel (14) eine Eingabeoberfläche mit berührungsempfindlichen Bereichen (16) besitzt.

3. Elektronische Eingabevorrichtung (MS) nach Anspruch 1 oder 2, bei der die ausgedehnte räumliche Konfiguration eben ist.

4. Elektronische Eingabevorrichtung (MS) nach einem vorhergehenden Anspruch, bei der die kompakt gemachte räumliche Konfiguration nicht eben ist.

5. Elektronische Eingabevorrichtung (MS) nach einem vorhergehenden Anspruch, bei der das Eingabemittel (14) in der kompakt gemachten räumlichen Konfiguration zu einer Rolle gewickelt ist.

6. Elektronische Eingabevorrichtung (MS) nach einem vorhergehenden Anspruch, die Mittel (11, 12) zum Bewegen des Eingabemittels (14) zwischen der ersten und der zweiten Konfiguration umfaßt.

7. Elektronische Eingabevorrichtung (MS) nach einem der vorhergehenden Ansprüche, bei der das Eingabemittel eine Tastatur (14) ist.

8. Elektronische Eingabevorrichtung (MS) nach einem der vorhergehenden Ansprüche, bei der das Eingabemittel (14) außerdem eine Anzeige ist.

9. Elektronische Eingabevorrichtung (MS) nach Anspruch 1, wobei die Vorrichtung so konfiguriert ist, daß sie den dritten Abschnitt in der zweiten Richtung zieht.

10. Elektronische Eingabevorrichtung (MS) nach Anspruch 9, wobei die Vorrichtung ein erstes Element (10) und ein zweites Element (12) umfaßt, die so konfiguriert sind, daß sie von dem Anwender ergriffen werden können, um das erste Element und das zweite Element auseinanderzuziehen.

11. Elektronische Eingabevorrichtung (MS) nach Anspruch 10, bei der das erste Element (10) einen Aufnahmeraum aufweist, in dem ein flexibles Eingabemittel aufgenommen ist, wenn die Vorrichtung im zweiten Zustand ist, und aus dem das flexible Eingabemittel (14) entnommen wird, wenn die Vorrichtung im dritten Zustand ist.

12. Elektronische Eingabevorrichtung (MS), die umfaßt:

ein flexibles Ausgabemittel (15) zum Ausgeben von Informationen; und
ein Gehäuse (11), das einen Raum für die Aufnahme des Ausgabemittels definiert; wobei die Eingabevorrichtung einen ersten Zustand (Fig. 1), einen zweiten Zustand (Fig. 3) und einen dritten Zustand (Fig. 4) besitzt; wobei
die Eingabevorrichtung im ersten Zustand eine kompakte räumliche Konfiguration besitzt, im zweiten Zustand eine teilweise ausgedehnte räumliche Konfiguration besitzt und im dritten Zustand eine vollständig ausgedehnte räumliche Konfiguration besitzt,

**dadurch gekennzeichnet, daß**

die Eingabevorrichtung so konfiguriert ist, daß sie durch Bewegen eines ersten Abschnitts der Vorrichtung in bezug auf einen zweiten Abschnitt der Vorrichtung in einer ersten Richtung aus dem ersten Zustand in den zweiten Zustand bewegt wird (Fig. 3) und die Vorrichtung so konfiguriert ist, daß sie durch eine Gleitbewegung eines dritten Abschnitts der Vorrichtung in einer von der ersten Richtung verschiedenen zweiten Richtung aus dem zweiten Zustand in den dritten Zustand bewegt wird (Fig. 4), und

das Ausgabemittel im zweiten Zustand eine



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kompakt gemachte räumliche Konfiguration besitzt und wenigstens ein Teil der Funktionalität der elektronischen Eingabevorrichtung für einen Anwender verfügbar ist und im dritten Zustand das Ausgabemittel eine ausgedehnte räumliche Konfiguration besitzt und die verfügbare Funktionalität erweitert ist.

**13.** Elektronische Eingabevorrichtung (MS) nach Anspruch 12, bei der das Ausgabemittel eine Anzeige (15) ist.

**14.** Elektronische Eingabevorrichtung (MS) nach Anspruch 12 oder 13, bei der das Ausgabemittel parallel zu dem Eingabemittel angeordnet ist, so daß die Eingabevorrichtung zwei Zustände besitzt, die dem ersten bzw. dem zweiten Zustand sowohl des Eingabemittels als auch des Ausgabemittels entsprechen.

**15.** Elektronische Eingabevorrichtung (MS) nach einem der Ansprüche 12 bis 14, die ein Scharnier (18) umfaßt, das das Gehäuse (11), das den Raum für die Aufnahme des Ausgabemittels definiert, mit dem Gehäuse (10), das einen Raum für die Aufnahme des Eingabemittels definiert, klappbar verbindet.

**16.** Elektronische Eingabevorrichtung (MS) nach einem vorhergehenden Anspruch, wobei die elektronische Eingabevorrichtung eine Telekommunikationsvorrichtung ist.

**17.** Elektronische Eingabevorrichtung (MS) nach Anspruch 16, die umfaßt:

zwei Elemente (10 und 12, 11 und 13), die um ein Scharnier (18) zwischen einer geöffneten Konfiguration und einer geschlossenen Konfiguration klappbar sind;
einen Lautsprecher (20), der sich in einem Element befindet, und
ein Mikrophon (21) in einem weiteren Element, so daß die elektronische Eingabevorrichtung aufgeklappt werden kann, um das Mikrophon und den Lautsprecher zu trennen.

**18.** Elektronische Eingabevorrichtung (MS) nach Anspruch 17, die umfaßt:

einen Anschlag (76), der sich dem Öffnen der beiden Elemente (10 und 12, 11 und 13) der Eingabevorrichtung über einen bestimmten maximalen Öffnungswinkel hinaus widersetzt, und
Mittel, die den maximalen Öffnungswinkel ändern, wenn die Konfiguration der Vorrichtung zwischen der kompakt gemachten räumlichen Konfiguration und der ausgedehnten räumlichen Konfiguration geändert wird.

**19.** Elektronische Eingabevorrichtung (MS) nach Anspruch 1, wobei die Vorrichtung so konfiguriert ist, daß der dritte Abschnitt in der zweiten Richtung gezogen wird.

**20.** Elektronische Eingabevorrichtung (MS) nach Anspruch 9, wobei die Vorrichtung ein erstes Element (10) und ein zweites Element (12) umfaßt, die so konfiguriert sind, daß sie von dem Anwender ergriffen werden können, um das erste Element und das zweite Element voneinander zu entfernen.

**21.** Elektronische Eingabevorrichtung (MS) nach Anspruch 10, bei der das erste Element (10) einen Aufnahmeraum aufweist, in dem ein flexibles Ausgabemittel untergebracht werden kann, wenn die Vorrichtung im zweiten Zustand ist, und aus dem das flexible Ausgabemittel (14) entnommen wird, wenn die Vorrichtung in den dritten Zustand bewegt wird.

**22.** Verfahren zum Betreiben einer elektronischen Eingabevorrichtung, die eine Anwenderschnittstelle besitzt, das die folgenden Schritte umfaßt:

Aufbewahren eines flexiblen Eingabemittels in einer kompakt gemachten räumlichen Konfiguration in einem Gehäuse der elektronischen Eingabevorrichtung;
Bewegen der Eingabevorrichtung aus einem ersten Zustand in einen zweiten Zustand durch Bewegen eines ersten Abschnitts der Vorrichtung in bezug auf einen zweiten Abschnitt der Vorrichtung in einer ersten Richtung, wobei die Eingabevorrichtung im ersten Zustand eine kompakte räumliche Konfiguration besitzt und im zweiten Zustand eine teilweise ausgedehnte räumliche Konfiguration besitzt;
Bewegen der Eingabevorrichtung aus dem zweiten Zustand in einen dritten Zustand durch gleitendes Bewegen eines dritten Abschnitts der Vorrichtung in einer von der ersten Richtung verschiedenen zweiten Richtung, wobei die Gleitbewegung das Ausfahren des flexiblen Eingabemittels aus dem Gehäuse in eine ausgedehnte räumliche Konfiguration umfaßt, damit es die Anwendereingabe empfangen kann,

wobei die Eingabevorrichtung in dem dritten Zustand eine vollständig ausgedehnte räumliche Konfiguration besitzt;

Ermöglichen, daß ein Anwender wenigstens auf einen Teil der Funktionalität der elektronischen Eingabevorrichtung Zugriff hat, wenn diese im zweiten Zustand ist; und

Erweitern der verfügbaren Funktionalität der



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elektronischen Eingabevorrichtung, wenn sie im dritten Zustand ist; und

Ermöglichen, daß die Eingabevorrichtung aus dem dritten Zustand in den zweiten Zustand bewegt wird, indem das flexible Eingabemittel wieder in die kompakt gemachte räumliche Konfiguration im Gehäuse zurückgeführt wird.

**Revendications**

1. Dispositif d'entrée électronique (MS) comprenant :

   un moyen de réception d'entrée souple (14) destiné à recevoir une entrée de l'utilisateur, et un logement (10) définissant un espace pour recevoir ledit moyen d'entrée,
   ledit dispositif d'entrée présentant un premier état (figure 1), un second état (figure 3) et un troisième état (figure 4), dans lequel
   le dispositif d'entrée adopte une configuration compacte dans l'espace dans le premier état, une configuration partiellement étendue dans l'espace dans le second état, et une configuration complètement étendue dans l'espace dans le troisième état,

   **caractérisé en ce que**

   le dispositif d'entrée est configuré pour passer du premier état au second état (figure 3) par un mouvement de la première partie du dispositif en relation avec une seconde partie du dispositif dans une première direction, et le dispositif est configuré pour passer du second état au troisième état (figure 4) par un mouvement glissant d'une troisième partie du dispositif dans une seconde direction, qui est différente de la première direction, et

   dans le second état, le moyen d'entrée adopte une configuration compactée dans l'espace et au moins une partie de la fonctionnalité du dispositif d'entrée électronique est disponible pour un utilisateur, et dans le troisième état le moyen d'entrée adopte une configuration étendue dans l'espace et la fonctionnalité disponible est étendue.

2. Dispositif d'entrée électronique (MS) selon la revendication 1, dans lequel le moyen d'entrée (14) a une surface d'entrée ayant des zones sensibles au toucher (16).

3. Dispositif d'entrée électronique (MS) selon la revendication 1 ou 2, dans lequel la configuration étendue dans l'espace est plane.

4. Dispositif d'entrée électronique (MS) selon l'une quelconque des revendications précédentes, dans lequel la configuration compactée dans l'espace n'est pas plane.

5. Dispositif d'entrée électronique (MS) selon l'une quelconque des revendications précédentes, dans lequel, dans la configuration compactée dans l'espace, le moyen d'entrée (14) est enroulé en un rouleau.

6. Dispositif d'entrée électronique (MS) selon l'une quelconque des revendications précédentes, comprenant un moyen (11, 12) pour faire passer ledit moyen d'entrée (14) entre lesdites première et seconde configurations.

7. Dispositif d'entrée électronique (MS) selon l'une quelconque des revendications précédentes, dans lequel ledit moyen d'entrée est un clavier (14).

8. Dispositif d'entrée électronique (MS) selon l'une quelconque des revendications précédentes, dans lequel ledit moyen d'entrée (14) est également un dispositif d'affichage.

9. Dispositif d'entrée électronique (MS) selon la revendication 1, dans lequel le dispositif est configuré pour tirer la troisième partie dans la seconde direction.

10. Dispositif d'entrée électronique (MS) selon la revendication 9, dans lequel le dispositif comprend un premier (10) et un second (12) éléments qui sont configurés pour être saisis par l'utilisateur de façon à écarter le premier et le second éléments l'un de l'autre.

11. Dispositif d'entrée électronique (MS) selon la revendication 10, dans lequel le premier élément (10) comprend un espace de stockage dans lequel un moyen d'entrée souple est stocké lorsque le dispositif est dans le second état, et dont le moyen d'entrée souple (14) est extrait lorsque le dispositif est amené dans le troisième état.

12. Dispositif d'entrée électronique (MS) comprenant :

   un moyen souple de sortie (15) destiné à fournir en sortie des informations, et
   un logement (11) définissant un espace destiné à recevoir ledit moyen de sortie, ledit moyen d'entrée présente un premier état (figure 1), un second état (figure 3) et un troisième état (figure 4), dans lequel
   le dispositif d'entrée adopte une configuration compacte dans l'espace dans le premier état, une configuration partiellement étendue dans l'espace dans le second état, et une configuration complètement étendue dans l'espace dans le troisième état,

   **caractérisé en ce que**



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le dispositif d'entrée est configuré pour passer du premier état au second état (figure 3) par un mouvement d'une première partie du dispositif en relation avec une seconde partie du dispositif dans une première direction, et le dispositif est configuré pour passer du second état au troisième état (figure 4) par un mouvement de glissement d'une troisième partie du dispositif dans une seconde direction différente de la première direction, et

dans le second état, le moyen de sortie adopte une configuration compactée dans l'espace et au moins une partie de la fonctionnalité du dispositif d'entrée électronique est disponible pour un utilisateur, et dans le troisième état, le dispositif de sortie adopte une configuration étendue dans l'espace, et la fonctionnalité disponible est étendue.

**13.** Dispositif d'entrée électronique (MS) selon la revendication 12, dans lequel ledit moyen de sortie est un dispositif d'affichage (15).

**14.** Dispositif d'entrée électronique (MS) selon la revendication 12 ou 13, dans lequel ledit moyen de sortie est disposé parallèlement audit moyen d'entrée de sorte que le dispositif d'entrée présente deux états correspondant au premier et second états à la fois du moyen d'entrée et du moyen de sortie.

**15.** Dispositif d'entrée électronique (MS) selon l'une quelconque des revendications 12 à 14, comprenant une articulation (18) pour relier de façon repliable le logement (11) définissant l'espace pour recevoir ledit moyen de sortie au logement (10) définissant un espace pour recevoir le moyen d'entrée.

**16.** Dispositif d'entrée électronique (MS) selon l'une quelconque des revendications précédentes, dans lequel le dispositif d'entrée électronique est un dispositif de télécommunications.

**17.** Dispositif d'entrée électronique (MS) selon la revendication 16, comprenant :

deux éléments (10 et 12, 11 et 13), qui sont repliables autour d'une articulation (18) entre une configuration ouverte et une configuration fermée,
un haut-parleur (20) situé dans un premier élément, et
un microphone (21) dans un autre élément de sorte que le dispositif d'entrée électronique peut être déplié pour séparer le microphone et le haut-parleur.

**18.** Dispositif d'entrée électronique (MS) selon la revendication 17, comprenant :

une butée (76) destinée à s'opposer à l'ouverture des deux éléments (10 et 12, 11 et 13) du dispositif d'entrée au-delà d'un certain angle maximum d'ouverture, et
un moyen destiné à modifier l'angle maximum d'ouverture lorsque la configuration du dispositif est modifiée entre la configuration compactée dans l'espace et la configuration étendue dans l'espace.

**19.** Dispositif d'entrée électronique (MS) selon la revendication 1, dans lequel le dispositif est configuré pour tirer la troisième partie dans la seconde direction.

**20.** Dispositif d'entrée électronique (MS) selon la revendication 9, dans lequel le dispositif comprend un premier (10) et un second (12) éléments qui sont configurés pour être saisis par l'utilisateur de façon à écarter le premier et le second éléments l'un de l'autre.

**21.** Dispositif d'entrée électronique (MS) selon la revendication 10, dans lequel le premier élément (10) comprend un espace de stockage dans lequel un moyen de sortie souple est stocké lorsque le dispositif est dans le second état, et dont le moyen souple de sortie (14) est extrait lorsque le dispositif est amené dans le troisième état.

**22.** Procédé de mise en oeuvre d'un dispositif d'entrée électronique comportant une interface d'utilisateur, comprenant les étapes consistant à :

stocker un moyen d'entrée souple dans une configuration compactée dans l'espace à l'intérieur d'un logement du dispositif d'entrée électronique,
faire passer le dispositif d'entrée d'un premier état à un second état en déplaçant une première partie du dispositif en relation avec une seconde partie du dispositif dans une première direction, dans lequel le dispositif d'entrée adopte une configuration compacte dans l'espace dans le premier état et une configuration partiellement étendue dans l'espace dans le second état,
faire passer le dispositif d'entrée du second état au troisième état en faisant glisser une troisième partie du dispositif dans une seconde direction qui est différente de la première direction, le glissement comprenant l'extension du moyen d'entrée souple hors du logement dans une configuration étendue dans l'espace pour recevoir une entrée de l'utilisateur, dans lequel le dispositif d'entrée adopte une configuration complètement étendue dans l'espace dans le troisième état,
permettre à un utilisateur d'accéder au moins à



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une partie de la fonctionnalité du dispositif d'entrée électronique dans le second état, et
étendre la fonctionnalité disponible du dispositif d'entrée électronique dans le troisième état, et
permettre au dispositif d'entrée de passer du troisième état au second état en ramenant le moyen d'entrée souple à nouveau dans la configuration compactée dans l'espace à l'intérieur du logement.



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Fig. 1

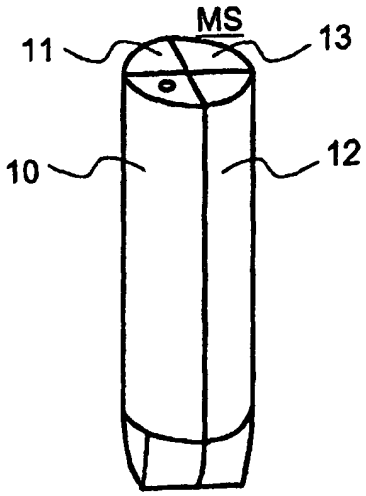
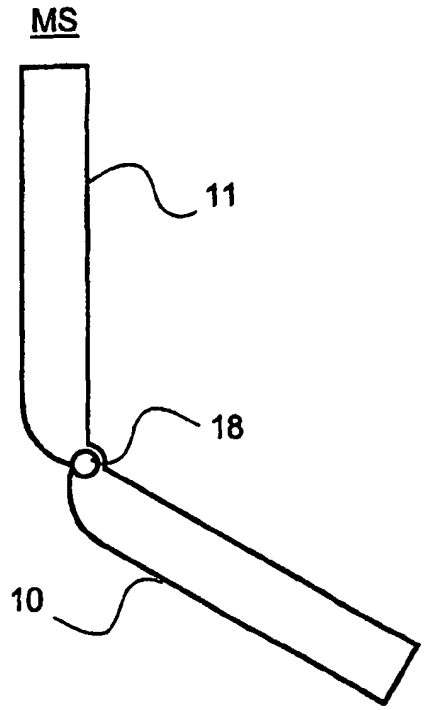



Fig. 2



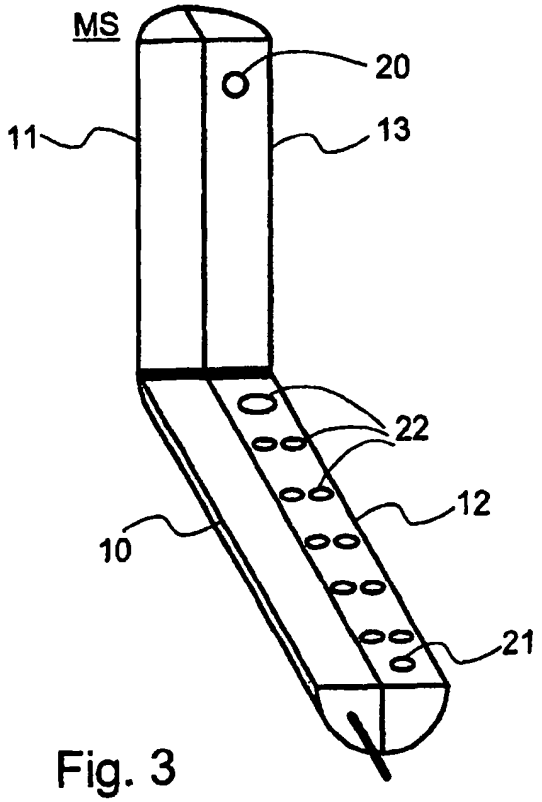




Fig. 3



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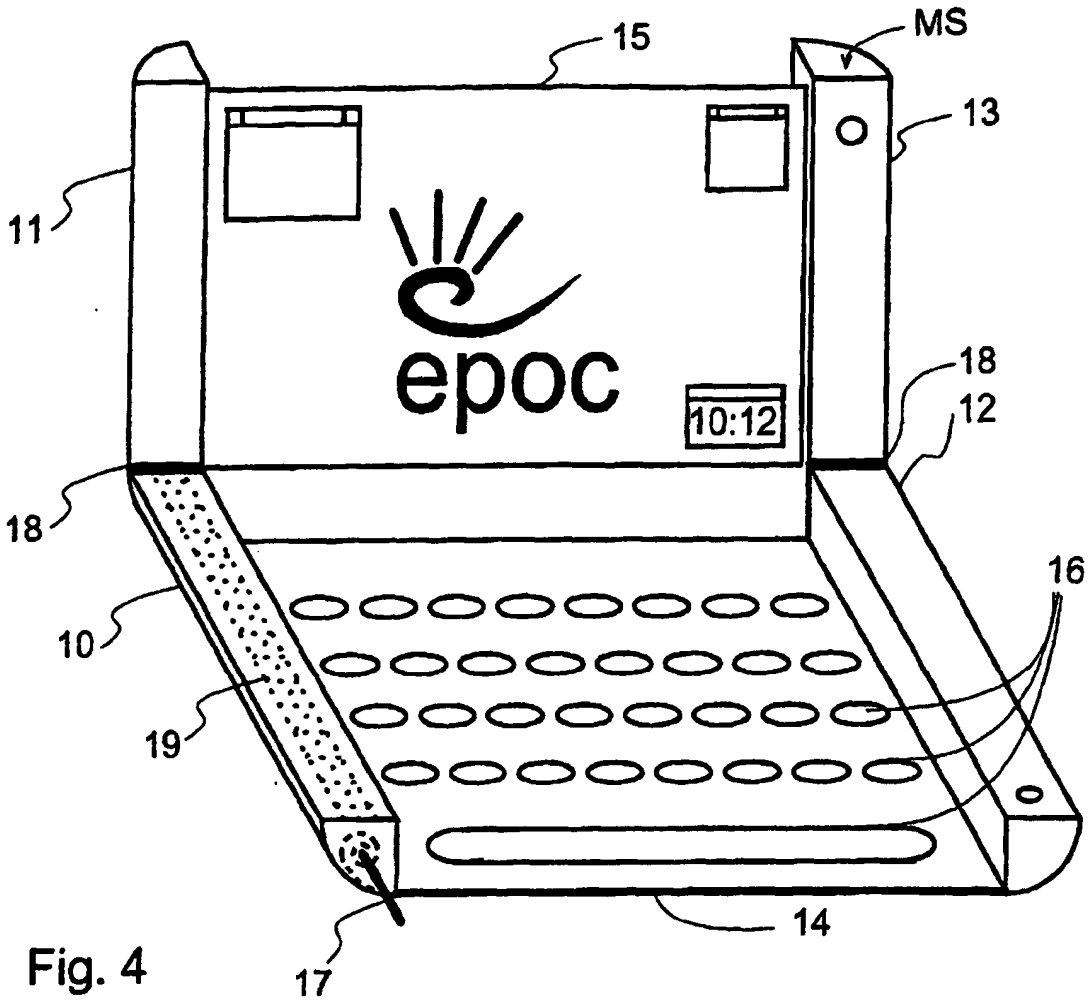



Fig. 4

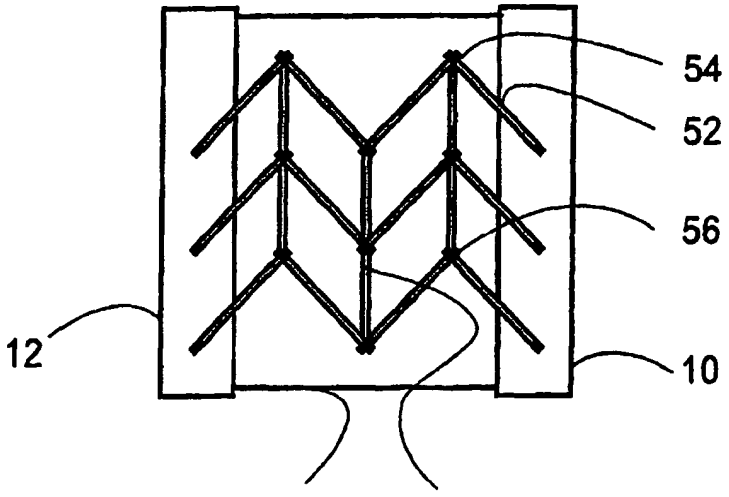



Fig. 5

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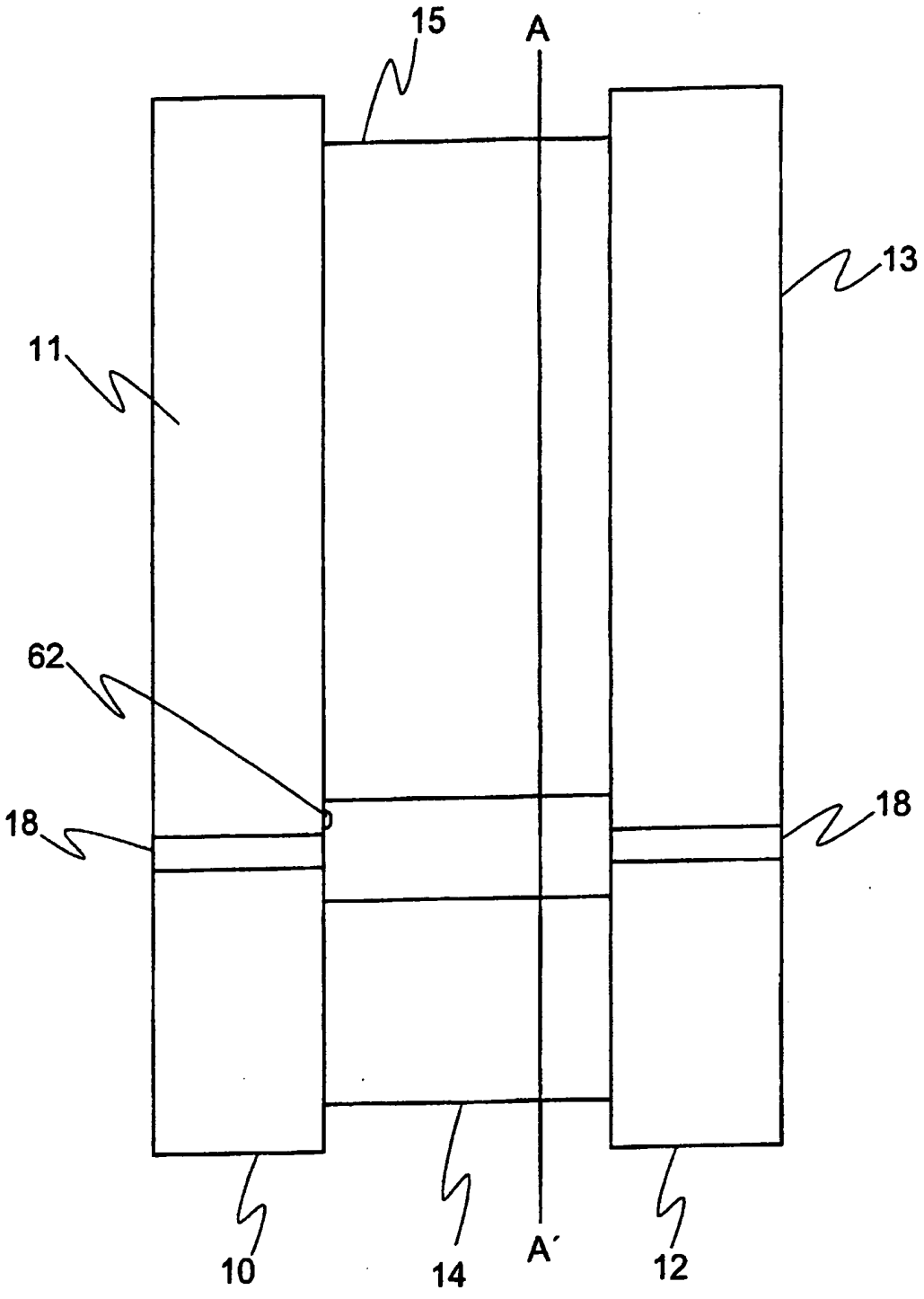



Fig. 6



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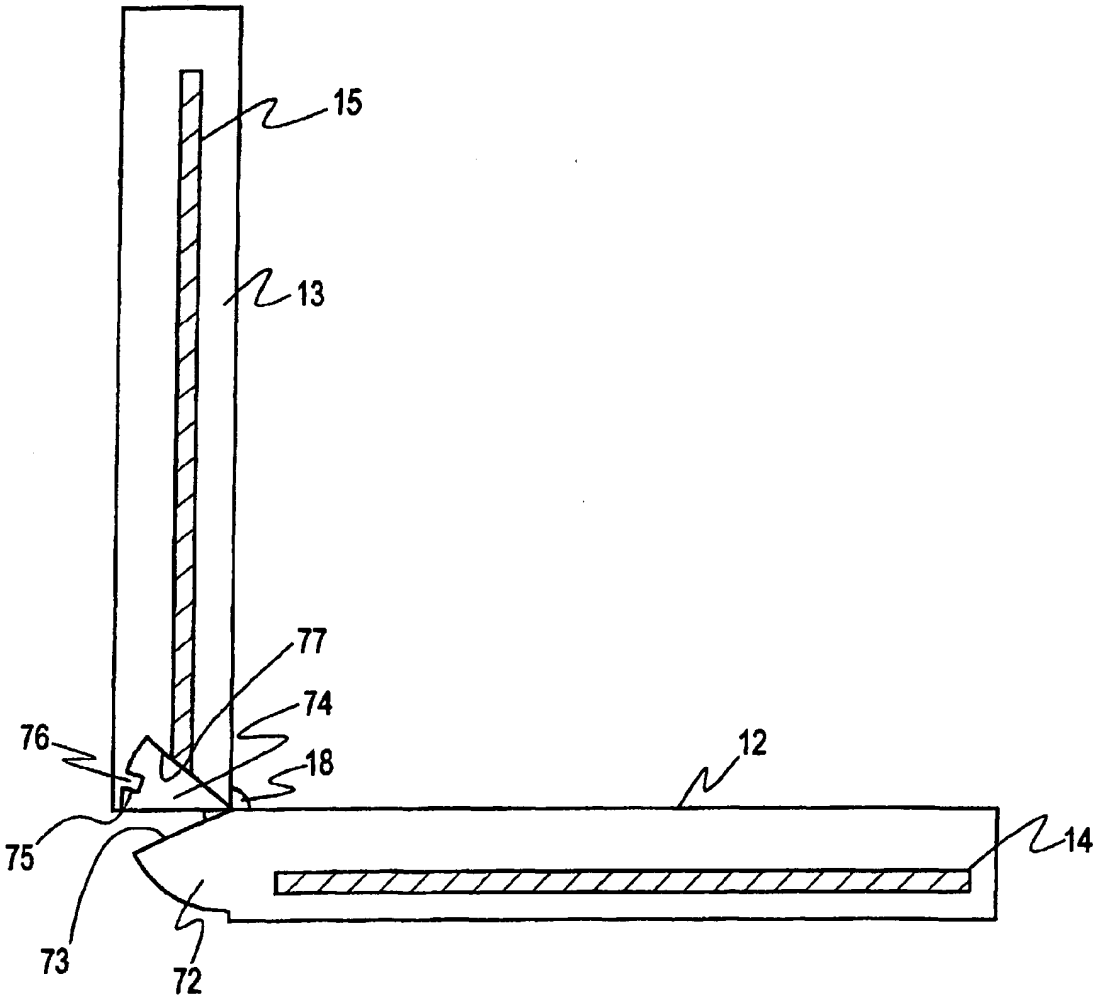



Fig. 7



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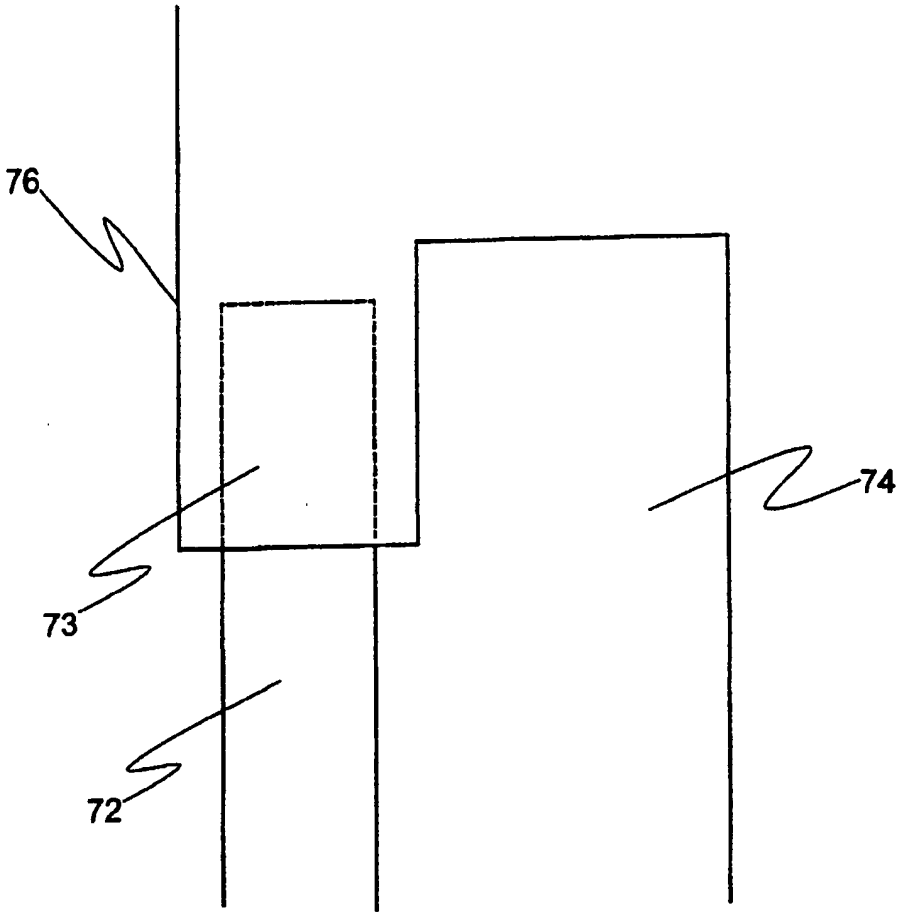



Fig. 8



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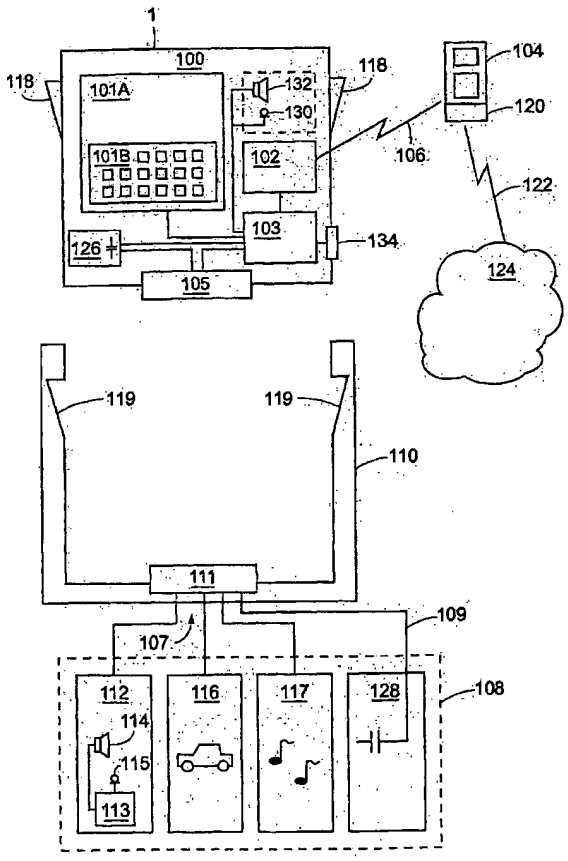
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*[Continued on next page]*

(54) Title: USER INTERFACE UNIT FOR A TELEPHONE




(57) Abstract: A user interface apparatus for remote control of a telephone (104), having input means (10113) adapted for inputting telephone control signals; a display (101A) for outputting visual information, communications means (102) adapted for short distance wireless signal communication; circuitry (103) adapted to convey input telephone control signals and display control signals between the user interface apparatus (100) and the telephone (104) by means of said short distance wireless signal communication means (102); wherein the circuitry (103) is configured to adapt the input and output signals of the user interface apparatus to have the same properties as corresponding signals of the telephone (104).

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TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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# User Interface Unit for a Telephone

## Technical Field

The present invention relates in general to user interfaces for communicating with and controlling telephone equipment. More particularly, the present invention relates to a user interface for wireless communication with telephone equipment.

## Background

In order to make the usage of mobile telephones in vehicles safer it is common to have hands free equipment stationary installed in the vehicle for audio input to and output from the telephone. The hands free equipment is provided with a connector for connecting a loudspeaker, a microphone and a power line to the telephone. In stationary hands free equipment the connector is often integrated with a docking unit with a holder fitting the telephone. The docking unit is usually mounted on the instrument panel of the vehicle within reach for the user, and when the mobile telephone unit is docked in the holder the telephone is controlled by means of the usual keypad and display on the telephone. There may also be some basic control keys integrated with or attached to the steering wheel. Some stationary hands free equipment is further coupled to an entertainment system or a vehicle information system of the vehicle, so that for example the audio output of a radio or a music player is switched off or silenced when an incoming telephone call is received.

There is also simpler hands free equipment such as a cable with an earphone, a microphone and a connector for connecting directly to an input/output socket of the telephone unit. There may also be a switch on the cable for basic control of the telephone such as answering or ending a call. Dialling and other handling of the telephone is done by means of the keypad and the screen of the telephone.

However, modern mobile telephones are small and for example in the vehicle environment it is often difficult to read the small screen of the telephone and to use the small keypad when handling the telephone and telephone calls. There are also other environments, circumstances or situations when it is unpractical or unsuitable to handle the telephone unit by means of the integrated keypad and screen.

Furthermore, there are technologies for coupling a stationary mounted hands free equipment wirelessly to a mobile telephone unit, whereas the telephone might be left in a case or pocket and the user interface of the telephone may thus be out of hand.

There is therefore a need for a complementary user interface for mobile telephones.

Prior Art

There are examples of prior art with regard to user interfaces for hands free equipment inter alia in the following patent publications.

In WO 98/57434 there is disclosed a car radio with a removable control and telephone unit. This apparatus is a car radio with a base unit that is stationary mounted in a vehicle and coupled to hands free telephone equipment. A detachable operating and telephone unit is provided with a key panel for operating the telephone and at least some functions of the car radio, a display for telephone and car radio functions, and a connector interface for connecting telephone antenna, audio lines, control lines and power supply. When the operating and telephone unit is dismounted it can be used as an autonomous mobile telephone, and when attached to the base unit it can be used as a hands free mobile telephone or car radio control device.

In GB 2 292 857 A there is disclosed a radio communication device with a radio receiver and a visual output interface via a mirrored surface, i.e. the information that is normally displayed on a screen is presented via or through a mirror surface. Input of control signals to the radio receiver is enabled via touch responsive areas on the mirror surface or via a keypad. The keypad is devised for wireless communication with the device by means of an infra red communication link.

In FR 2 779 598 A there is disclosed a universal hands free kit for use with different types of mobile telephones. An autonomous device with a microphone and a loudspeaker is connectable to a variety of mobile phones via a connector interface that is adaptable to different types of mobile phones. The device is provided with an input/output port for connecting different accessories, such a message recorder, a vibration call indicator, a wireless microphone and a remote control keypad.

In DE 297 23 162 U1 there is disclosed a hands free system for a mobile telephone. The mobile telephone has an additional contact device that enables the telephone to be electrically connected to a spatially separate parallel keyboard installed in the hands free system. The parallel keyboard can be operated with a connection to the contact device that is parallel to the keyboard of the mobile telephone and has at least partially identical functions.

In EP 1 084 894 A2 there is disclosed a multimedia unit for a vehicle with a control panel that is detachable from a stationary installed base unit. The detachable control panel is provided with a touch sensitive display operating together with a processor for controlling different functions such as a telephone, a radio, a CD-player and traffic information display. The

detachable control panel is provided with an autonomously usable radio telephone having means for direct access to a radio telephone network.

There are also products available on the market for wirelessly connecting a stationary mounted hands free system with a mobile telephone unit. An example of such a product is the *Sony Ericsson Bluetooth™ Car Handsfree HCB-30,* which currently is shown on the www.sonyericsson.com Internet website. This hands free equipment communicates with a telephone unit via a short distance radio communication according to the standard technology that goes under the trade mark *Bluetooth™*. The HCB-30 connects automatically with a mobile telephone unit correspondingly being provided with *Bluetooth™* functionality without placing the telephone unit in any particular position, and therefore the telephone can remain in for example a pocket or a case. The user controls basic functions of the telephone via a keypad mounted on the dashboard and designed as a five button control panel configured to activate the telephone, control loudspeaker volume, and to answer or reject calls. Another similar product is the Sony Ericsson Advanced Car Handsfree HCA-20, also currently shown on the www.sonyericsson.com Internet website. The HCA-20 is further provided with means for voice recognition to enable voice dialing as a means for controlling the telephone. It also has functionality for muting a car stereo for incoming calls.

Problem to be Solved by the Invention

The general problem that the invention seeks to solve is to achieve a satisfactory user interface for operating a telephone.

An aspect of the problem deals with hands free equipment that communicates wirelessly with a telephone unit, for example by means of short distance radio communication such as *Bluetooth™* technology. In this connection the user interface of the hands free equipment only allows a limited control of the telephone. For example, there is no possibility to enter a telephone number to the telephone and there is no visual control feedback or other visual information from the telephone to the user via the hands free equipment.

Another aspect of the problem is that the user interface of the telephone with its capability of two-way communication with the user may for circumstantial reasons not be sufficiently accessible or available.

Yet another aspect of the problem is that existing hands free equipment is incompatible with devices for wireless communication with the telephone unit, and when upgrading to such wireless communication between hands free equipment and telephone unit new complete equipment has to be installed.

Another aspect of the problem is that in some applications the user interface of the telephone unit is inappropriate or insufficient for the purpose of the application. Furthermore, for some reasons or in some specific situations it may be inappropriate to use the transmitter or the antenna part of the telephone close to the user or close to the head of the user.

Yet another aspect of the problem is to provide a user interface for a telephone that is adaptable to personal characteristics, properties or needs.

Object of the Invention

It is therefore a general object of the present invention to provide a user interface for wirelessly communicating with and remotely controlling a telephone unit. A more particular object is to provide a user interface that is connectable to peripheral equipment, such as hands free equipment, and capable of wireless communication with a telephone unit.

Summary of the Invention

The object of the invention is achieved and the problem is solved by a user interface unit comprising means for wireless short distance communication with a telephone unit, a display for presenting an output of visual information from the telephone unit, and switch means for inputting control signals to the telephone. The user interface unit possibly further comprises circuitry for adapting input control commands to a signal format that is suitable for wireless short distance transmittal and interpretation as control commands in the telephone unit. The invention operates together with a telephone unit that likewise is provided with means for wireless short distance communication and conveys input and output signals between these devices. The user interface unit according to the invention enables an enlarged and enhanced man-machine-interface (MMI) to remotely operate the telephone unit.

One embodiment of the invention comprises adaptation of the telephone unit such that signals corresponding to those of the user input/output interface that is integrated with the telephone unit, usually the keypad and the display signals, are also communicated to and from a data processing unit of the telephone via the wireless short distance communication means. This may be performed in parallel with or alternatively to the signal communication of the integrated user input/output interface. Other telephones are already provided with this feature. The invention can be applied together with mobile telephones as well as with stationary installed telephones.

The circuitry of the user interface unit is adapted for receiving, interpreting and presenting on the display visual information that is received wirelessly from the telephone unit.

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Power supply is preferably arranged by means of a connector adapted to be connected to a power line from for example a vehicle battery or electric mains.

An embodiment adapted to be capable of fully wireless usage is provided with battery slot and battery connectors for housing or attaching and connecting a small battery. Preferably, this embodiment also has a connector to an external power supply or power line and circuitry such that the user interface unit can be powered and its battery loaded while connected. The user interface unit is preferably made in size, e.g. rather small, and fully portable, dependent on the usage purpose of the specific model. This enables usage of the user interface and the telephone in any circumstances where it is convenient or more suitable to operate the telephone from the user interface and have the telephone positioned or placed somewhere else. For example in a tough working or leisure environment such as a construction site or on a beach, it may be advantageous to have the telephone protected in a case or a pocket whereas it operated via a user interface unit that is adapted to the circumstances of usage. For example, the user interface unit can be manufactured in water protected, particle protected or shock protected design and be usable together with any telephone model that is provided with short distance communication means for wireless communication with the user interface unit.

In one embodiment, the user interface unit comprises housing and an electrical connector that detachably fit to a holder for the interface unit. The holder is a docking unit that is electrically connected to peripheral equipment such as audio functionality of hands free equipment, a vehicle entertainment system or a vehicle information system. The holder and the housing can be designed per se and the holder be connected to the electrical wiring of peripheral equipment. Alternatively, the housing can be adapted to fit to holders designed to fit and dock a telephone unit. The latter embodiment would thus fit to existing holders of for example hands free equipment and this equipment is thereby upgradable to operate with a wireless communication with the telephone unit via the user interface unit of the invention.

A further development of this embodiment comprises an adapter piece for adapting shape fitting and connector fitting between a holder and the user interface unit. Thereby, the user interface unit is adaptable to fit a holder for example designed for docking a particular model or model series of telephone. One embodiment of the adapter piece further comprises circuitry configured to adapt a first signal format for peripheral equipment of a first manufacture to a second signal format for a user interface unit of a second manufacture, and vice versa. Similarly, one embodiment of the user interface unit is provided with circuitry configured to adapt a first signal format for a telephone unit of a first manufacture to a second signal format for a user interface unit of a second manufacture, and vice versa.

One aspect of the invention solves the problem aspect that in some applications the user interface of the telephone unit is inappropriate or insufficient for the purpose of the application. One typical such kind of application is for example game applications, that is when the processing power of the telephone is used to run a game and the user interface unit can be configured to an appropriate input/output game interface. Similarly, mobile Internet applications and the like would also benefit from having the more versatile and handy input/output functionality of the user interface unit.

Another aspect of the invention solves the problem aspect that for some reasons or in some specific situations it may be inappropriate to use the transmitter or the antenna part of the telephone close to the user or close to the head of the user. For example, the signal circumstances may be such that the telephone unit is incapable of receiving a signal from the base station in the position where the user wants to or has to be situated. With the user interface unit of the invention, the telephone unit can thus be placed in a suitable position or place and conveniently be operated by means of the separate user interface.

The invention thus enables that a telephone unit and/or peripheral equipment are upgraded or supplemented with an enhanced user interface to a comparatively low cost and without any costly installation. From an environmental point of view it is also environmentally beneficial to upgrade and use existing products rather than changing and throwing them away.

As mentioned above, different configurations and usage situations are conceivable for the invention. For example, the user interface unit may thus be used as a complementary or enhanced user interface to the telephone with the user interface unit docked to a car hands free system and the telephone unit placed somewhere in the car. The user interface can be detached from the hands free system, and as it is portable it can be handed over and used as a telephone interface for example by other passengers somewhere in the car. Similarly, the user interface unit and the telephone unit can be used in any outdoors or indoors situation.

According to an aspect of the invention, the user interface unit is adaptable to personal characteristics, properties or needs. So for example, a disabled person may need a user interface of a certain design, size or disposition of the keys. A person having an impaired vision may need to have keys and visual feedback information in a certain, perhaps variable size or colour. In an embodiment for the purpose of the latter case, the circuitry of the user interface unit comprises software and hardware for adapting a possibly touch sensitive screen to the specific need.

According to a further aspect of the invention, the user interface unit is adapted to provide different selectable or controllable extent of functionality or operability of the telephone.

Thus, there may for example be different modes of operation of the telephone via the user interface apparatus, for example a first mode of operations with a limited selection of operability that is adapted to a safe driving situation, and a second mode of operation with full operability of the telephone. The selection or mode of operation is advantageously controlled dependent on the position of the user interface unit, such as a limited functionality mode of operation is activated when the user interface unit is placed in a car holder and else full functionality mode of operations is activated.

Aspects and embodiments of the invention further comprise different combinations of features as follows.

Described with its basic features the invention concerns a user interface apparatus for remote control of a telephone (104), comprising input means (101B) adapted for inputting telephone control signals; a display (101A) for outputting visual information, communications means (102) adapted for short distance wireless signal communication; and circuitry (103) adapted to convey input telephone control signals and display control signals between the user interface apparatus (100) and the telephone (104) by means of said short distance wireless signal communication means (102). The circuitry (103) is configured to adapt the input and output signals of the user interface apparatus to have the same properties as corresponding signals of the telephone (104).

The user interface apparatus further comprises an electrical connector (105) coupled to the circuitry (103) and adapted to connect to signal lines (107,109) from peripheral equipment (108). For the purpose of detachable docking, the user interface apparatus preferably further comprises mechanical attachment means (118) adapted for detachably attaching the user interface apparatus to corresponding attachment means of a holder. Preferably, the user interface comprises mechanical attachment means (118) adapted for detachably attaching the user interface apparatus to corresponding attachment means (119) of a docking unit (110), and an electrical connector (105) coupled to the circuitry (103) and adapted to connect to a corresponding electrical connector of said docking unit (110).

The inventive concept of the user interface apparatus may further comprise a docking unit (110) adapted for detachably coupling mechanical attachment means (118,119) and for electrically coupling electrical connectors (105,111) of said docking unit (110) and a user interface unit (100), respectively. The user interface apparatus is preferably adapted to be intermediately coupled between and conveying signals between the telephone (104) and peripheral equipment (108). For example, the user interface apparatus is adapted to be intermediately coupled between and conveying signals between the telephone (104) and a

peripheral equipment being a hands free system (112); between the telephone (104) and a peripheral equipment being a vehicle information system (116); or between the telephone (104) and a peripheral equipment being an entertainment system (117). Preferred embodiments of the user interface apparatus are further adapted to be coupled to a peripheral equipment being a power supply (128).

For the purpose of fully wireless usage of the user interface apparatus, it may further comprise a connector slot (126) for a battery, said connector slot being coupled to the circuitry (103). The connector slot (126) is preferably coupled to the electrical connector (105) for connecting to a charging peripheral power supply (128). Such an embodiment may also comprise a microphone (130) and a loudspeaker (132) coupled to the circuitry (103), or an input connector (134) coupled to the circuitry (103) for connecting a headset.

For the purpose of adapting a user interface unit of a first type to a docking unit of a second type there are the following varieties of the invention. The user interface apparatus may comprise an adapter piece (202) configured to mechanically and electrically fit to first mechanical and electrical couplings (203, 201) of a user interface unit (200) and to second mechanical and electrical couplings (205,206) of a docking unit (204). It may further comprise an adapter piece (202) having first mechanical attachment means (212) adapted for detachably attaching to corresponding first mechanical attachment means (203) of a user interface unit (100) and second mechanical attachment means (214) adapted for detachably attaching to corresponding second mechanical attachment means (206) of a docking unit. The an adapter piece (202) preferably also has a first electrical connector (208) adapted for connecting to a corresponding first electrical connector (201) of a user interface unit (100) and a second electrical connector (210) adapted for detachably attaching to a corresponding second electrical connector (205) of a docking unit. The user interface apparatus may further comprise a an circuitry (103,216) configured to adapt first signals of a user interface unit (200) to second signals of peripheral equipment, and vice versa. Alternatively, an adapter piece (202) may have circuitry configured to adapt first signals of a user interface unit (200) to second signals of a docking unit 204.

In an embodiment the display (101A) is touch sensitive and together with the circuitry (103) is configured to realise input keys (101B) for said input means. The user interface apparatus further comprises a portable housing (1) for housing said components. The short distance wireless communication means (102) is preferably based on short distance radio communication, for example according to the Bluetoth standard. The short distance wireless communication means (102) may also be based on infra red signal communication.

In one embodiment the user interface apparatus is further adapted to provide a first mode of operation with a first set of functionality and a second mode of operation with a second set of functionality, said second set of functionality being a subset of said first set of functionality. Preferably, said second mode of operation is activated in response to the user interface being attached to a docking unit.

Brief Description of the Drawings

The invention will be further explained with reference to the accompanying drawings, in which:

Fig 1 shows a schematic overview of the user interface according to the invention with co-operating apparatus;

Fig 2 shows schematically an adapter piece of an embodiment of the inventive user interface.

Detailed Description of Embodiments

**Figure 1** shows schematically the inventive user interface unit 100 having a housing 1 provided with a visual output display 101A and input switches 101B, means for short distance wireless data or signal communication 102 and driving circuitry 103 coupled to the before mentioned components. The circuitry 103 is configured to drive the output display 101A, the input switches 101B and the short distance communications means 102, and to convey and adapt signals between these components. The input switches 101B are in different embodiments coupled to a key panel of push buttons or integrated in a touch sensitive display with accompanying software for visualising and activating input key areas on the display.

The user interface unit 100 is thus capable of short distance wireless data or signal communication 106 with a telephone unit 104 also having means for short distance wireless data or signal communication 120. Preferably, this short distance wireless communication is realised by means of a radio system for short distance radio communication according to the standard technology that goes under the trade mark *Bluetooth*™. Other alternatives, such as infra red communication is however also conceivable within the inventive concept. Wireless short distance communication is in this connection meant to concern reliable signal or data communication between devices within a range of typically about 10 meters or so.

As shown in Fig 1, the telephone unit is further coupled or couplable for radio telephone communication 122 to a telephone network 124, such as a stationary telephone

network or a radio telephone network that for example operates with a GSM or a GPRS system. The telephone unit may be portable or stationary installed in for example a vehicle.

In a basic embodiment, the driving circuitry 103 of the user interface unit 100 is configured with basic functionality for remotely operating the telephone unit 104 by means of key input to and visual feedback from the telephone unit 104 via the user interface 100. Basically, per se known hardware and software constructions already employed in existing telephone units can be used in the driving circuitry of the interface unit. In another wording, the circuitry of the user interface unit is configured to be transparent for or to imitate the signalling, electromechanical and logical properties of a telephone. Whereas the data and signal processing power as well as the proper telephone communication functionality is concentrated to the telephone unit 104, operating functionality such as handling calls, managing phonebook and viewing messages is done via the enhanced interface provided by the user interface unit. A further elaborated embodiment is in addition provided with a microphone 130 and a loudspeaker 132, as well as circuitry 103 that is adapted for driving them. Alternatively or additionally, the user interface may be provided with an input connector 134 and driving circuitry 103 that is adapted for driving a headset. Thus, while manufacturing costs can be kept comparatively low, the inventive user interface is designed to have suitable and convenient shape, size and layout of the input keys and the display for specific ranges of purpose.

Again referring to figure 1, an embodiment of the user interface unit comprises one or more external electrical connectors 105 for connecting signal lines 107, 109 from peripheral equipment 108. The user interface unit 100 preferably comprises a slot 126 and connector for an internal battery coupled to the circuitry 103, and for charging purposes preferably also coupled to the power line connection of the connector 105. The peripheral equipment is for example a power supply 128 feeding power to the user interface unit through a power line 109. Another piece of possible peripheral equipment is a vehicle or car hands free system 112 having an electronic circuitry for driving the hands free functionality and being coupled to a loudspeaker 114 and a microphone 115. The peripheral equipment may further be a vehicle information system 116 showing e.g. status information and warning signals to the driver, or a car entertainment system 117 e.g. comprising a radio, a compact disk player and the like. In another embodiment, the user interface apparatus is coupled to a GPS position unit or the like.

Thus coupled to the user interface unit 100, the input and output means of the user interface would be configured to selectively operate also this peripheral equipment. Possibly, the power line 109 can be led together with a signal bus or bundle of cables making up one of the signal lines 107. The electrical connector is preferably adapted to the standard system connector

of a telephone model series so that existing accessories such battery chargers, holder and the like can be used together with the user interface unit.

A docking unit 110 in the shape of a holder comprises a corresponding electrical connector 111 that in Fig 1 is directly coupled to the signal lines 107 and the power line 109 and configured to safely couple to the external connector 105 of the user interface unit 100. The docking unit 110 and the user interface unit 100 have corresponding geometrical shapes such that they fit together and the user interface unit 100 thus can be docked to and held by the docking unit while connecting the electrical connectors 105 and 111. The mentioned geometrical shapes of the user interface unit 100 and the docking unit 110 or specific parts constitute detachable first and second mechanical attachment means 118 and 119 for fitting when in a docked position. The mechanical attachment means may be provided with mechanical locking means for secure locking between the attached user interface unit and the docking unit. In the figure the attachment means have an exemplifying shape, and it should be appreciated that there are many conceivable designs.

In one embodiment a realisation of the invention would comprise the user interface unit, with inter alia the display and other internal components, and a holder as a docking unit for the display. The docking unit would be realised such that it is compatible with the signal cable or signal connector of existing peripheral equipment, for example a car hands free system. This embodiment can thereby be made available together with new peripheral equipment or as a complement to already installed peripheral equipment. In the latter case only the holder for the user interface unit has to be coupled to the installed peripheral equipment, possibly exchanging an existing telephone unit holder for the user interface unit holder. In another embodiment, the geometrical shape of the user interface unit 100 is adapted to fit to a holder or a docking unit 110 that also fits to a telephone unit 104. This embodiment makes it possible to supplement a set of hands free equipment and telephone unit with the inventive user interface unit and thereby achieve an enhanced or complementary user interface. These embodiments are beneficial for the manufacturer as well as for the consumer. Furthermore, it is also easy to change usage and for example use a likewise dockable telephone unit that lacks the wireless short distance means together with the peripheral equipment by replacing the user interface unit in the docking unit.

**Figure 2** shows an embodiment of the invention with a user interface unit 200 as described above and an adapter piece 202. The adapter piece 202 is configured to mechanically fit and electrically connect to the user interface unit 200 on one hand, and on the other hand to a holder or docking unit 204. The docking unit 204 is in its turn possibly connected to peripheral equipment 206 as described above. The adapter piece 202 thus comprises a first electrical

connector 208 adapted for coupling with a corresponding electrical connector 201 of the user interface unit 200 and a second electrical connector 210 adapted for coupling with a corresponding electrical connector 205 of the docking unit 204. Similarly, the adapter piece comprises first mechanical attachment means 212 for mechanically attaching the adapter piece 202 to corresponding mechanical attachment means 203 of the user interface unit 200. Further, the adapter piece comprises second mechanical attachment means 214 for mechanically attaching the adapter piece 202 to corresponding mechanical attachment means 206 the docking unit 204. These and the above mention mechanical attachment means are preferably detachable without tools and may be designed for example as bayonet joints or other form fitting shapes in a per se known manner. The adapter piece may further comprise circuitry 216 that is configured to adapt signals of a first format to signals of a second format for enabling signal communication between a user interface unit of a first type and a docking unit of a second type. This embodiment enables adaptation for coupling and usage of a user interface unit of a first manufacture or model series together with a docking unit of a second manufacture or model series.

The invention has been explained and described by means of examples, but it is understood that it can be realised in a variety of manners within the scope of the accompanying claims.

Claims

1. A user interface apparatus for remote control of a telephone (104), characterised in input means (101B) adapted for inputting telephone control signals;
a display (101A) for outputting visual information,
communications means (102) adapted for short distance wireless signal communication;
circuitry (103) adapted to convey input telephone control signals and display control signals between the user interface apparatus (100) and the telephone (104) by means of said short distance wireless signal communication means (102); and in that
the circuitry (103) is configured to adapt the input and output signals of the user interface apparatus to have the same properties as corresponding signals of the telephone (104).

2. The user interface apparatus of any of the preceding claims, further comprising an electrical connector (105) coupled to the circuitry (103) and adapted to connect to signal lines (107,109) from peripheral equipment (108).

3. The user interface apparatus of any of the preceding claims, further comprising mechanical attachment means (118) adapted for detachably attaching the user interface apparatus to corresponding attachment means of a holder.

4. The user interface apparatus of any of the preceding claims, further comprising mechanical attachment means (118) adapted for detachably attaching the user interface apparatus to corresponding attachment means (119) of a docking unit (110), and an electrical connector (105) coupled to the circuitry (103) and adapted to connect to a corresponding electrical connector of said docking unit (110).

5. The user interface apparatus of any of the preceding claims, further comprising a docking unit (110) adapted for detachably coupling mechanical attachment means (118,119) and for electrically coupling electrical connectors (105,111) of said docking unit (110) and a user interface unit (100), respectively.

6. The user interface apparatus of any of the preceding claims, further being adapted to be intermediately coupled between and conveying signals between the telephone (104) and peripheral equipment (108).

7. The user interface apparatus of any of the preceding claims, further being adapted to be intermediately coupled between and conveying signals between the telephone (104) and a peripheral equipment being a hands free system (112).

8. The user interface apparatus of any of the preceding claims, further being adapted to be intermediately coupled between and conveying signals between the telephone (104) and a peripheral equipment being a vehicle information system (116).

9. The user interface apparatus of any of the preceding claims, further being adapted to be intermediately coupled between and conveying signals between the telephone (104) and a peripheral equipment being an entertainment system (117).

10. The user interface apparatus of any of the preceding claims, further being adapted to be coupled to a peripheral equipment being a power supply (128).

11. The user interface apparatus of any of the preceding claims, further comprising a connector slot (126) for a battery, said connector slot being coupled to the circuitry (103).

12. The user interface apparatus of the preceding claims 3-12, wherein the connector slot (126) is coupled to the electrical connector (105) for connecting to a charging peripheral power supply (128).

13. The user interface apparatus of any of the preceding claims, further comprising a microphone (130) and a loudspeaker (132) coupled to the circuitry (103).

14. The user interface apparatus of any of the preceding claims, further comprising an input connector (134) coupled to the circuitry 103 for connecting a headset.

15. The user interface apparatus of any of the preceding claims, further comprising an adapter piece (202) configured to mechanically and electrically fit to first mechanical and

electrical couplings (203, 201) of a user interface unit (200) and to second mechanical and electrical couplings (205,206) of a docking unit (204).

16. The user interface apparatus of any of the preceding claims, further comprising a an adapter piece (202) having first mechanical attachment means (212) adapted for detachably attaching to corresponding first mechanical attachment means (203) of a user interface unit (100) and second mechanical attachment means (214) adapted for detachably attaching to corresponding second mechanical attachment means (206) of a docking unit.

17. The user interface apparatus of any of the preceding claims, further comprising a an adapter piece (202) having a first electrical connector (208) adapted for connecting to a corresponding first electrical connector (201) of a user interface unit (100) and a second electrical connector (210) adapted for detachably attaching to a corresponding second electrical connector (205) of a docking unit.

18. The user interface apparatus of any of the preceding claims, further comprising a an circuitry (103,216) configured to adapt first signals of a user interface unit (200) to second signals of peripheral equipment, and vice versa.

19. The user interface apparatus of any of the preceding claims, further comprising a an adapter piece (202) having circuitry configured to adapt first signals of a user interface unit (200) to second signals of a docking unit 204.

20. The user interface apparatus of any of the preceding claims, wherein the display (101A) is touch sensitive and together with the circuitry (103) is configured to realise input keys (101B) for said input means.

21. The user interface apparatus of any of the preceding claims, further comprising a portable housing (1).

22. The user interface apparatus of any of the preceding claims, wherein the short distance wireless communication means (102) is based on short distance radio communication.

23. The user interface apparatus of any of the preceding claims, wherein the short distance wireless communication means (102) is based on short distance radio communication according to the Bluetoth standard.

24. The user interface apparatus of any of the preceding claims, wherein the short distance wireless communication means (102) is based on infra red signal communication.

25. The user interface apparatus of any of the preceding claims, further being adapted to provide a first mode of operation with a first set of functionality and a second mode of operation with a second set of functionality, said second set of functionality being a subset of said first set of functionality.

26. The user interface of the preceding claim, wherein said second mode of operation is activated in response to the user interface being attached to a docking unit.

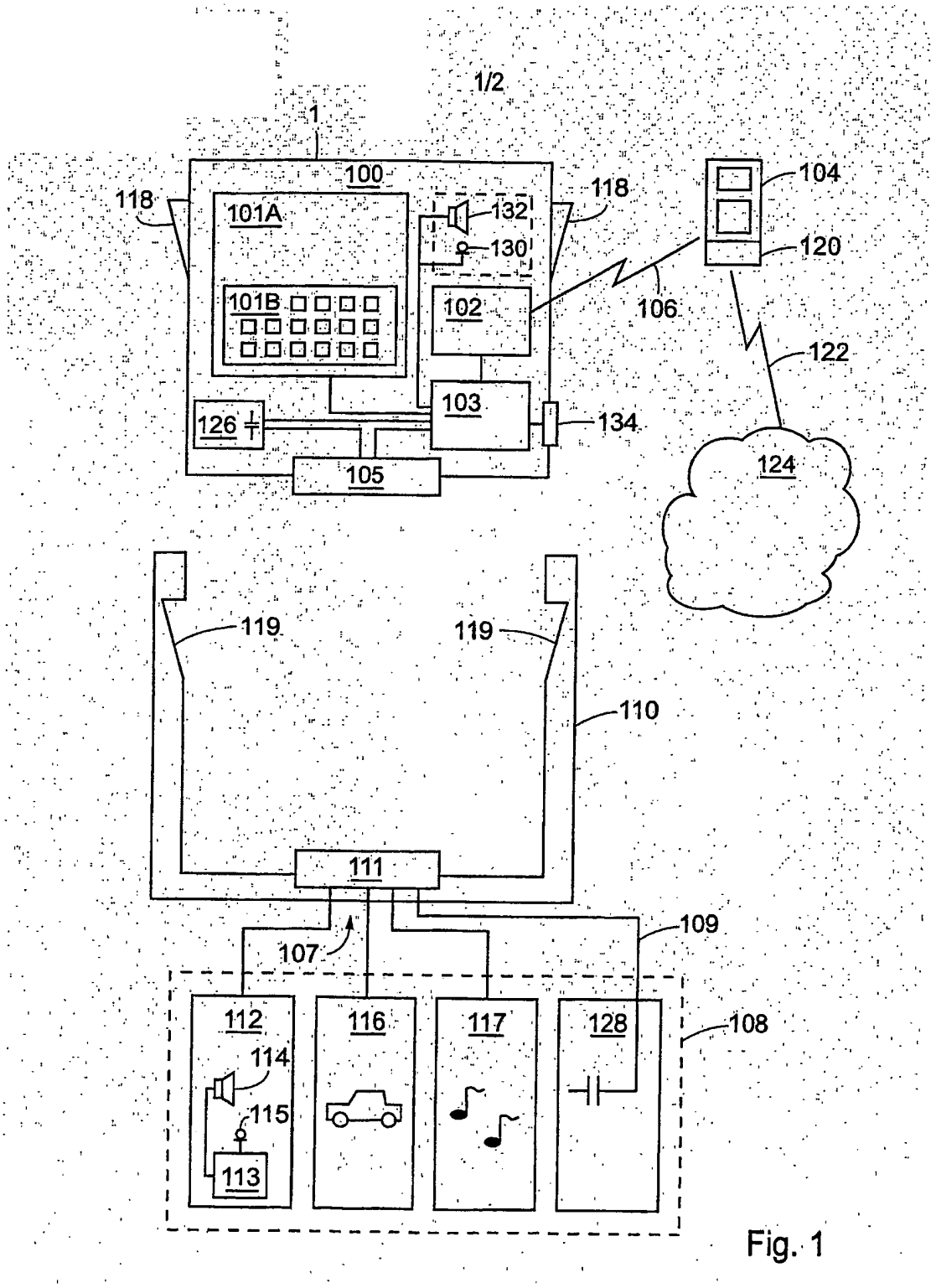

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Fig. 1

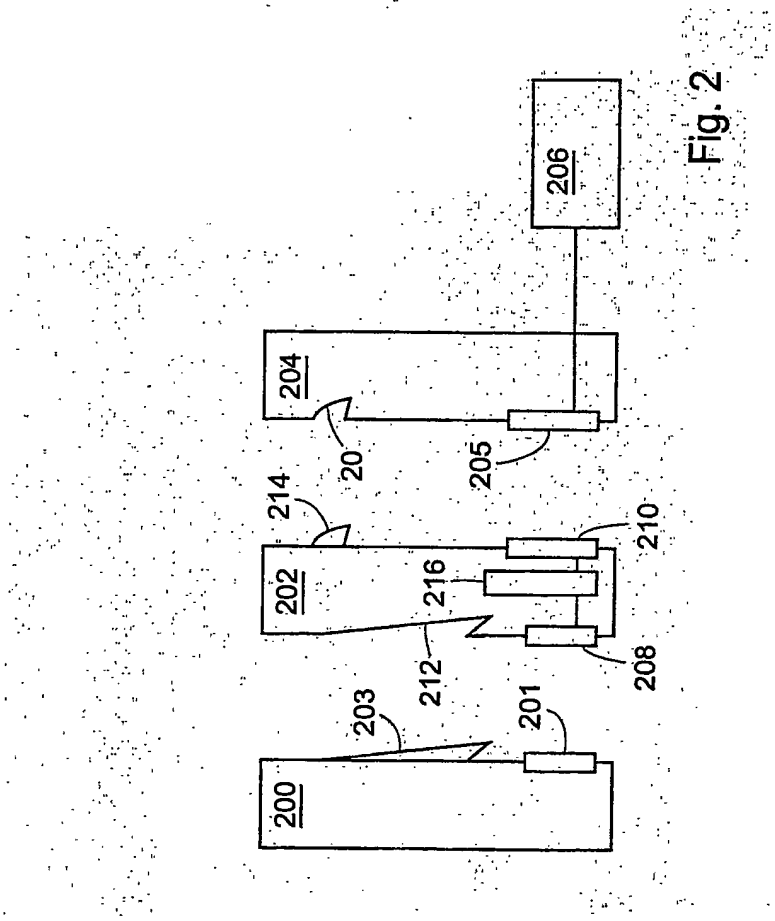



Fig. 2

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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10/615,474 7 July 2003 (07.07.2003) US

(71) Applicant *(for all designated States except US)*: SONY ERICSSON MOBILE COMMUNICATIONS AB [SE/SE]; Nya Vattentornet, S-221 88 Lund (SE).

(72) Inventors; and

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(74) Agent: MYERS BIGEL SIBLEY & SAJOVEC, P.A.; P.O. Box 37428, Raleigh NC 27627 (US).

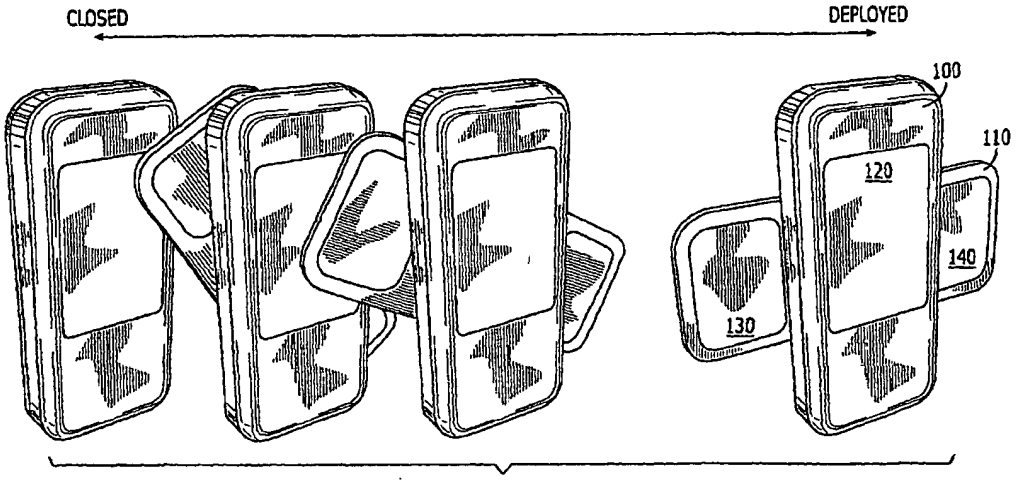
(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

*[Continued on next page]*

(54) Title: MOBILE COMPUTING DEVICES HAVING ROTATIONALLY EXPOSED USER INTERFACE DEVICES




(57) Abstract: A mobile computing device includes a first housing that is rotationally coupled to a second housing, computing circuitry within the first housing and a display that is at least partially disposed within the first housing. The display is configured to visually display information from the computing circuitry to a user. A first user interface device and a second user interface device are at least partially disposed within the second housing. The second housing is configured to be rotated relative to the first housing between a closed position in which the first and second user interface devices are at least partially covered by the first housing, and a deployed position in which the first and second user interface devices are at least partially uncovered on opposite lateral sides of the first housing.

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Page 891 of 1144

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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17 March 2005

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G06F1/16 H04M1/02

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G06F H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

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[X] Patent family members are listed in annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"&" document member of the same patent family

| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 20 January 2005 | 28/01/2005 |

| Name and mailing address of the ISA | Authorized officer |
|---|---|
| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Semple, M |



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Page 893 of 1144

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*G06F 3/033* (2006.01)

(21) International Application Number:
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(30) Priority Data:
60/483,776 30 June 2003 (30.06.2003) US

(71) Applicant *(for all designated States except US)*: **KONINKLIJKE PHILIPS ELECTRONICS, N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).

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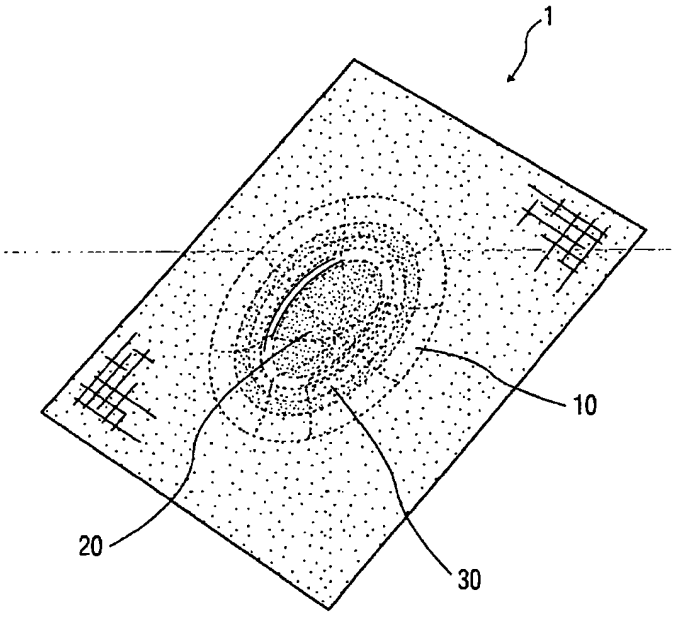
(74) Common Representative: **KONINKLIJKE PHILIPS ELECTRONICS, N.V.**; c/o Waxler, Aaron P.O. Box 3001, Briarcliff Manor, NY 10510-8001 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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*[Continued on next page]*

(54) Title: A TOUCH SENSITIVE INTERFACE




(57) Abstract: There is provided a flexible, lightweight high-performance touch sensitive interface or textile construction (1) having one or more touch sensitive switches (10) cooperative with a variety of different textiles including those commonly used in upholsteries and/or garments (65), as well as various electronic devices/systems (40) without compromising the inherent characteristics or properties associated with such textiles. The one or more touch sensitive switches (10) have a three-dimensional recess (20) and one or more conductive fibers (35) having an electromagnetic field (37) associated therewith. The one or more conductive fibers (35) can be formed into a conductive coil (30).

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FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Declarations under Rule 4.17:**

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Published:**

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H01H G06F G06K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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[X] Further documents are listed in the continuation of box C.

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| 20 February 2006 | 24/02/2006 |

| Name and mailing address of the ISA | Authorized officer |
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| European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Leineweber, H |

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Page 898 of 1144

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Page 899 of 1144

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Information on patent family members

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Page 900 of 1144

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(30) Prlority Data:
60/475,466 4 June 2003 (04.06.2003) US

(71) Applicant and
(72) Inventor: **MEHMET, Badisse, David** [US/US]; 26 Bond Street, Apt. 2R, New York, NY 10016 (US).

(74) Agents: **FARRES, Ozzie, A.** et al.; Hunton & Williams LLP, 1900 K Street, N.W., Washington, DC 20006 (US).

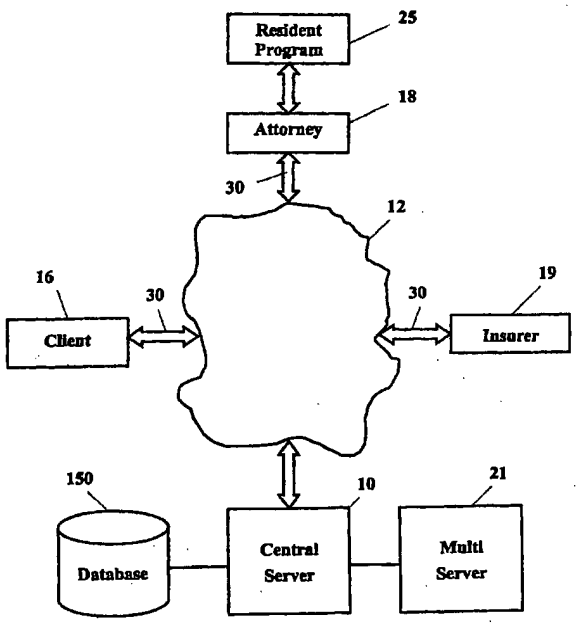
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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: SYSTEM AND METHOD FOR MANAGING CASES




(57) Abstract: A system for managing cases is provided. The system comprising: an attorney module comprising an attorney files management tool for managing client and opposing party files, a settlement tool for receiving and transmitting settlement offers and counter-offers, and a documents tool for drafting, receiving and transmitting documents and correspondence, a document submission tool for the electronic document filing of Court record, a payment tool for the receiving of electronic payments; and a central module communicating with the attorney module over at least one communications network, the central module comprising (1) a client module comprising a client files management tool for managing attorney and opposing party files, and a client payment tool for electronic payments, and (2) an opposing party module comprising an opposing party files management tool for the identification and consolidation of multiple attorneys and consolidating and managing attorney and client files, and an opposing party settlement tool for receiving and transmitting settlement offers and counter-offers, and an opposing party payment tool for electronic payments. Preferably the system also allows for the collection, processing and dissemination of file data generated from the file data entered into the system by the parties for use by Insurers for identifying fraudulent insurance claims and by Landlords in reviewing and evaluating the past rental history of potential Tenants.

WO 2004/111766 A2

TCL EXHIBIT 1007

# SYSTEM AND METHOD FOR MANAGING CASES

## RELATED APPLICATIONS

This application claims priority to Provisional Application No. 60/475,466, filed on June 4, 2003, which is hereby incorporated-by-reference in its entirety.

## FIELD OF THE INVENTION

The present invention relates generally to case management systems and systems, and more particularly to an automated case management system and system that enables parties to a dispute to present and receive settlement offers and counter-offers, send and receive electronic payments, electronic document filing of Court records and electronically file insurance claims with the Insurers, and to access documents and information regarding pending cases via at least one communications network. The invention also relates to a system for the collection, processing and dissemination of file data generated from the parties entry of file data into the system for use by Insurers to identify fraudulent insurance claims and by Landlords in reviewing and evaluating the past rental history of potential tenants.

## BACKGROUND OF THE INVENTION

Case management programs have been used by attorneys and law firms for many years. For example, the case management programs Abacus, Saga, Amacus, Real Legal, CLS and Needles. Typically, modern attorney case management programs have the ability to keep track of attorney caseloads and to properly docket upcoming deadlines, court dates and hearings. By effectively managing and communicating such information, case management programs can go a long way in helping attorneys manage and administer the convoluted web of a heavy litigation practice.

However, conventional case management programs suffer from various drawbacks. First, they require a great deal of user time to input case, client and file

information, making maintenance of an up-to-date and current system highly labor-intensive. Second, they do not effectively incorporate the various communication systems and networks to set up files and settle disputes, electronically send and receive payments, electronic document filing of Court records, nor allowing opposing parties access to files and thus do not adequately inform and service all parties to a dispute. Indeed, current case management programs do little for clients and opposing parties. For example, while many systems are available wherein clients can access documents over the Internet prepared by an attorney on their behalf, these systems do not give clients the ability to efficiently settle cases, or to print up reports personalized "24/7," or to submit Tenant data for non-payment of rent or allow attorneys, clients and third-parties to enter/review/pull-up file documents outside their office without having to connect to the attorney's hard drive within their office or allow electronic document filing of Court records with the Courts or electronic submission of insurance claims with Insurers or allow opposing parties access to files or electronically send and receive payments. For example, payments against attorney invoices, insurance claims and Tenant rent.

A further problem with conventional case management programs is that they do not allow attorneys, clients or third parties to remotely create, update and manage new files and cases. For example, current products and technologies specifically do not provide the capability to automatically process a claim from initiation to the point of settlement, without the attorney ever having to enter data manually. They also lack the ability to consolidate multiple cases into one single Summons and Complaint, such as is usually required for class action lawsuits, for example.

Further, current programs do not submit automated settlement offers periodically, or settlement offers on one or more cases by using a simple four (4) step process. For example, they would not permit the filing of 10,000 plus settlement offers to 10,000 plus



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different insurance adjusters via fax or email in a matter of seconds, with the adjusters having the ability to electronically accept, refuse or counter such offers.

Present case management programs also lack the ability to automate document drafting, client notifications, settlement review, acceptance; the creation of counter-offers, and collections on settled cases. They further lack the ability of automated case status upgrades.

Additionally, present available case management programs lack the ability to provide settlement statistics on all settled cases, to perform automated index number tracking, to perform automated DMV searches, to utilize multiple means of communication, to forward bills and medical records to insurance companies, the ability to accept electronic payments from insurers on settled cases or pending client bills, allow insurers access to general information of attorney's pending cases and print up reports via the internet.

Conventional programs further lack the ability to submit bills and medical records to insurance companies via the internet other than from programs created specifically for insurance companies websites to accept such submissions of bills and medical records. Present day case management programs lack the ability to assist insurance companies in fighting insurance fraud. The inapt nature of present day case management programs prevents the creation of an on-line "attorney, client and opposing party market place" where multiple parties are connected together in a daily system of interacting with each other in the managing and resolution of pending cases.

While present day case management systems may be suitable for the particular purposes to which they address, they do not utilize the full potential of present day advances in technology, and have caused a burden on some attorneys who have had to



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hire additional employees to cover the shortcomings of these programs, for example, the consolidation of multiple files into one suit (particularly in Class action suits).

Recent advances in information technology have created the ability for attorneys, clients, and insurers to be connected via the Internet in a manner that would create an attorney, client and opposing party on-line market place that facilitates and speeds up the processing of claims, while allowing insurance companies to fight insurance fraud, not only on the legislative level but by the presentation of printable reports obtained from each attorney case management program accessible via the Internet. For example, the creation of reports showing the same claimant being involved in multiple accidents with multiple insurers, or a practitioner's duplicate billing practices, would be an important feature in reducing fraud. The collection, processing and dissemination of the insurance claim data could be utilized in a system that effectively assists Insurers in fighting fraud. Currently Insurers maintain a central database, which is accessible to all Insurers for reviewing and uncovering fraudulent claims. However, this system is dependant on a collaborated and coordinated effort by all Insurers to submit updated and timely insurance claim data, which tends to suffer from extended delay, missing data and any uncovering of a fraudulent claim through this present system tends to be retroactive. Causing insurers to attempt to recoup monies already lost to fraudulent claimants. For example, a claimant who purchased five (5) insurance policies and was involved in a single accident then obtained treatment at five (5) different medical facilities that billed each Insurer separately. Because the fraudulent claims where filed simultaneously, no updated insurance claim data involving this accident would be available to insurers on the centralized database. Thus, causing the Insurers to pay the fraudulent claims only to subsequently discover the fraud once all the Insurers enter the insurance claim data on the centralized database. Because of the current system employed by Insurers and the



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legislative intent for Insurers to pay medical claims timely, Insurers are incapable of effectively investigating fraudulent claims in a timely manner prior to the payment of such claims being over due. The recent advances in technology allows for the creation of a new system, which would create an attorney, client and opposing party daily on-line market place through the receiving, transmitting and storing of documents, data and communications through multiple interconnecting attorney, client and opposing party modules to improve an Insurer's ability to investigate fraudulent claims in a way that facilitates the payment of claims and effectively uncovers these fraudulent claims. For example, the creation of an attorney module for case management that incorporates a system, which allows the submission of new insurance claims to Insurers through a central module connected to the Internet, which system not only gives insurers an additional cost effective level of security through the attorneys' submission of such claims but the insurance claim data stored in the system can be immediately cross referenced in the investigation of fraudulent claims and which does not require Insurers to enter insurance claim data. Thus, eliminating the delay experienced in present systems. Such technologies can weed out fraudulent practitioners and claimants, thus assisting in the reduction of yearly payouts of fraudulent claims, properly paying honest attorneys and clients, while protecting the public from fraud. If the insurance industry with legislative amendments required all insurance claims to be electronically submitted to insurance carriers through the attorney and central modules, insurers would not only have more cost effective protection in fighting insurance fraud through an attorney level of review but would have access to updated and more accurate data to timely investigate insurance fraud prior to claims being over due. For example, the claimant who purchased five (5) insurance policies and filed five (5) simultaneous but separate claims on a single accident



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would immediately be uncovered as Insurers cross-reference the insurance claim data in the central module incorporating this new system.

A number of patents have issued in the area of claims and negotiation management systems. U.S. Patent No. 6,330,551 discloses a computerized system for automated dispute resolution through an Intranet website via the Internet or other communications linkage for communicating and processing a series of demands to satisfy a claim made by or on behalf of a claimant or other person involved in a dispute with at least one other person, such as a defendant, his or her insurer, or other sponsor, and a series of offers to settle the claim through at least one central processing unit including operation system software for controlling the central processing unit is disclosed. Preferably the system also allows for the collection, processing and dissemination of settlement data generated from the settlement through the operation of the system for use by sponsors and claimants in establishing the settlement value of future cases.

U.S. Patent No. 6,553,347 discloses a system for conducting "one to one" commercial negotiations through an electronic medium such as the Internet. The negotiation process consists of sending persuasive texts to the user by the system, including discounts given by the system and responses to the price offers of the user. The system offers the product for a specific price, a price that may be optionally decreased as negotiation continues. The system frequently asks how much the user is willing to pay for the product. Based on the user's input, the system may accept the offer or, after one or more unacceptably low inputs from the user, may alternatively end the process of negotiation. Preferably, the system negotiates on many more parameters than simply the price itself.

U.S. Patent No. 6,502,113 discloses a system for managing negotiations between parties, comprising the steps of: storing a selected document having a plurality of



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negotiable clauses; creating a first retrievable display relating to the document; updating the document as the clauses are modified by the parties, so that each clause corresponds to the last of the modifications; creating a plurality of respective, retrievable clause displays for all modifications of the clauses as each clause is negotiated; creating a retrievable summary display for the clauses; and, visually coding the retrievable displays to distinguish between clauses which have not been negotiated and clauses which have been agreed to, and so that updated clauses which have not yet been agreed to are attributed to one of the parties, whereby the negotiations can be tracked by reviewing the visually coded displays. All of the steps can be implemented at an Internet web site.

U.S. Patent No. 6,141,653 discloses a multivariate negotiations engine for iterative bargaining which: enables a sponsor to create and administer a community between participants such as buyers and sellers having similar interests; allows a buyer/participant to search and evaluate seller information, propose and negotiate orders and counteroffers that include all desired terms, request sample quantities, and track activity; allows a seller/participant to use remote authoring templates to create a complete Website for immediate integration and activation in the community, to evaluate proposed buyer orders and counteroffers, and to negotiate multiple variables such as prices, terms, conditions etc., iteratively with a buyer.

U.S. Patent No. 6,112,189 discloses a system calculates the mutual satisfaction between negotiating parties and maximizes their mutual satisfaction over a range of decision variables and does so without requiring the parties to identify themselves and their positions to each other. For automatically negotiating agreements between multiple parties, a computer accepts a satisfaction function from an offering party who defines his degree of satisfaction to agree to a range of terms upon which the party is desirous of negotiating as a function of the relevant decision variables.



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U.S. Published Patent Application No. 2003/0154172 discloses a computer program is provided for developing component-based software capable of facilitating insurance-related negotiation. The program includes a data component that stores, retrieves and manipulates data utilizing a plurality of functions. Also provided is a client component that includes an adapter component that transmits and receives data to/from the data component. The client component also includes a business component that serves as a data cache and includes logic for manipulating the data. A controller component is also included which is adapted to handle events generated by a user utilizing the business component to cache data and the adapter component to ultimately persist data to a data repository. In use, the client component provides a plurality of data fields relating to an insurance-related negotiation. In addition, a plurality of rules is provided which dictate events to be raised based on data in the data fields. The user is then able to input data into the data fields. Finally, events are raised based on the data entered into the data fields.

U.S. Patent No. 20020120588 discloses a computer system for allowing negotiation between a plurality of entities, the computer system comprising a computer network having a plurality of computer nodes; a computer node being arranged to define the negotiation between the entities with a set of negotiation activities; wherein the computer node is operable to implement a plurality of negotiation rule sets, each rule set constraining the negotiation activities to a specific negotiation type, thereby allowing a plurality of negotiation types to be selected by an entity.

U.S. Patent No. 20020069182 discloses a system and system for alternative dispute resolution involving multiple offers and flexible setting of settlement parameters. Individuals determine whether settlement offers overlap with one another without deciding the settlement terms. Terms may be monetary, non-monetary, or time-limited. Participants access the system on a web site. Participants submit a series of confidential



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settlement demands beginning with non-monetary demands. Unique identifying devices match respective settlement demands against one another. When a participant signs on to the web site, a "click-wrap" agreement binds him to the terms of any settlement reached. Participants pay a fee for each round of negotiations. Where settlement figures overlap, an algorithm resident on the server of the present invention chooses the midpoint between the figures. Participants may restrict the analysis to knowing whether their demands overlap. If a settlement is reached, email messages are sent to the parties.

Client bulleting board systems also exist that provide secure online workspace for clients and attorneys. These systems connect clients and attorneys over the Internet and provide documents and transaction information in customizable virtual private workspaces. These systems enable documents and other case information to be instantly available to attorneys, clients, and team members while on the road or from a remote location. These systems allow attorneys and clients to conduct a wide-variety of operations in a secure environment: publish documents through the secure network; review transcripts, depositions, filings and the like, in progress; share comments and edits; check agendas and scheduling; distribute late-breaking news and valuable research; and participate in discovery document review. Additional features such as event calendar and automated content notification help to keep projects on track and all members of the team informed.

None of these patents and known systems adequately fulfill the needs of attorneys, clients and opposing parties, for example, by providing a comprehensive case management system as claimed by the present invention.

These and other problems exist.

## SUMMARY OF THE INVENTION



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[0001] An object of the present invention is to overcome the aforementioned and other drawbacks existing in prior art systems and systems, and to create an attorney, client and opposing party daily on-line market place through the receiving, transmitting and storing of documents, data and communications through multiple interconnecting attorney, client and opposing party modules.

In view of the foregoing disadvantages inherent in the known types of case management programs now present in the prior art, the present invention provides a new attorney case management system and system that interconnects multi-parties on-line through attorney, client and opposing party modules that enables settlement, provides parties to a dispute immediate access to status reports, and allows attorneys, clients and opposing parties to review and manage pending cases in a secure and reliable manner, and allows the electronic document filing of Court records, allows the submission of Tenant data for non-payment of rent, the electronic sending and receive of payments. For example, payments against attorney invoices, insurance claims and Tenant rent.

The various embodiments disclosed herein comprise systems and systems that enable efficient case management by parties to a dispute. In some embodiments, the invention enables attorneys, clients, and opposing parties, for example, to more immediately and accurately obtain information relating to a particular dispute, case or suit, for example. In various other embodiments, the present invention enables parties to a dispute to reach settlement in an efficient and time-effective manner.

The features and functions of the invention may be described in the context of no-fault litigation. No-fault litigation typically arises when an insurance carrier refuses to pay a claim submitted on a patient's behalf by the medical provider. As a condition to treatment, most medical providers require that the patient assign its benefits to collect under a policy. When an insurer subsequently refuses to pay a particular claim, the



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medical provider can bring an action under state no-fault statutes seeking payment of benefits. The litigation process typically involves the exchange of medical bills and information, photographs of facilities and equipment, providers licenses and certifications, as well as testimony of patients and doctors. Given the high-volume of no-fault litigation that exists today, parties (attorneys, clients (e.g., medical providers), and opposing parties (e.g., insurance company)) find themselves overwhelmed by the administration of voluminous documents and information, and the drawn out and laborious settlement process. Overwhelmed insurance companies are hindered in the effective and timely investigation of fraudulent insurance claims and are repeatedly paying fraudulent claims only to attempt to recoup such losses retroactively. Although the invention is described primarily in the context of no-fault litigation practice, its features and functionality are applicable to many different types practices, legal and non-legal, including landlord-tenant disputes.

The system and system of the present invention enables parties to a dispute to collaborate and interact efficiently and reliably on a single platform. In some embodiments, the present invention may comprise an attorney module, accessible by an attorney, that provides various modules, tools and interfaces that enable the attorney to: (1) set-up and/or access client and opposing party files, (2) manually or automatically submit and receive single and bulk settlement offers, (3) review relevant documents and information uploaded by clients and/or opposing parties; (4) keep clients and opposing parties informed of current case status and upcoming deadlines, for example, (5) manually or automatically draft documents, such as notifications, pleadings, summons and complaints, discovery, and other relevant documents, (6) submit medical bills to insurance companies on behalf of clients and receive electronic payment from insurance companies, for example, (7) process denied claims, (8) consolidate multiple client or



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opposing party files into a single document, such as a summons and complaint, for example, (9) outsource to third-parties, (10) automatically draft documents, (11) submit invoices to and receive electronic payment from clients, and (12) receive new clients, (13) receive data on non-paying Tenants, (14) receive electronic payment of Tenant rent, and (15) electronic document filing of court records. Other features and functionality are of course provided, as will be explained below. According to various embodiments, the attorney module can be saved on an attorney's hard drive, for example, which may receive and transfer information back and forth from the Internet and telecommunication networks, for example. Disk containing computer language which can be stored on the attorney's hard drive, database on a server that receives and transfers data to and from the attorney's hard drive. In a further embodiment, the invention comprises an on-line ASP-type system. The invention envisions numerous attorneys having individualized attorney modules as described herein.

According to various embodiments, the attorney module may connect (such as over a communications network, for example) to a central module which may be accessed by clients and opposing parties, for example. In some embodiments the central module may comprise a client module and an opposing party module. The client module may provide various modules, tools and interfaces that enable a client, for example, to: (1) set-up attorney and opposing party files, (2) upload documents, such as medical bills, photographs of facilities and equipment, for example, (3) transmit uploaded documents to attorneys or opposing parties, (4) set and submit files on denied claims for immediate processing by an attorney, (5) securely submit new no-fault bills and records, for example, to an insurer through the attorney, (6) choose and manage multiple attorneys for particular claims and disputes, (7) coordinate directly with insurance companies and help fight fraud by giving insurers an additional level of security through which they access



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and review current facilities and equipment, (8) be notified of single and bulk settlement offers, (9) review relevant documents and information uploaded by attorneys and/or opposing parties; (10) access information and documents inputted by attorneys via attorney modules or opposing parties via opposing party modules, and (11) be informed of current case status and upcoming deadlines, and (12) electronically send payments on attorney invoices, (13) submit data on non-paying Tenants, for example. Other features and functionality are of course provided, as will be explained below.

In still other embodiments, the central module may comprise an opposing party module. The opposing party module may provide various modules, tools and interfaces that enable an opposing party, for example, to: (1) set-up client and attorney files, (2) review pending suits from multiple attorneys, (3) submit and manage one or multiple settlement offers, (4) receive settlement agreements and stipulations of discontinuance, (5) review and securely submit records to peer/IME/EUO, (6) review doctor/provider licenses and photographs of equipment and facilities to help fight fraud, (7) review relevant documents and information uploaded by attorneys and/or clients inputted via attorney modules or client modules, and (8) be informed of current case status and upcoming deadlines, (9) electronically send payment on insurance claims, and (10) electronically send payment on Tenant rent, for example. Other features and functionality are of course provided, as will be explained below.

**[0002]** A primary object of the present invention is to provide an attorney case management program that will overcome the shortcomings of the prior art systems and systems, and create an attorney, client and opposing party on-line market place through the receiving, transmitting and storing of documents, data and communications through multiple interconnecting attorney, client and opposing party modules in the daily management and resolution of pending cases.



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Further objects of the present invention are to provide an attorney case management program for attorneys that permits settlements with insurance companies, provides clients with status reports on their cases 24/7, and allows insurance companies to review pending cases with the attorneys utilizing an account number via the internet.

An additional object of the invention is to provide an attorney case management program that will allow attorneys, clients and third parties to set-up their own files via the internet or telephone communications with an automated file number assignment.

A still further object of the invention is to provide an attorney case management program that will enable attorneys, clients and third parties to access file information without ever having to connect with the attorney's hard drive.

Another object of the invention is to provide an attorney case management program that will allow attorneys to send and receive settlement offers via the internet or telephone communications, including the ability to view statistics of all accepted/declined/pending settlement offers sent and received.

A still further object is to provide an attorney case management program that will allow attorneys, clients, insurers and third parties to obtain case status information "24/7" and in which access is provided by the internet or telephone.

A further object of the present invention is to provide an attorney case management program that will provide automated case status notifications to be sent to attorneys, clients and third parties via the internet or telephone.

Another object of the invention is to provide an attorney case management program that will provide automated case status upgrades.

Another object of the invention is to provide a central module connected to the Internet that will receive and consolidate multiple file data from multiple attorney modules then display the file data to opposing parties.



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Another object of the invention is to provide an attorney case management program that will allow the consolidation of multiple and separate file data into a single drafted document.

Another object of the invention is to provide an attorney case management program that will allow the electronic submission of medical records and bills to insurers for electronic payment.

Another object of the invention is to provide an attorney case management program that will allow the electronic document filing of Court records.

Another object of the invention is to provide an attorney case management program that will allow the submission of Tenant data for non-payment of rent.

Another object of the invention is to provide an attorney case management program that will allow the electronic sending and receive of payments. For example, payments against attorney invoices, insurance claims and Tenant rent.

Another object of the invention is to provide an attorney case management program that will allow the collection, processing and dissemination of file data generated from the file data entered into the system by the parties for use by Insurers for identifying fraudulent insurance claims and by Landlords in reviewing and evaluating the past rental history of potential Tenants.

A yet additional object of the invention is to provide an attorney case management program that will be capable of automatically settling cases and drafting legal documents, as well as providing automated calendaring of settlements for check tracking.

Other objects and advantages of the present invention will become obvious to the reader and it is intended that these objects and advantages are within the scope of the present invention.



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According to one embodiment of the invention, a system for managing cases is provided. The system comprising: an attorney module comprising an attorney files management tool for managing client and opposing party files, a settlement tool for receiving and transmitting settlement offers and counter-offers, and a documents tool for drafting, receiving and transmitting documents and correspondence, a document submission tool for the electronic document filing of Court records with the Courts, a payment tool for the receiving of electronic payments on attorney invoices, insurance claims and Tenant rent; and a central module communicating with the attorney module over at least one communications network, the central module comprising (1) a client module comprising a client files management tool for managing attorney and opposing party files, and a client payment tool for electronic payments of attorney invoices, and (2) an opposing party module comprising an opposing party files management tool for the identification and consolidation of multiple attorneys and consolidating and managing attorney and client files, and an opposing party settlement tool for receiving and transmitting settlement offers and counter-offers, and an opposing party payment tool for electronic payments of insurance claims and Tenant rent. Preferably the system also allows for the collection, processing and dissemination of file data generated from the file data entered into the system by the parties for use by Insurers for identifying fraudulent insurance claims and by Landlords in reviewing and evaluating the past rental history of potential Tenants.

In another embodiment of the invention, a system for settling at least one dispute is provided. The system comprises: receiving and viewing at least one settlement offer from at least one user over at least one communications network; comparing the at least one settlement offer to at least one corresponding floor settlement amount; proposing the at least one corresponding floor settlement amount as a counter offer to the at least one



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user over the at least one communications network if the at least one settlement offer is less than the at least one corresponding floor settlement amount; and populating and sending acceptance correspondence over the at least one communications network to the at least one user if the at least one settlement offer is equal to or greater than the at least one corresponding floor settlement amount.

In yet another embodiment of the invention, a system for settling a dispute is provided. The system comprising: a settlement reception module for receiving and viewing at least one settlement offer from at least one user over at least one communications network; a comparison module for comparing the at least one settlement offer to at least one corresponding floor settlement amount; a counter-offer module for proposing the at least one corresponding floor settlement amount as a counter offer to the at least one user over the at least one communications network if the at least one settlement offer is less than the at least one corresponding floor settlement amount; and a documents module for populating and sending acceptance correspondence over the at least one communications network to the at least one user if the at least one settlement offer is equal to or greater than the at least one corresponding floor settlement amount.

In still another embodiment of the invention, a system for making bulk settlement offers is provided. The system comprises: accessing information relating to a plurality of offerees; determining a particular offerees based on the information accessed; determining an overriding settlement percentage; simultaneously submitting a settlement offer over a communications network to each of the particular offerees, each of the settlement offers being based on the overriding settlement percentage.

In another embodiment of the invention, a system for settling a dispute is provided. The system comprising: receiving at least one settlement offer over at least one communications network; and submitting at least one settlement response over the at least



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one communications network corresponding to each of the at least one settlement offer, said at least one settlement response being submitted without entering information related to the case or dispute being settled. In some embodiments, the submission of the at least one settlement response comprises a single step. In other embodiments, the step of submitting at least one settlement response comprises initiating an acceptance or rejection. In still other embodiments, the initiation of an acceptance, rejection or counter-offer is accomplished by a single key-stroke or mouse-click, wherein the single key-stoke may comprise initiating an accept icon or reject icon displayed on a graphical user interface (or GUI).

In still another embodiment of the invention, a system for settling a dispute is provided. The system comprising: settlement reception means for receiving at least one settlement offer over at least one communications network; and settlement offer response means for submitting at least one settlement response over the at least one communications network corresponding to each of the at least one settlement offer, said at least one settlement offer being submitted without entering information related to the case or dispute being settled. In some embodiments, the settlement reception means may comprise a settlement tool associated with at least one of an attorney module, a client module, or an opposing party module. In other embodiments, the settlement tool may comprise a settlement reception module for receiving settlement offers, a comparison module for comparing the settlement offers to stored floor settlement amounts, and counter-offer module for proposing counter-offers to settlement offers. In still other embodiments, the at least one settlement offer is proposed in response to a single step.

In yet another embodiment of the invention, a system for making a settlement offer is provided. The system comprising: accessing information relating to at least one of a pending action or suit, an attorney, a plaintiff, a defendant, or any combination



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thereof; determining a particular settlement percentage; calculating an offer to settle for each of the at least one of a pending action or suit, an attorney, a plaintiff, defendant, or any combination thereof, each offer to settle being based on the particular settlement percentage; and proposing the offers to settle over a communications network. In some embodiments, the offers to settle are received by a corresponding attorney, plaintiff, defendant, or any combination thereof. In other embodiments, each proposed offer to settle results in a acceptance or counter-offer, while in other embodiments each offer to settle is proposed without providing case or dispute information. In still other embodiments, the recipient of each offer to settle is able to view or access the offer to settle.

In another embodiment of the invention, a system for managing a case is provided. The system comprising: determining the type of documented being prepared by a user; and upgrading the status of at least one case based on the type of document being drafted. In some embodiments, system further comprises the step of preparing a status report to a client. In some embodiments, the user is an attorney. In still other embodiments, the document being drafted is at least one of a settlement notification or a settlement agreement, while in other embodiments the document being drafted is related to a particular case or dispute. In some embodiments, the uploaded documents comprise at least one of medical records, medical bills, and licenses. In other embodiments, the user comprises an attorney, while the another user comprises an insurance company. In still other embodiments, the system further comprises the step of transferring the documents and information to an insurance company over a communications network.

In still another embodiment of the invention, a system for uploading and transmitting case documents and information is provided. The system comprising: uploading documents and information related to a particular case; transmitting the



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uploaded documents and information to a user for viewing; and receiving approval from the user to transmit or forward the documents and information to another user. In some embodiments, the uploaded documents comprise at least one of medical records, medical bills, and licenses. The user may comprise an attorney, while the another user comprises an insurance company. In other embodiments, the system further comprises the step of transferring the documents and information to an insurance company over a communications network.

In another embodiment of the invention, a system for simultaneously drafting a plurality of documents is provided. The system comprising: accessing information relating to a plurality of pending cases, suits or disputes; selecting at least one document to draft; populating various drafts of the selected at least one document, each version being populated with information relating to one of the plurality of pending cases, suits or disputes; and triggering transmission of the various populated drafts of the selected at least one document by initiating a single step. In some embodiments, the single step comprises a single key-stroke or mouse-click. In other embodiments, the at least one document comprises a complaint, answer, pleading or other document related to a particular case(s) or dispute(s). In other embodiments, accessing information occurs in response to a predetermined event. In some embodiments, the predetermined event comprises at least one of the passage of a predetermined period of time and denial of payment. In some embodiments, the select case or dispute information comprises information relating to claims against a particular insurance company. In other embodiments, the select case or dispute information comprises information relating to claims brought by a particular client. In other embodiments, the at least one document to prepare comprises at least one of a complaint, answer, and summons. In still other embodiments, the status of a case is updated upon drafting of the at least one document.



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In still another embodiment of the invention, a system for consolidating case information into a document is provided. The system comprising: selecting at least one of a client and an opposing party; accessing select case or dispute information relating to the selected at least one of a client and an opposing party; selecting at least one document to prepare; populating the at least one document with accessed case or dispute information; and transmitting the populated document to at least one intended recipient over a communications network.

In yet another embodiment of the invention, a system of providing an attorney landlord and tenant management website is provided. The system comprising the steps of: entering the tenant's information by a client into a database connected to the Internet when the tenant has failed to pay rent; preparing a file for the tenant that can be accessed repeatedly whenever the client fails to pay rent; notifying the tenant by the client of the tenant's failure to pay rent; providing the tenant with the capability to pay the tenant's rent via the website; notifying the client of a bill from the attorney; providing the client with the ability to pay the attorney's bill via the website; and identifying the bill for review if no work is performed on the file for the tenant.

To the accomplishment of the above and related objects, this invention may be embodied in the form illustrated in the accompanying drawings, attention being called to the fact, however, that the drawings are illustrative only, and that changes may be made in the specific construction illustrated.

The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate various embodiments of the invention and, together with the description, serve to explain the principles of the invention.

## BRIEF DESCRIPTION OF THE DRAWINGS



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Various other objects, features and attendant advantages of the present invention will become fully appreciated as the same becomes better understood when considered in conjunction with the accompanying drawings, in which like reference characters designate the same or similar parts throughout the several views, and wherein:

Figure 1 is a block diagram of the system of the present invention, according to one embodiment of the invention.

Figure 2 is a block diagram of the web system in accordance with the present invention, according to one embodiment of the invention.

Figure 3 is a block diagram of the database system in accordance with the present invention, according to one embodiment of the invention.

Figures 4 -6 illustrate block diagrams of the operation of the invention from the standpoint of attorneys, clients and insurers, according to one embodiment of the invention.

Figures 7 illustrates a block diagram of one embodiment of the system of the invention.

Figure 8 illustrates a block diagram of an attorney module, according to one embodiment of the invention.

Figure 9a illustrates a block diagram of a central module, according to one embodiment of the invention.

Figure 9b illustrates a block diagram of a client module, according to one embodiment of the invention.

Figure 9c illustrates a block diagram of an opposing party module, according to one embodiment of the invention.

Figures 10 - 18 illustrate various embodiments of systems performed by the invention.



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Figures 19-70 illustrate various embodiments of interfaces to the features and functions of the invention.

## DETAILED DESCRIPTION OF THE INVENTION

According to some embodiments, the invention relates generally to a case management program, and more particularly to an attorney automated case management program that interconnects multiple attorneys, clients and opposing parties through attorney, client and opposing party modules creating an on-line market place and enables parties in dispute, for example, to communicate, present and coordinate settlements, automatically draft and consolidate multiple files into single documents, electronically file drafted documents with the Courts, electronically send and receive payments, and record the rental history of Tenants. for example. Taking no-fault litigation practice as an example, the various features and functionality of the invention can be described in the context of attorneys, clients (or medical facilities, for example), adjusters (or insurance companies) and court houses, for example.

The present invention is broadly directed to a system and system for managing client cases over a communication network using, for example, personal computers and similar devices. While the present invention is being described in the context of a system using a personal computer, the manner of the end user device is not critical to the present invention. The present invention may be used with any system that connects to the Internet or uses other IP transport systems. The end user device can comprise any end user device which can connect to a network such as a wireless device, palm pilot, PDA, end user workstation or hand-held device. As will be discussed herein, the present invention is described both in the context of a stand-alone system connected to a worldwide network (Internet) or a system and application fully accessible via an Internet website.



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Referring now to the drawings wherein like reference numerals refer to the same components across the several views, and in particular to Figure 1, the technical environment for one embodiment of the present invention is disclosed and shown. The most preferred embodiment comprises a central computer server 10 connected by a computer network 12 to remote end user stations. The central server connects to a database 150.

In a preferred embodiment, end user stations comprise a plurality of end users 16, 18, 19. The end users broadly comprise three types of users: clients 16, attorneys 18 and insurers 19. While the invention is described in the context of an insurer based program such as might be used for a personal injury law practice. It is to be appreciated that the invention can accommodate any third party payee or litigant.

End user attorneys 18 will have a comprehensive resident program 25 (or attorney module) in their hard drives. Users 16, 18, 19 are linked with the central computer server 10 via a transport medium 30, and will be linked via a global computer network 12 such as the Internet or Worldwide web, but other embodiments including LANs, WANs and Intranets, fulfill the spirit and scope of the present invention. In other embodiment, the resident program may be stored on a remote server accessible over a communications network.

As noted, the end user devices 16, 18 19 will typically comprise any device that connects to the system via the Internet or other IP transport systems and includes, but is not limited to, such devices as televisions, computers, hand- held devices, cellular phones, land based telephones, wireless electronic devices and any device which uses a transport medium 30. Non-limiting examples of a transport medium 30 applicable for use in the present invention comprise any backbone or link such as an ATM link, FDDI link, satellite link, cable, cellular, twisted pair, fiber optic, broadcast wireless network, the



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internet, the world wide web, local area network (LAN), wide area network (WAN), or any other kind of intranet environment such a standard Ethernet link. In such alternative cases, the clients will communicate with the system using protocols appropriate to the network to which that client is attached. All such embodiments and equivalents thereof are intended to be within the scope of the present invention.

Referring again to Figure 1, the present invention may comprise a multi-server 21 environment which comprises a computer system in accordance with the present invention that allows the multiple end users 16, 18, 19 to communicate with the system and system clients. Through communication link and transport medium 30, end users 16, 18, 19 will receive data entries which must be correctly identified and confirmed and who are linked to the central server 12, preferably by a customizable interface to be described in greater detail below.

Referring to Figures 2 and 3, the central server and database systems of the present invention are now shown and described in greater detail. A local director 23 routes signals through the system to the various servers, to be described below, and to and through transport medium 30 to end users 16, 18, 19. The system preferably includes two primary servers, a web server 40 and a database server 50 which may operate using such database platforms as SQL server or Oracle. Hence, in one embodiment the SQL server may run SQL server database management software from Microsoft Corporation. Alternatively, the server can further comprise an Oracle database server.

The system further includes an administrative workstation 60 or system which provides the administrative capabilities and monitoring for the system under the control of an administrative subsystem 140. The administrative workstation 60 allows administrators or other operators to perform routine operations which affect the entire system. Such operations include, but are not limited to, administering the accounts of end



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users 16, 18, 19 monitoring the traffic through the system, performing a backup and maintaining the programs that comprise the overall system.

A web subsystem 70 is responsible for all interactions with a web browser 80 in the end user devices 16, 18, 19 and serves as the end user interface to the system. All interactions between the end user devices 16, 18, 19 and the database subsystem occur through the web subsystem 70. Internet Information Server 200 ( by Microsoft Corporation is an exemplary web server software system 70 in accordance with the present invention, although the present invention is in no way limited to this system.

All systems listed above are preferably communicated via an Ethernet 100 base T network and a switching hub. In addition, a second isolated network segment will preferably exist between the web server 40 and the external communications hardware (e.g. internet router).

The web server 40 is the point of entry to the entire system. The system determines the identity of the users 16, 18, 19 and makes appropriate decisions while serving web pages to the end users 16, 18, 19. The web server 40 sends HTML or other high level computer language to the end user work stations 16, 18, *19* validates passwords, sends logging and transaction information to the database server 50, and performs logical operations, thus behaving as a transactional server.

As noted above, in one embodiment, the server operating system may be a Windows NT server, a multi-platform operating system provided by Microsoft Corporation. The Sun Microsystems Solaris is an alternative embodiment.

The operators of the system may create, delete and update account information by utilizing the administrative subsystem 140 in administration workstation 60. A billing subsystem 100 is used for crediting and debiting end user accounts. End user attorneys and insurers will typically pay an access fee for the use of the system.



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Database 110, communication 120 and billing 100 subsystems thus execute essential services for the other parts of the system, and will therefore have well-defined application program interfaces (API) 110', 120', 100', as is well recognized by those with skill in the art. The system will preferably be protected for the Internet by a "firewall" 90 which is a safety precaution, and important with respect to the present invention due to the sensitive and confidential nature of the information in the database.

In a preferred embodiment, the database subsystem 110 stores all pertinent information pertaining to user accounts, administrator accounts, payment, as well as general dynamic system information. All interactions with the database subsystem 110 are performed through a database API 110' which may define the interface to a library of stored procedures 130.

The administration subsystem 140 provides an interface for operators and managers of the system to modify the database, print reports, view system data and log user comments and complaints. The administration subsystem 140 provides a collection of access forms, queries, reports and modules to implement the administration interface. Administrators typically will have the power within the system to force most actions. The administration subsystem 140 will interact with the communications, database and billing subsystems.

The communications subsystem 120 interfaced to a communications API 120' will be used to email and contact end users 16, 18, 19. End users 16, 18, 19 may be notified by phone, fax, email or pager, or other communications devices which can be contacted by the system 135.

End users 16, 18, 19 will also have a password accessed section of a website where they can access information relevant to their activities and be provided with detailed reports. A batch subsystem 125 may periodically send out grouped notifications.



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It will access the database subsystem 110 to determine what notifications are required, and uses the communication subsystem 120 to make those notifications. A group notification may comprise a special premium offered to end users 16, 18. The billing subsystem 100 will be used to verify and bill credit cards and communicate through the billing API 100' to the administration subsystem 140, and potentially to an outside billing and verification service which could be used to perform the billing functions.

Referring to Figure 3, the database server 50 which implements the database subsystem 110 of the present invention comprises a server that maintains all associated logging and transaction information for the system. Through the database 150 (which is backed up by a backup database for safety purposes), the database server 50 logs planner and provider setup and account creation information, stores data and changes made to that information, maintains user account information, maintains account balances, produces and prints reports, hosts backup operations and performs statistical calculations for the entire system.

The database server 50 is preferably a dual processor computer microprocessor. Each connection to the database 150 and its associated work may be handled by a separate thread within the database server 50 process space. The disk subsystem 190 of the database server may comprise a vulnerable and crucial server element. Statistical calculations will be performed by the database server 50, along with other types of report generation.

In one embodiment, there will be one operator workstation 60 used for administering the system. As the need for additional workstations arises, additional operator workstations can be added by adding additional computer systems, installing the administration software and connecting them to the LAN. Operator workstation machines



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preferably utilize a Windows operating environment manufactured by Microsoft Corporation.

Figures 4-6 illustrate one embodiment of a process flow of the present invention. The process is set up to permit an unlimited number of attorneys to represent an unlimited number of clients and to interface with a plurality of insurer/payees. The system comprehensively handles all aspects of the transaction, including file set up; the drafting of documents, electronic document filing; offer, proffer and acceptance; and payment. At step 1 of the process, for example, an unlimited number of clients (e.g., medical providers) may set-up files associated with medical bills that need to be submitted to insurance companies for payment, for example. In one embodiment, each file may relate to a particular bill or set of bills associated with a particular attorney, patient or insurance company, for example. Using a client module, the client may upload all relevant bill information and document and forward to the appropriate attorney(s) for review. The corresponding attorney may then access and view the uploaded documents and information using an attorney module, for example. Upon receipt of the uploaded documents and information, the attorney or the attorney module may automatically draft related documents to forward to an insurance company along with the uploaded bills for payment, and electronically submit drafted documents to the Courts for litigation or arbitration as shown in step 2. In some embodiments, the document(s) drafted may comprise a cover sheet, for example, summarizing the bills presented, while in other embodiments the document drafted may comprise a settlement offer that comprises the total amount of the bills presented, or a predetermined percentage thereof. That is, the attorney and/or the client may decide to seek full payment or some percentage of the bills. Determination of a percentage may be done on a case-by-case basis, such as based on the particular insurance company, patient, medical provider, attorney, or treatment rendered,



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for example. For instance, it may be decided that all bills presented to a particular insurance company should be offered at a 10% discount, or that bills for a particular procedure, patient or client be offered at a 25% discount, for example. In some embodiments, the process of drafting documents and presented settlement offers is done automatically without any form of attorney invention.

At step 3, the bill documents and information, including any documents drafted by the attorney module are submitted for payment. In one embodiment, submission for payment involves storage in a particular database (DB) accessible by attorneys, clients and insurance companies, as shown. At step 4, the insurance company may receive the bill documents and information, such as by accessing the DB, for example. In some embodiments, the insurance company accesses the bills and documents using an opposing module. At step 5, the insurance company decides whether it accepts the bills (i.e. will pay), denies, present an offer for payment, or if an specific offer was proposed, whether to present a counter-offer. In some embodiments, the insurance companies disposition of the bills may be done via the opposition module which may be in communication with the attorney and client modules.

At step 6 and 7, the attorney and client may be notified that the insurance company has processed the bills, and that they may be accessed through DB. If payment is denied, the client and attorney may decide to litigate the denial, as shown in step 8, or make a settlement offer, which would involve going back to step 3. The decision to litigate/arbitrate or present a settlement offer may be done manually, such as by the attorney, or automatically, such as by attorney module 25. If litigation/arbitration is desired, the attorney module may automatically draft the appropriate summons and complaints associated with the denial of payment. Information relevant to the summons and complaint may be automatically populated onto the necessary forms by the attorney



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module, for example. Further, the attorney module may docket relevant dates and provide appropriate notifications, such as to the client and opposing party, for example. In other embodiments, electronic filing of the summons and complaint with the appropriate court(s) may also be accomplished.

If a settlement offer or counter-offer is proposed, the cycle between steps 3 and 7 may repeat until settlement is reached. In some embodiments, settlement offers and counteroffers, for example, may be presented without the need of inputting information relating to the claims. That is, the information relating to the client, attorney and insurance company has been previously stored and the various modules are able to automatically identify the relevant parties. In various embodiments, the appropriate attorney, client, and/or insurance company is immediately notified of an offer, such as through a pop-window, email, fax, telephone call, or any other form of communication. If the offer is rejected, counter-offers may be proposed. In some embodiments, settlement percentages may be predetermined. Such settlement percentages may be applied as designated, such as depending on insurance company, client, attorney, patient, treatments rendered, etc.

If a particular settlement is accepted by a client, attorney or insurance company, the attorney module, for example, may automatically draft the necessary documents, such as a settlement agreement or related documents, for example. In some embodiments, the settlement agreement and related documents may be automatically populated by the attorney module and transmitted to the appropriate recipients, such as the client and insurance company, for example. In some embodiments, settlement statistics, such as the ultimate settlement amount, and previous offers and counteroffers, for example, may be stored in DB for future reference.



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According to various embodiments of the invention, the client and opposition modules are part of a central module or server, which in turn is connected to various attorney modules (each representing specific attorneys or firms) over at least one communications network, such as the Internet, for example.

Figure 7 illustrates a system 700 according to one embodiment of the invention. As shown, system 700 includes a law firm or attorney 705 which has access to a server 710 and a terminal 715. In some embodiments, server 710 may include the attorney module 25 discussed above. The attorney or law firm may interact and engage the attorney module 25 through terminal 715. In some embodiments, information or data inputted, received or processed by attorney module may be stored in a database specifically associated with server 710, as shown. In other embodiments, select data and information may also be stored in a remote database associated with a central server, as shown in 715 and 725, which is further accessible by clients and attorneys.

Central servers 715 and 725 may also include client and opposing party modules through which clients and opposing parties, for example, may respectively access the various features and functionality of the invention. In some embodiments, clients and opposing parties have more limited access than do attorneys. In various embodiments, central servers 715 and 725 may periodically (or as determined by attorneys, for example) receive select data and information (i.e. scrape) from all or any number of available attorney modules. This data and information may relate to particular cases and disputes and may provide clients and opposing parties with up-to-date and accurate status information, for example.

Figure 8 illustrates one embodiment of an attorney module 25. In some embodiments the attorney module 25 includes files management module 800. Files management module 800 may enable an attorney to input information about itself during



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registration, such as name, contact information, etc. The information entered may be used by the various modules of the systems described herein to enable the various automated features and functionality discussed. Files management module 800 may enable the attorney to manage client files as well as insurance company files. For example, in some embodiments, file management module 800 may enable the attorney to view incoming bill documents and information from corresponding clients. Files Management module 800 may process the incoming bill documents and information and present them to the attorney in a viewable and efficient manner. In various other embodiments, the attorney module 25 may also include a settlement module 805. Settlement module 805 may be used by the attorney interacting with the attorney module to present and receive settlement offers. For example, the attorney may interact with the settlement module 805 to prepare or propose a particular settlement offer for a particular set of client bill(s). Settlement module 805 may also be used to receive particular settlement offers from insurance companies, for example. Settlement module 805 may also be used by an attorney to designate particular settlement percentages to be applied as determined, and to receive electronic payments on the settlements. For example, a particular settlement percentage may be determined for each particular insurance company, for each client, for each patient, or for particular treatments rendered. Thus, all bills from a particular client may be presented at a particular discount. Bills to a particular insurance may also be presented at a particular discount.

Attorney module 25 may also include in some embodiments a comparison module 810 for comparing settlement offers or counteroffers received from insurance companies, for example. In some embodiments, the comparison module 810 may receive a particular settlement offer from an insurance company and compare that offer to a predetermined settlement amount stored in the system. The predetermined settlement amount may



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comprise a percentage of a particular bill from a particular client, for example. In some embodiments, if the offer received from an insurance company is less than the predetermined settlement amount the comparison module may associate with a counteroffer module 815 to present a counteroffer to the insurance. If, however, the offer is equal to or greater than a predetermined settlement amount, comparison module may associate or cooperate with document module 820 to automatically prepare the necessary acceptance documents, for example.

Attorney module 25 may also include a document module 820 for preparing and drafting documents necessary or relevant to any of the features in functionality described herein. For example, document module 820 may associate with files management 800 whenever incoming bills are coming from particular clients. Thus, whenever a client sends or uploads bills and documents to an attorney, document module 820 may automatically populate and draft the necessary corresponding documents. These documents may include coversheets to include with the bill and documents when the attorney presents for payment to an insurance company. In other embodiments, document module 820 may also associate with any of settlement module 805, comparison module 810 or counteroffer 815 in association with the presentation, reception and proposals of offers and counteroffers.

Attorney module 25 may also include a notification module 825 which allows an attorney to notify clients and opposing parties (e.g., insurance companies) of upcoming deadlines, dates, meetings, court dates, settlement conferences, etc. Notification module 25 may also interface or cooperate with a document module 820 to track documents being manually or automatically prepared or drafted. Notification may determine the document being drafted and immediately notify clients, other attorneys, and/or opposing parties, for example.



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Attorney module 25 may also include a litigation module 830 which operates to automatically populate and draft litigation related documents, such as summons and complaints, for example, and to file the same with the appropriate court(s). In some embodiments, litigation module 830 may prepare and/or electronically file such litigation forms upon an insurance companies denial of particular bill(s) or claim(s), for example. In some embodiments, electronic document filing may be accomplished , by submitting documents to a third party "interface" that does the actual electronic filing, such as Lexis/Nexis File & Serve, for example. In other embodiments, a submission tool, for example, may be incorporated within the attorney module and simply by choosing the "third-party" and "court", the document(s) will be transmitted to the third-party who actually files the document in court.

Attorney module 25 (or client and opposing modules) may also comprise a payment tool for the sending and receiving of electronic payments. The payment tool may function to interface with or transmit/receive payment data to or from a third-party Paypal™ or Verisign™ and process the information through the attorney, client and insurer module. For example, the third party would deposit the funds in a bank account and send you an email notice that you received the funds. The attorney module, for example, may simply take the electronic payment data received from the third-party and process it through the program. It would note the file, enter the payment on the clients account and automatically deduct the amounts due from the client invoice, and then automatically notify the attorney and client. Client and Opposing party modules would simply present an invoice to the parties collect the payment information from the parties and automatically submit it to the third-party. This feature is to be used to automate the attorney, client and opposing party modules to perform this function without manually



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repeating the entry and uploading of identical documents and information sent or received from a third-parties server.

Figure 9A illustrates one embodiment of a central server 10. Central server 10, as shown, may include a client module 900 and an opposing module 905. Each will be described below.

Figure 9B illustrates one embodiment of a client module 900. In some embodiments client module 900 may include a file management module 910 for managing files associated with particular attorneys and insurance companies, for example. Files management module 910 may be used by a client, for example, to input information about itself during registration. The information entered may be used by the various modules of the systems described herein to enable the various automated features and functionality discussed. In other embodiments, file management module 900 may enable a client to provide particular information regarding the client's patients, medical reports, medical bills, treatment procedures, including the sending of payment information against attorney invoices, etc. All this information may be uploaded (as explained below) so that attorneys and perhaps insurance companies can access as necessary.

According to the various embodiments, client module 900 may also include a notification module 915 for receiving and providing notifications related to any case or pending dispute. For example, notification module 915 may provide pop-up windows to the client whenever a particular event or occurrence occurs or takes place during a case dispute. Such event or occurrence may include, for example, the reaching of settlement, the filing of a summons and complaint, the presentation of bills for payment, or any other date which a client should be notified of. Notification module 915 may be used to also notify other attorneys and opposing parties.



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Client module 900 may also include an upload module 920 through which clients can upload documents and information relevant to particular bills or treatment rendered to its patients, for example. Upload module 920 may be used, for example, to upload photographs of facilities and equipment. Module 920 may also be used to upload medical records, medical bills, license and certifications of various doctors and providers as well as any other documents or information related to the collection of bills for treatment rendered to patients. Client module 900 may also include in some embodiments a bills and records module 925 for administering bills and records on the client side. Bills and records module 925 may associate or cooperate with upload module 920 to provide described functionality.

Figure 9c illustrates an embodiment of an Opposing party module 905. According to some embodiments, opposing module 905 may include a file management module 930 for allowing an insurance company, for example, to manage client(e.g., medical provider) and attorney files. In other embodiments opposing module 905 may include a settlement module 935 for allowing the insurance company to receive and propose settlement offers to attorneys and clients. Including the sending of electronic payments. Opposing module 905 may also include a comparison module 940 for comparing received settlement offers and counteroffers to predetermined settlement amounts. A predetermined settlement amount may comprise a particular amount that an insurance company would be willing to pay to settle a particular set of bills or claims. A predetermined settlement amount may, in some embodiments, be based on a predetermined settlement percentage that the insurance company is willing to pay for particular bills or set of claims. For example, if an insurance company does not want to pay more than 75% of presented bills from medical provider A, for example, then a predetermined settled percentage may be applied to any bills from medical provider A. This way, an insurance company may



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automatically present a counteroffer to medical provider B for an amount equivalent to the proposed bill times the predetermined settlement percentage, for example. Opposing module 905 may also include a records module 950 for allowing an insurance company, for example, to present and access records related to its disposition of bills presented for payment by clients or attorneys.

Various systems performed by the above systems are described below.

Figure 10 illustrates a system 1000 for settling at least one dispute. An insurance company or attorney, for example, may receive and view at least one settlement offer over at least one communications network, as discussed above. In some embodiments, the offer may be received over the Internet or telecommunications network. At step 1005, the offer may be automatically compared to at least one corresponding floor settlement amount. In some embodiments, the floor settlement amount is predetermined. In various embodiments, the floor settlement amount may comprise the balance due under a particular bill or bills times a predetermined settlement percentage. The predetermined settlement percentage may be determined by the client, attorney or insurance company, and may apply as determined. At step 1010, the party receiving the offer may propose the corresponding floor settlement amount as a counter-offer if the at least one settlement offer is less than the corresponding floor settlement amount. If, however, the offer is equal to or greater than the corresponding floor settlement amount, an appropriate document may be populated and sent to the offeror. The document may comprise acceptance correspondence sent over at least one communications network.

Figure 11 illustrates a system 1100 for making bulk settlement offers. At step 1105, particular bill information is accessed. In some embodiments, information may comprise outstanding balances owed under particular bill(s), for example. In other embodiments, information may comprise pending settlement offers or counter-offers



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corresponding to particular bill(s). Once this information is accessed, at step 1110 particular offerees may be selected based on the bill information accessed. An offeree may comprise an attorney, client or insurance company. Thus, if the bill information accessed indicates various attorneys, for example, the insurance company may specify a particular attorney or attorneys it would like to present a settlement offer to. Likewise, if the bill information accessed indicates various insurance companies, for example, an attorney may select an insurance company or companies to present a settlement offer to. At step 1115, an overriding settlement percentage may be determined. At step 1120, the an attorney, for example, may simultaneously submit a settlement offer to each of the offerees selected. In some embodiments, each of the settlement offers presented may be based on the overriding settlement percentage. That is, each settlement offer being presented may comprise the product of the overriding settlement percentage and the particular amount due under a particular bill(s).

Figure 12 illustrates a system 1200 for settling a dispute. At step 1205, an attorney or insurance company, for example, may receive at least one settlement offer over at least one communications network. At step 1210, the attorney or insurance company may submit at least one settlement response over the at least one communications network corresponding to each of the at least one settlement offer, said at least one settlement response being submitted without entering information related to the case or dispute being settled.

Figure 13 illustrates a system 1300 for making a settlement offer. At step 1305, information relating to at least one of a pending action or suit, an attorney, a plaintiff, a defendant, or any combination thereof is accessed. At step 1310, a particular settlement percentage is determined. At step 1315, an offer to settle is calculated for each of the at least one of a pending action or suit, an attorney, a plaintiff, defendant, or any



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combination thereof, each offer to settle being based on the particular settlement percentage. At step 1320, the offers to settle are proposed over a communications network.

Figure 14 illustrates a system 1400 for managing a case. At step 1405, the type of documented being prepared or drafted by an attorney is determined. At step 1410, the status of at least one case is upgraded based on the type of document being drafted.

Figure 15 illustrates a system 1500 for uploading and transmitting case documents and information. At step 1505, documents and information related to a particular case are uploaded. At step 1510, the uploaded documents and information are transmitted to a user for viewing. At step 1515, approval is received from the user to transmit or forward the documents and information to another user.

Figure 16 illustrates a system 1600 for simultaneously drafting a plurality of documents. At step 1605, information relating to a plurality of pending cases, suits or disputes is accessed. At step 1610, at least one document to draft is selected. At step 1615, various drafts of the selected at least one document are populated, each version being populated with information relating to one of the plurality of pending cases, suits or disputes. At step 1620, transmission of the various populated drafts of the selected at least one document is triggered by initiating a single step.

Figure 17 illustrates a system 1700 for consolidating case information into a document. At step 1705, at least one of a client and an opposing party is selected. At step 1710, select case or dispute information relating to the selected at least one of a client and an opposing party is accessed. At step 1715, at least one document to prepare is selected. At step 1720, at least one document with accessed case or dispute information is populated. At step 1725 the populated document is transmitted to at least one intended recipient over a communications network.



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Figure 18 illustrates a system 1800 of providing an attorney landlord and tenant management website. At step 1805, the tenant's information is entered by a client into a database connected to the Internet when the tenant has failed to pay rent. At step 1810, a file for the tenant is prepared that can be accessed repeatedly whenever the client fails to pay rent. At step 1815, the tenant is notified by the client of the tenant's failure to pay rent. At step 1820, the tenant is provided with the capability to pay the tenant's rent via the website. At step 1825, the client is notified of a bill from the attorney. At step 1830, the client is provided with the ability to pay the attorney's bill via the website. At step 1835, the bill for review is identified if no work is performed on the file for the tenant.

Figures 19-64 exemplify various screen shots (or graphical user interfaces (GUIs)) which may enable interaction between users--e.g., attorneys, clients, and insurance companies--and the various modules and features described above. Other screen shots and interfaces are of course possible.

Figures 19-45, for example, illustrate various interfaces that may be associated with attorney module 25 discussed above.

Figure 19 illustrates an embodiment of an interface for logging into an attorney module 25 discussed above. Attorneys will typically have more viewing power than the clients in the system. When an attorney is logging on an online server database, the program will notice that it is not the client but one of the attorneys registered under the manage page and it will take that attorney to his/her pages containing only files for those clients he is representing.

Figures 19-70 exemplify various screen shots (or graphical user interfaces (GUIs)) which may enable interaction between users--e.g., attorneys, clients, and insurance companies--and the various modules and features described above. Other screen shots and interfaces are of course possible.



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Figures 19-43, for example, illustrate various interfaces that may be associated with attorney module 25 discussed above.

Figure 19 (S1) illustrates an embodiment of an interface for logging into an attorney module 25 discussed above. Attorneys will typically have more viewing power than the clients in the system. When an attorney is logging on an online server database, the program will notice that it is not the client but one of the attorneys registered under the manage page and it will take that attorney to his/her pages containing only files for those clients he is representing.

Figure 20(S2) illustrates an embodiment of an interface displaying a list of clients entered into in by the attorney or received from the client module.

Figure 21(S3)illustrates an embodiment of an interface displaying case data entered into by the attorney or received from the client module.

Figure 22(S4) illustrates an embodiment of an interface displaying case data received from the client module and allowing the entry of case data by the attorney.

Figure 23(S5) illustrates an embodiment of an interface allowing the attorney to submit one or multiple settlement offer to opposing parties and to review the status of submitted offers.

Figure 24(S6) illustrates an embodiment of an interface that allows attorneys to view and print-up reports on clients and case data entered by the attorney or received from the client module.

Figure 25(S7) illustrates an embodiment of an interface that allows attorneys to view and print-up reports on case files entered by the attorney or received from the client module.

Figure 26(S8) illustrates an embodiment of an interface that allows attorneys to view and print-up reports on tasks, meetings & alerts entered by the attorney.



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Figure 27(S9) illustrates an embodiment of an interface that allows attorneys to view and print-up reports on court dates entered by the attorney or received from a third-party provider maintaining an index number database.

Figure 28(S10) illustrates an embodiment of an interface that receives contact information of attorneys and Insurers from multiples attorney modules, consolidates the information and displays it as a directory entry. Also, transmits contact information of attorneys and Insurers to multiple attorney modules.

Figure 29(S11) illustrates an embodiment of an interface that allows the entry of Administrator information, username and passcodes to access the attorney module and to gain access to the Manage page, which controls the administration functions of the program. Including allowing attorneys to send payment for licensing, web hosting and maintenance services pertaining to the system.

Figure 30(S12) illustrates an embodiment of an interface that allows the entry of information of Insurers and clients, which the attorney module utilizes in drafting documents and creating a client username and passcode to allow the client to gain access to the client module.

Figure 31(S13) illustrates an embodiment of an interface that allows the entry of users to access the attorney module. For example, attorneys, paralegals, clerks, third-parties, administrator, etc.

Figure 32(S14) illustrates an embodiment of an interface that allows the entry templates, which are utilized by the attorney module for drafting documents, and to schedule the automation of drafting document.

Figure 33(S15) illustrates an embodiment of an interface that allows the entry of client bills and receiving of electronic payments.



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Figure 34(S16) illustrates an embodiment of an interface that allows attorneys to utilize phone, fax or email to contact a client or opposing party.

Figure 35(S17) illustrates an embodiment of an interface that displays client information and preferences.

Figure 36(S18) illustrates an embodiment of an interface that allows the entry of client and third-party information and preferences as to automated notices and the lowest acceptable percentage on settlements, which the attorney module utilizes to accept, decline or submit a counter-offer on received settlement offers from the central module.

Figure 37(S19) illustrates an embodiment of an interface that allows the entry of contact information pertaining to Insurance companies.

Figure 38(S20) illustrates an embodiment of an interface that allows the entry of new users and provides the ability to customize user access.

Figure 39(S21) illustrates an embodiment of an interface that allows attorneys to manually draft settlement agreements, which can be printed, emailed or faxed to opposing parties from the attorney module.

Figure 40(S22) illustrates an embodiment of an interface that allows the automated and manual entry of attorney fees, and the subsequent submission of invoices to clients from the attorney module.

Figure 41(S23) illustrates an embodiment of an interface that allows the entry and uploading of medical records and bills and the subsequent submission to opposing parties from the attorney module.

Figure 42(S24) illustrates an embodiment of an interface that allows the entry of tasks, meetings and court dates with alerts on the calendar of the attorney module.

Figure 43(S25) illustrates an embodiment of an interface that allows the manual and automated drafting of documents on the attorney module.



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Figure 44(S26) illustrates an embodiment of an interface that allows the entry of contact information on the directory of the attorney module.

Figure 45(S27) illustrates an embodiment of an interface that allows the entry of multiple cases and the subsequent submission of bulk settlement offers to opposing parties from the attorney and central module.

Figures 46-70 illustrates various interfaces associated with the client and opposing party modules discussed above.

Figure 46.(W1) illustrates an embodiment of an interface informing attorneys, clients and opposing parties of the services provided by the system and allows for the login of attorneys, clients and Insurers.

Figure 47(W2) illustrates an embodiment of an interface informing attorneys, clients and opposing parties of the services provided by the system.

Figure 48(W3) illustrates an embodiment of an interface further informing Insurers of the services provided by the system.

Figure 49(W4) illustrates an embodiment of an interface further informing Clients of the services provided by the system.

Figure 50(W5) illustrates an embodiment of an interface further informing attorneys of the services provided by the system.

Figure 51(W6) illustrates an embodiment of an interface for receiving file data pertaining to pending cases uploaded from multiple attorney and client modules, consolidating the data and displaying it to an opposing Insurer.

Figure 52(W7) illustrates an embodiment of an interface for receiving bill and medical documents uploaded from a client and attorney module.



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Figure 53(W8) illustrates an embodiment of an interface displaying specific case data uploaded from a client and attorney module. Including the displaying of notes entered by the attorneys and Insurers on the file.

Figure 54(W9) illustrates an embodiment of an interface that allows Insurers to customize and print-up reports on cases uploaded from multiple client and attorney modules.

Figure 55(W10) illustrates an embodiment of an interface for entering user information and choosing preferences in the delivery route of the settlement agreement.

Figure 56(W11) illustrates an embodiment of an interface for receiving data uploaded and consolidated from multiple attorney modules in the creation of a comprehensive directory displaying Providers, Insurers and Attorneys contact information to Insurers.

Figure 57(W12) illustrates an embodiment of an interface for receiving file data pertaining to a case from an attorney module and displaying it to a client.

Figure 58(W13) illustrates an embodiment of an interface for displaying Insurance claim amounts outstanding and recording receipt of Insurers payments on such claims.

Figure 59(W14) illustrates an embodiment of an interface that allows the client to customize and print-up reports on cases uploaded by the client and attorney modules.

Figure 60(W15) illustrates an embodiment of an interface displaying specific case data uploaded from a client and attorney module. Including the displaying of notes entered on the file by attorneys, clients and Insurers.

Figure 61(W16) illustrates an embodiment of an interface allowing specific case data and documents to be uploaded from a client's module.

Figure 62(W17) illustrates an embodiment of an interface allowing specific case data, medical records and bills to be uploaded from a client's module.



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Figure 63(W18) illustrates an embodiment of an interface for receiving, displaying and sending electronic payments on attorney invoices from a client's module.

Figure 64(W19) illustrates an embodiment of an interface for the displaying of medical bills and entry of insurance payments.

Figure 65(W20) illustrates an embodiment of an interface for logging into the client and attorney modules.

Figure 66(W21) illustrates an embodiment of an interface for sending single settlement offers to opposing parties from the attorney and opposing party module.

Figure 67(W22) illustrates an embodiment of an interface for the sending of bulk settlement offers to opposing parties from the attorney and opposing party modules.

Figure 68(W23) illustrates an embodiment of an interface for storing and displaying drafted and uploaded documents from the attorney and client modules.

Figure 69(W24) illustrates an embodiment of an interface for registering new clients and assigning username and passcode over the Internet.

Figure 70(W25) illustrates an embodiment of an interface for registering insurance adjusters and assigning username and passcode over the Internet.

The present invention suggests a wide variety of modifications and applications. A further embodiment of the present invention is a landlord/tenant management system. In this embodiment, a landlord/real estate management company (clients) can enter the names and addresses of the tenants who have failed to pay rent. The clients only have to submit the tenant's name and information once.

The program sets up a file for the tenant that can be visited repeatedly whenever the tenant fails to pay rent and a "Notice" needs to be sent out. A client will never have to enter identical tenant information into the program twice. The client simply picks one or multiple tenants already listed on the program and hits "Send Notice." The clients can



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utilize the program to setup new tenant accounts and bill the tenants via your program. If the payments are not entered into the program manually or by the tenant visiting the website and making payment by credit card/debit card or on-line check, the program can automatically send out Notices to the tenants. The program further does "Automated Client Invoicing".

Each time the program creates a Notice or Petition, it will add the bill on the client's invoice, which can be printed out automatically on a designated date and be made available to the client on the website. The clients will be able to pay bills via the website as well. The program will be able to handle hourly billing also. It can calculate the hourly billing by having an internal clock, which starts running when you enter a client's file. It records the work performed on the file and calculates the correct fees. If no work is performed on the file, it can identify the billing as "Reviewed."

The website can transmits this information to the stand alone case management program. When a client submits a non-paying tenant's information via the website to the attorney's stand alone program, it automatically sets up a file and assigns a file number and then automatically prints out a dated "Notice" on the attorney's letterhead.

The Notice will include a "username" and "passcode" for the tenant or tenant's attorney to log into the website and make the rent payment or just review the case details. All clients submit non-paying tenant information through the website. The program will send this information to the stand alone program, which will automatically printout the Notices on a "standby" printer designated for Notices.

The tenant then pays the attorney or enters the payment into the program via the website, which transmits this information to the stand alone program. This will then stop the "automated" feature of the program from automatically drafting a petition.



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If the tenant fails to pay the rent on the requested date noted on the Notice, after the program automatically identifies the passing of such date, the program will automatically draft a petition. The attorney will review, sign, serve and file it in court. There will be a second standby printer designated for Petitions. The printer will automatically print out Petitions when the program identifies every file in which the Notice date has past.

At any time, the tenant or the tenant's attorney can utilize the "username" and "passcode" on the Notice to access their account on a website and make payment (this website address would be noted on Notices with the username and passcode). The system can be set up to accept payment plans, e.g. 1, 2, 3 or 6 month payment plans, etc. for past due rents. Tenants can then simply log in each month and make the minimum payments on the past due rent. Besides paying the current rent. They can even send in the payments, which have to then be manually entered either by you on your standalone program or on the website.

With respect to the above description, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention. Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.



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Other embodiments, uses and advantages of the present invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. The specification and examples should be considered exemplary only.

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## CLAIMS

1. A multi-party interconnecting system for managing and resolving cases, comprising:

an attorney module comprising an attorney files management tool for managing client and opposing party files, a settlement tool for receiving and transmitting settlement offers and counter-offers, and a documents tool for drafting, receiving and transmitting documents and correspondence, a document submission tool for the electronic filing of drafted documents with the courts, a payment tool for the receiving of electronic payments on attorney invoices and insurance claims; and

a central module communicating with the attorney module over at least one communications network, the central module comprising (1) a client module comprising a client files management tool, managing attorney and opposing party files for, and a client payment tool for electronic payments of attorney invoices, and (2) an opposing party module comprising an opposing party files management tool for the identification and consolidation of multiple attorneys and consolidating and managing attorney and client files, and an opposing party settlement tool for receiving and transmitting settlement offers and counter-offers, and an opposing party payment tool for electronic payments of insurance claims.

2. The system of claim 1 wherein the attorney and opposing party settlement tools further comprise corresponding settlement modules for preparing and receiving settlement offers, corresponding comparison modules for comparing received settlement offers to predetermined floor settlement amounts, and corresponding counter-offer modules for proposing a counter-offer if a particular settlement offer received is less than a predetermined floor settlement amount.



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3. The system of claim 1 wherein the documents tool further comprises a document drafting module for populating and drafting documents, correspondence, pleadings, summons, and other documents related to a particular case(s).

4. The system of claim 3 wherein the document drafting module populates and drafts particular documents, correspondence, pleadings, summons, complaints, and other documents related to a particular case(s) upon the occurrence of a predetermined event.

5. The system of claim 4 wherein the predetermined event comprises at least one of the filing of a complaint or answer, the acceptance of settlement, the passage of a predetermined number of days or time, and the payment of an amount.

6. The system of claim 1 wherein the client module further comprises a client records management module for uploading and transmitting documents.

7. The system of claim 1 wherein the client module further comprises a client case module for accessing pending suits or actions.

8. The system of claim 1 wherein the opposing party module further comprises a records tool for receiving and transmitting documents and correspondence.

9. The system of claim 1 wherein the opposing party module further comprises an opposing party case module for viewing pending suits or actions.

10. A system for settling at least one dispute, comprising:

receiving and viewing at least one settlement offer from at least one user over at least one communications network;

comparing the at least one settlement offer to at least one corresponding floor settlement amount;

proposing the at least one corresponding floor settlement amount as a counter offer to the at least one user over the at least one communications network if the at least



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one settlement offer is less than the at least one corresponding floor settlement amount; and

populating and sending acceptance correspondence over the at least one communications network to the at least one user if the at least one settlement offer is equal to or greater than the at least one corresponding floor settlement amount.

11. The system of claim 10 wherein the settlement amount comprises the product of a predetermined percentage and a disputed amount.

12. The system of claim 10 wherein the acceptance correspondence comprises a settlement agreement.

13. The system of claim 10 further comprising the step of docketing a reminder to pay notice at a later predetermined time or date upon transmission of the acceptance correspondence.

14. The system of claim 13 further comprising the step of populating and sending reminder correspondence if the predetermined time or date expires and payment has not been received.

15. The system of claim 10 further comprising informing a client of settlement.

16. The system of claim 10 further comprising the step of storing particulars of the settlement.

17. The system of claim 16 wherein the particulars of the settlement comprise at least one of an initial settlement offer, counter-offer, and final settlement amount.

18. The system of claim 10 wherein the at least one corresponding floor settlement amount is calculated prior to the receipt of the at least one settlement offer.

19. A system for settling a dispute, comprising:



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a settlement reception module for receiving and viewing at least one settlement offer from at least one user over at least one communications network;

a comparison module for comparing the at least one settlement offer to at least one corresponding floor settlement amount;

a counter-offer module for proposing the at least one corresponding floor settlement amount as a counter offer to the at least one user over the at least one communications network if the at least one settlement offer is less than the at least one corresponding floor settlement amount; and

a documents module for populating and sending acceptance correspondence over the at least one communications network to the at least one user if the at least one settlement offer is equal to or greater than the at least one corresponding floor settlement amount.

20. The system of claim 19 wherein the settlement amount comprises the product of a predetermined percentage and a disputed amount.

21. The system of claim 19 wherein the acceptance correspondence comprises a settlement agreement.

22. The system of claim 19 further comprising the step up of docketing a reminder to pay notice at a later predetermined time or date.

23. The system of claim 19 further comprising the step of populating and sending reminder correspondence if the predetermined time or date expires and payment is not received.

24. The system of claim 23 wherein the reminder is sent via at least one of fax, email, or standard mail or overnight delivery.

25. A system for making bulk settlement offers, comprising:

accessing particular bill information;



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determining at least one particular offeree based on the information accessed;

determining an overriding settlement percentage;

simultaneously submitting a settlement offer over a communications network to each of the at least one particular offerees, each of the settlement offers being based on the overriding settlement percentage.

26. The system of claim 25 further comprising receiving and viewing at least one of an acceptance, rejection and counter-offer from any number of the plurality of offerees.

27. The system of claim 25 wherein the plurality of settlement offerees comprises at least one of an adjuster, an attorney, a plaintiff, a defendant, or any combination thereof.

28. The system of claim 25 wherein each of the plurality of offerees can access the corresponding settlement offer prior to accepting, rejecting, or proposing a counter-offer.

29. The system of claim 25 wherein each of the plurality of offerees can initiate acceptance, rejection or presentation of a counter-offer without providing case or dispute information.

30. A system for consolidating multiple attorney names and client file data for submission to opposing parties, comprising:

a central module communicating with at least one attorney module over at least one communications network through which multiple attorneys utilizing the at least one attorney module and clients utilizing the central module may submit client file data to opposing parties utilizing the central module, and wherein such multiple attorney names and client file data are consolidated and displayed to the opposing party.



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31. The system of claim 30 the attorney, client and/or opposing party accesses attorney names and client file data through the central module by the utilization of a username and passcode.

32. The system of claim 30 wherein the attorney, client and/or opposing party accesses attorney names and client file data through the central module by Insurance company or defendant name.

33. The system of claim 30 wherein the attorney, client and/or opposing party accesses attorney names and client file data through the central module by attorney or Plaintiff name.

34. The system of claim 30 wherein the attorney, client and/or opposing party accesses attorney names and client file data through the central module by client or Plaintiff name.

35. The system of claim 30 central module serves to receive and view attorney name and client file data.

36. The system of claim 30 further comprising a database for storing particulars of the attorney name and client file data.

37. The system of claim 30 further comprising a client records management module for uploading, transmitting documents and client file data.

38. The system of claim 30 further comprising a client case module for accessing pending suits or actions.

39. The system of claim 30 further comprising an attorney records management module for uploading, transmitting documents and client file data.

40. The system of claim 30 further comprising an attorney case module for accessing pending suits or actions.



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41. The system of claim 30 further comprising an opposing party records management module for uploading, transmitting documents and client file data.

42. The system of claim 30 further comprising an opposing party case module for accessing pending suits and actions.

43. The system of claim 30 wherein the central module provides customizable reports on pending suits, actions and client file data.

44. The system of claim 30 further comprising a document drafting module for populating and drafting documents, correspondence, pleadings, summons, and other documents related to a particular case(s).

45. A system for electronic document filing of court records, comprising:

an attorney document submission module communicating over at least one communications network through which the attorney electronically files drafted documents with the Courts.

46. The system of claim 45 further comprising an attorney module for entering client file data.

47. The system of claim 45 further comprising an attorney module for receiving and reviewing client file data submitted through a central module communicating through the at least one communications network.

48. The system of claim 45 further comprising a database storing the particulars of client file data.

49. The system of claim 45 further comprising an attorney records management module for uploading, transmitting documents and client file data.

50. The system of claim 45 further comprising an attorney case module for accessing pending suits or actions.



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51. The system of claim 45 further comprising customizable status reports on pending suits, actions and client file data.

52. The system of claim 45 further comprising a document drafting module for populating and drafting documents, correspondence, pleadings, summons, and other documents related to a particular case(s).

53. A system for multiple file consolidation in document drafting, comprising:

an attorney document-drafting module for the consolidation of particulars of multiple client files into a single drafted document, correspondence, pleading, summons, and other documents related to a particular case(s).

54 The system of claim 53 wherein the particulars of the multiple client files comprise file numbers, client and opposing parties names, details of the suit or action taken, amounts due or claimed, and attorney's name.

55. The system of claim 54 wherein the attorney document-drafting module presents at least one of a clients menu, files menu and document templates menu.

56 The system of claim 53 further comprising an attorney module for the entering of client file data.

57. The system of claim 53 further comprising an attorney module, for receiving and reviewing of client file data submitted through a central module communicating through at least one communications network

58. The system of claim 53 further comprising a database for storing the particulars of client file data.

59. The system of claim 53 further comprising an attorney records management module for uploading, transmitting documents and client file data.

60. The system of claim 53 further comprising an attorney case module for accessing pending suits or actions.



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61. The system of claim 53 further comprising customizable reports on pending suits, actions and client file data.

62. The method of claim 53 further comprising a document drafting module for populating and drafting documents, correspondence, pleadings, summons, and other documents related to a particular case(s).

63. A method of providing an attorney landlord and tenant management website, comprising the steps of:

entering the tenant's information by a client into a database connected to the Internet when the tenant has failed to pay rent:

preparing a file for the tenant that can be accessed repeatedly whenever the client fails to pay rent;

notifying the tenant by the client of the tenant's failure to pay rent;

providing the tenant with the capability to pay the tenant's rent via the website;

notifying the client of a bill from the attorney;

providing the client with the ability to pay the attorney's bill via the website; and

identifying the bill for review if no work is performed on the file for the tenant.

64. The method of claim 60, further comprising the step of transmitting the information stored in the database of the website to a standalone computer maintained by the attorney via the Internet.

65. The method of claim 60, further comprising the step of automatically selling up a file and assigning a file number when the client enters the tenant's information of the tenant who has failed to pay rent.

66. The method of claim 67, further comprising the step of generating a dated notice to the tenant for review by the attorney.



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67. The method of claim 68, further comprising generating a username and password on the notice for the tenant or a tenant's attorney to review the tenant's information on the website.

68. The method of claim 68, further comprising the step of generating a petition for the attorney to review, sign, serve and file if the tenant does not pay after receiving the notice.



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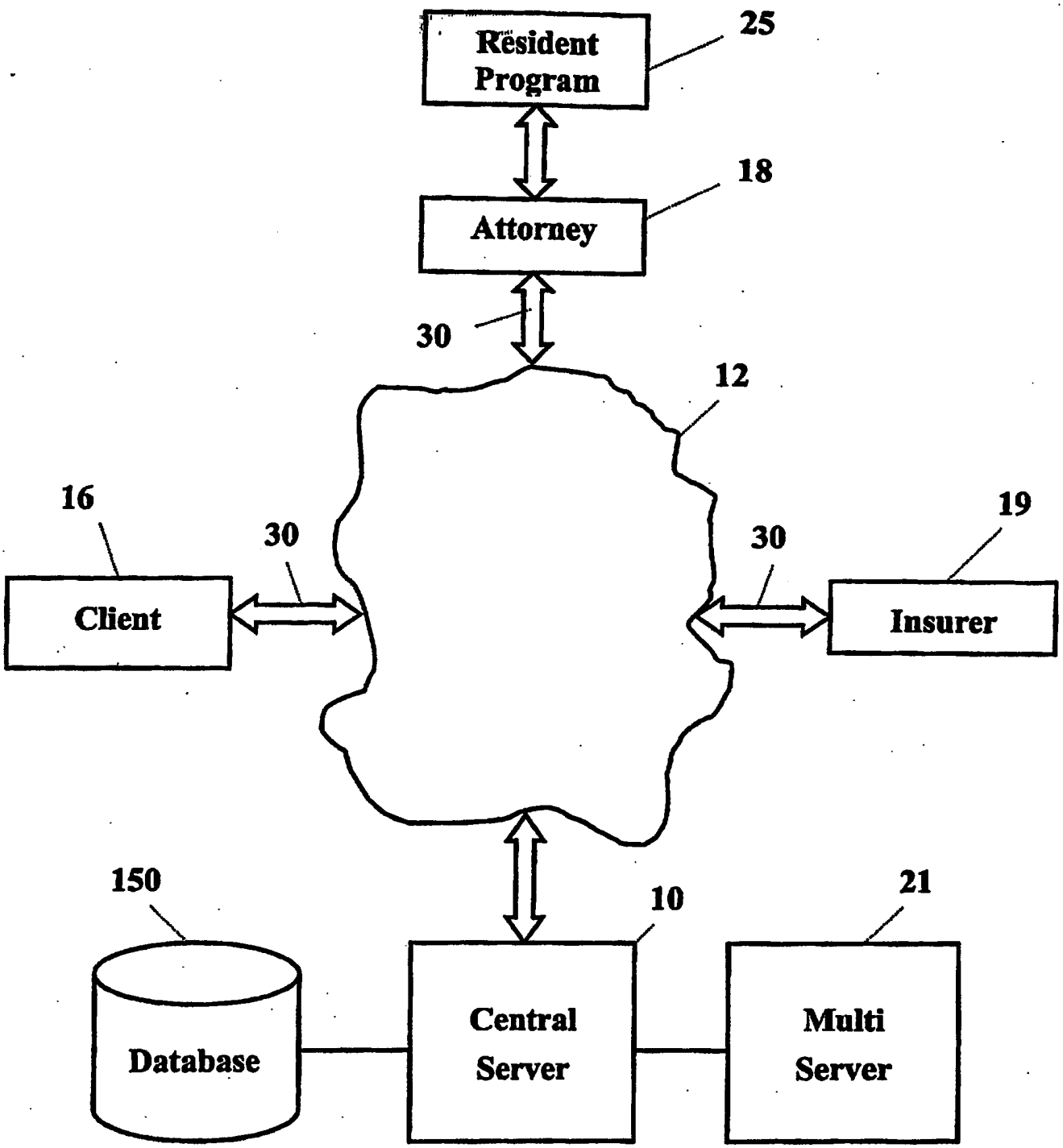



**Figure 1**



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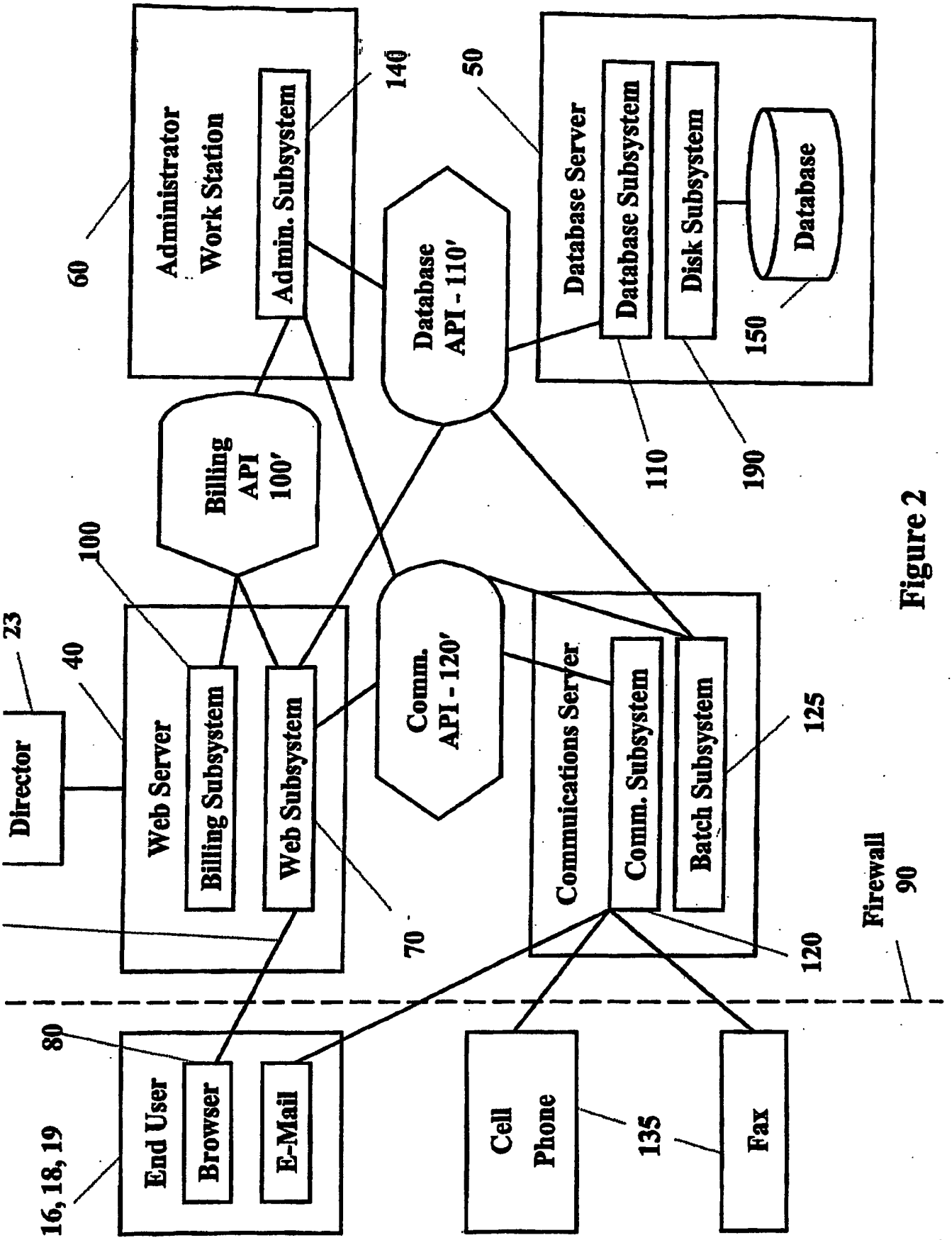



Figure 2



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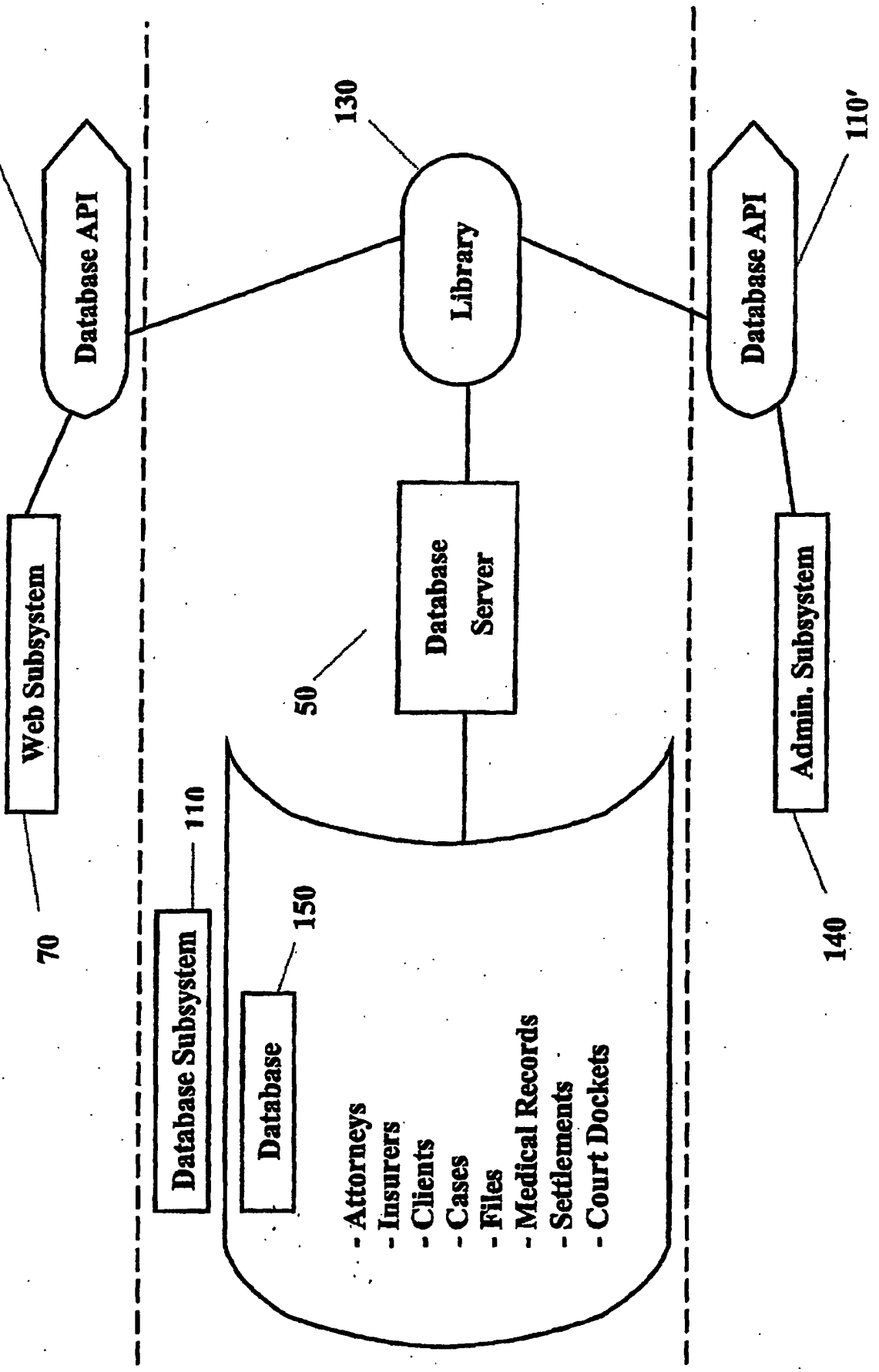



Figure 3



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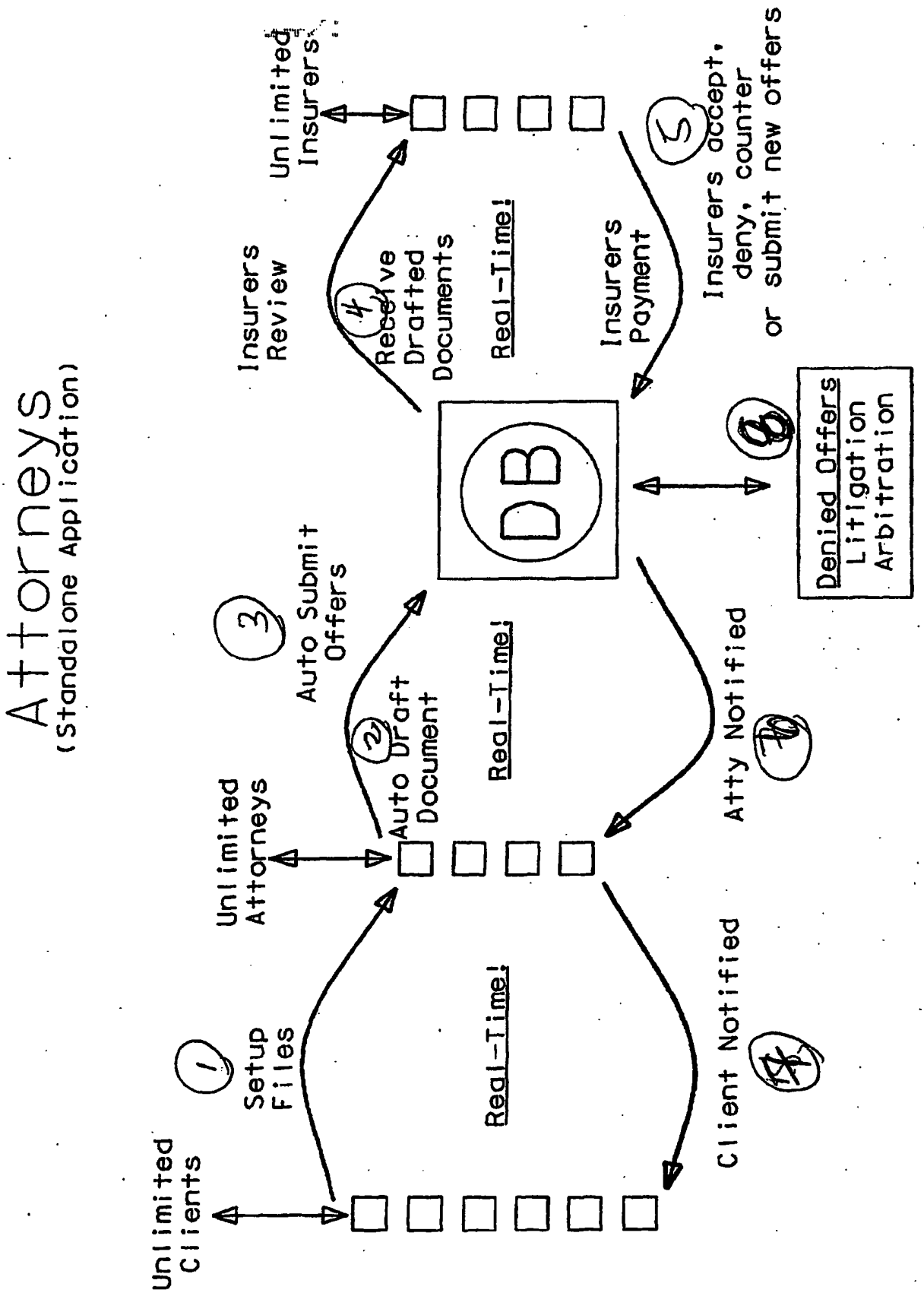



FIGURE 4



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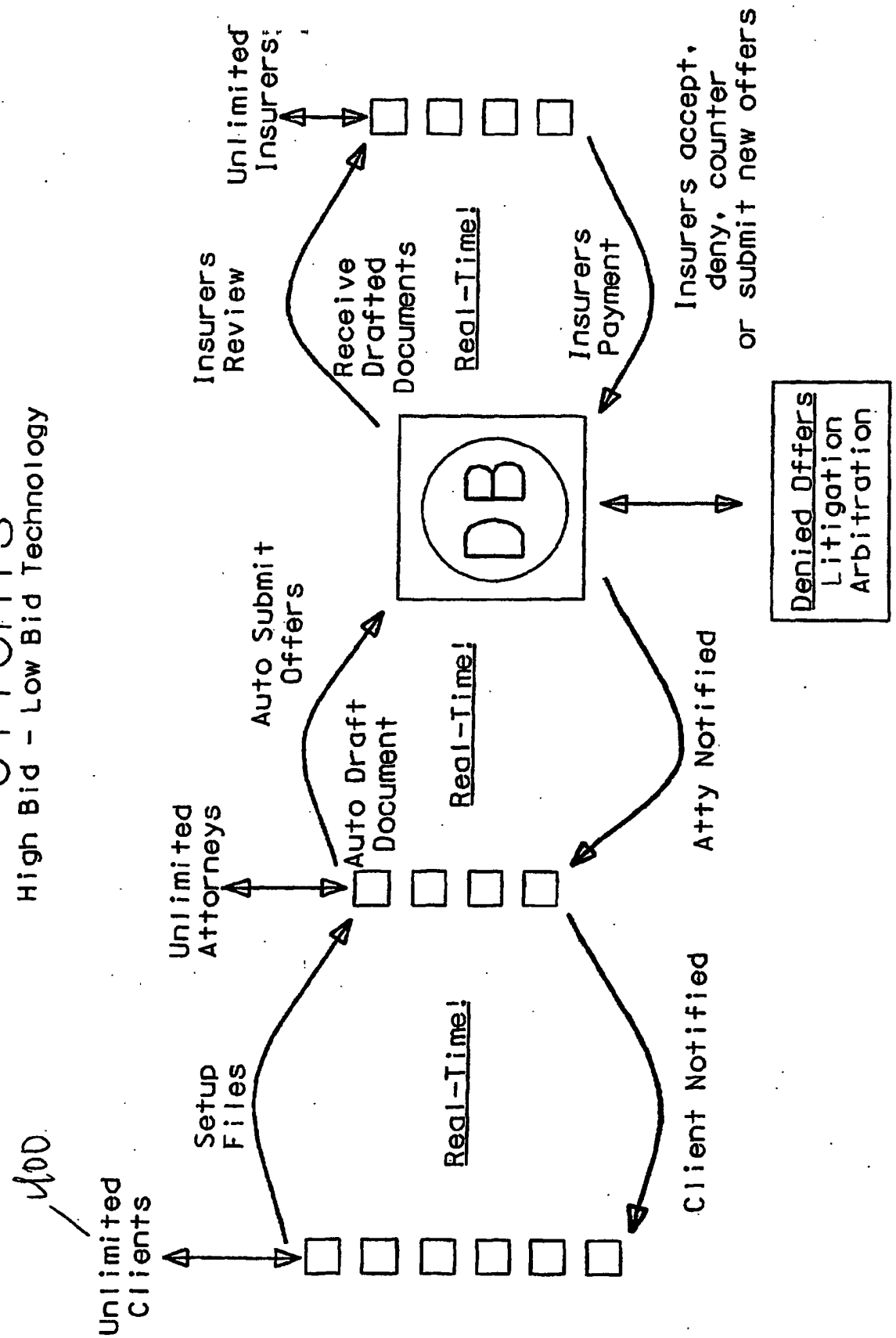



FIGURE 5



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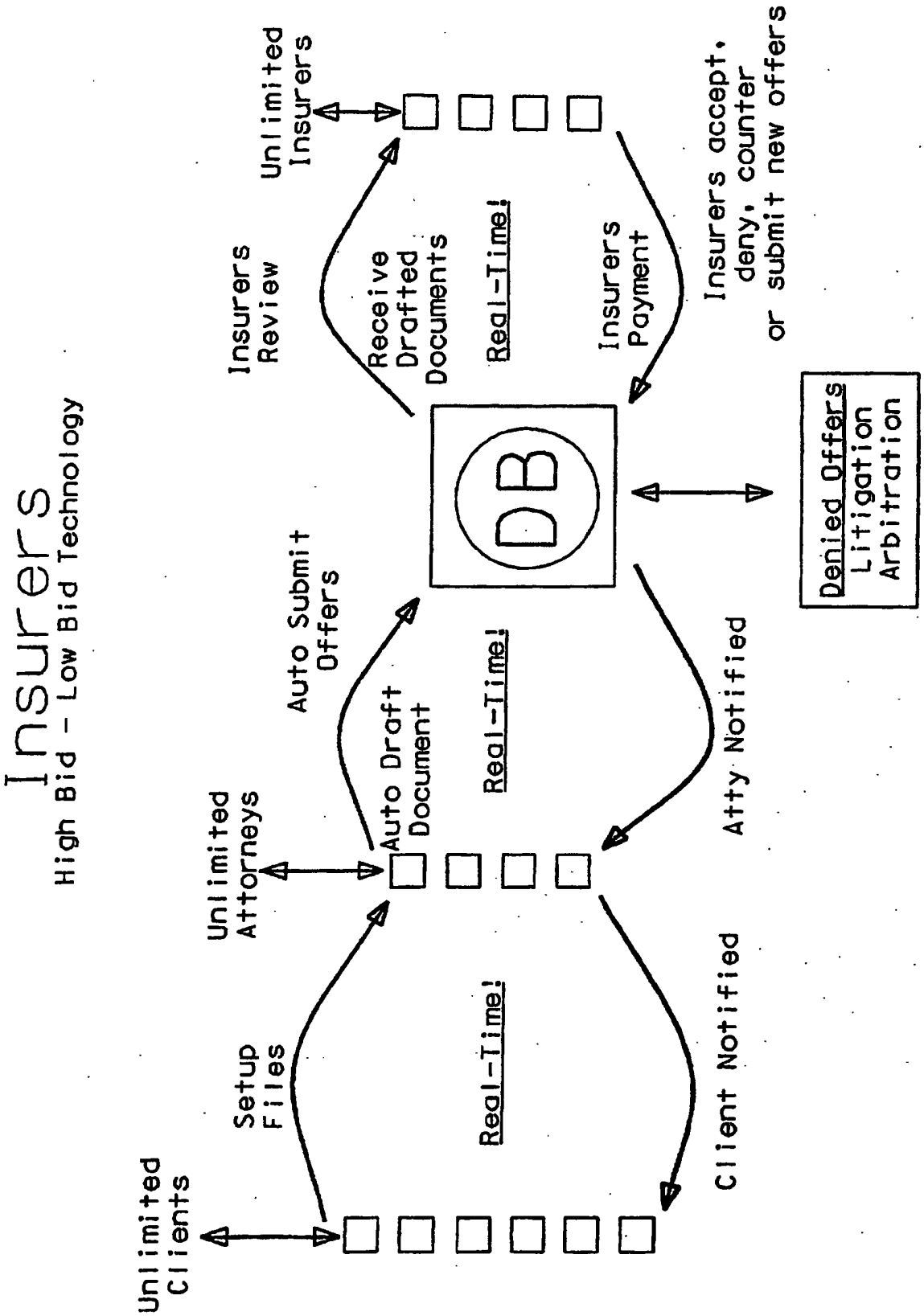



FIGURE 6



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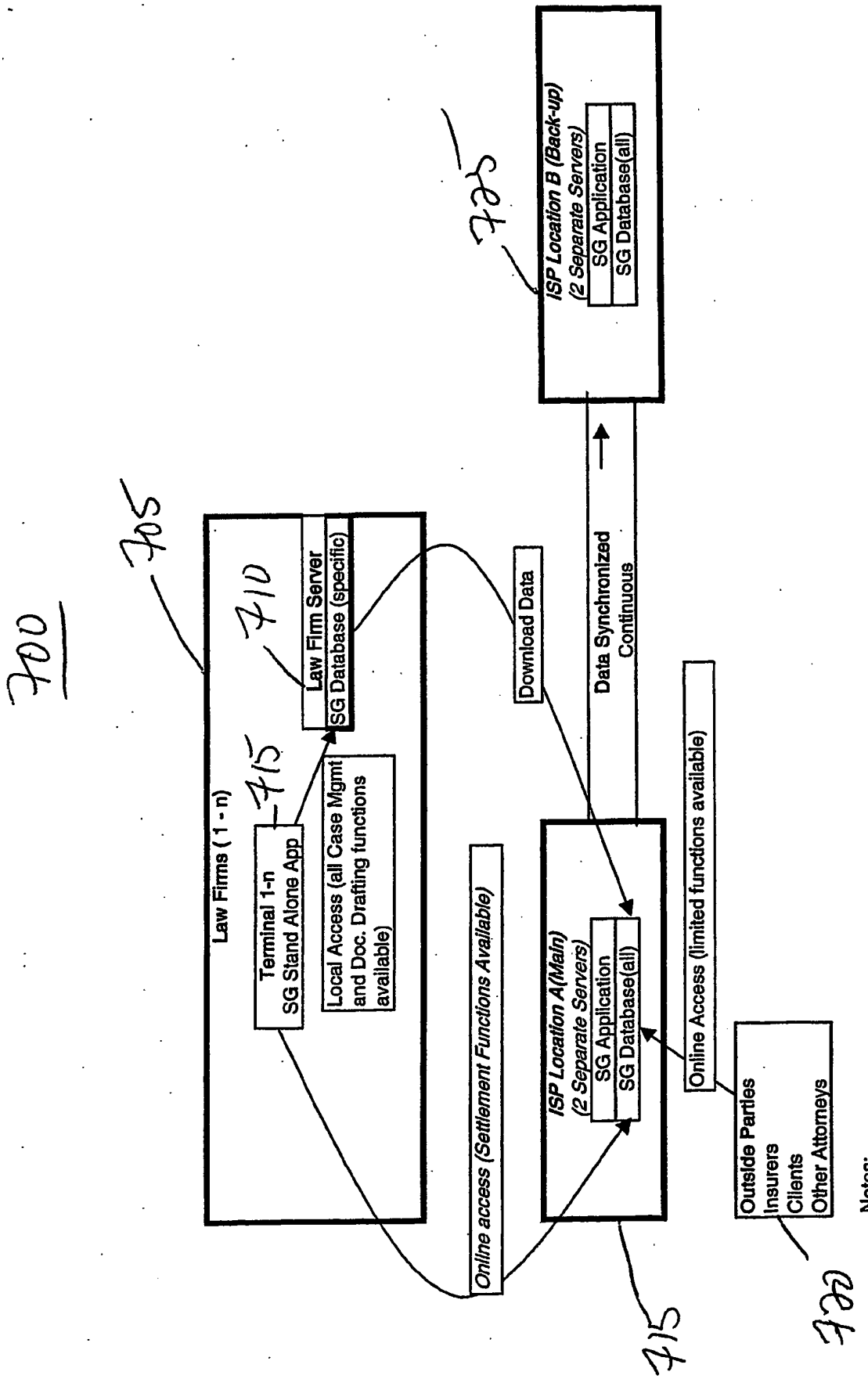



Fig. 7



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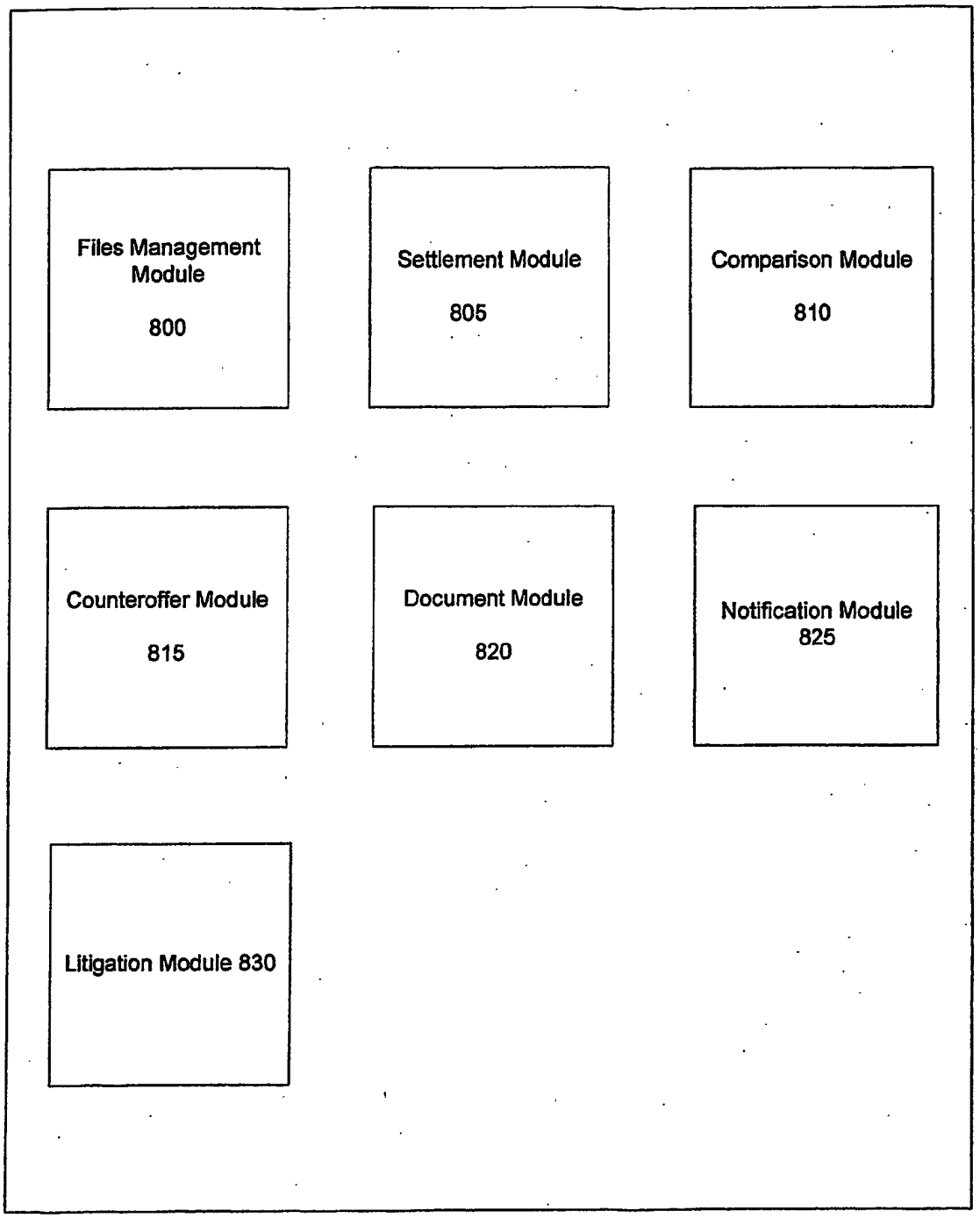



Figure 8



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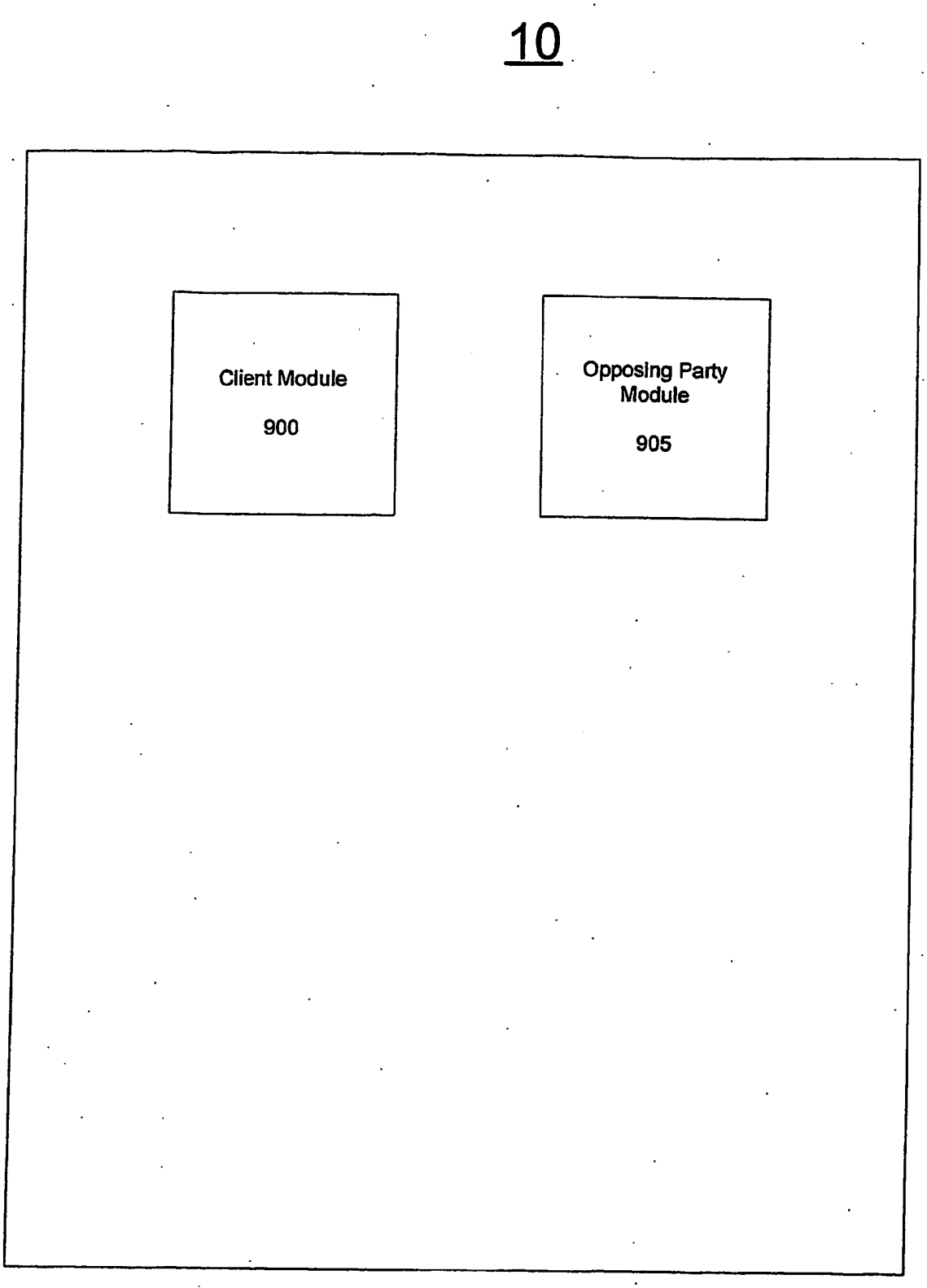



Figure 9a



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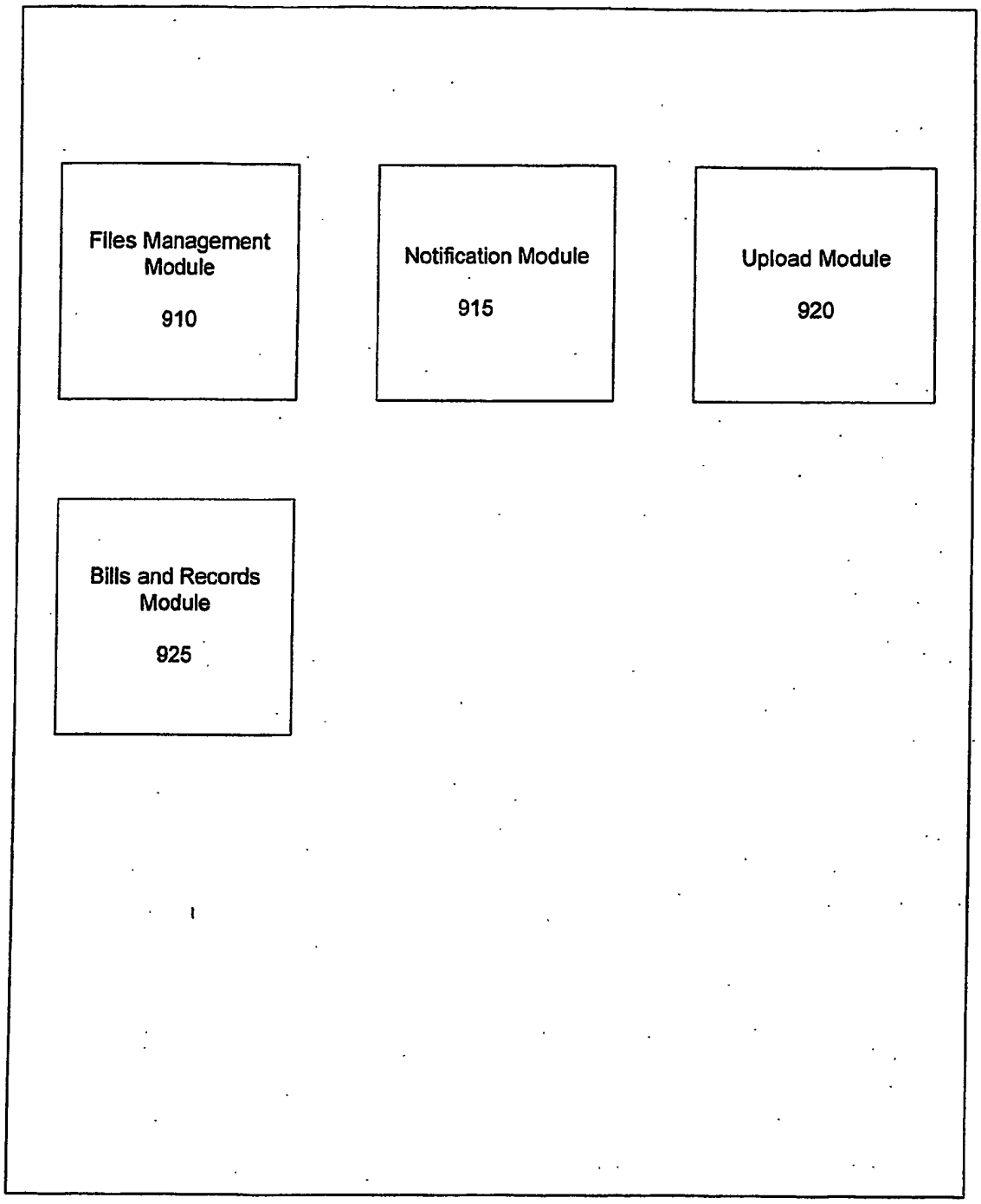



Figure 9b



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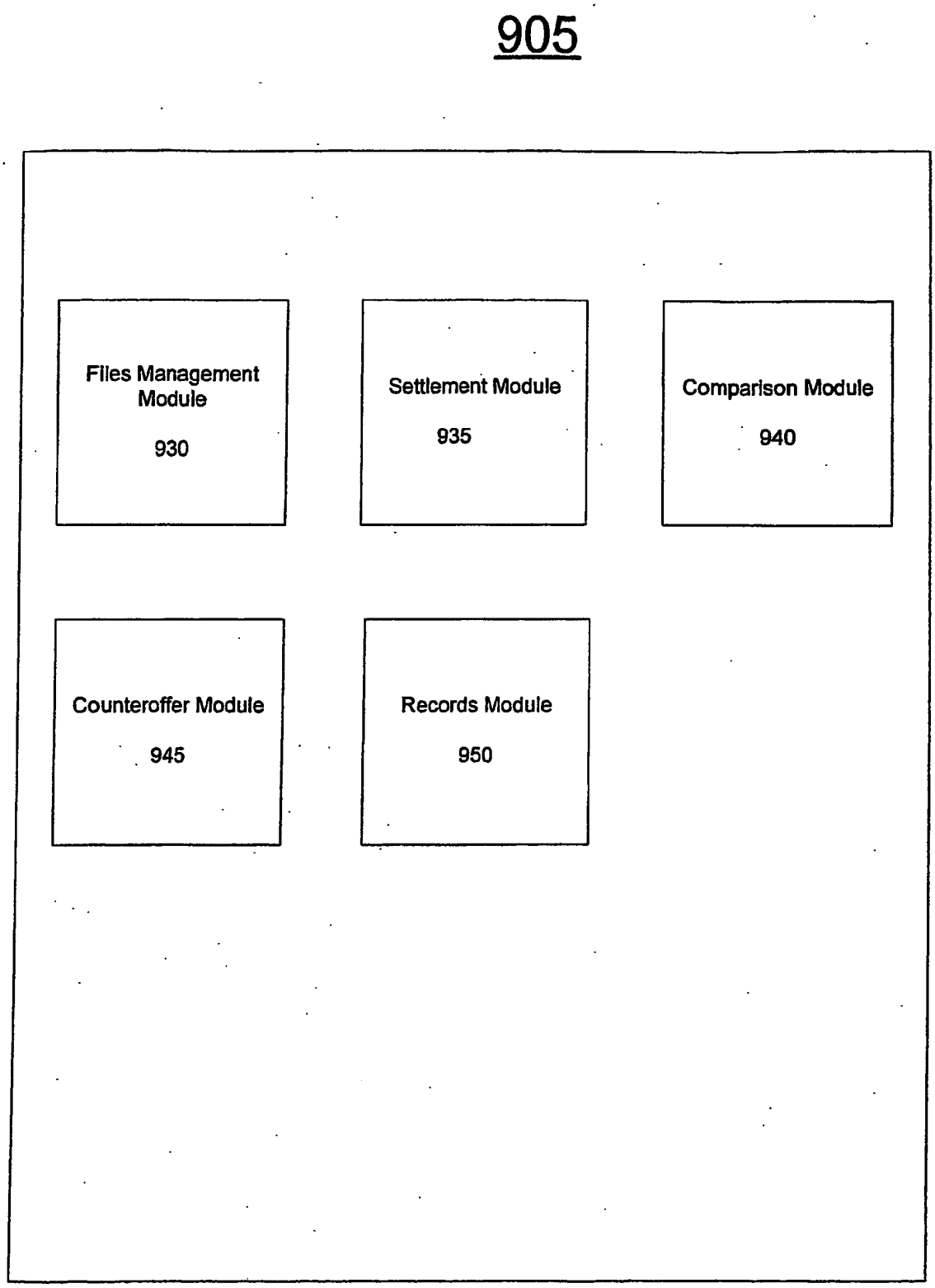



Figure 9c



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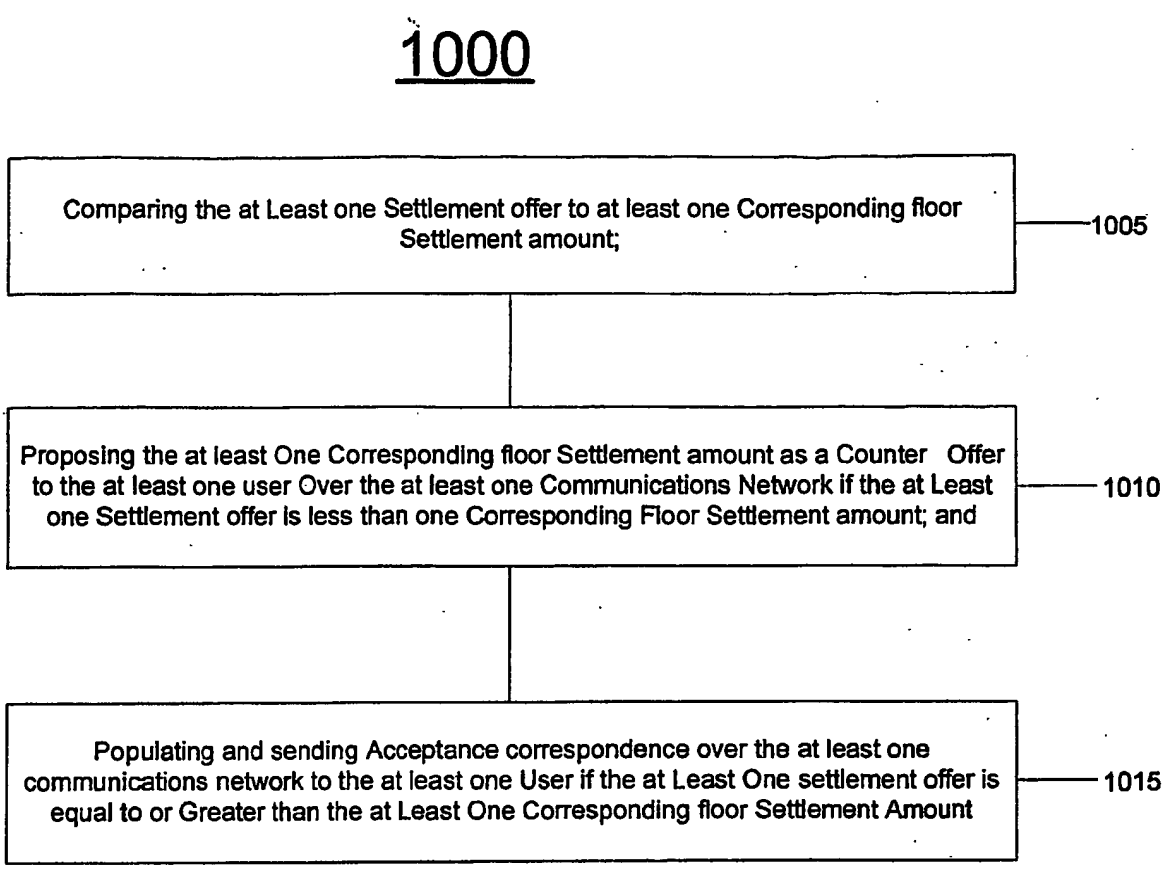



Figure 10



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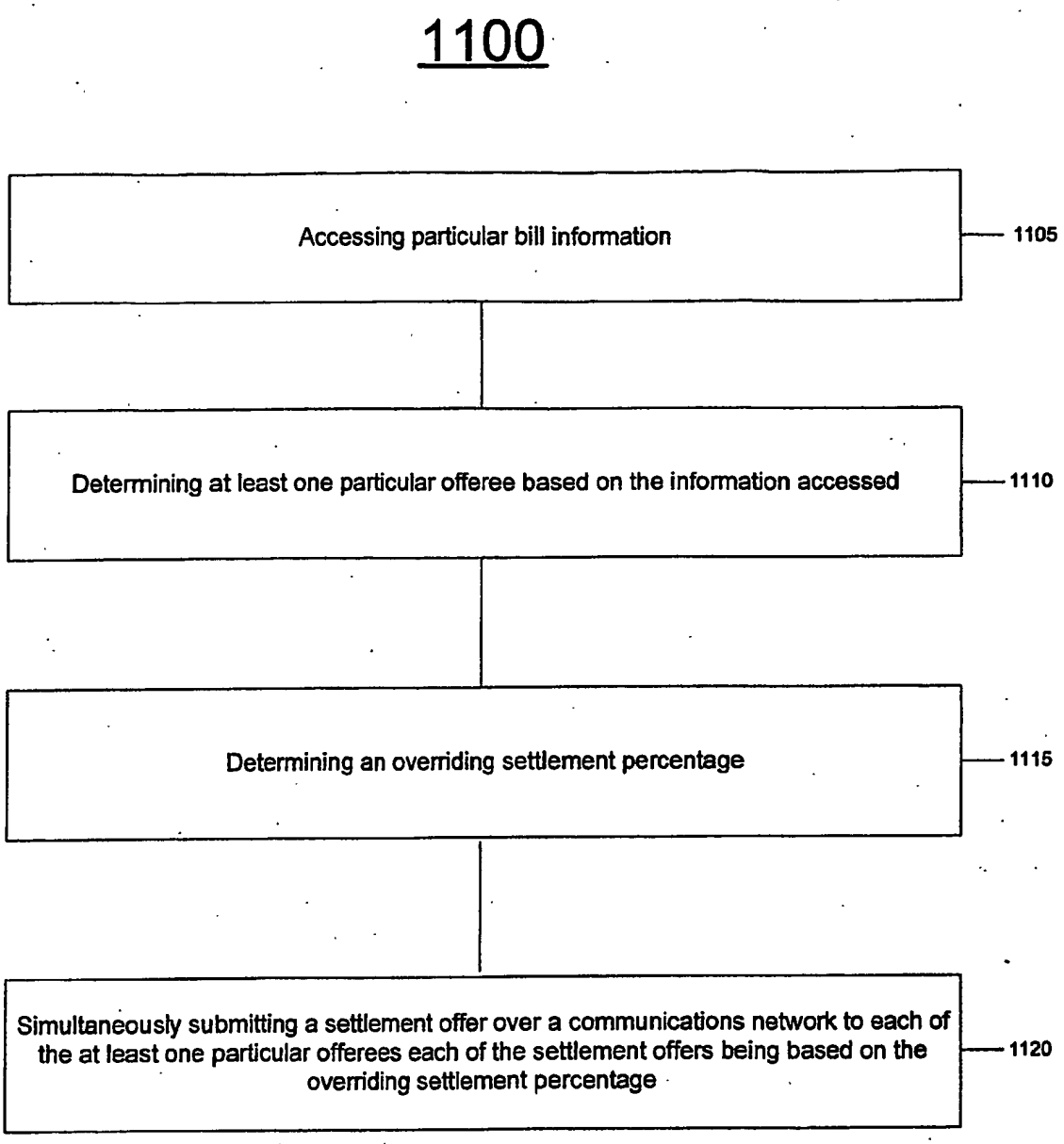



Figure 11



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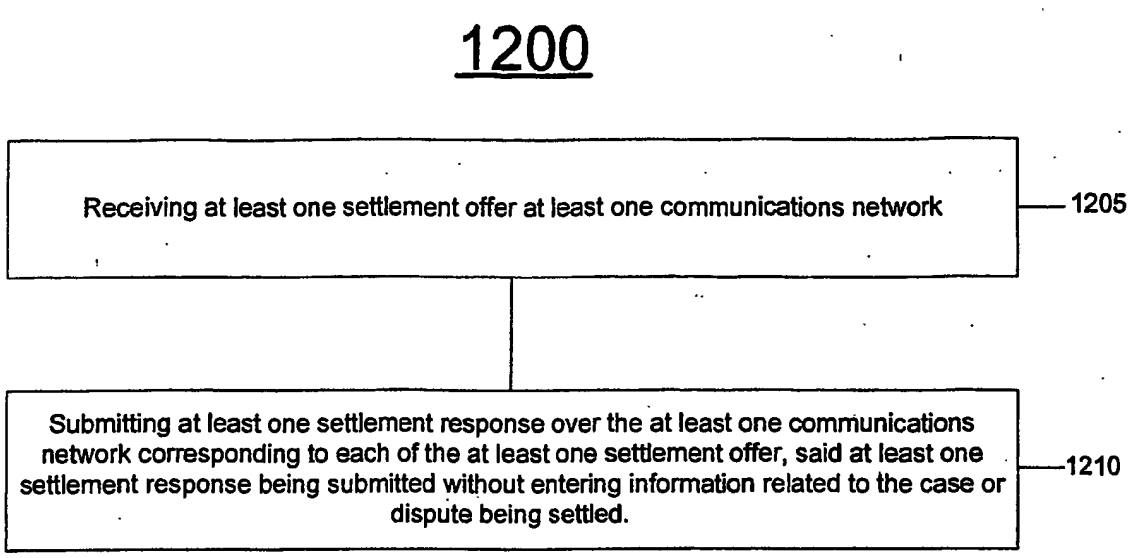



Figure 12



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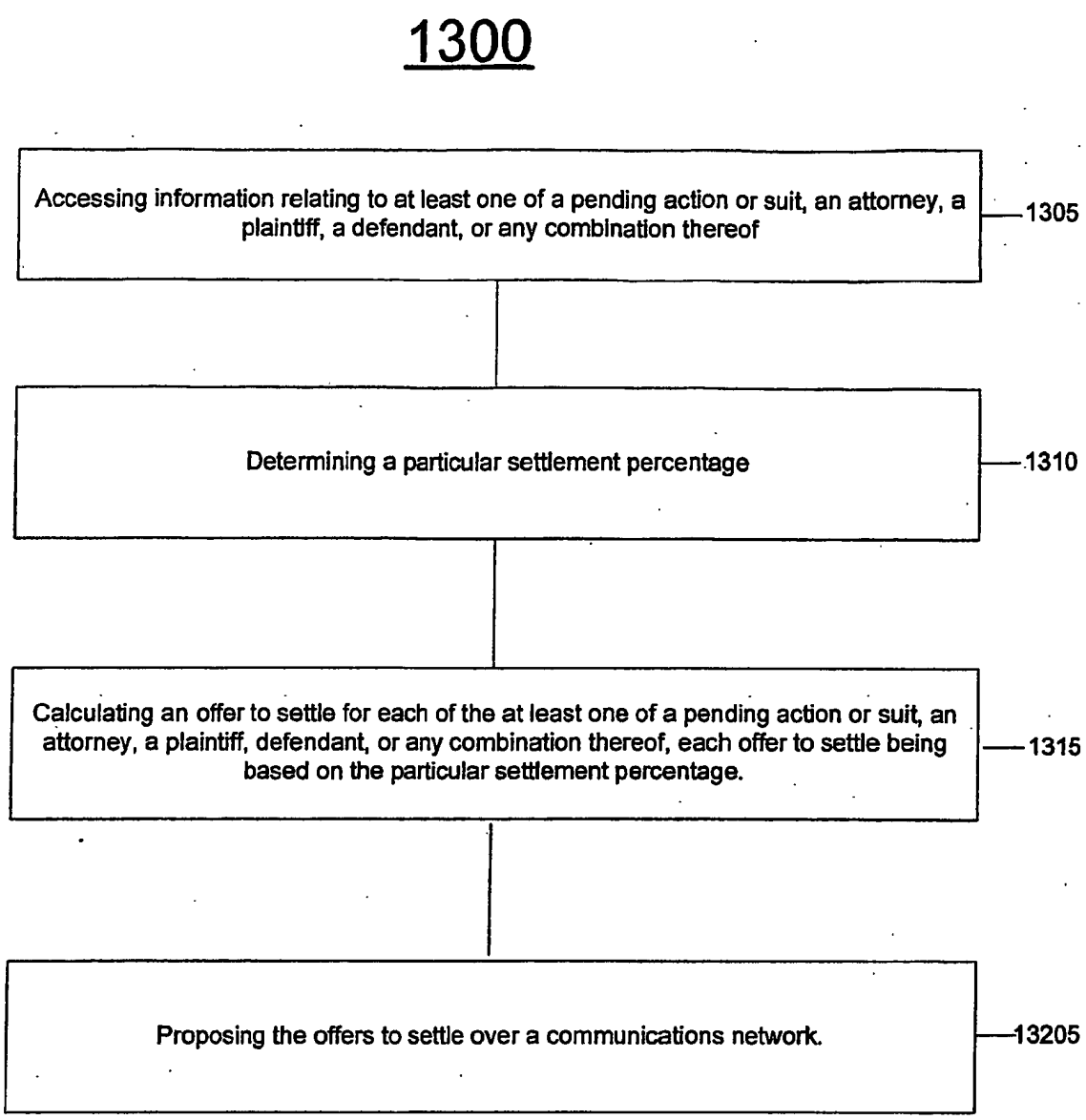



Figure 13



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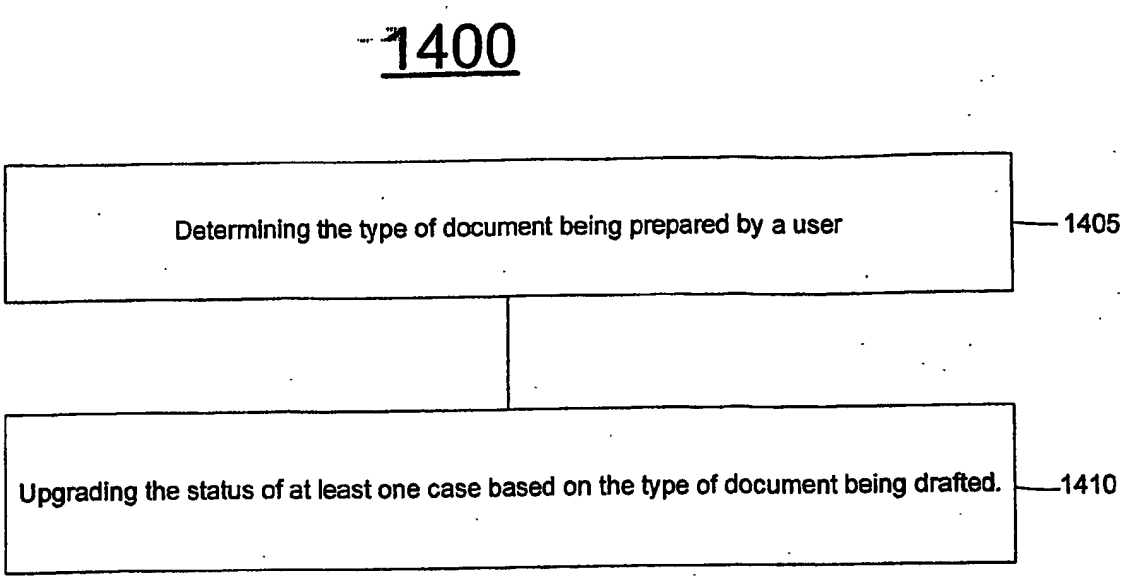



Figure 14



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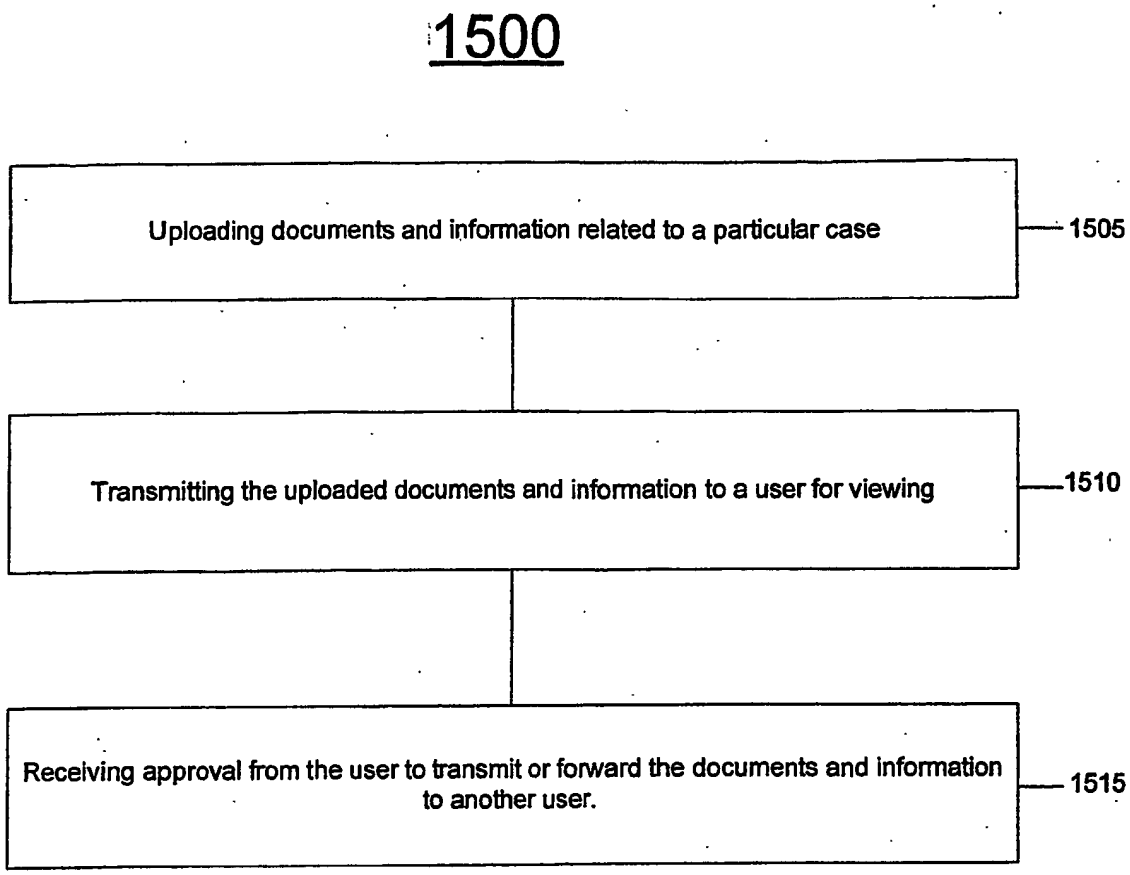



Figure 15



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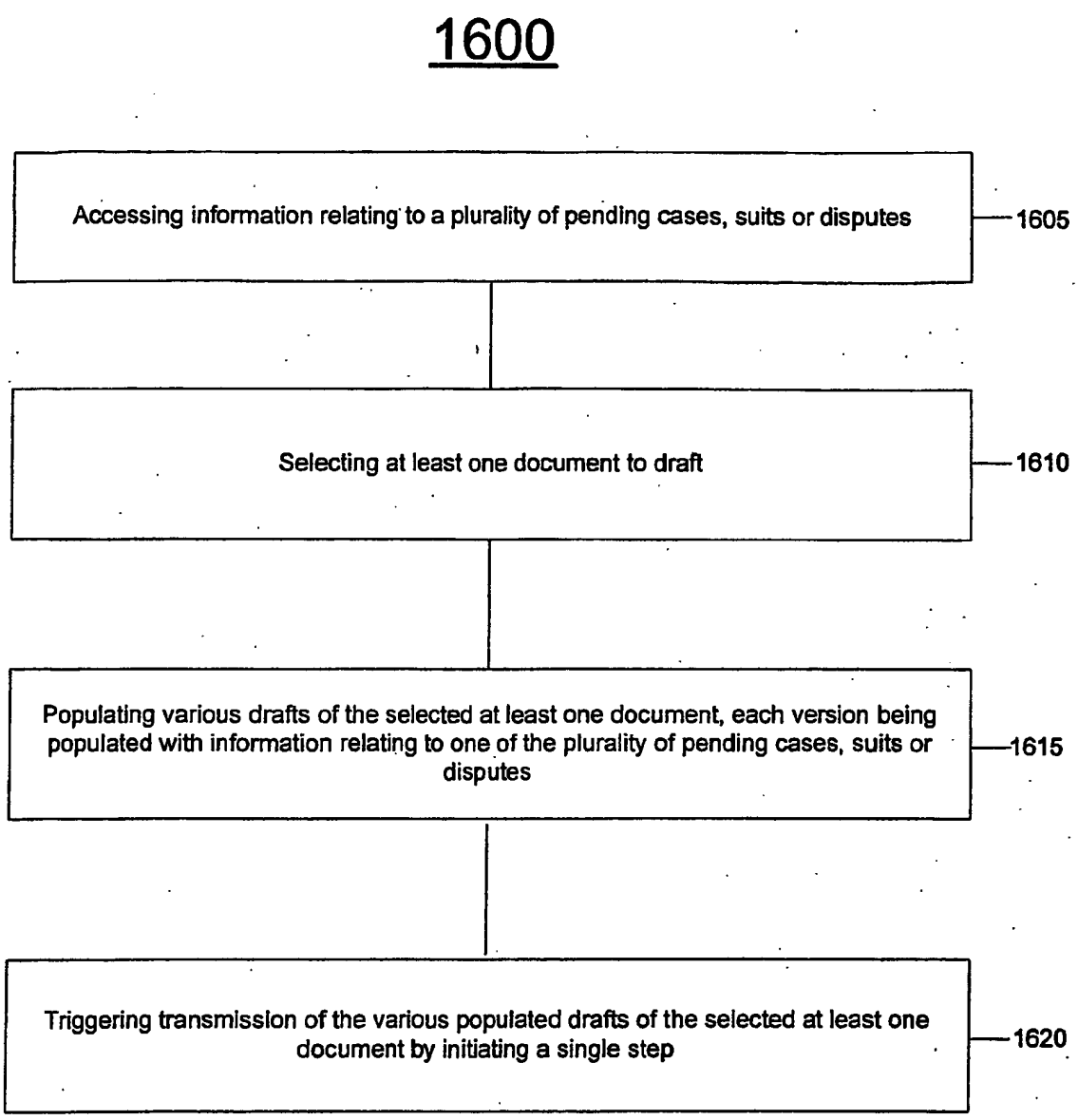



Figure 16



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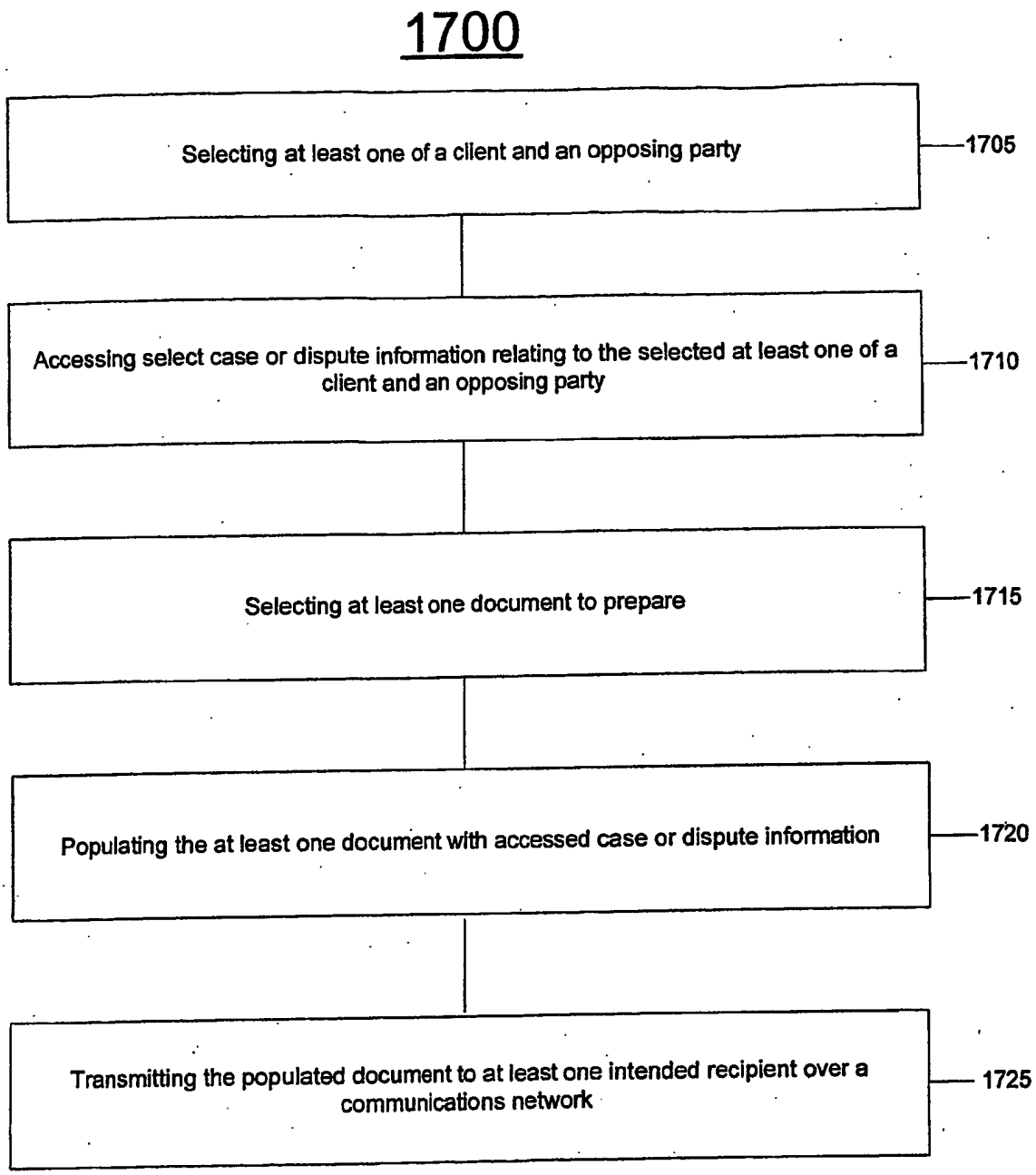



Figure 17



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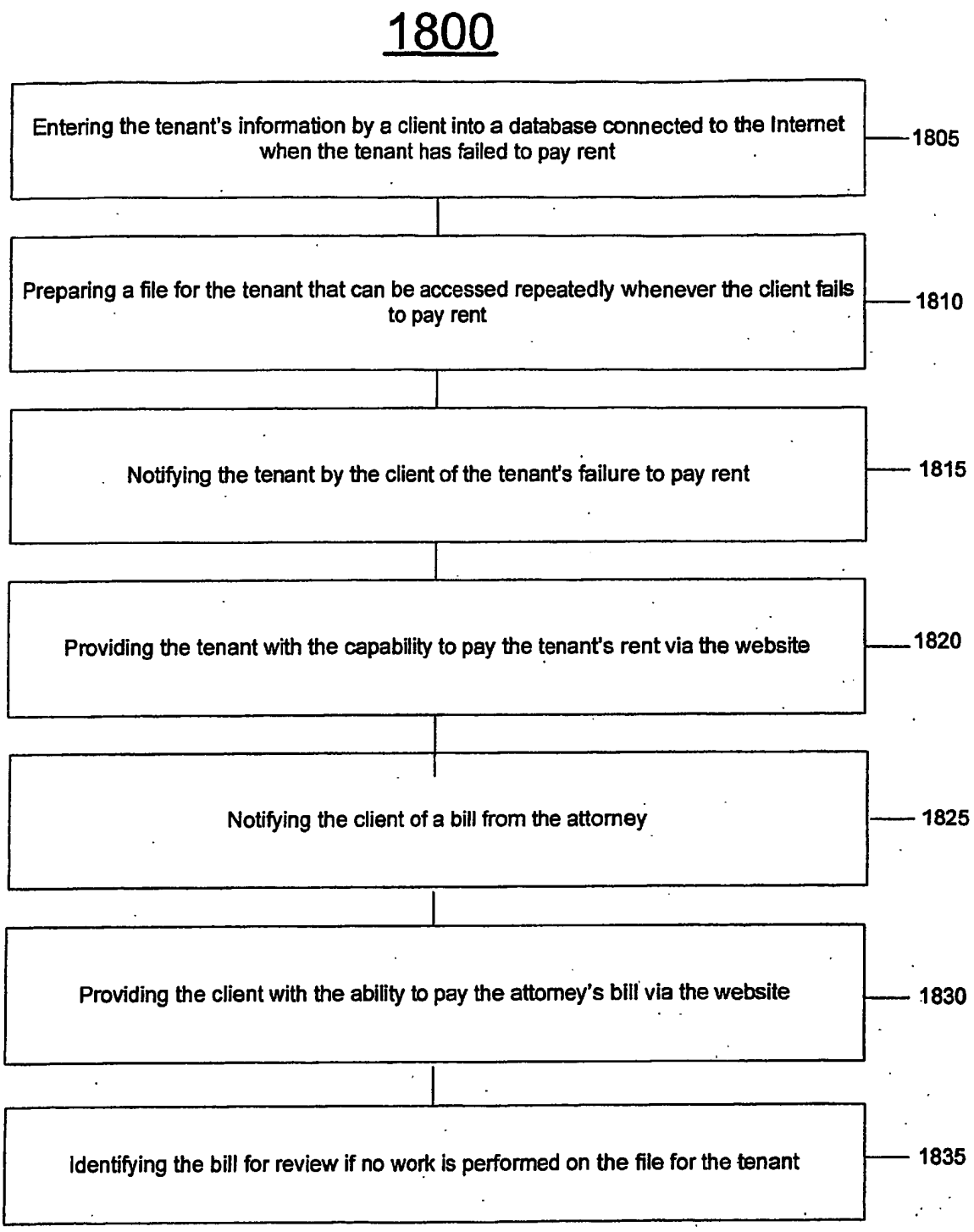



Figure 18



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Fig. 19



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Settlements Galore
THE PASSAIC SETTLEMENT FOUNDATION
Logout
Powered by
HOME
CLIENTS/FILES
SETTLEMENT OFFERS
REPORTS
DIRECTORY
MANAGE
VIEW BY
Clients
Pending
DISPLAY CLIENT
Select
CLIENTS
Client Name
Client ID
Total Files
Total Amount($)
Total Settlements
Contact
View Client Info
View Client Files

Fig. 20

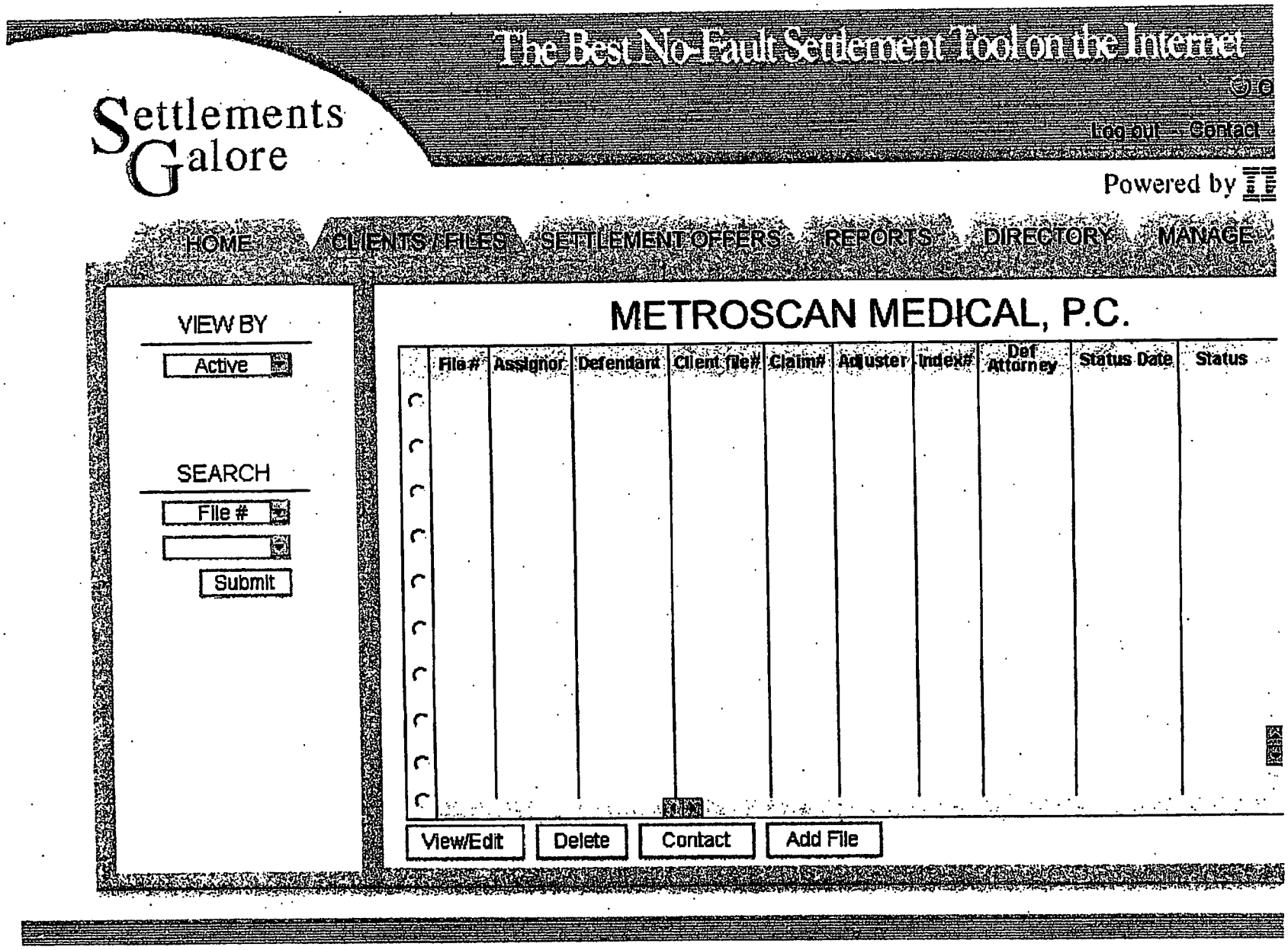



Fig. 21



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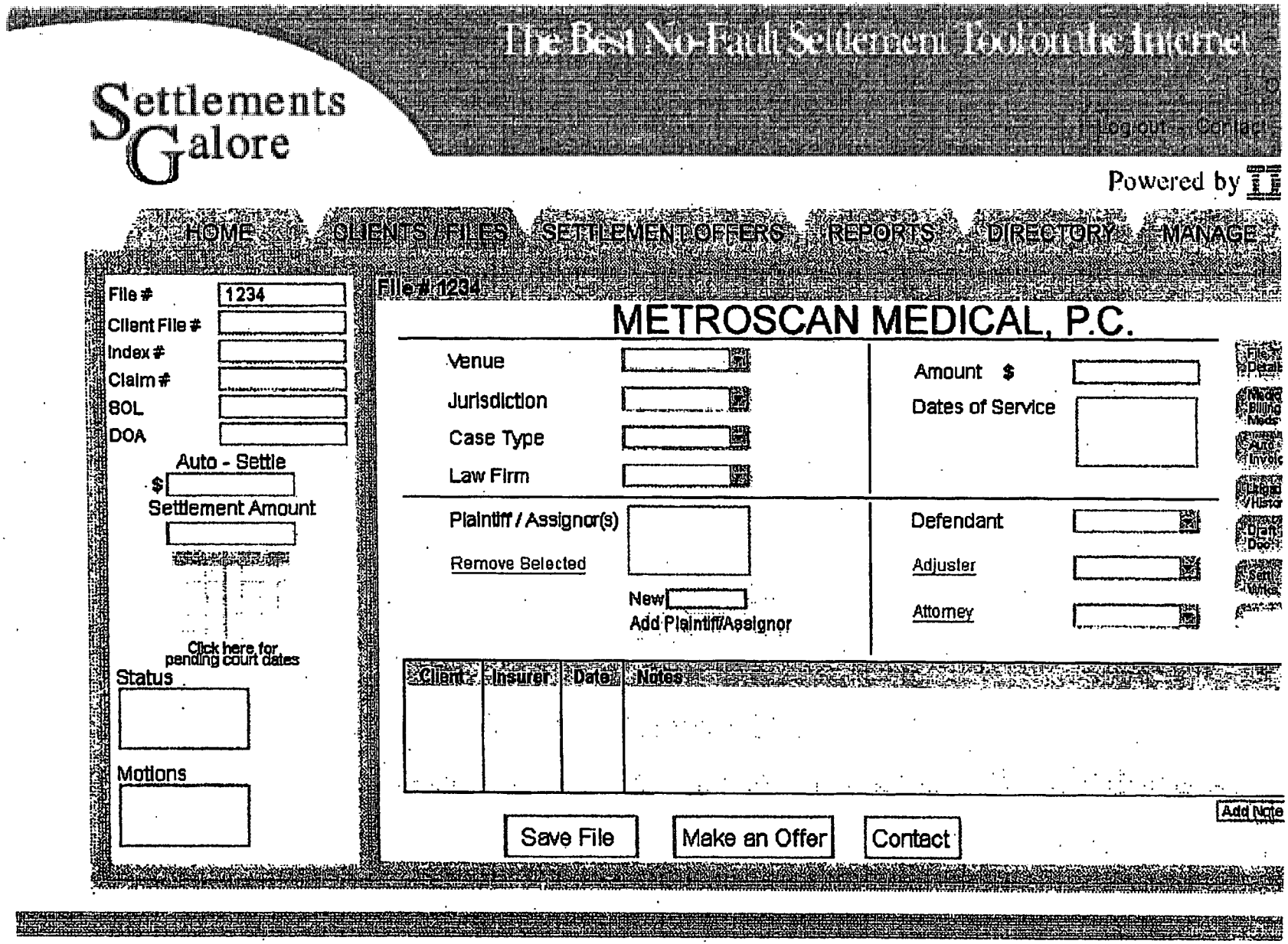



Fig 22



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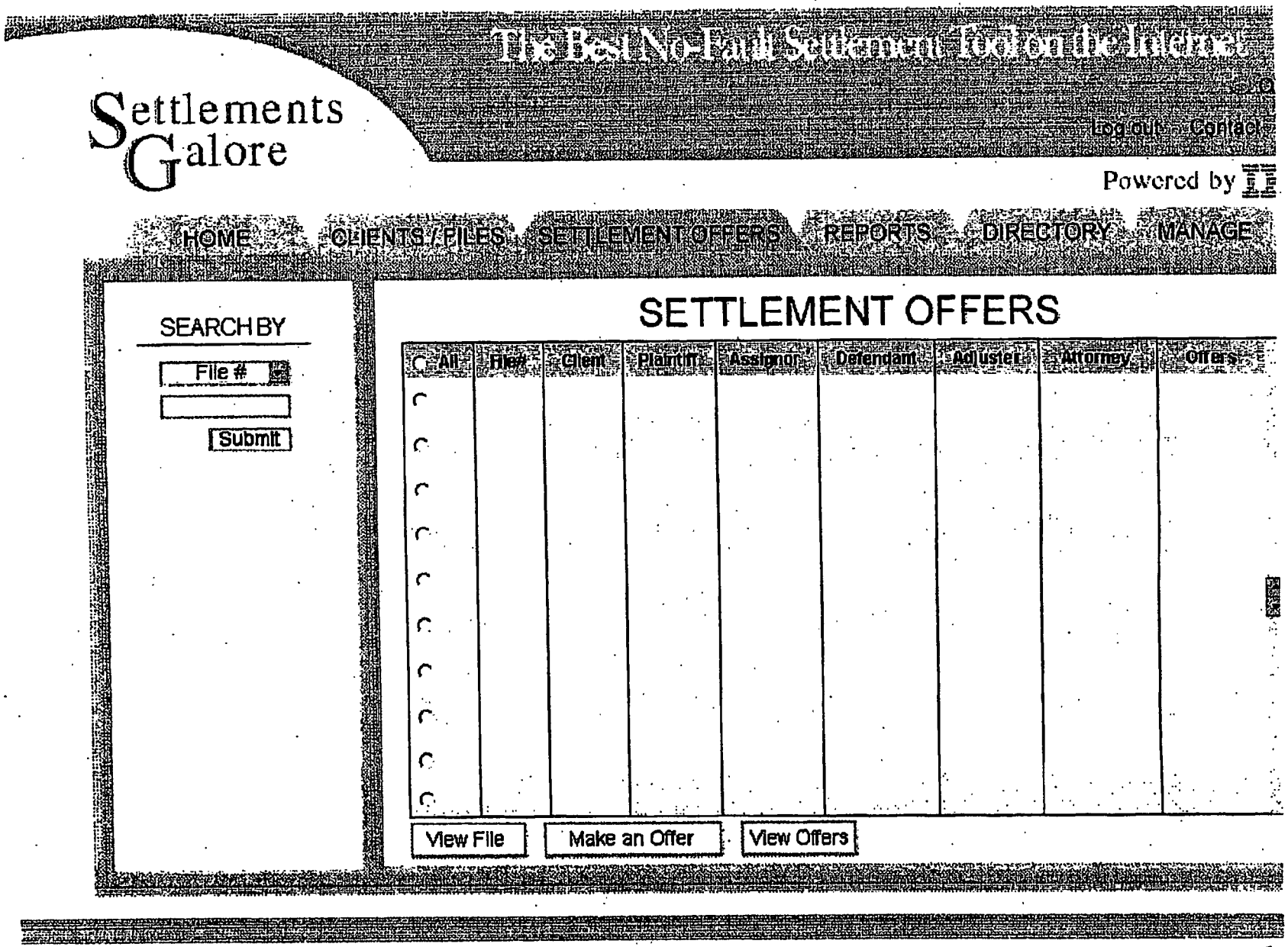



Fig 23

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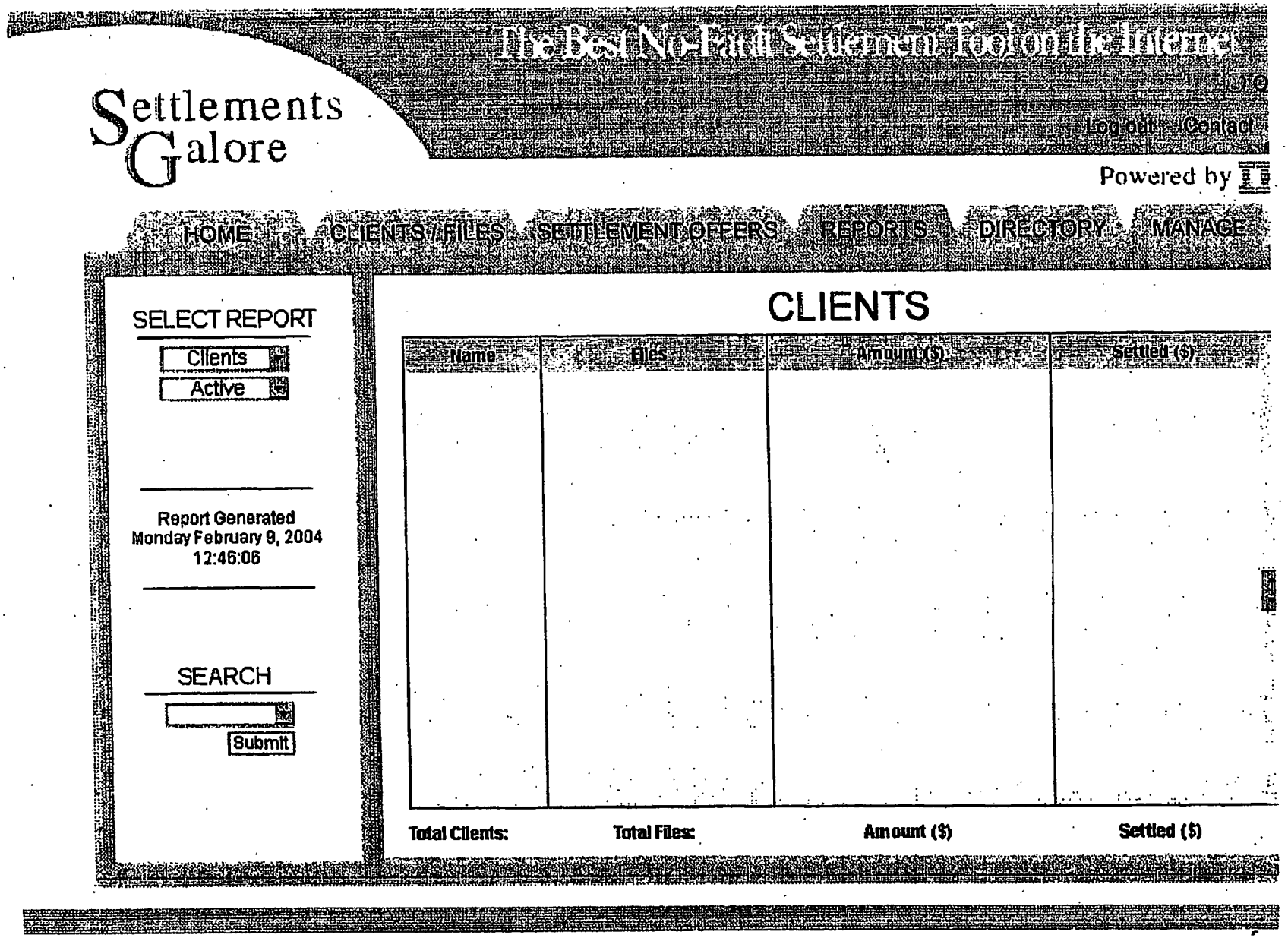



Fig. 24



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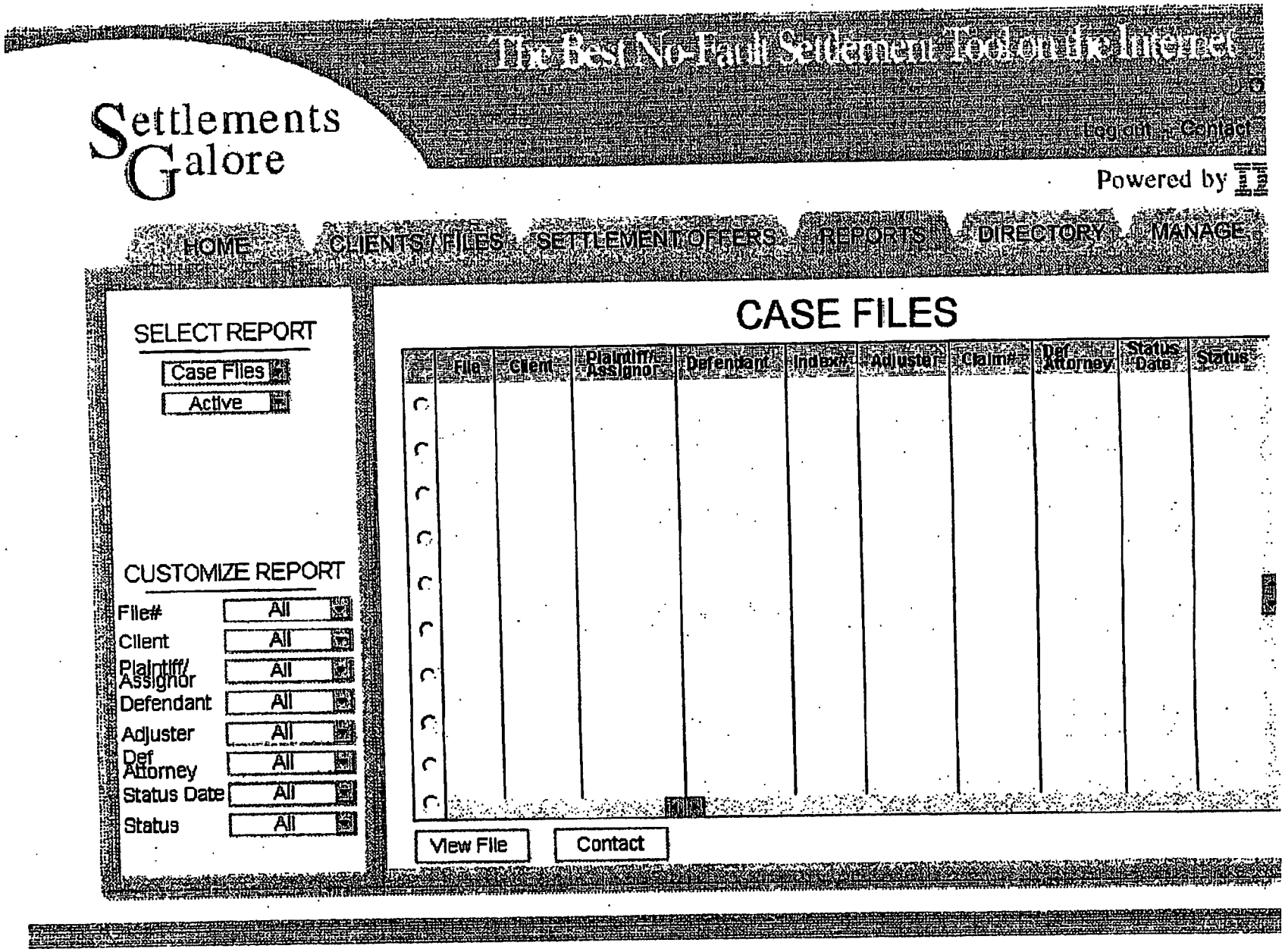



Fig. 25



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Fig. 26



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Fig. 27



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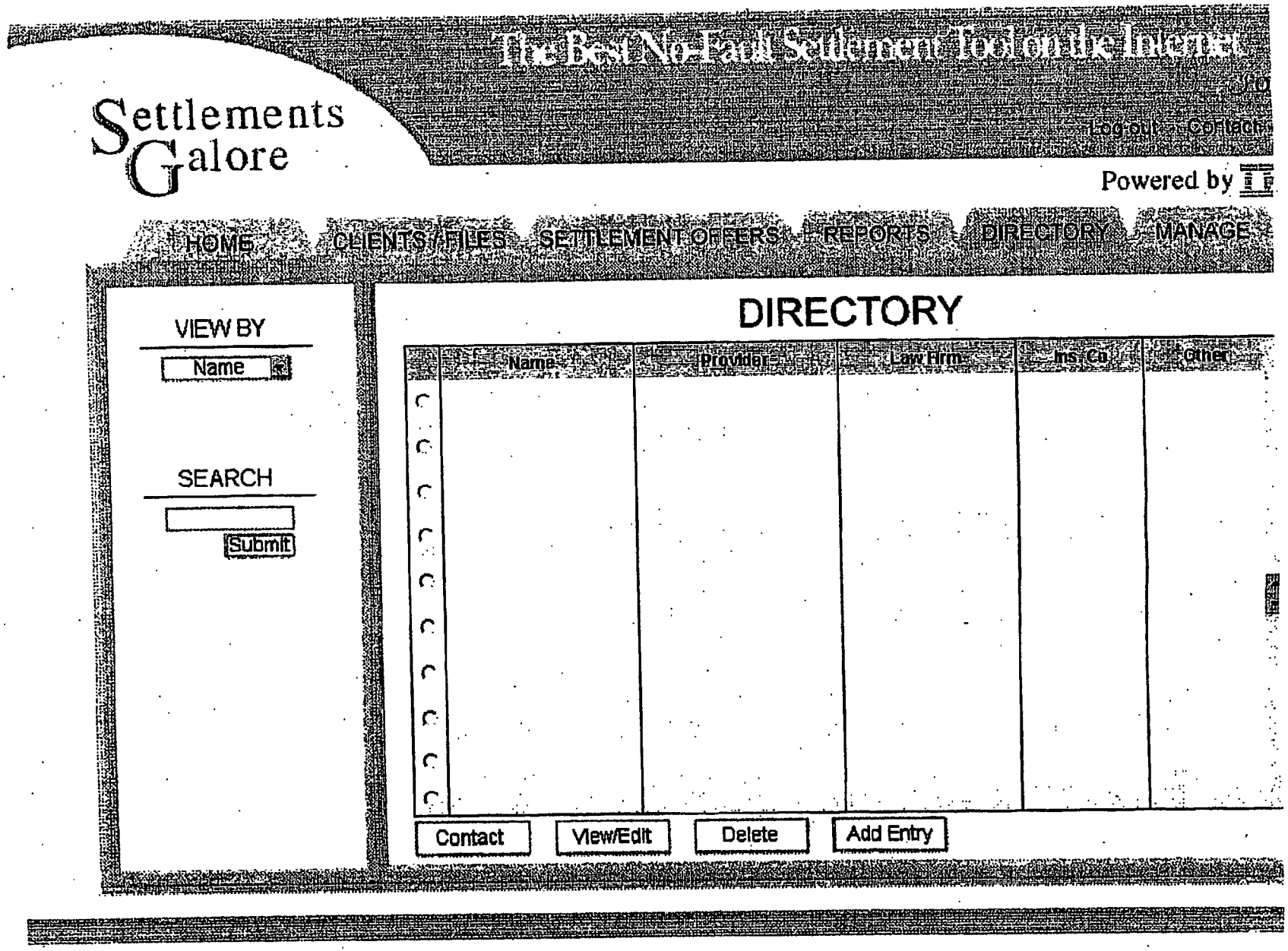



Fig. 28



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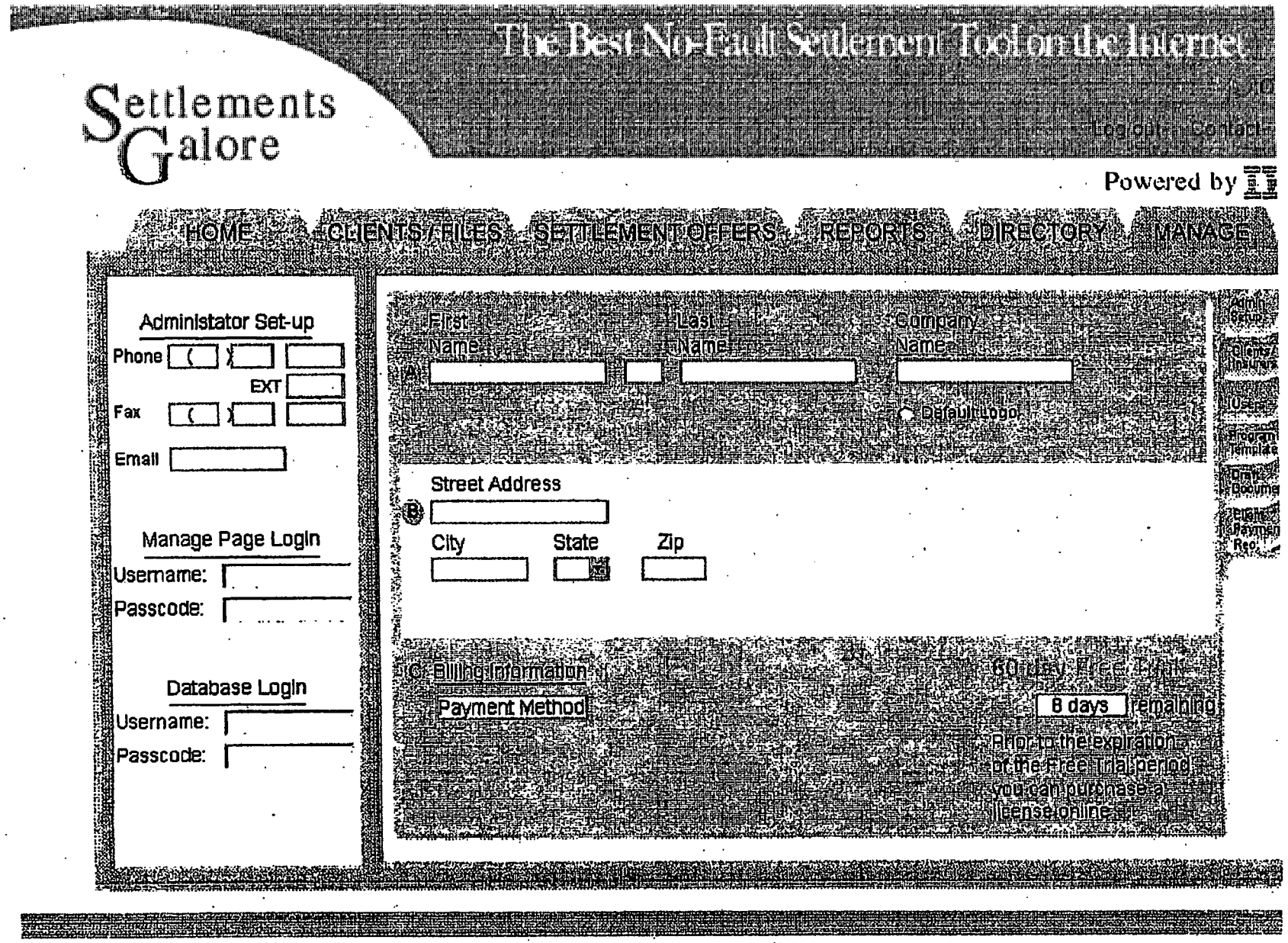



Fig. 29



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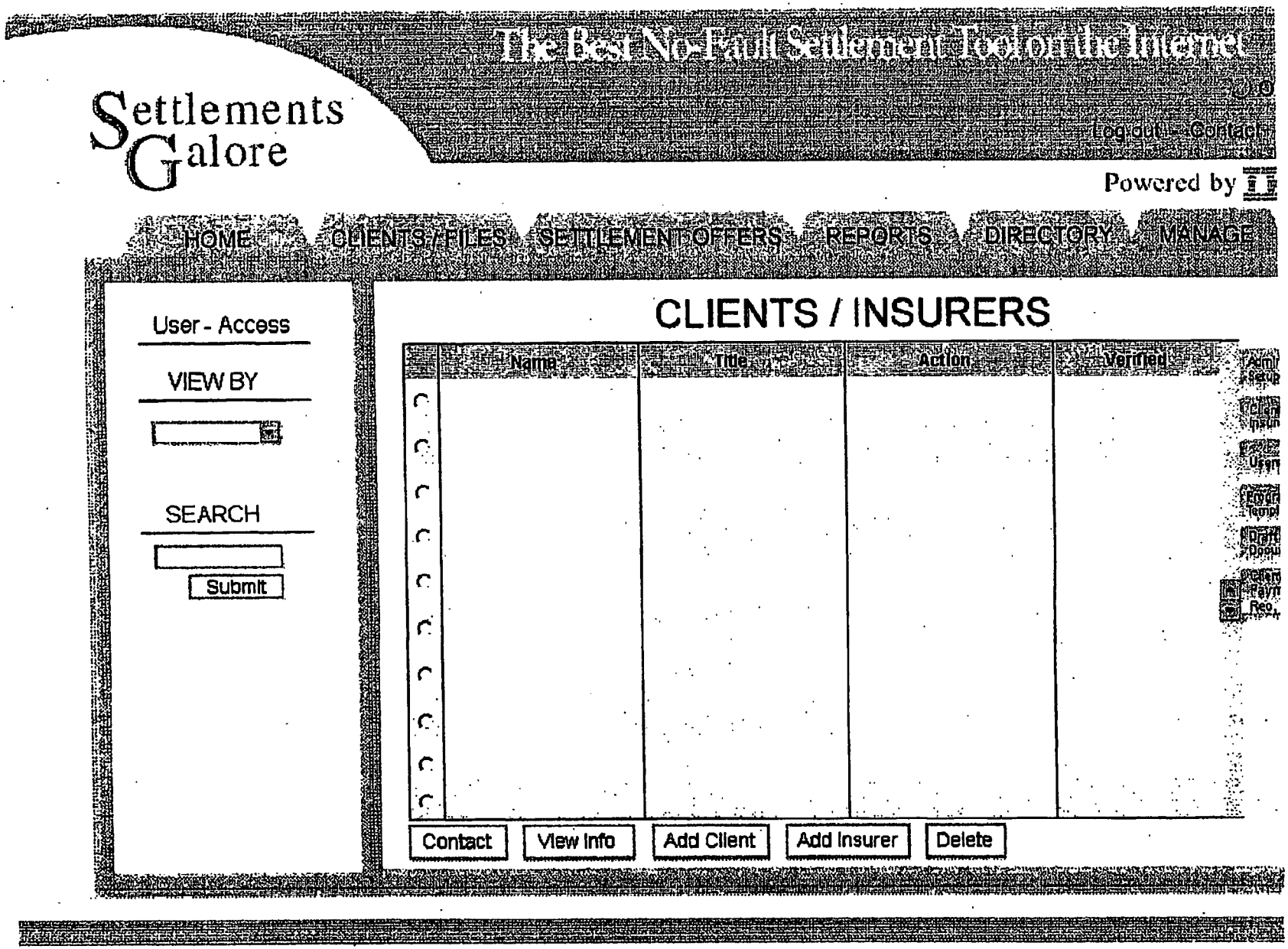



Fig. 30



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Fig. 31



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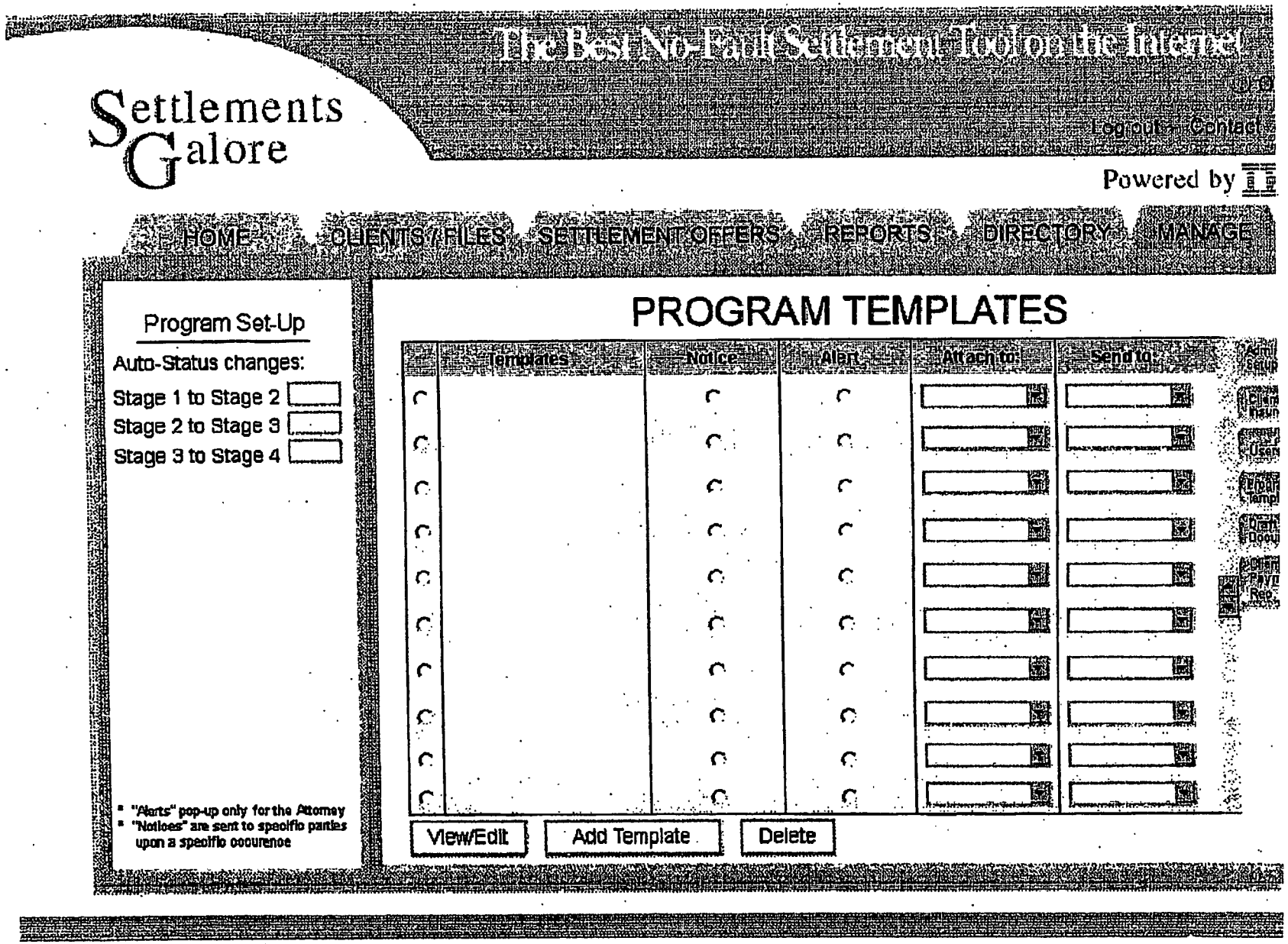



Fig-32



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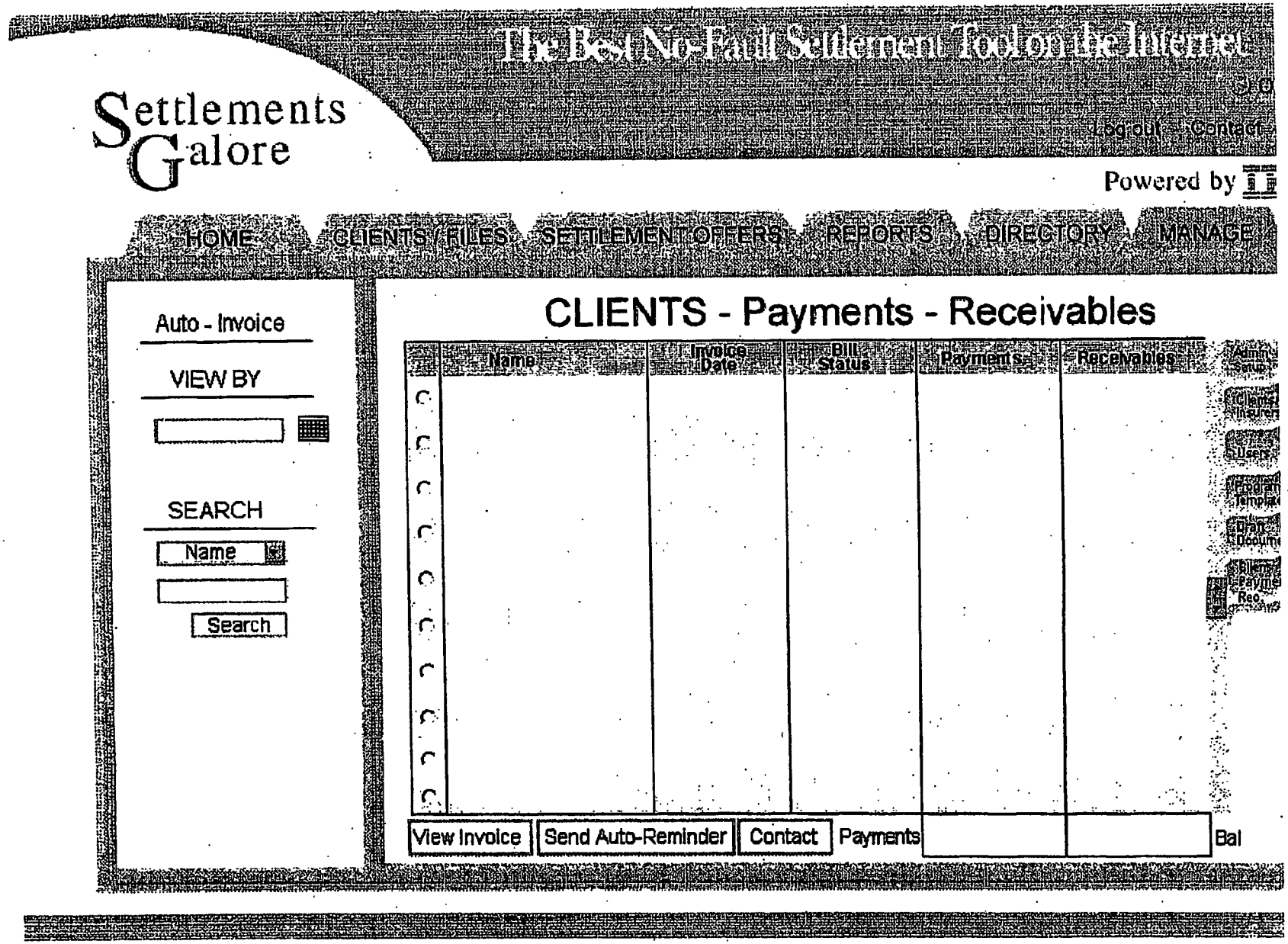



Fig. 33



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Fig. 34



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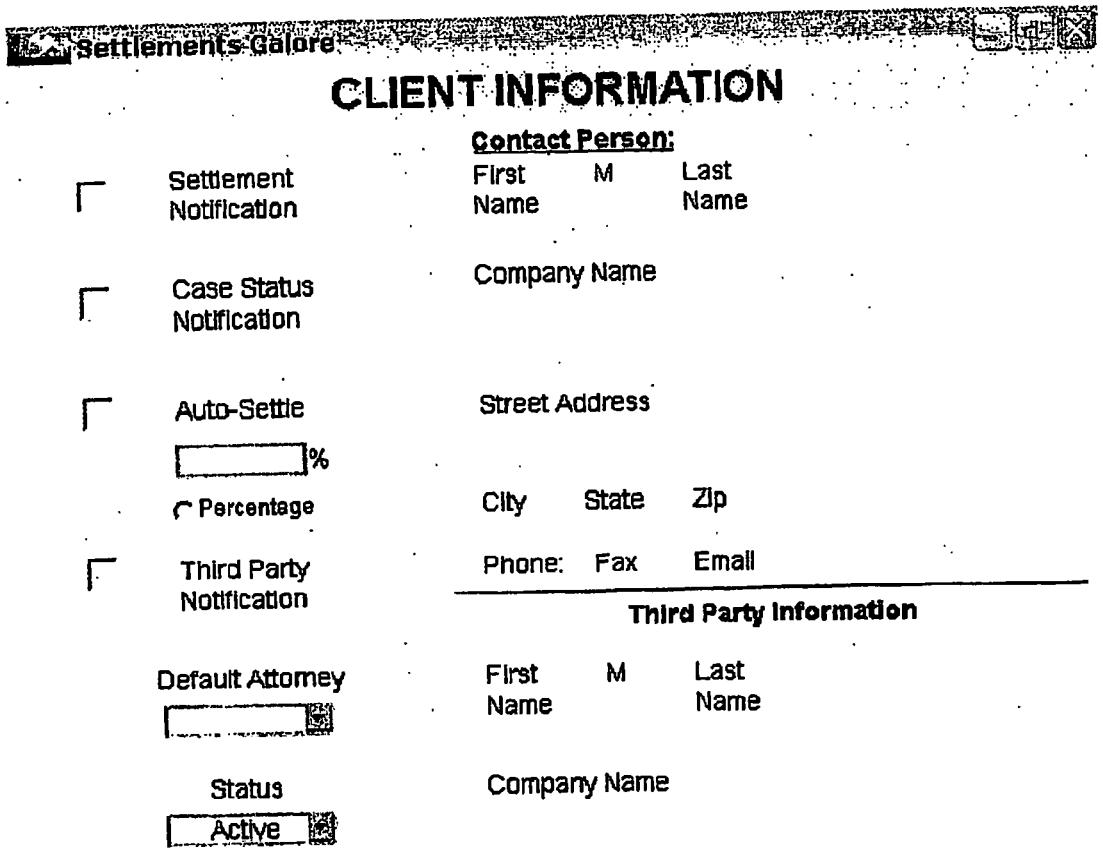



Fig. 35



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Fig 36



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Fig. 31



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Fig. 38



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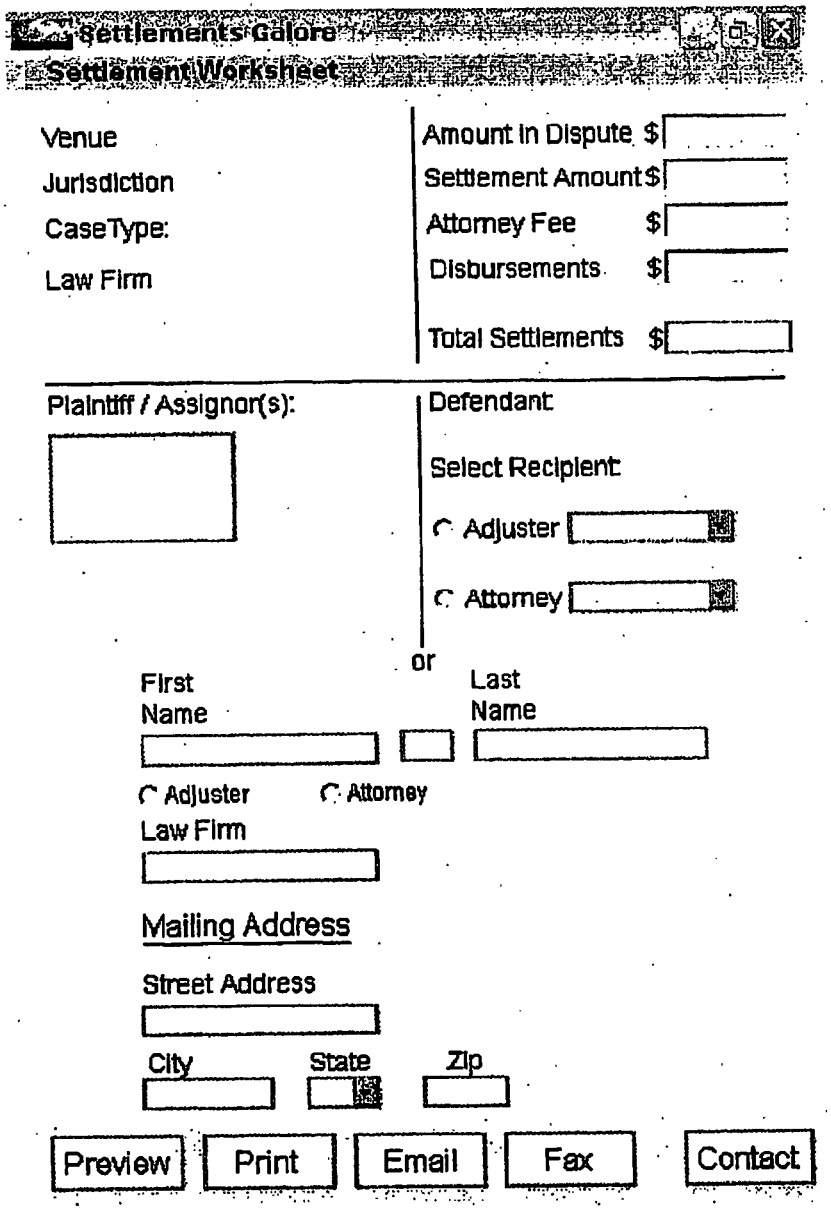



Fig. 39



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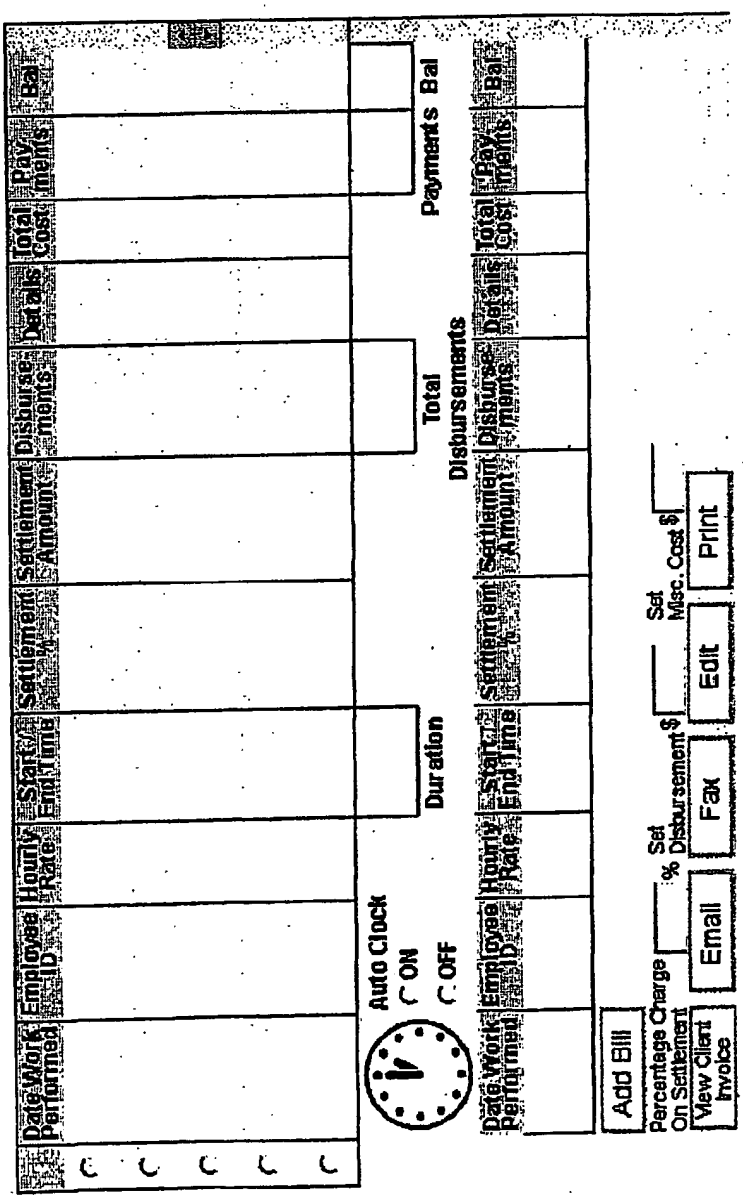



Fig. 40



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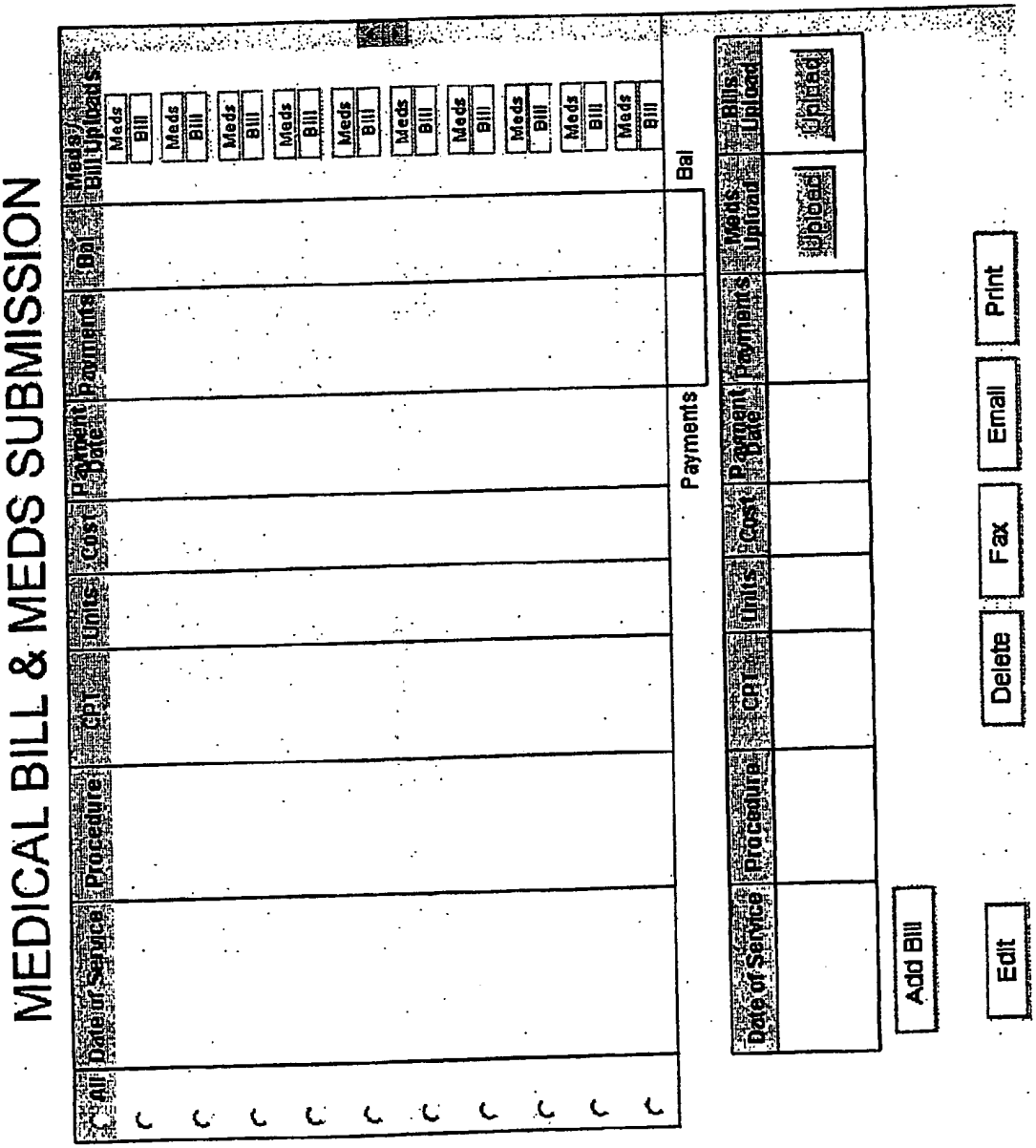



Fig. 41



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Fig. 42



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Fig. 43



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Fig. 44



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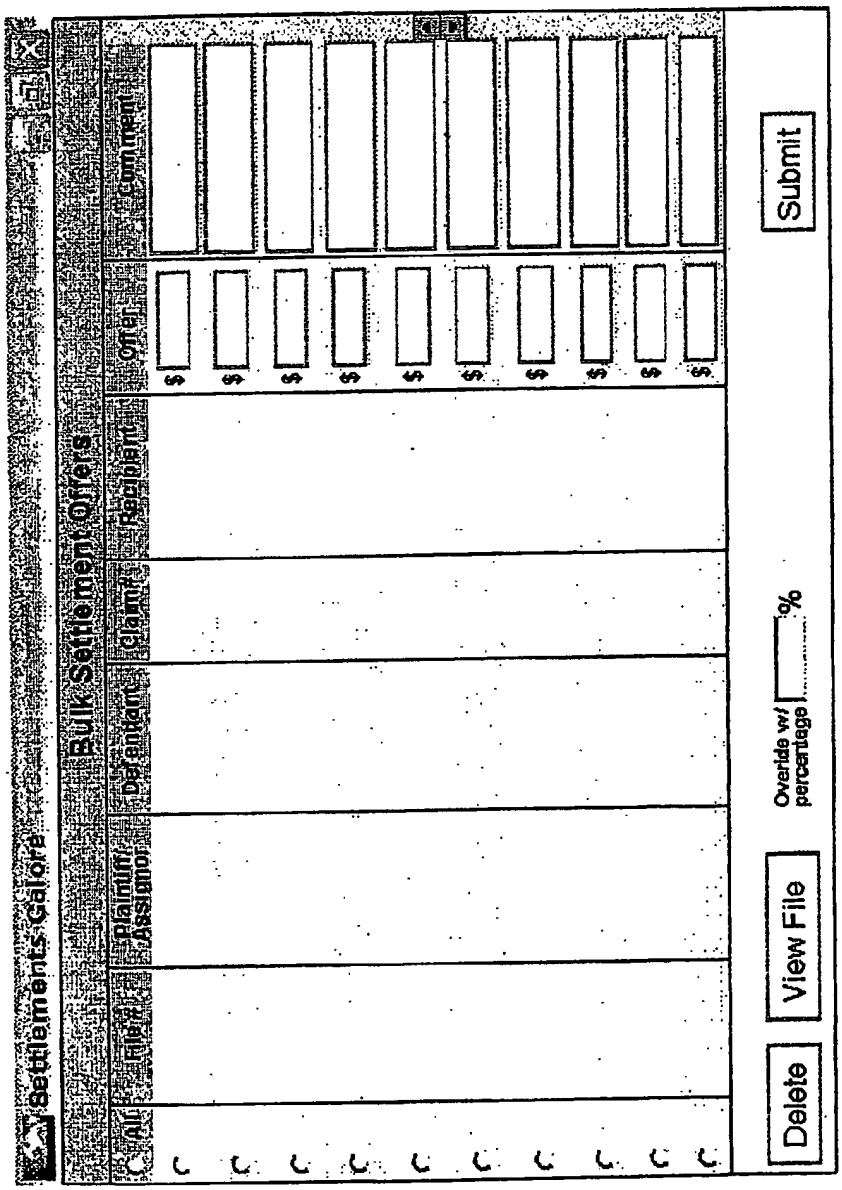



Fig. 45



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Fig. 46



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Fig. 47



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Fig. 48



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Fig. 49



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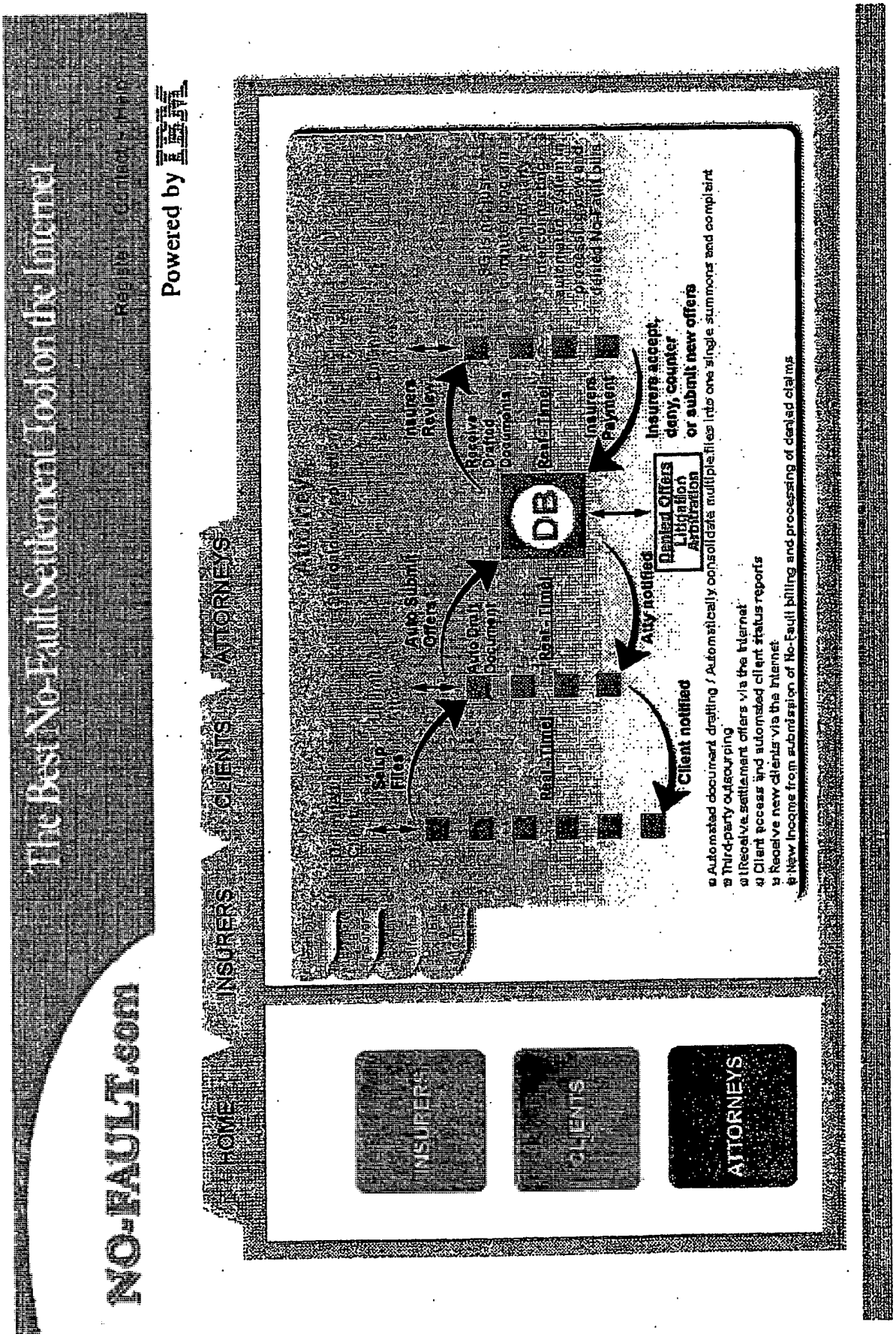



Fig. 5D



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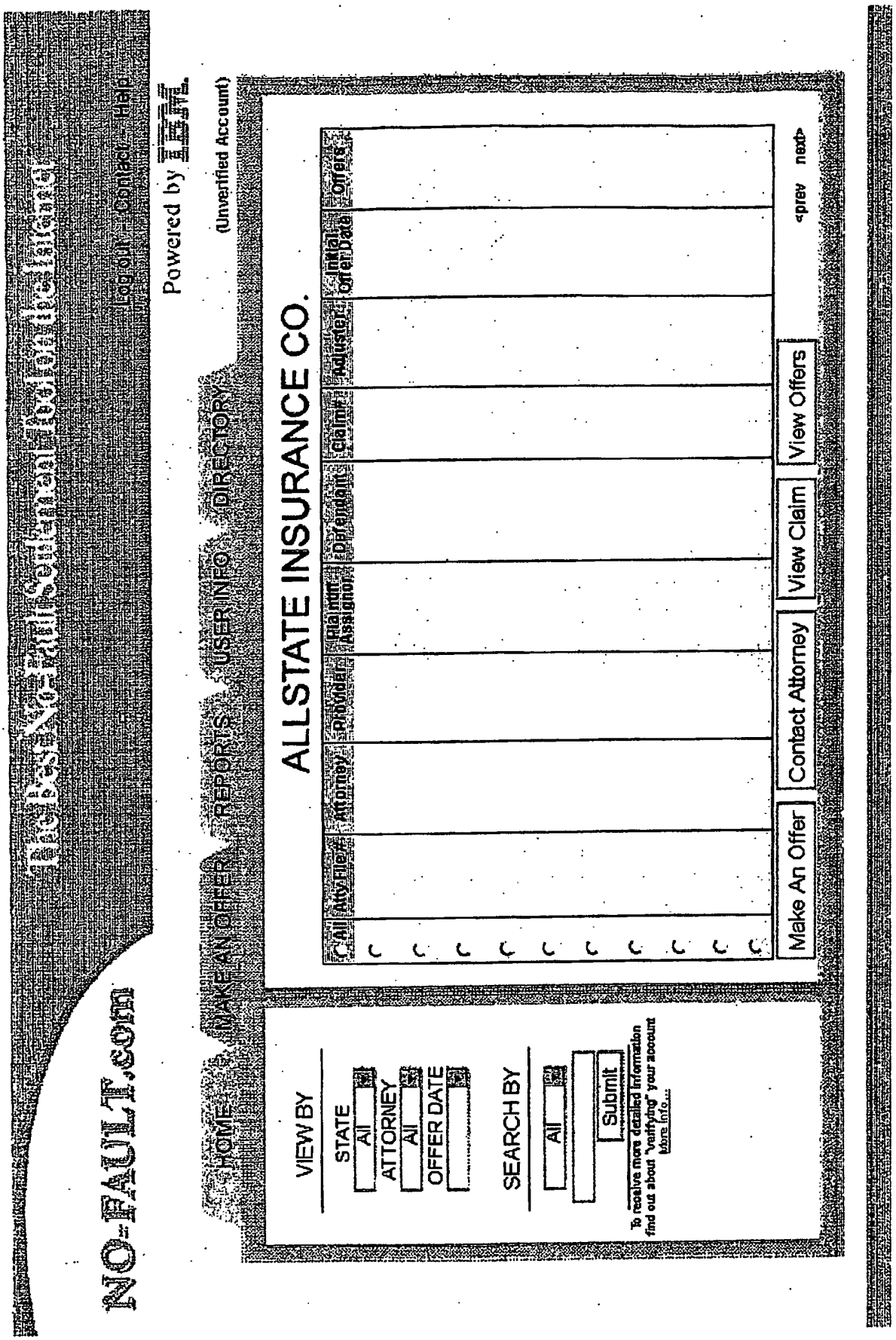



Fig. 51



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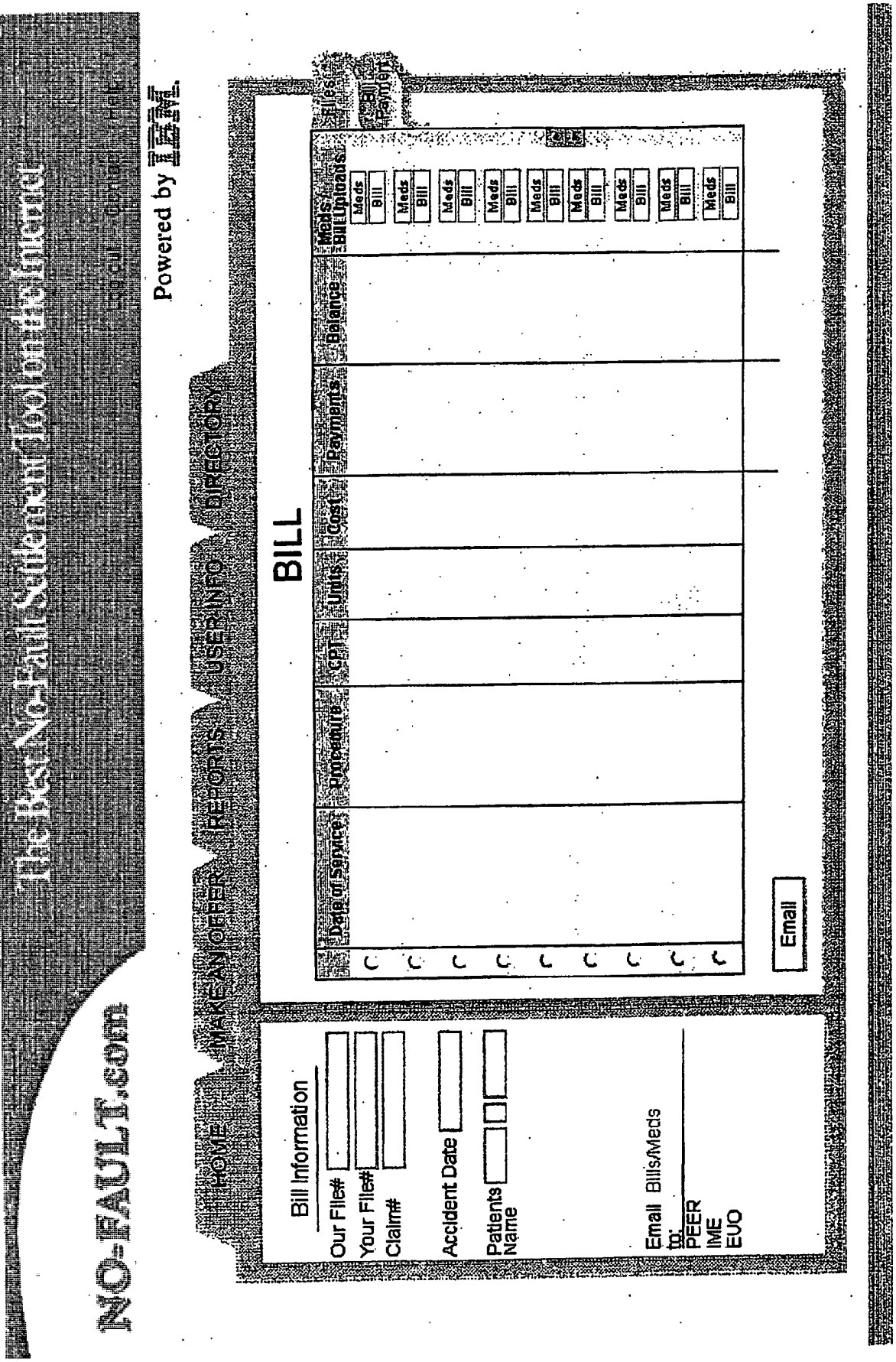



Fig. 52



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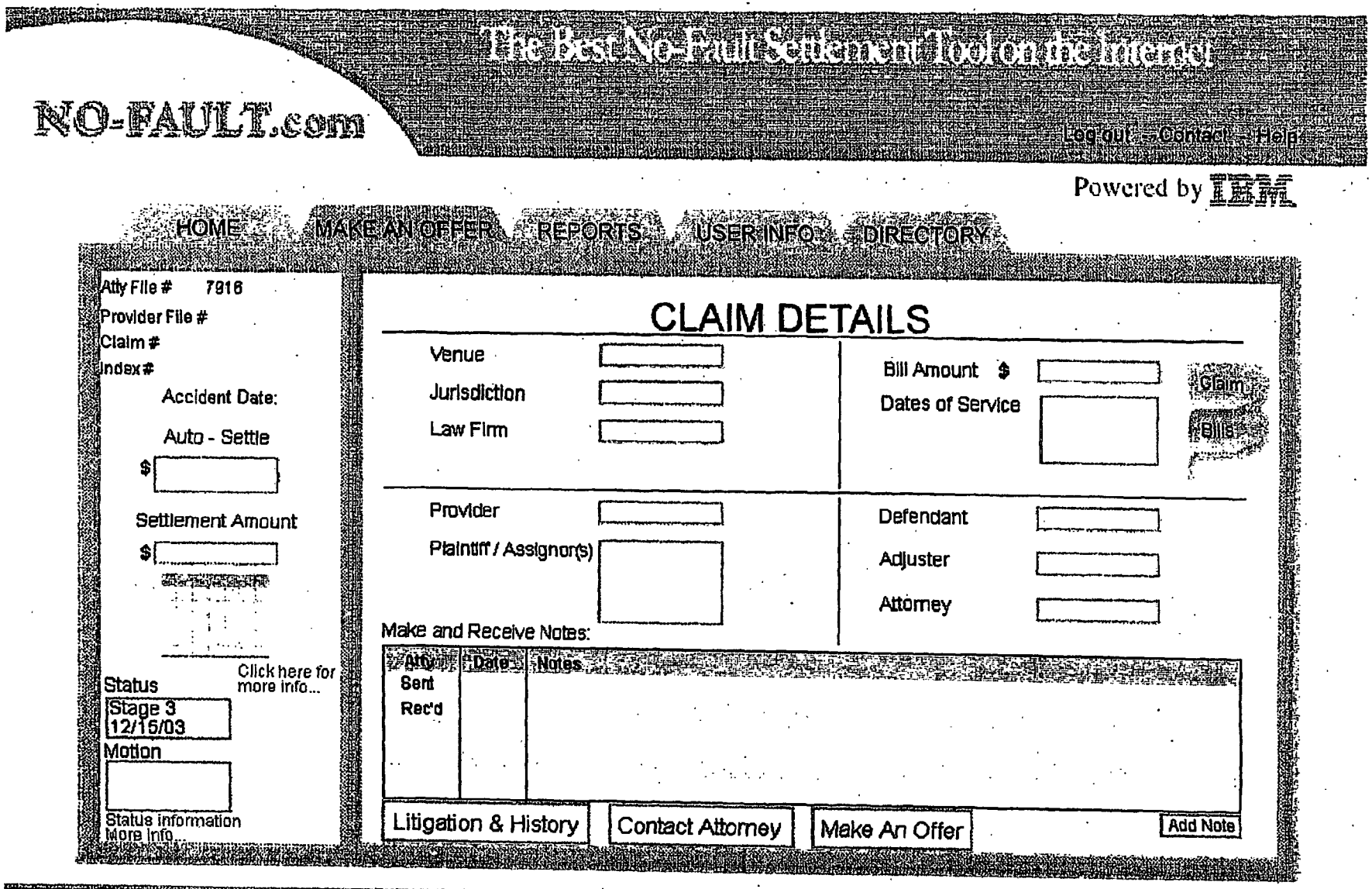



Fig. 53



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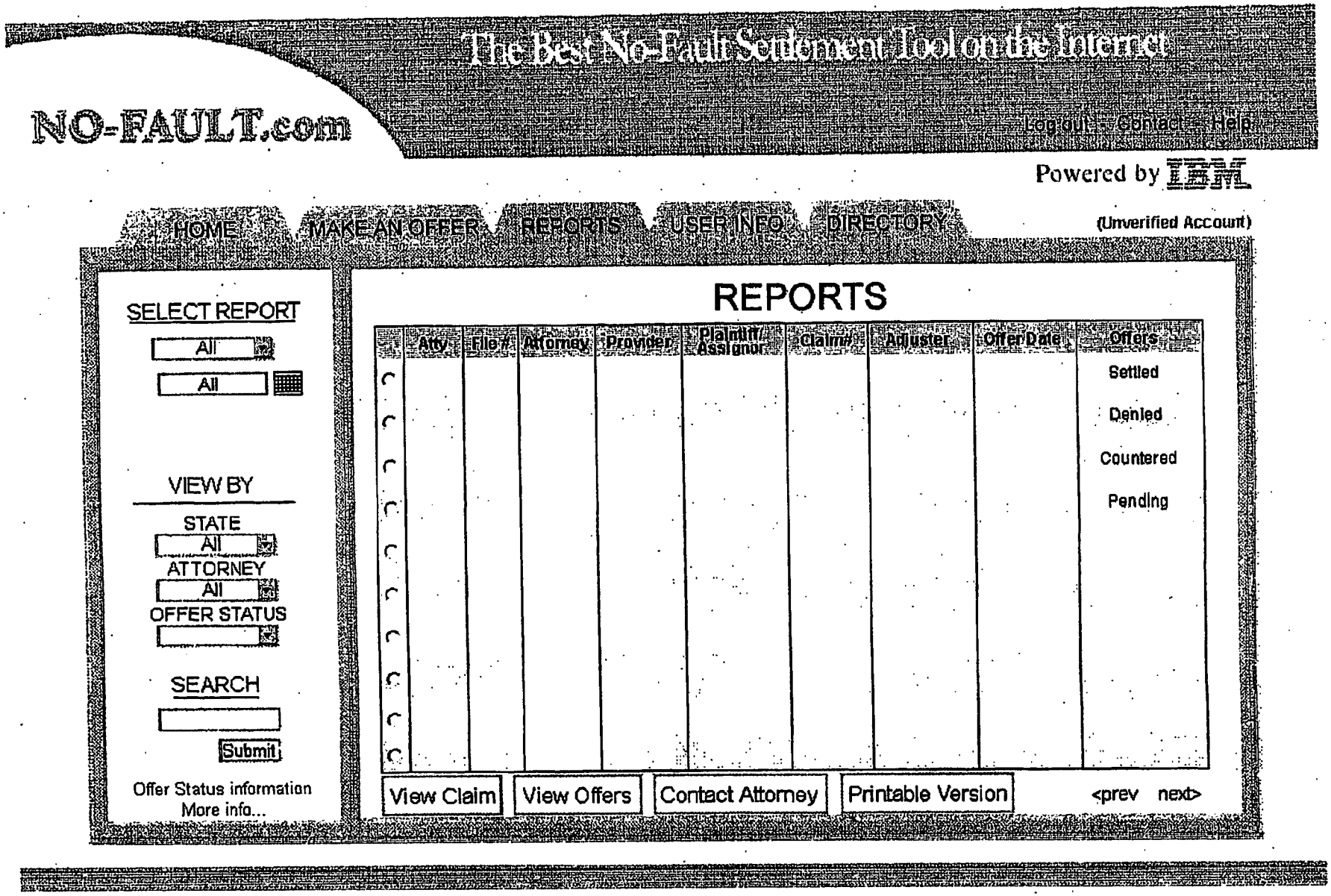



Fig. 54



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Fig. 55



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Fig. 5b



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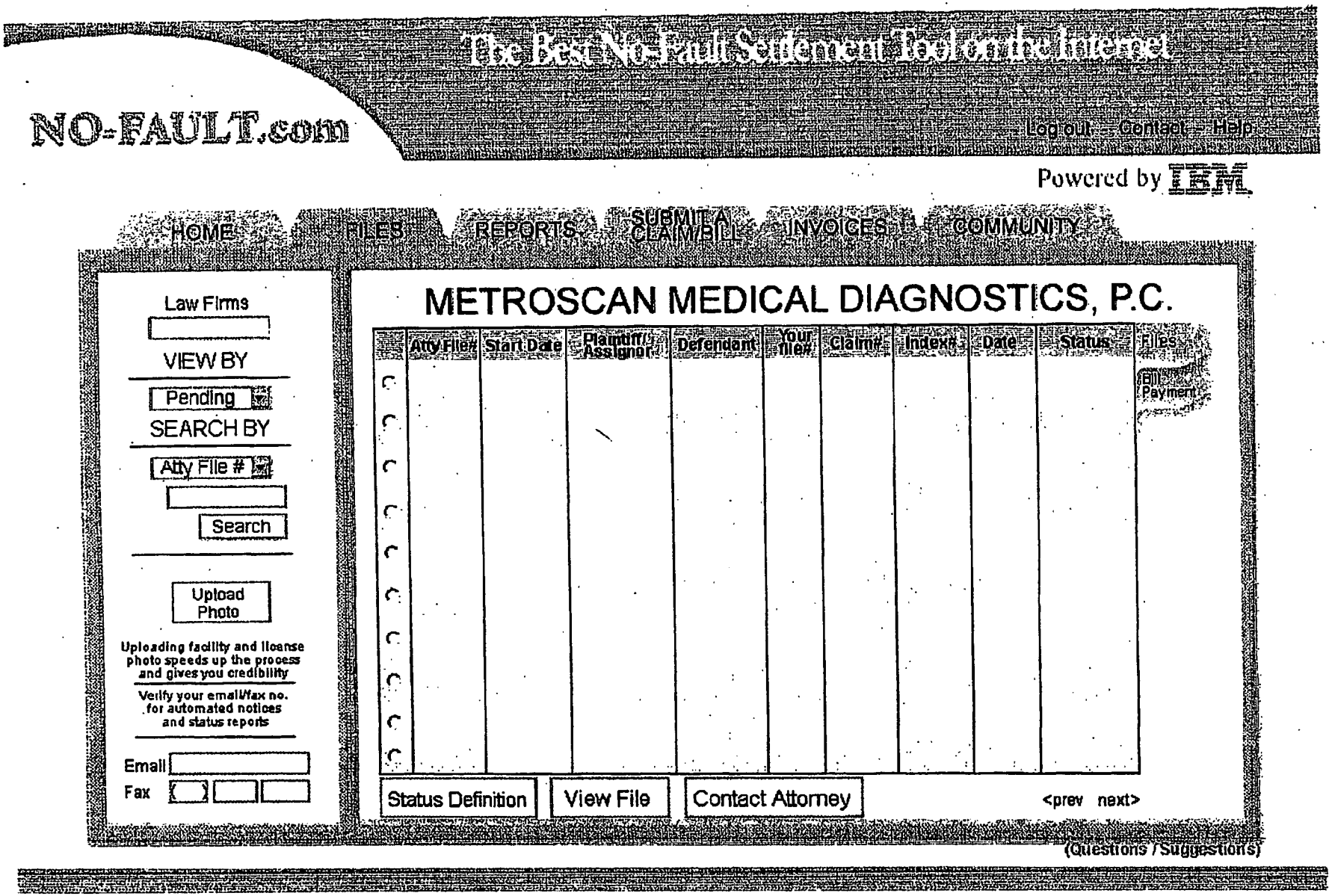



Fig. 57



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Fig. 58



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Fig. 59



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Fig. 60



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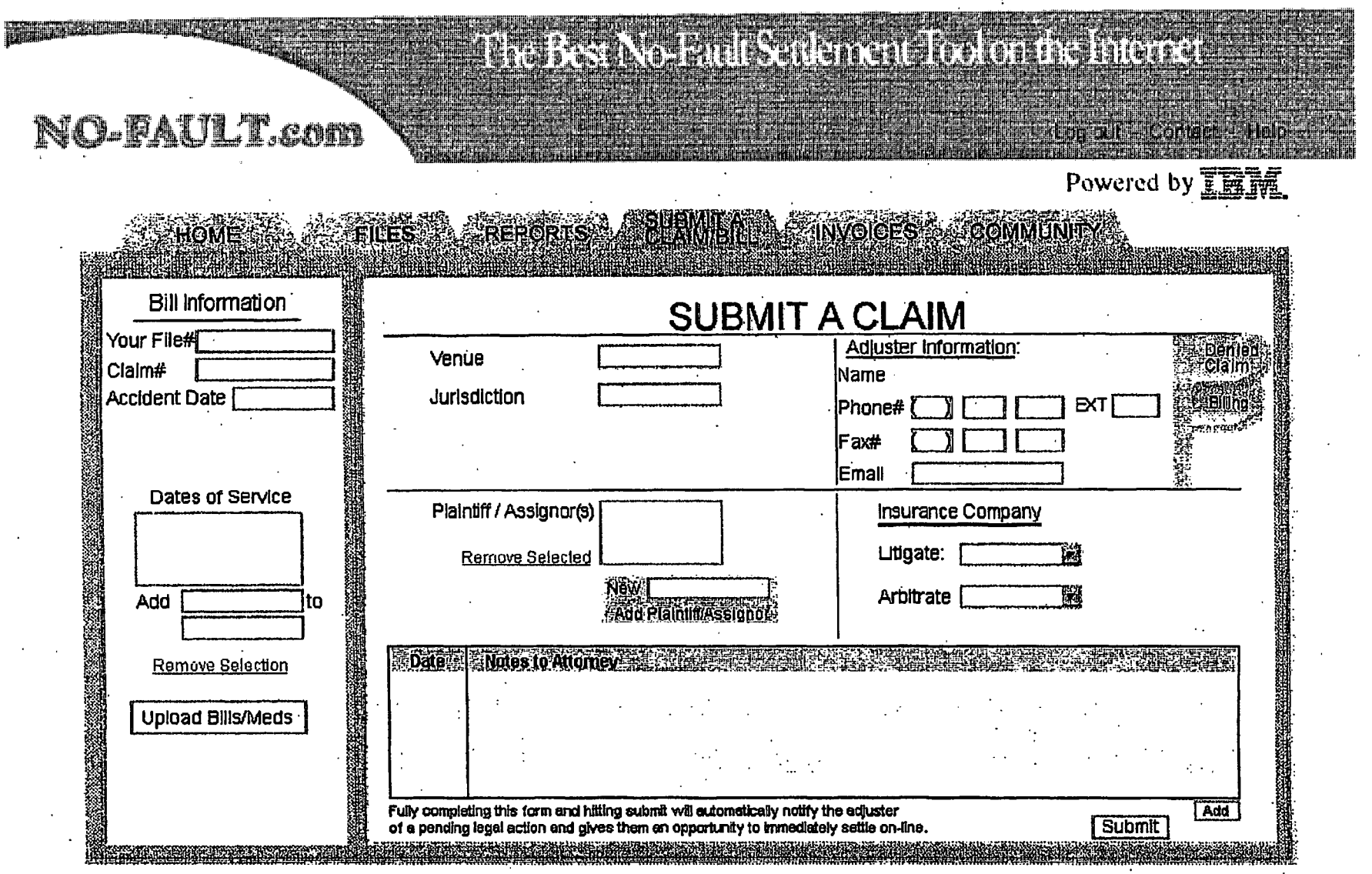



Fig. 61



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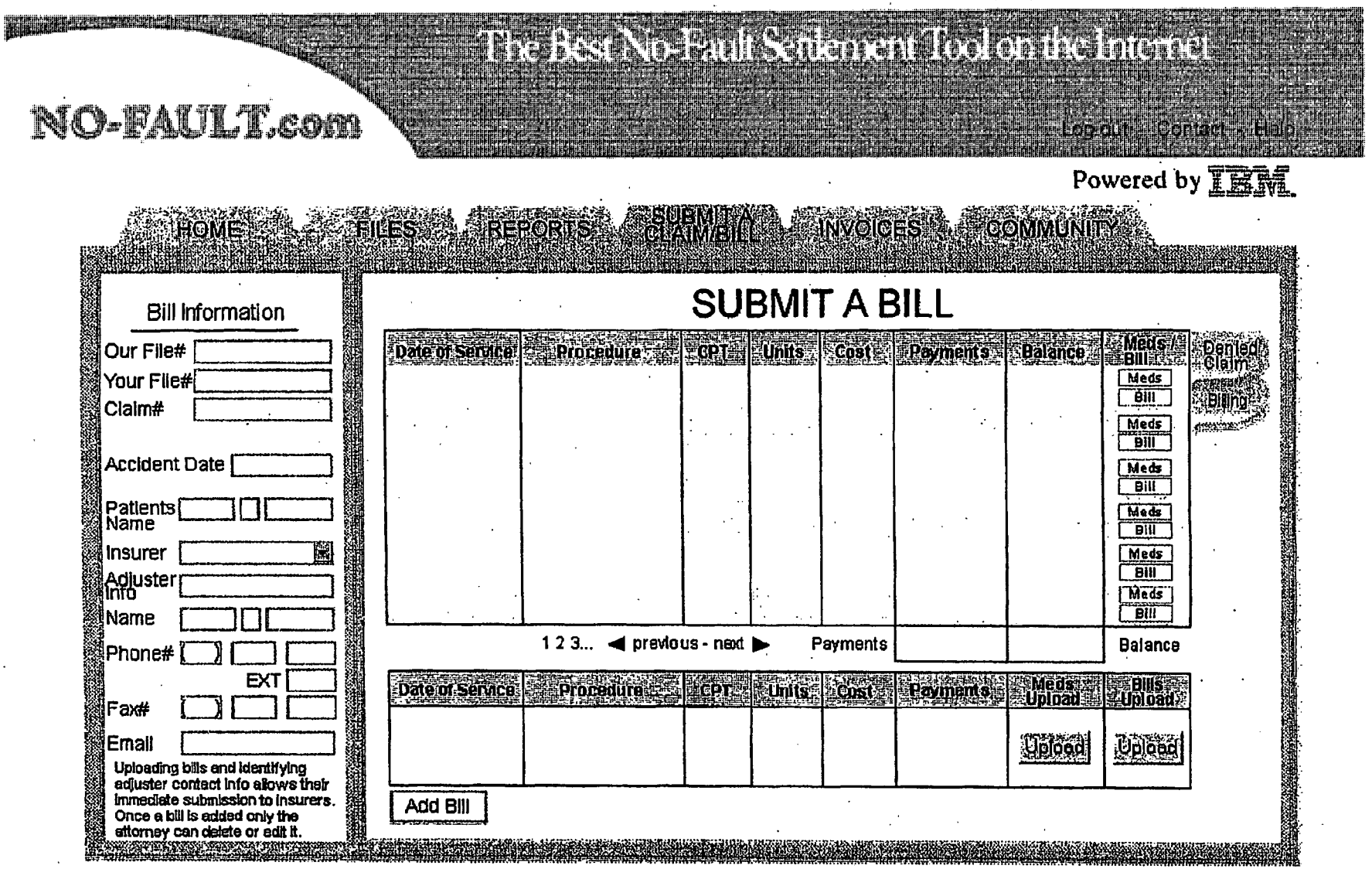



Fig. 62



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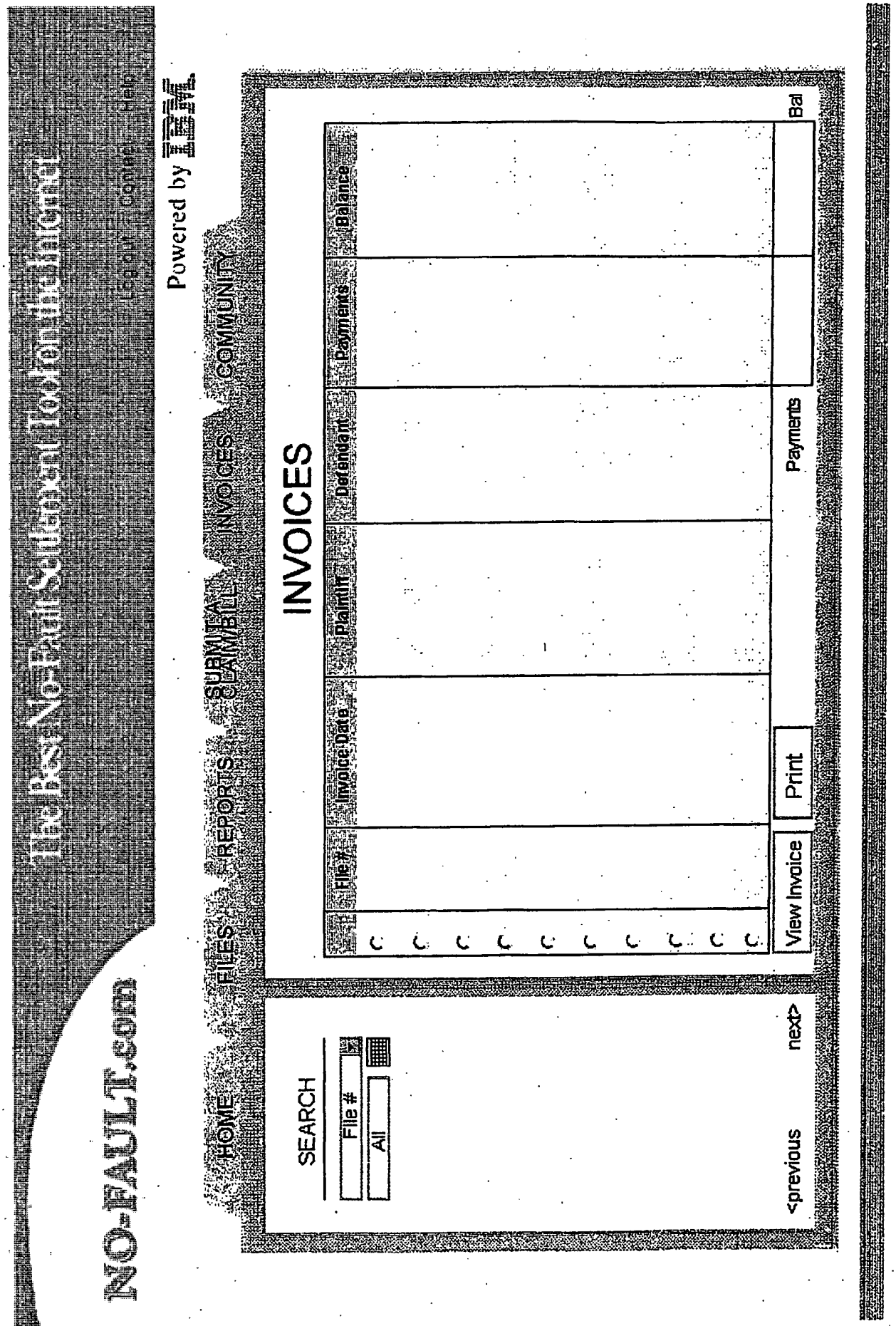



Fig. 63



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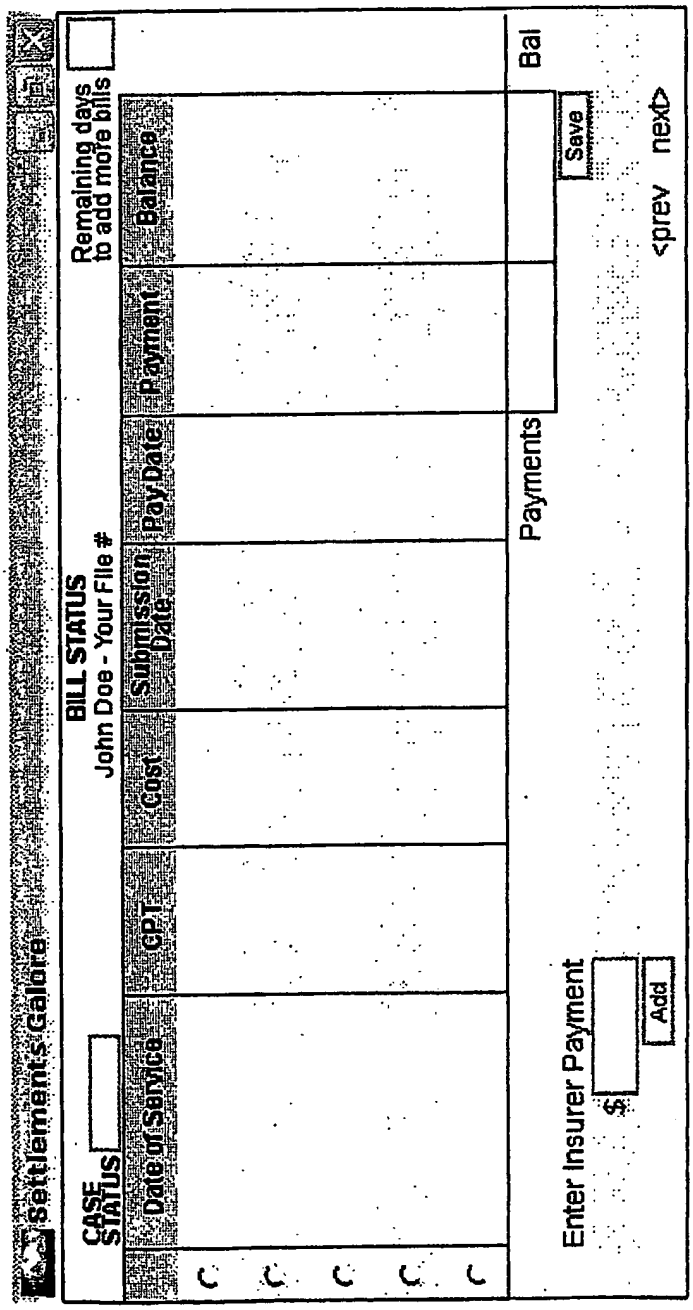



Fig. 64



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Fig. 65



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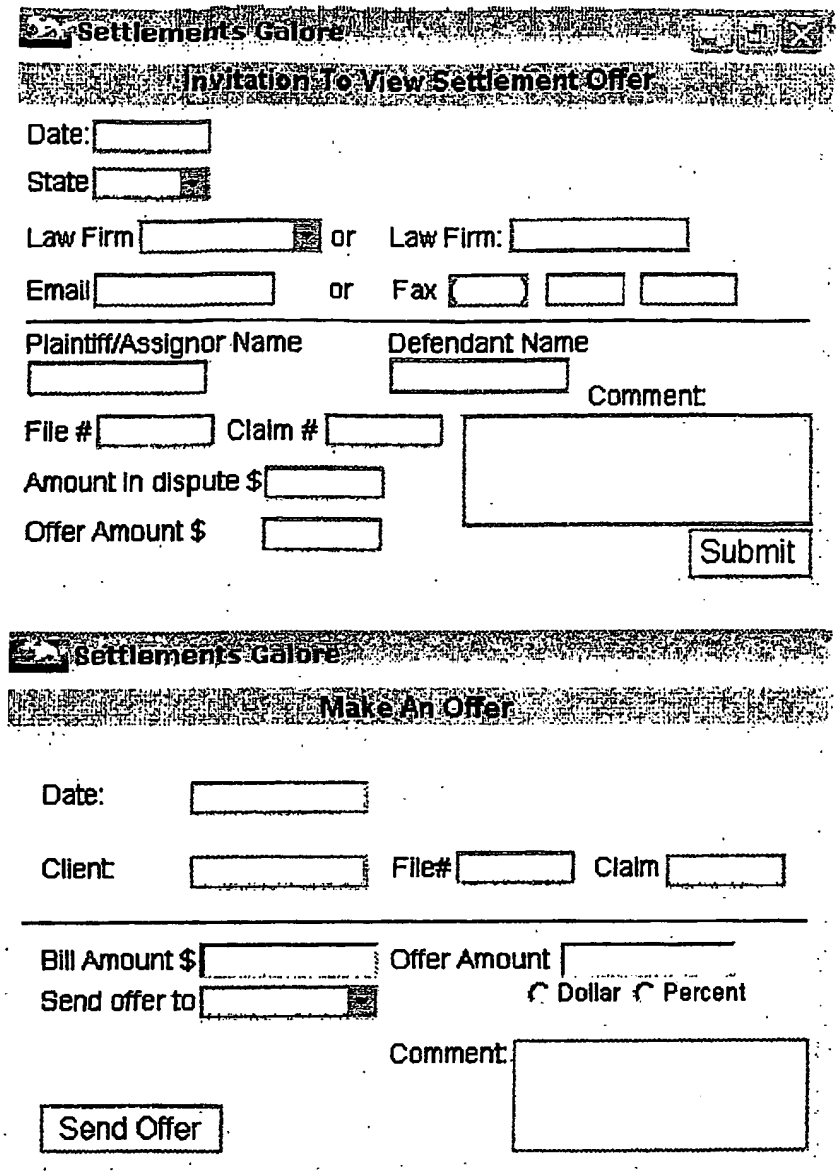



Fig. 66



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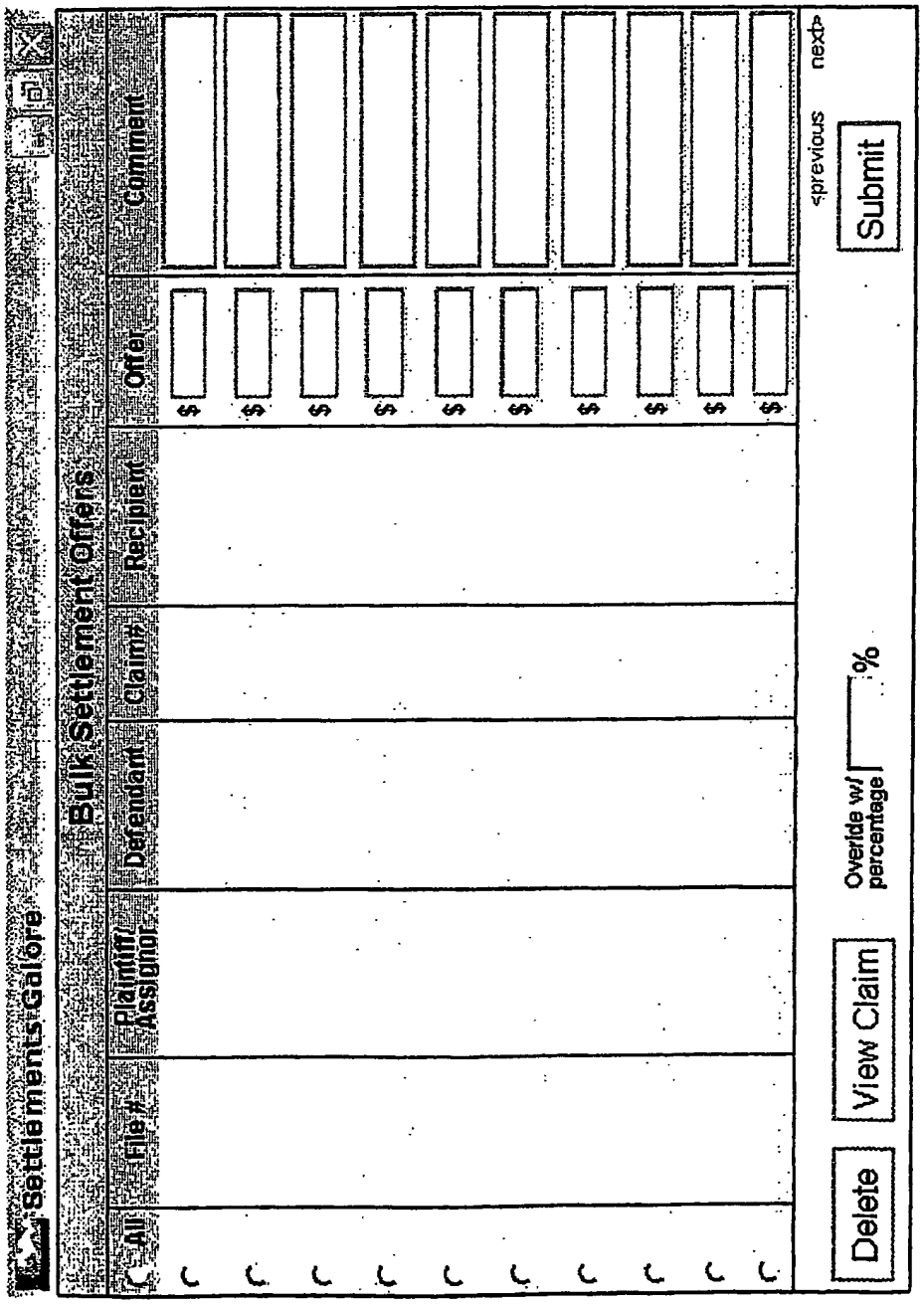



Fig. 67



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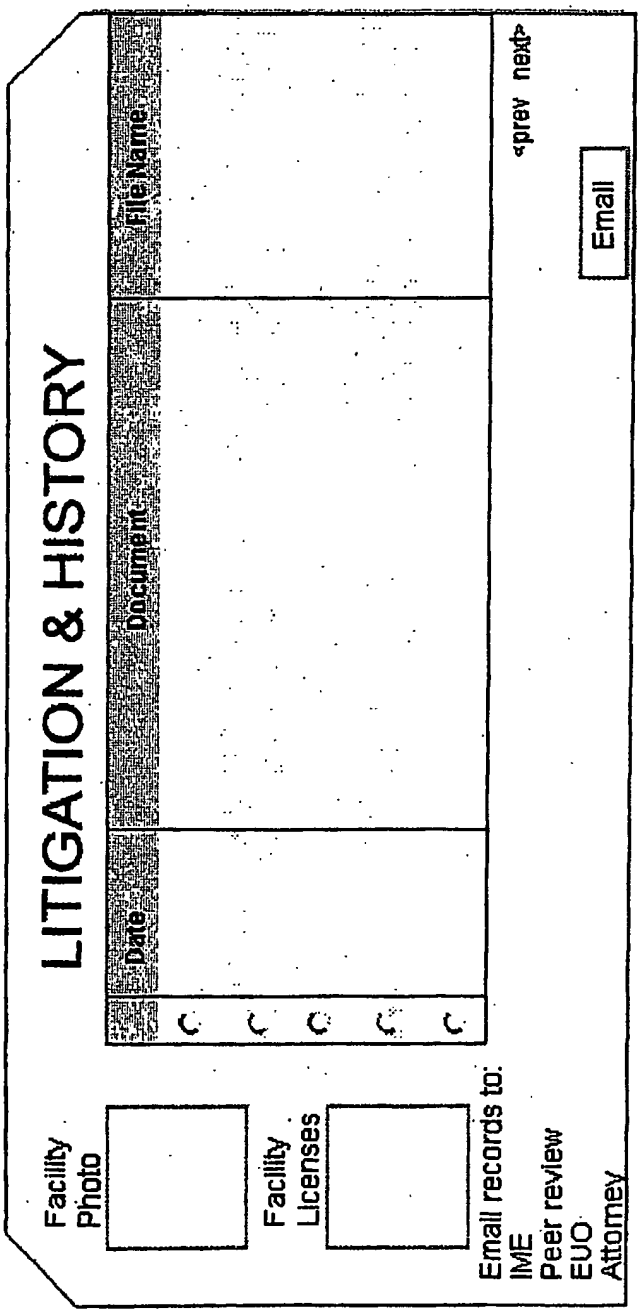



Fig. 68



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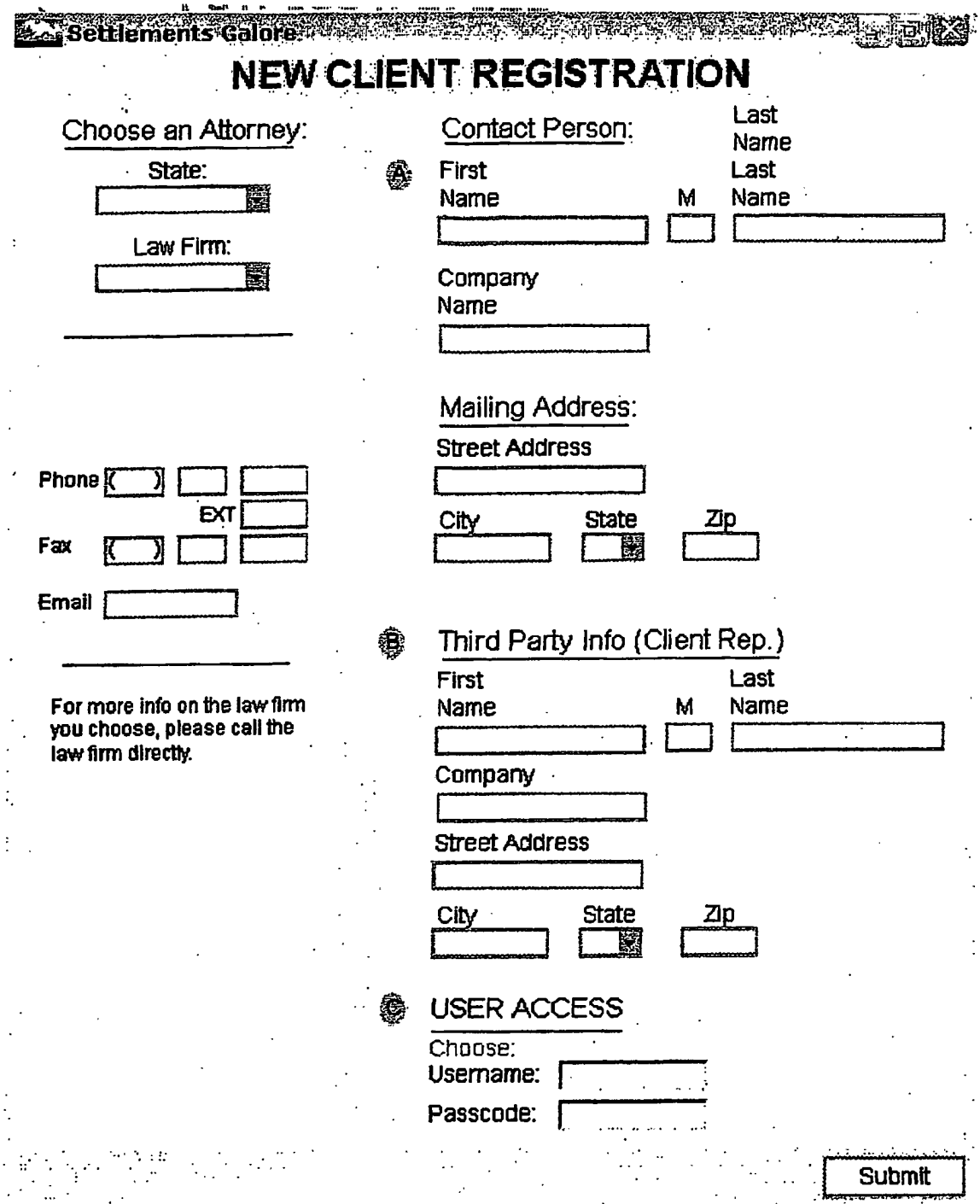



Fig. 69



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Settlements Galore

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Fig. 70



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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI | 1137 |

7590 03/17/2006

Steven H Slater
Slater & Matsil LLP
17950 Preston Road
Suite 1000
Dallas, TX 75252

| EXAMINER | |
|---|---|
| APPIAH, CHARLES NANA | |
| **ART UNIT** | **PAPER NUMBER** |
| 2686 | |

DATE MAILED: 03/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 11/078,916 | HAYES ET AL. | |
| | Examiner | Art Unit | |
| | Charles N. Appiah | 2686 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *11 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-73* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-73* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.



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## DETAILED ACTION

### *Reissue Applications*

1. Applicant is reminded of the continuing obligation under 37 CFR 1.178(b), to timely apprise the Office of any prior or concurrent proceeding in which Patent No. 6,278,888 is or was involved. These proceedings would include interferences, reissues, reexaminations, and litigation.

Applicant is further reminded of the continuing obligation under 37 CFR 1.56, to timely apprise the Office of any information which is material to patentability of the claims under consideration in this reissue application.

These obligations rest with each individual associated with the filing and prosecution of this application for reissue. See also MPEP §§ 1404, 1442.01 and 1442.04.

2. The reissue oath/declaration filed with this application is defective because the error, which is relied upon to support the reissue application is not an error upon which a reissue can be based. See 37 CFR 1.175(a)(1) and MPEP § 1414. The identified error causing the patent to be invalid is not specific enough as to how it is wholly or partially inoperative by claiming more than patentee is entitled to fails to specifically point out an exact word, phrase or expression that makes the patent invalid. See MPEP § 1401.01.

3. Claims 1-73 are rejected as being based upon a defective reissue oath/declaration under 35 U.S.C. 251 as set forth above. See 37 CFR 1.175.

The nature of the defect(s) in the oath/declaration is set forth in the discussion above in this Office action.

***Double Patenting***

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-73 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-6 of U.S. Patent No. 6,131,047. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations of the claims of the instant application are broad enough to be encompassed by the limitations of the claims of the patent and as such it would have been obvious to one of ordinary skill in the art to implement the inventions of the instant application using the claims of the patent in order to provide a versatile and reliable user input device for controlling the operation of a portable terminal.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 30, 31,38-62, 64-68, 70, 71,72 and 73 are rejected under 35 U.S.C. 102(b) as being anticipated by **Yaniv et al. (EP 0 499 012).**

Regarding claims 30, 31, 62 and 68, Yaniv discloses an apparatus for providing user input to a hand-held electronic device, comprising: a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm (see Fig. 1), a display (4) supported by the housing, that displays an image at a front surface of the housing (see col. 14, lines 5-33), a contact sensitive transducer, supported by the housing, which produces an output signal that characterizes contact of an object along the contact sensitive surface of the contact- sensitive transducer (see col. 11, line 29 to col. 12, line 35), and a controller (microprocessor being provided to oversee all of the operations and functions of the various components of the telecommunication system, see col. 20, lines 5-15), responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer (position sensor specifically adapted for

detecting and signaling the X-Y coordinate location of a touch point such as the finger placed in contact with the surface, see col. 11, lines 6-38).

Regarding claim 31, Yaniv further discloses a radiotelephone communications transceiver supported by the housing and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal (feature of controlling distinct operating modes by touch sensitive switch or control panel, col. 4, lines 33-54).

Regarding claim 38, Yaniv further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Fig. 1, which illustrates the portable compact device having a display integrated with a touch sensitive position sensor, col. 18, lines 35-44, and position sensor having an exposed surface adapted for detecting and signaling the X-Y coordinate location of a touch point such as the finger of a user or a stylus, placed in contact with the surface, see col. 11, lines 29-38).

Regarding claim 39, Yaniv further discloses wherein the contact-sensitive transducer is disposed on the front surface of the housing (touch-sensitive control panel integrally formed with the display, see col. 2, line 54 to col. 3, line 4, col. 6, lines 18-23).

Regarding claim 40, Yaniv further discloses wherein the contact-sensitive transducer is an elongate strip (see col. 11, lines 16-52).

Regarding claim 41, Yaniv further discloses wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductor transducer (see col. 13, lines 27-35).

Regarding claims 42-43, Yaniv further discloses an additional user input interface devices for the apparatus on the front surface of the housing wherein the additional interface devices are contact-sensitive (see keypad on surface 4, Fig. 1).

Regarding claim 44, Yaniv further discloses wherein the output signal is produced in response to moving contact with a contact sensitive transducer along the axis of the contact-sensitive transducer (see col. 13, lines 36-55).

Regarding claim 45-50, Yaniv further discloses wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer, detection of momentary contact with the contact-sensitive transducer or detection of a predetermined number of momentary contacts with the contact-sensitive transducer within a predetermined time interval (position sensor having an exposed surface adapted for detecting and signaling the X-Y coordinate location of a touch point such as the finger of a user or a stylus, placed in contact with the surface, see col. 11, lines 29-38).

Regarding claims 51-53 Yaniv further discloses inherently a second contact-sensitive transducer, supported by the housing which produces a second output signal that characterizes contact of an object along the contact sensitive surface of the contact-sensitive surface of the second contact-sensitive transducer (inherent feature of keypad on surface 4, Fig. 1), a controller for providing controlling functions of the

apparatus including an output signal in response to detection of momentary contact or predetermined number of momentary contacts with the contact-sensitive transducer (position sensor having an exposed surface adapted for detecting and signaling the X-Y coordinate location of a touch point such as the finger of a user or a stylus, placed in contact with the surface, see col. 11, lines 29-38),

Regarding claims 58, 59, 64 and 65 Yaniv further discloses a power supply disposed inside the housing wherein the power supply comprises a battery (see col. 20, lines 5-36).

Regarding claims 60 and 66, Yaniv further discloses a circuit, which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer (power being supplied to each of the components based on the appropriate power requirements of each of the components, see col. 20, line 45 to col. 21, line 21).

Regarding claims 61 and 67, Yaniv further discloses a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer (feature of controlling distinct operating modes by touch sensitive switch or control panel, col. 4, lines 33-54).

Regarding claim 70, Yaniv further discloses wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand (see Fig. 1, which illustrates the portable compact device having a display integrated with a touch sensitive position

sensor, col. 18, lines 35-44, and position sensor having an exposed surface adapted for detecting and signaling the X-Y coordinate location of a touch point such as the finger of a user or a stylus, placed in contact with the surface, see col. 11, lines 29-38).

Regarding claim 71, Yaniv further discloses wherein the contact-sensitive transducer is disposed on the front surface of the housing (touch-sensitive control panel integrally formed with the display, see col. 2, line 54 to col. 3, line 4, col. 6, lines 18-23).

Regarding claim 72, Yaniv further discloses wherein the contact-sensitive transducer is an elongate strip (see col. 11, lines 16-52).

Regarding claim 73, Yaniv further discloses wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductor transducer (see col. 13, lines 27-35).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 37, and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yaniv et al (EP 0 499 012).**

Regarding claims 37 and 69 Yaniv fails to explicitly teach wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

However, Yaniv's Fig. 1 illustrates the portability and compactness of the telecommunications device having the integrated touch panel and display which can be held in one hand of a user. It would therefore have been obvious to one of ordinary skill in the art to ensure that the compact portable device can be held in one hand such that the thumb of the user can engage the touch panel in order to provide some operational input on the touch panel using for example the thumb of the user for one-handed operations.

10. Claims 54-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yaniv et al** as applied to claim 30 above, and further in view of **Di Santo et al. (4,870,677).**

Regarding claims 54-55, Yaniv fails to explicitly disclose wherein the controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of the display based on the output signal from the transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display.

Di Santo teaches a telephone subset incorporating electrophoretic displays, which include means for scrolling displayed rows along an axis of a display responsive to the output signal of a touch-sensitive transducer wherein the direction of scroll is traverse to the direction that the rows extend across the display (see col.8 lines 24-34).

It would therefore have been obvious to one of ordinary skill in the art to incorporate the teaching of **Di Santo** into the invention of Yaniv for the benefit of conveniently displaying selected desired items for implementation.

11. Claims 56 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yaniv et al and Di Santo et al** as applied to claim 54 above, and further in view of **Meins et al. (6,587,700).**

Regarding claims 56 and 57, the combination of Yaniv and Di Santo fail to explicitly teach wherein the rows consist of alphanumeric characteristic comprising menu selections wherein the controller identifies successive ones of the rows displayed along the axis of the display by highlighting successive rows.

In an analogous field of endeavor, Meins discloses a portable communicator that included a touch-sensitive display, which enables a user to input information by touching menu items presented on the display by highlighting selected menu items (see Fig. 5, col. 2, lines 28-42col. 4, lines 15-27, col. 6, lines 62-65 and col. 7, line 45 to col. 8, line 5).

It would therefore have been obvious to one of ordinary skill in the art to combine Meins' touch-sensitive display having menu-item selection capability with Yaniv as modified by Di Santo in order to provide an enhanced communication device with optional menu items display that can be scrolled through easily.

***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Duwaer et al. (6,201,951) discloses detachable input device for a data terminal including a touch a touch screen.

Potter (GB 2 301 217) discloses touch sensitive displays that may be used in handheld devices.

D'Amico et al. (5,956,020) discloses a touch-sensitive input device for a computer system.

Hlady (3,916,099) discloses a touch-sensitive position device for computer input device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles N. Appiah whose telephone number is 571 272-7904. The examiner can normally be reached on M-F 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CA

CHARLES APPIAH
PRIMARY EXAMINER

| Notice of References Cited | Application/Control No. 11/078,916 | Applicant(s)/Patent Under Reexamination HAYES ET AL. | |
|---|---|---|---|
| | Examiner Charles N. Appiah | Art Unit 2686 | Page 1 of 1 |

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| * | B | US-4,870,677 | 09-1989 | Di Santo et al. | 379/93.19 |
| * | C | US-5,956,020 | 09-1999 | D'Amico et al. | 345/173 |
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| | G | US- | | | |
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| | I | US- | | | |
| | J | US- | | | |
| | K | US- | | | |
| | L | US- | | | |
| | M | US- | | | |

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|---|---|---|---|---|---|---|
| | N | EP 0 499 012 A2 | 08-1992 | EPO | Yaniv et al. | --- |
| | O | GB 2 301 217 A | 11-1996 | UK | Potter | --- |
| | P | | | | | |
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**NON-PATENT DOCUMENTS**

| * | | Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) |
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| | X | |

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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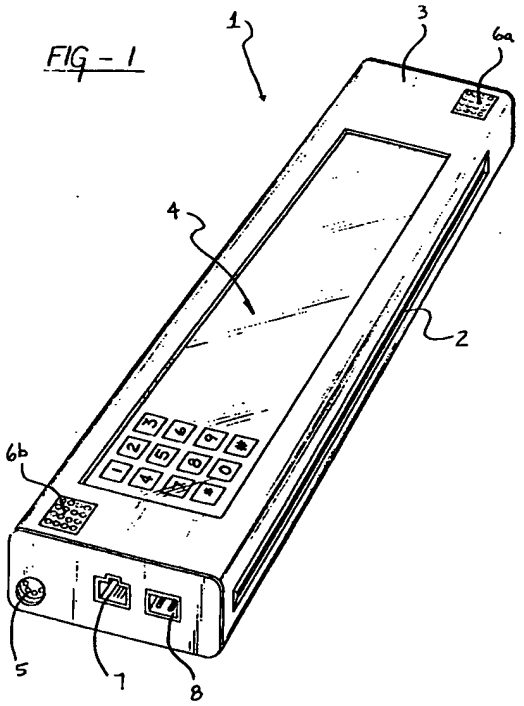
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## (54) Portable, compact voice and data telecommunications apparatus.

(57) Disclosed is a portable, compact telecommunications system (1) adapted to send and receive information in either voice or facsimile fashion. The telecommunications system can transmitted and receive information over the standard or mobile telephone networks, and stores received facsimile information in on board memory devices (926), while displaying the message on a information display (920).

FIG - 1




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## FIELD OF THE INVENTION

The present invention generally relates to an apparatus adapted to receive and transmit voice and facsimile data. The present invention more particularly relates to a portable, compact telecommunications apparatus intended to transmit, receive, store, display and archive data and image information and transmit and receive voice information over either the switched telephone network or through the cellular telephone network. As the instant device is portable and compact, it is battery operated for operation in locations remote from standard electric power sources, and is integrally housed in a low profile, ergonomic case.

## BACKGROUND OF THE INVENTION

The transmission and receipt of information, voice, graphic and text, has become an integral part of the way increasing numbers of people conduct their business and personal affairs. Mobile telephone service has only recently become readily accessible to the general public. This accessibility has greatly increased the efficiency of managing information flow by allowing individuals to communicate during drive times which were heretofore unproductive. This accessibility has also opened up the possibility of transmitting and receiving facsimile information to and from remote locations, not having standard telephone service.

However, while portable cellular telephone devices have only recently become truly compact and portable, facsimile machine while arguably portable, can be by no means considered compact. Moreover, there has heretofore been no device which incorporates both voice and facsimile communications capabilities into a single light weight, low profile housing easily fitting into a brief case or automobile glove compartment. Additionally, the individual facsimile machines heretofore known in the field have not possessed easily removable memory means for use in other office systems.

Accordingly, there is and has been a need for an integrated voice and facsimile transmission and receiving telecommunications system which is light weight, low profile and easily portable, which has not been addressed by the devices known in the prior art.

## SUMMARY OF THE INVENTION

The shortcomings of the prior art are obviated by the portable, compact voice and facsimile information telecommunications system disclosed herein and adapted to communicate over the public, switched telephone network and the cellular telephone network. The system is adapted to be used as a normal telephone for voice messages and to transmit and receive facsimile images. As the device is portable and compact, it is battery operated and is small enough to be easily carried in a brief case. It is to be understood by compact and portable, it is intended that the telecommunications system have dimensions of approximately 15 inches by 5 inches by 2 inches and weigh less than about 5 lbs. While the telecommunications system is small and portable, it comprises a number of components critical to its unique operation.

The telecommunications system consists of several major components which each contribute to the operation of the device. The first such component is a scanning mechanism for digitizing information, i.e., for providing electrical signals representative of an image having light and dark or multi-colored portions carried on an image bearing member. In practice, this component will digitize information, either graphic or text, which will be subsequently sent in facsimile form.

In a preferred embodiment of the invention, the scanning mechanism is a thin film image scanning device, such as a contact image sensor, which comprises an array of at least one column of light sensitive elements disposed upon a substrate. The light sensitive elements can be, for example, photovoltaic cells or photoresistors formed of deposited semiconductor material such as an amorphous silicon alloy. The thin film scanning device typically further includes a light source for illuminating portions of the image bearing member immediately adjacent to the device for detecting the differences in the light, dark or color portions of the image thereon. The image scanning device may further include an optical element, such as a selfoc lens so as refine device resolution.

The second major component of the telecommunications system is a display device, which is adapted to perform at least two functions; to operate as a dynamically varying control panel for operator interaction with the system; and to display information, either graphic or text, which is 1) scanned into the system either by the scanning mechanism 2) which is received by facsimile transmission; or 3) which is stored in the memory device, described in greater detail hereinafter. In practice, the display is typically selected from the group including cathode ray tubes, liquid crystal displays, active matrix liquid crystal displays, passive displays, electroluminescent displays, gas plasma displays, and displays employing twisted nematic or supertwist liquid crystal material.

Integrally formed with the display is the third major component of the telecommunications device; a transparent, touch sensitive control panel. The control panel, which can be, for example a thin membrane touch sensitive switch panel or a solid



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state touch sensitive position sensor, overlays the display for inputting information into the telecommunications system in response to the prompts displayed by the dynamically varying display.

Included in the telecommunications system is a modem integrated circuit and associated interfaces for effecting communication with the general telephone network, either through a direct access arrangement or through the mobile cellular network. In practice, the modem integrated circuit performs the protocol conversions which enable the telecommunications system to communicate with other facsimile machines.

The fifth major component of the instant system is one or more long-term memory devices for storing information 1) received by the system; 2) information scanned into the system by the thin film image scanning device; and 3) information programmed into the system through the touch sensitive control panel. It is also contemplated that with sufficient on-board memory, voice information may also be stored. In a preferred embodiment, the memory device is erasable, programmable and removable memory so that information stored therein can be taken from the system and input into other devices such as a laser printer so as to print a hard copy of the information stored therein, or into a personal computer so that the stored information can be accessed and manipulated or printed. In a further preferred embodiment, the memory device is a serial access random access memory. In a second and equally preferred embodiment, the memory device is a flash memory card.

The system further includes a compression expansion engine integrated circuit for quickly performing the algorithms required to transmit and receive compressed information in communication with another facsimile machine. Of course each of the above-referenced components requires control and coordination instructions in order to operate as a fully integrated telecommunications system. This function is satisfied by the inclusion in the system of a microprocessor control circuit having a real time clock and associated memory. This microprocessor circuit is a standard circuit of the type well known in the art.

As the system is intended to be small, compact and easily transportable, each of the above-recited elements is incorporated into an ergonomically designed housing. This housing is adapted to allow the image scanning device to operate as a hand held scanner. This is accomplished by having via or a slit formed through the housing on the side thereof opposite the scanner so that the housing may be moved over an image bearing member to scan the image present thereon. As the system is intended to provide for easy, hands-free operation, it may further include a voice recognition integrated circuit to allow for voice activated operation.

As can be discerned from the description of the telecommunications system provided hereinabove, the system does not include a printer mechanism integrally associated therewith. This has the advantage of eliminating the size, weight and power constraints imposed by such a mechanism. Additionally, the problems associated with paper handling and storage are eliminated. The power requirements are of particular importance, as the device is intended to be compact and portable, thus demanding a light weight, low profile device.

Rather than using a printer mechanism, images stored in the telecommunications system are viewed on the display provided. These images can be converted into hard copy in at least two ways; first, the system can directly interface with a printer through a standard printer connection, and can thus be instructed through the control panel to output a stored image; or the memory device itself can be removed, as in the case of a flash memory card, and inserted into any computer with the appropriate software, so as to be printed out on the associated printer. Of course these images could also be used as input files for word processing or similar programs. Similarly, information generated on a computer and stored on the flash memory card could be used as the input file to be subsequently sent out by facsimile from the telecommunications system.

As the telecommunications system is adapted to operate in several distinct operating modes, operation must be controlled by the touch sensitive switch or control panel. This panel can be used for every operation of the device from selecting the operating mode to dialing the desired phone number. The simplest operation of the device is its use as a telephone for voice communication. A microphone and speaker are provided in the device and either hand-held or speaker phone operation can be selected. Additionally, the system is adapted to be voice actuated, i.e., respond to the voice commands of the operator. Provision is also made to accommodate automatic dialing of pre-programmed telephone numbers, and transmission of previously stored facsimile images. Further, when the operator is not present, the telecommunications system can be put into an automatic mode in which incoming messages, primarily facsimile, will be stored in the memory. Such stored messages can then be retrieved at the operators leisure and restored, if desired, for later printing.

As the telecommunications system places a premium on light weight and portability, it is necessary to reduce the power requirements and thus avoid the need for a large battery. The battery



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power source provided is made appropriate for each of the components by an efficient, integrated switching circuit. Power is supplied to each of these components for the absolute minimum time required for that component to accomplish its function. In this regard, the microprocessor includes a reduced function mode to conserve power and the flash card memory does not require a battery to preserve information stored thereon. A small long-life battery can be provided to power the real-time clock and the memory of the microprocessor. Otherwise, the telecommunications system is powered by a rechargeable battery pack, or one or more non-rechargeable batteries. Of course, the system is adapted to run off of standard household currents.

These and other advantages and objects of the telecommunications system of the instant invention will be detailed in the following paragraphs.

## BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the telecommunications system of the instant invention, including a display and voice communication means;

Figure 2 is a partial side view, partially in cross section, of a thin film image scanning device of the type employed in the instant invention;

Figure 3 is a top plan view of the thin film contact image scanning device of Figure 2;

Figure 4 is a perspective view of a touch sensitive position sensor of a type usable in the telecommunications system of Figure 1;

Figure 5 is a cross-sectional side view of a liquid crystal display of the type usable in the telecommunications system of Figure 1;

Figure 6 is a top plan view as seen along lines 6-6 of Figure 5;

Figure 7 is a schematic circuit diagram illustrating the equivalent circuit of the liquid crystal display of Figure 5;

Figures 8a and 8b are perspective, partially exploded, partially cutaway illustrations of an integrated touch sensitive position sensor and display; and

Figure 9 is a block diagram illustrating the relationship between the various components of the instant telecommunications system.

## DETAILED DESCRIPTION OF THE INVENTION

The telecommunications system of the instant invention allows, for the first time, the integration of a number of information transmitting and receiving input/output elements so as to provide for a truly compact, telecommunication system. Referring now to Figure 1, there is illustrated therein the compact, portable telecommunication system 1 of the instant invention. The telecommunications system 1, includes a number of different components integrated into a single compact, portable package. Each discrete component will be discussed in greater detail hereinbelow. The telecommunication system 1 includes a contact-type document scanner 2 integrated into the telecommunication system's housing 3. As may be appreciated from a perusal of Figure 1, the document scanner 2 is designed so as to traverse, for example, the entire width dimension of an image bearing member, such as a standard sheet of paper. The document scanner 2 digitizes the image carried on the image bearing member for transmittance per standard facsimile transfer (either cellular or standard telephone line).

The telecommunication system 1 further includes a touch-sensitive display 4 integrated into the housing 3. The touch-sensitive display 4 is adapted to be a dynamically varying display to provide for menu-driven operation of the various functions of the telecommunications system, as well as being adapted to display incoming and/or stored facsimile messages. Incoming facsimile messages are also stored in an on-board memory device (not shown) of the kind known in the art. Accordingly, incoming facsimile messages can be received on the display 4 and stored in the device by the telecommunication system user. Important messages can then be subsequently recalled from memory so as to make hard copies by down loading the stored information via the printer interface 5. The printer interface 5 allows the telecommunication system 1 to communicate with a standard desktop facsimile machine or laser jet printer so as to provide for a printed copy of the fax message. Alternatively, the memory itself is removed from the telecommunications system 1, and inserted into a computer having appropriate software to input the information stored thereon.

The telecommunication system 1 also includes telephone receiver 6a and transmitter 6b components to allow the telecommunication system 1 to operate as a telephone for voice communication. Accordingly, the system 1 includes a telecommunication input/output plug 7 adapted to transmit and receive both analog (voice) and digital (data) information from the standard wire accessed telephone network as well as through the mobile cellular telephone network. Finally, as the telecommunication system 1 is meant to be portable, the system must include an on board power source. The power source (not shown) is a rechargeable battery of pack including, for example, one or more rechargeable cells such as , for example NiCad, metal hydride or lithium cells of the type know in the art. The battery pack includes a power input



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port 8 adapted to allow the telecommunication system 1 to either recharge while not in use, or to run off of common sources of power such as are found in the home, office or standard automotive electrical systems.

As one of the principle advantages of the instant telecommunication system 1 is portability, the system is designed to fit easily into brief cases, or portfolios while presenting a low profile, package which fits easily on a car dashboard, in the utility tray or in the glove compartment. Accordingly, it may be appreciated that the system 1 have dimensions of no more than, (and preferable less than) about 16 inches in length, 6 inches in width and 3 inches in thickness, and less than about 5 lbs in overall weight.

In order to gain an appreciation for the telecommunication system disclosed herein, it is helpful to understand the individual components integrated thereinto. Accordingly, each component is described in greater detail hereinbelow.

A. CONTACT TYPE DOCUMENT SCANNER

FIGS. 2 and 3 illustrate a thin film image scanning device of the type typically employed in the present invention. The system 10 illustrated in FIG. 2 generally includes an apparatus 12 capable of providing electrical signals representative of an image carried by an image-bearing member such as a document 14 disposed thereover, and a light source 16.

The apparatus 12 includes a transparent substrate 18, a first set of X address lines including address lines 20, 22, and 24, a second set of Y address lines including address lines 26, 28, and 30,and a plurality of light sensitive elements 32, 34, 36, 38, 40, 42, 44, 46, and 48. The apparatus 12 further includes an isolation device 50, 52, 54, 56, 58, 60, 62, 64, and 66 associated with each light sensitive element, and, a transparent cover means 68.

As can be noted in FIG. 3 the X address lines 20, 22, and 24 and the Y address lines 26, 28, and 30 cross at an angle, and, as will be more apparent hereinafter, are spaced from one another to form a plurality of crossover points 70, 72, 74, 76, 78, 80, 82, 84, and 86. Associated with each of the crossover points is a respective one of the light sensitive elements. The light sensitive elements 32-48 are formed on the substrate 18 and are distributed thereover in spaced apart relation to form spaces 88 between the light sensitive elements. The light sensitive elements 32-48 are further of the type which effect a detectable electrical characteristic in response to the receipt of light thereon. As will be more fully described hereinafter, the light sensitive elements 32-48 can comprise photovoltaic cells or photoresistors which effect a detectable change in electrical conductivity in response to the receipt of incident light thereon. The light sensitive elements are preferably formed from a deposited semiconductor material, such as an amorphous semiconductor alloy. Preferably, the amorphous semiconductor alloy. Preferably, the amorphous semiconductor alloy includes silicon and hydrogen and/or fluorine. Such alloys can be deposited by plasma assisted chemical vapor deposition, i.e., glow discharge, as disclosed, for example, in U.S. Pat. No. 4,226,898 which issued on Oct. 7, 1980 in the names of Stanford R. Ovshinsky and Arun Madan for Amorphous Semiconductors Equivalent to Crystalline Semiconductors Produced By A Glow Discharge Process.

Each of the isolating devices 50-66 is associated with a respective one of the light sensitive elements 32-48. The isolation devices are also preferably formed from a deposited semiconductor material, and most preferably, an amorphous semiconductor alloy including silicon. The amorphous silicon alloy can also include hydrogen and/or fluorine and can be deposited by plasma-assisted chemical vapor deposition as disclosed in the aforementioned U.S. Pat. No. 4,226,898. As can be noted in FIG. 2, each of the isolation devices 50-66 is coupled in series relation with its associated light sensitive element 32-48 between respective paris of the X address lines 20, 22, and 24 and the Y address lines 26, 28, and 30. As a result, the isolation devices facilitate the selective addressing and detection of the electrical conductivity of each of the light sensitive elements by the application of read potentials to respective pairs of the X an Y address lines.

Referring now more particularly to FIG. 2 as can there be noted, the light source 16 comprises a plurality of individual light sources 90, 92, and 94. Associated with each of the sources 90, 92, and 94 is a reflector 96, 98, and 100. The light sources 90, 92, and 94 and the reflectors 96, 98, and 100 are arranged to provide diffuse light indicated by the arrows 102 which is projected onto the apparatus 12 on the side of the substrate 18 opposite the light sensitive elements and the document 14 to be scanned. The document 14 is disposed adjacent a transparent cover 68 which includes a substantially planar surface 104. The document 14 includes at least one portion 106 of high optical density, hereinafter referred to as the dark portions of the document, and portions 108 which are low optical density, and are hereinafter referred to as the light portions of the document. The cover 68 is preferably relatively thin so that the document 14 is closely spaced in juxtaposed relation to the light sensitive elements, such as the light sensitive elements 44, 46, and 48 illustrated in FIG. 2 for



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proximity focusing the image on document 14 onto the light sensitive elements. Alternatively, the image-bearing member may be spacedly disposed from the light sensitive elements, and the image on the image bearing member can be focused on the light sensitive elements by means of an optical elements such as a selfoc lens. The thickness of the cover 68 is chosen to give maximum useable signal consistent with a number of other variable parameters. These parameters include the angular distribution of the diffuse light intensity, the width of the light sensitive elements, and the spacing between the light sensitive elements. Preferably, the thickness of the cover 68, the width of the light sensitive elements, and the spacing between the light sensitive elements are all of comparable dimension.

When the document is to be scanned, it is first placed adjacent the planar surface 104 of the transparent cover 68 so that the document is disposed in closely spaced juxtaposed relation to the light sensitive elements. Then, the light source 16 is energized for projecting the diffuse light 102 onto the back side of the apparatus 12. The diffuse light is hereby projected onto the surface of the document 14 adjacent the planar surface 14. In the dark portions 106 of the document 14, the light will be substantially absorbed so that very little of the light impinging upon the dark portions 106 will be reflected back onto the light sensitive elements adjacent thereto, for example, light sensitive elements 44 and 46. However, the light striking the light portions 108 will not be substantially absorbed and a substantially greater portion of the light impinging upon the light portions 108 of the document will be reflected back onto the light sensitive elements adjacent thereto, such as light sensitive element 48. The light sensitive elements adjacent the light portions 108 of the document will thereby effect a detectable change in their electrical conductivity. When the light sensitive elements are formed from photovoltaic cells, they will not only effect a change in electrical conductivity, but will also generate current. When the light sensitive elements are photoresistors, they will effect an increased electrical conductivity which can be detected by the application of read potentials to the respective pairs of the X address lines 20, 22, and 24, and the Y address lines 26, 28, and 30.

Electrical signals representing a faithful reproduction of the document 14 can be obtained because the light sensitive elements 32-48 can be made very small. For example, the light sensitive elements can be made to have dimensions of approximately 90 microns on a side. The isolating devices 50-66 can be formed to have a dimension of about 10-40 microns on a side and preferably 20 microns on a side. Also, the light sensitive elements 32-48 can be spaced apart so that they cover only a portion of the substrate 12 to permit the light to be projected onto the document to be scanned. For example, the light sensitive elements can be spaced so that they cover about 25-50% of the overall surface area of the substrate 18. Also, the light sensitive elements can be arranged in substantially coplanar relation so that each will be equally spaced from the document to be scanned. Although FIG. 3 illustrates a 3 x 3 matrix of light sensitive elements, it can be appreciated that a much larger array of elements would be required in actual practice for scanning a document.

The electrical characteristic, and, in accordance with this preferred embodiment, the electrical conductivity of the light sensitive elements can be detected by applying read potentials to respective pairs of the X and Y address lines in series, and one at a time. However, and most preferably, the light sensitive elements can be divided into groups of elements and the read potentials can be applied to each group of elements in parallel to facilitate more rapid scanning of the document. Within each group of elements, the elements can be scanned in series.

Further, electrical signals can be provided which represent the color hues of an image. For example, each of the light sources 96, 98, and 100 can include three separate light sources each being arranged to emit light of a different primary color of red, green, and blue. To generate the electrical signals representative of the color hues of the image, the image-bearing member 14 can be sequentially exposed to red, green, and blue light. During each exposure, the light sensitive elements can be addressed. For example, when the document 14 is exposed to the red light, those image portions thereof which include a red color component will reflect red light onto the light sensitive elements adjacent thereto. These elements will effect a greater change in electrical conductivity than those elements adjacent image portions which do not include a red color component. After this procedure is performed for each of the red, green, and blue primary colors, the three electrical signals provided from each light sensitive element can be combined to derive both intensity and color hue of the image.

Finally, the thin film image scanning device further includes a paper drive motor operatively disposed in relation thereto. The function of the paper drive is to allow the image-bearing member to be moving relative to the image scanning device so that the entire image bearing member is scanned. Additionally, the paper motor moves the paper past the image scanner at a preprogrammed speed so that the image on the image bearing member is properly scanned without loss of resolu-



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tion.

B. TOUCH SENSITIVE DISPLAY

1. Touch Sensor

The telecommunications system of Figure 1, further includes a touch sensitive position sensor integrally formed with a display means (described in greater detail hereinbelow), and adapted for use as an input device in the instant invention, for inputting information into the telecommunications system, such as telephone numbers and operating instructions, in response to the dynamically varying instructions displayed by the display means.

In a first preferred embodiment of the instant system, the touch sensor is a thin membrane film touch sensor of the type well known in the art. This thin membrane film is capable of detecting the presence of a touch point made by, for example, a human finger, a pointer or a stylus. After detecting the presence of the touch point, the thin membrane film is capable, in coordination with integrated processing means, to identify the precise location of said touch point and relay that location to downstream processing means. This function is necessary to preserve the operation of the display as a dynamically varying control panel.

The touch sensor illustrated generally in FIG. 4 by the reference numeral 400, represents a second, but equally preferred embodiment of the instant system. The position sensor 444 depicted in FIG. 4 includes a generally rectangularly-shaped, electrically conductive, exposed surface 402 that is specifically adapted for detecting and signalling the X-Y coordinate location of a touch point 404, such as the finger of a user or a stylus, placed in contact with the surface 402.

In order to accomplish the function of touch point 404 location detection,, the position sensor 400 includes at least two sets of current distribution and collection means, generally 410. The current distribution and collection means 410 establishes a uniform linear electric field across the conductive surface 402 thereof. More specifically, the electric field distribution is established by a first elongated, current distribution means 412a, disposed along at least one boundary of the conductive surface 402 (such as the lower horizontal boundary thereof) and a first, elongated, current collection means 414a operatively disposed along at least a second boundary of the conductive surface 402. The current distribution means 412a and the current collection means 414a are parallel to and face each other on the conductive surface 402. The first set of current distribution and collection means, 412a and 414a are operatively disposed along two opposite boundaries of the conductive surface 402 of the position sensor 400 and are adapted to cooperatively provide a substantially uniform linear electric field distribution of substantially parallel equipotential lines E across the conductive surface 402. The current distribution and collection means can be formed as distributed diodes, though other devices may be employed with equal success.

In the rectangularly-shaped, touch sensitive position sensor 400 illustrated in FIG. 4 the first horizontally disposed current distribution means 412a and the first horizontally disposed, but vertically spaced, current collection means 414a cooperate to establish a first uniform electric field distribution with a first set of horizontal equipotential lines. This provides high resolution means of determining the y axis coordinate of the touch point. A second set of current distribution and collections means 410 are required in order to provide a x axis coordinate location. More specifically, the second set of current distribution and collection means includes one elongated, current distribution and collection means 412b disposed along one vertical boundary of the conductive surface 402 and a second elongate, current distribution and collection means 414b disposed along the opposite vertical boundary of the conductive surface 402, horizontally spaced from said second current distribution means 412b. The second set of vertically oriented, spacedly positioned, current distribution and collection means 412b and 414b, cooperate to establish a second set of uniformly spaced equipotential lines having a second electric field distribution orthogonal to the equipotential lines of the first field distribution. This provides x axis coordinate location determination means of high resolution.

The current distribution and collection means 412a, 412b, 414a, 414b contain a plurality of current leads (such as 416a, 416b, 416c...416m; and 418a, 418b, 418c...418m; 420a, 420b, 420c...420m; and 422a, 422b, 422c...422m) equally spaced along the lengths thereof. These current leads provide for the flow of electrical current through the current distribution and collection means to the conductive surface 402 of the position sensor 400, thereby establishing an electric field there across, which field results in a flow of current between the oppositely disposed and charged distribution and collection means (412a and 414a; 412b and 414b). The current leads are arranged in a configuration of approximately 40 lines per inch, though any given resolution (from 2 lines to 100 or more lines per inch) may be employed. However, it is to be understood that the number of current leads per unit length is limited by the requirement that cross-talk between adjacent current leads must be substantially prevented.

In the current distribution and collection means, the lateral distance between adjacent current leads



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must be such as to provide relatively high impedance to current flow therebetween, as compared to the effective impedance path along the conductive surface 402 of the position sensor 400. In this way current is preferentially conducted in a direction other than along the length of the current distribution and collection means. The resolution of the touch position sensor 400 (defined as the accuracy of determining a specific X-Y coordinate location by the uniformity and linearity of the field across the conductive surface, especially along edges of said surface nearest the disengaged current distribution and collection means, wherein the impedance of the disengaged current distribution and collection means must be fairly high to avoid the flow of current thereinto.

Electrically interconnected with each of the current distribution and collection means, 412a, 412b, 414a and 414b, are current control means (not shown). The current control means sequentially turn on and off, in alternating manner, the sets of current distribution and collection means 410. The current control means must be capable of switching from a substantially on condition to a substantially off condition, without allowing any leakage of current while in the off state.

The touch sensitive position 400 sensor further includes a resistance means electrically disposed between said current distribution and collection means 410 and said bounded conductive surface 402. It is preferred that the resistance means be capable of providing resistance substantially the same as the resistance of the conductive surface 402, and typically within the rang of 10 to 1000 ohms, and most preferably 50 to 500 ohms.

The exact principle employed in electrically determining the x-y location of the touch point 131 can be best described as follows. The conductive surface 402 of the sensor 400 is continually scanned by a stream of discrete scanning cycles. The scanning cycles are triggered by associated timing means adapted to correlate the location of a touch point 404 with respect to the distributed electric field. Specifically, each scanning cycle, of which there may be approximately 500 per second is an independent variable which may be within the range of 10 to 10,000 cycles per second) comprises two half cycles; the first half cycle is dedicated to determining the y-axis touch point 404 location by energizing the first or y-axis current distribution and collection means, 412a and 414a, and the second half cycle is dedicated to determining the x-axis location of the touch point 404 by energizing the second or X-axis current distribution and collection means, 412b and 414b. The complete operating parameters of the touch sensor described hereinabove are more fully described in commonly assigned United States Patent No. 4,827,085 to Yaniv, et al, issued May 2, 1989, the disclosure of which is incorporated herein by reference.

2. Display

The telecommunication system of the invention includes means for displaying information either received from other facsimile machine, stored in the memory provided in the telecommunications system or as part of the operational menu. In the preferred embodiment, the display means is a light influencing display, such as a passive or an active matrix display employing for example, chiral smectic material, twisted nematic material or supertwist material; an electroluminescent display, and a plasma display. The telecommunications system may also employ a standard cathode ray tube.

The light influencing display 4 of FIG. 1 includes a plurality of individually addressable picture elements, called pixels. Each pixel has a separate pair of opposing pixel electrodes, with light influencing material between them. Voltages are selectively applied to the electrode pairs, causing the light influencing material between the electrode to emit light or to change optical density. These opposing pixel electrodes may be located on opposing substrates, such as opposing glass plates, with the light influencing material, such as liquid crystal material, located between the substrates. Alternatively, the electrodes may be on the same plate, with the liquid crystal material disposed therebetween.

In displays with many pixels it is necessary to use x-y matrix addressing. In x-y matrix addressing all of the "first" pixel electrodes of a given row are connected to an address line associated with that row and all the "second" pixel electrodes of a given column are connected to an address line associated with that column. This enables each pixel to be address by selecting its associated x and y address lines.

In a preferred embodiment of the instant telecommunications system, the display is an active matrix liquid crystal display, wherein each of the pixels has associated with it a non-linear electronic device which acts as a switch. This switch enables current to flow to or from the pixel during the brief period when the pixel is selected enabling the pixel to rapidly change state from "off" to "on", or vice versa. However, the switch prevents current flow to or from the pixel when the pixel is not selected. In this way the charge placed on the pixel during its brief selection period is substantially maintained during the rest of the scanning cycle. As a result, the pixel tends to maintain its "on" or its "off" state during the entire scanning cycle, greatly increasing the contrast and readability of the display.



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The non-linear device that is the switch, may be a two-terminal device, as a diode, or a three-terminal device, as a transistor.

ii. Pixel With Two Terminal Control Devices

A two-terminal control device is one that has two current path electrodes and a junction therebetween. The junction has a barrier height which allows current flow in one direction but blocks current flow in an opposite direction.

FIGS. 5 and 6 illustrate a display pixel 510. Although just one display pixel 510 is illustrated, it can be appreciated that many such pixels arrayed in row and column arrangement are necessary to provide a complete liquid crystal display.

The display pixel 510 includes an insulative substrate 512 which can be formed from glass, for example. Formed on the substrate 512 is an interconnect bus or lead 514 and a first address lead 516. The interconnect lead 514 and first address lead 516 can be formed from a conductive material such as a metal, for example, aluminum, molybdenum, or a molybdenum tantalum alloy, chromium, tantalum tungsten, palladium or platinum.

The display pixel 510 further includes at least a pair of diodes 518 and 520 formed on the interconnect leads 514 and first address lead 516 respectively. The diodes 518 and 520 are preferably formed from a deposited semiconductor material. The deposited semiconductor material is preferably an amorphous semiconductor alloy including silicon. The amorphous silicon alloy can also include hydrogen and/or fluorine and can be deposited by plasma assisted chemical vapor deposition, i.e. glow discharge. The diodes 518 and 520 preferably have a p-i-n configuration formed by a first doped region 518a 520a, which can be p-type, an intrinsic region 518b and 520b overlying the first doped regions 518a and 520a respectively, and a second doped region 518c and 520c, which be n-type, overlying the intrinsic regions 518b and 520b respectively.

The display pixel 510 further includes a second address lead 526 in electrical contact with the n-type region 518c of diode 518 and a first electrode 528 which is in electrical connection with the interconnect lead 514 through the opening 524 and the n-type region 520c of diode 520.

The address leads 516, 526 are formed of deposited metal essentially parallel to one another, as can be seen from FIG. 6, and both are coupled to the first electrodes 528. The diodes 518,520 form an isolator coupled to the first electrode 526. The isolator formed of the diodes 518, 520 has first and second inputs to which the address line 526, 516 respectively are coupled.

The first electrode 528 can be configured in a square configuration as illustrated in FIG. 6 and can be, for example, 300 microns to 2,000 microns on a side depending on the overall size of the finished display matrix and the desired aspect ratio.

With the first electrode 528 contacting the interconnect lead 514 through the opening 524, the diodes 518 and 520 are connected together in series relations. The address lead 516 and 526 are only in electrical connection with the first electrode 528 through the diodes 518 and 520.

Overlying the resulting structure described above, is a layer of light influencing material 530.

The display pixel 510 further includes a top transparent insulative plate 532 formed from, for example, glass. On the inner surface 534 of the insulative plate 532 is a layer of transparent conductive material 536 which can be, for example, indium tin oxide. The indium tin oxide layer 536 forms a second electrode of the display pixel 510. This electrode 536 is in contact with the liquid crystal material 530. The second electrode 536 is configured to have the same dimension as the first electrode 526 and is aligned therewith. The top insulative plate 532 is polarized in a manner well known in the art consistent with the type of liquid crystal display material (light influence material 530) utilized in the display pixel 510. An alignment coating of a conventional type can be applied over the first electrode 526 for the purpose of aligning molecules in the liquid crystal display material 530.

FIG. 7 illustrates the equivalent circuit diagram of the pixel 510 of FIG. 10. The pixel 510 includes the address leads 516 and 526, a pair of series connected diodes 518 and 520 coupled between the address leads 516 and 526, and the first conductive electrode 526 coupled between the diodes. The pixel 510 further includes the second electrode 536 spaced from the first electrode 526 . In between the electrodes 526 and 536 is the liquid display material 530.

The useful life of a liquid crystal display can be extended if the polarity of the applied voltage potential is reversed during alternate frames or scans. this can be accomplished with the pixel 510 of FIG. 10 by impressing a positive potential onto first address leads 516 and a negative potential onto the second electrode 536 during one frame to forward bias diode 520 and by impressing a negative potential onto the second address lead 526 and a positive potential on the second electrode 536 during the next frame. Repeating this sequence causes the potential applied to the liquid crystal display material to be reversed during alternate frames.

ii. Pixel With Three-Terminal Control Devices

Alternatively, the active matrix may have three-



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terminal non-linear control devices. A three-terminal control device is one that has two current path electrodes and a control electrode, with the effective resistance between the two current path electrodes being controlled as a function of a signal supplied to the control electrode. For example, in the thin film field effect transistors often used in active matrix displays, the voltage applied to the gate electrode controls the amount of current which flows between the source and drain electrode of the transistor.

Pixel electrodes of one polarity, the associated X and Y address lines, and the associated three-terminal devices are deposited on one substrate of the display. Each of the three-terminal devices has one of its current path electrodes connected to pixel electrode of the associated pixel. The X and Y lines are on the substrate to enable each three-terminal device and its associated pixel to be individually addressed. One of the sets of the address lines, for example, the X address lines, are connected to the control electrodes of the three terminal devices, with an X address line being connected to all of the control electrodes (gate) in one row of pixels. Correspondingly, the other set of address lines, for example, the y address lines, are connected to one of the current path electrodes (source or drain) of the control devices, with a Y address line being connected to a current path electrode (source or drain) of each pixel in one column of pixels. The pixel electrodes on the opposite substrate are usually connected to a common voltage, such as ground.

An individual pixel is switched by applying a voltage above a threshold voltage across the liquid crystal material of the pixel. This is accomplished by applying a potential i.e., a gate voltage, to the X address line connected to the control electrode of a three-terminal device and simultaneously applying a potential, i.e., a drain potential, across the Y address line connected to the current path electrode of the three-terminal device. For example, when the three terminal devices are thin film field effect transistors, the gate of each transistor is connected to an X address line and the source of each transistor is connected to a Y address line. In a field effect transistor, the pixel is switched, i.e., is selected or is turned on or off by applying the appropriate voltages between to the X address line connected to its gate and the Y address line connected to its source.

A typical light influencing display, useful in providing the display of the integral, modular, input and display and the mode of operation of the display are shown in FIGS. 8.

FIG. 8 shows a schematic diagram of a 3 X 3 pixel array. The circuit elements formed on the bottom substrate are shown by solid lines and the circuit elements formed by the strip conductors 844 on the upper substrate 842 are shown by dotted lines. The gates 824 of the transistors are connected to the x address lines 830 while the drains 826 are connected to the y address lines 844 through the pixel electrodes 820 and pixel 851. The sources 828 of all of the transistors 822 are connected to ground through the second conductive leads 832.

In operation, each of the transistors 822 in a given row 814, 815, or 816 is turned on when its respective X address line 830 is supplied with a positive "on" gate voltage, which for the TFTs of the illustrated embodiment is approximately 10 volts. Once the transistors 822 of a given row are turned on, the conductivity between the sources 828 and drains 826 of that row is greatly increased, effectively connecting the bottom pixel electrodes 820 of that row to ground. When a given row is selected in such a manner, a plurality of selected data voltages are applied in parallel to the second pixel electrodes of the row by means of the data leads, or Y lines 844. This causes each of the pixels 851 in the selected row to be charged to a voltage equal to the difference between the data voltage on its associated Y line and the ground voltage on its source line 832.

As stated above with respect to two terminal devices, it is important to periodically reverse the polarity of the voltages applied across the individual pixels. For this reason the voltage driving scheme used to power a typical display is divided into alternating positive and negative modes.

3. The Integrated Display and Touch Sensor

The touch sensitive position sensor described hereinabove and the display means also described hereinabove, may either be discrete individual elements which are subsequently collated or stacked as is illustrated in Figure 8a. Alternatively, the touch sensitive position sensor may be a coating or layer disposed upon the display means as is shown in Figure 8b.

C. THE MEMORY DEVICE

The next major component of the instant telecommunications system is a memory device adapted to store information which is either: 1)incoming information received from facsimile machine; 2)-voice information such as a message left by a caller; 3)information stored in memory after having been scanned in by the thin film scanning device; or 4)information preprogrammed in to allow for interactive menu driven function of the telecommunications system.

The telecommunications system of the instant



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invention is adapted to use one or more memory devices as required for the type and amount of information desired to be stored. In a preferred embodiment, the memory device is a random access memory, such as a flash RAM card memory. In a further preferred embodiment, the flash RAM memory is removable from the telecommunications device so that information stored thereon can be use as input file to, for example, word processing programs used in conjunction with a personal computer. Similarly, a personal computer could then be used to store information of the flash RAM memory, which could then be used as an input file for the telecommunications system to be sent via facsimile at some later date, or as a memo to the system user. Alternatively, the memory device may be some other type of memory chip of the kind well known in the art, such as a miniature floppy diskette or an optical memory.

Of course the instant telecommunications system also includes standard read only memory elements of the type well know in the art so that operational and control functions of the telecommunications system are always present "on-board" the system, without regard to the presence of the flash Ram memory card.

D. COMMUNICATIONS ELEMENTS

In addition to the foregoing elements, the telecommunications system requires certain components which allow it to communicate with telephones, (both standard and cellular) and with facsimile equipment. The first such component is a fax modem integrated circuit, which includes interfaces to the public telephone lines either through a direct access arrangement or through the mobile cellular network. In a preferred embodiment, this fax modem integrated circuit performs the protocol conversions which are required for the telecommunications system to communicate with standard facsimile machine. A typical such fax modem integrated circuit is a Yamaha model YM7109 fax modem integrated circuit.

A related component necessary for the telecommunication system to effect facsimile communication is a compression/expansion engine integrated circuit. This component is required to perform the algorithms required to transmit and receive compressed information in communication with a facsimile machine. A compression/expansion engine of this type is exemplified by NEC model No. UPD72185.

A third component essential for communication is a standard telephone/speakerphone circuit of the type well known in the art. This element is of course necessary in order to effect voice communication between the telecommunications system and the standard telephone systems.

E. THE CONTROL ELEMENT

As with all complex electronic devices, it is necessary to provide a control element or elements to oversee the functions and operations of the device. The telecommunications system of the instant invention is no exception in this regard. A microprocessor is provided so as to over see all of the operations and functions of the various components of the telecommunications system. The microprocessor used in the regard is a standard 80186 microprocessor of the type well known in the art.

As noted hereinabove, the telecommunications system places a premium on light weight and portability, thus, it is necessary to reduce the power requirements and thus avoid the need for a large battery. The battery power source provided can be made appropriate for the power requirements of each of the components by an efficient, integrated switching circuit or power convertor. Power is supplied to each of these components for the absolute minimum time required for that component to accomplish its function. In this regard, the microprocessor includes a reduced function mode to conserve power and the flash card memory does not require a battery to preserve information stored thereon. A small long-life battery can be provided to power the real-time clock and the memory of the microprocessor. Otherwise, the telecommunications system is powered by a rechargeable battery pack, or one or more non-rechargeable batteries. Of course, the system is also adapted to run off of standard household currents.

F. RELATIONSHIP BETWEEN THE ELEMENTS

While each of the elements of the telecommunications system have been set forth hereinabove, it is useful to peruse Figure 9 so as to gain an appreciation for the relationship of each component to the others.

Turning therefore to Figure 9, the telecommunications system relies upon a source of power to operate each element. This power source can be either standard household or automotive power sources as is illustrated in block 910, or can be provided by a rechargeable battery as is illustrated in blocks 912 and 912a. As each of the component elements of the telecommunications system has differing power requirements, the power provided can be made appropriate for the power requirements of each of the components by an efficient, integrated switching circuit or power converter 914. Power is supplied to each of these components through this convertor 914 for the absolute mini-



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mum time required for that component to accomplish its function.

Given a source of power, the telecommunications system next relies upon the microprocessor or microcontroller 916, which together with the program EPROM 916a govern each of the functions and operations of the telecommunications system. The microprocessor typically includes a real time clock 917a and a scratch RAM 917b to perform it operation. These devices 917a and 917b further include a small, long life battery backup 919 so that the telecommunications system can continue to function without regard to the presence of the flash memory device. The operator of the telecommunications system can direct the operation thereof by using the control panel 918 in conjunction with the dynamically varying information screens provided by the display 920. As noted hereinabove, the control panel 918 is a touch sensitive position sensor integrally formed with the display 920.

In operation, the telecommunications system is adapted to receive information via the standard telephone/speakerphone circuit 922 generally. Voice information is readily received and transmitted by the speakerphone circuit, while facsimile information is directed through a fax modem integrated circuit 924, which performs the protocol conversions which are required for the telecommunications system to communicate with standard facsimile machine.

The facsimile information the is directed to two separate locations: 1) the flash RAM memory device 926 and 2) the display 920 (via the display driver and memory 920a) were it is displayed in human readable form. As has been noted hereinabove, the displayed information may then be saved in the flash RAM memory or deleted therefrom. If the operator desires to make a hard copy of the stored information, two alternatives exist. First, the flash RAM memory card 926 may be removed and inserted into, for example, a personal computer, wherein information stored therein can be used as an input file for a word processing package and printed therefrom. Similarly, information can be stored on the flash RAM memory card and subsequently sent by facsimile from the telecommunications system. Alternatively, the information stored on the memory card may be downloaded therefrom to a standard printer (having the appropriate software) via a printer port 928.

As noted hereinabove, a related component necessary for the telecommunication system to effect facsimile communication is a compression/expansion engine integrated circuit 930. This component is required to perform the algorithms required to transmit and receive compressed information in communication with a facsimile machine. A compression/expansion engine of this type further requires an amount of associated memory 932a and 932b.

Information to be transmitted in facsimile form is scanned into the system through the scanner device or scanner engine 934 which digitizes the pattern of information of the document or image-bearing member. As noted above, the scanning device includes a paper drive 936 to correctly feed the image-bearing member past the scanning device 934. Information so scanned is subjected to the regimen of the compression/expansion engine 930 and the fax modem 924 prior to final transmission via the standard telephone network. Of course, the scanned information may be first stored in the flash memory 926, (or may have been placed in the memory by, for example a personal computer) prior to its transmission.

While the invention has been described with respect to certain preferred embodiments and exemplifications, those embodiments and exemplifications are not intended to define or otherwise limit the scope of the instant invention; rather the instant invention is to be define solely by the claims appended hereto.

## Claims

1. A portable, compact, voice and facsimile information telecommunications system (1), said system comprising;

   a voice/facsimile data signal receiving/transmitting means (922) (924) adapted to transmit and receive both voice and facsimile information;

   processing means connected to said voice/facsimile information signal receiving/transmitting means, said processing means adapted to demodulate incoming voice and facsimile information and modulate outgoing voice and facsimile information;

   memory means connected to said processing means for storing information (926);

   display means (920) for displaying received information;

   an thin film image scanning device (934) for digitizing information on an image bearing member;

   information compression means (930) adapted to perform algorithmic operations associated with facsimile information transmission and receipt; and

   electronic control means (916) for coordinating operation of said processing means, memory means, display means, information signal receiving/transmitting means, information compression means and scanning device.



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2. The telecommunications system of Claim 1, further including an information outlet means operatively associated with said electronic control means and said memory means, adapted to download information stored in said memory means for recording, in human readable form, said stored information.

3. The telecommunications system of Claim 2, wherein the information outlet means is a standard printer connection.

4. The telecommunication system of Claim 1, wherein said voice/facsimile information signal receiving/transmitting means is selected from the group consisting of a standard telephone, a cellular telephone, a radio, a wireless communication terminal and combinations thereof.

5. The telecommunications system of Claim 1, wherein said processing means is a modem integrated circuit.

6. The telecommunications system of Claim 5, wherein said modem integrated circuit further includes interface means for communication with standard telephone service through either direct access or the mobile cellular network.

7. The telecommunications system of Claim 5, wherein said modem integrated circuit is further adapted to perform protocol conversion for communication with standard facsimile equipment.

8. The telecommunications system of Claim 1, wherein said memory means comprises a plurality of memory means.

9. The telecommunications system of Claim 1, wherein said memory means is a long term memory means.

10. The telecommunications system of Claim 9, where said memory means is erasable and programmable.

11. The telecommunications system of Claim 9, wherein said memory means is a serial access random access memory.

12. The telecommunications system of Claim 9, where said memory means is erasable, programmable and removable.

13. The telecommunications system of Claim 12, wherein the memory means is flash memory card.

14. The telecommunications system of Claim 1, wherein said memory means is further adapted to store voice data.

15. The telecommunications system of Claim 1, wherein said memory means is adapted to store received facsimile information.

16. The telecommunication system of Claim 1, wherein said memory means is adapted to store information digitized by said image scanning device.

17. The telecommunications system of Claim 1, wherein said display means is selected from the group consisting of an active matrix liquid crystal display, a passive liquid crystal display, an electroluminesent display, a gas plasma display and combinations thereof.

18. The telecommunications system of Claim 17, wherein said display means is an active matrix liquid crystal display including a plurality of discrete picture elements arranged in an N by M matrix of rows and columns.

19. The telecommunications system of Claim 18, wherein each liquid crystal picture element comprises a pair of electrodes having liquid crystal material disposed therebetween and at least one threshold device connected at one of the terminals thereof to one of said electrodes.

20. The telecommunications system of Claim 19, wherein a pair of threshold devices are provided, said threshold devices electrically coupled together at a common node in non-opposing series relationship.

21. The telecommunications device of Claim 20, wherein said threshold devices are fabricated from deposited layers of semiconductor material.

22. The telecommunications system of Claim 19, wherein said at least one threshold device comprises a transistor formed from deposited layers of semiconductor material.

23. The telecommunications system of Claim 20, wherein the threshold devices comprise diodes formed from deposited layers of semiconductor material.

24. The telecommunications system of Claim 21, wherein the semiconductor material is an amorphous semiconductor material.



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25. The telecommunications system of Claim 24, wherein the amorphous semiconductor material is selected from the group consisting essentially of amorphous silicon, amorphous silicon alloys, amorphous germanium, amorphous germanium alloys and combinations thereof.

26. The telecommunications system of Claim 1, wherein said display means further includes an integrally formed touch position sensor input means.

27. The telecommunications system of Claim 26, wherein said display and integrally formed touch position sensor input means are adapted to function as a dynamically varying control panel.

28. The telecommunications system of Claim 27, wherein said integral touch position sensor input means is a thin film membrane switch panel.

29. The telecommunications system of Claim 27, wherein said integral touch position sensor input means is a solid state touch sensor panel.

30. The telecommunications system of Claim 1, further including sound sensing/recognition means connected to said switching means, said sound sensing/recognition means adapted to provide voice actuated operation of said telecommunications system.

31. The telecommunications system of Claim 1, wherein said thin film image scanning device comprises an array including at least one column of light sensitive elements operatively disposed upon a substrate, so as to be adjacent to and cover at least a portion of at least one dimension of an image bearing member, so as to provide electrical signals representative of said member.

32. The telecommunications system of Claim 31, wherein said light sensitive elements comprise photovoltaic cells.

33. The telecommunications system of Claim 31, wherein said light sensitive elements comprise photoresistors.

34. The telecommunications system of Claim 31, wherein said light sensitive elements are formed from deposited semiconductor material.

35. The telecommunications system of Claim 31, wherein said deposited semiconductor material is an amorphous semiconductor alloy.

36. The telecommunications system of Claim 31, further including a light source arranged for projecting light onto said image bearing member, on the side thereof immediately adjacent said array of light sensitive elements.

37. The telecommunications system of Claim 31, wherein said light sensitive elements are adapted to provide electrical signals representative of different colors carried by said image bearing member.

38. The telecommunications system of Claim 1, wherein said electronic control means is a microprocessor circuit.

39. The telecommunications system of Claim 38, wherein the microprocessor circuit includes a real time clock and associated memory.

40. The telecommunications system of Claim 1, further including a compact ergonomically designed housing.

41. The telecommunications system of Claim 40, wherein said housing has a via formed therein adapted to allow said thin film contact image scanning device to operate as a hand held scanner.

42. The telecommunications system of Claim 1, further including a power source.

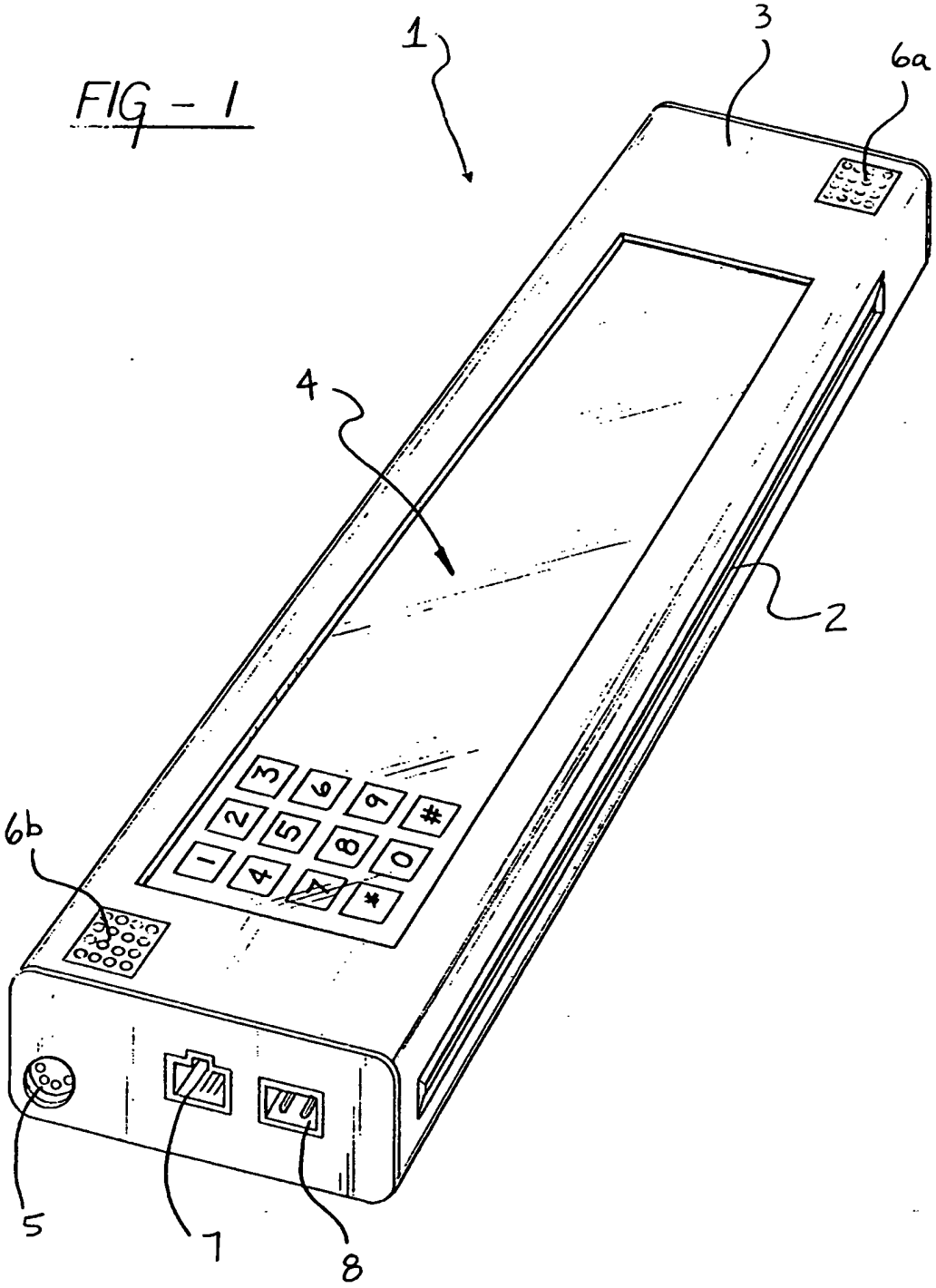
43. The telecommunications system of Claim 42, wherein the power source is a portable power source.

44. The telecommunications system of Claim 43, wherein said portable power source is a rechargeable battery pack.



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FIG - 1






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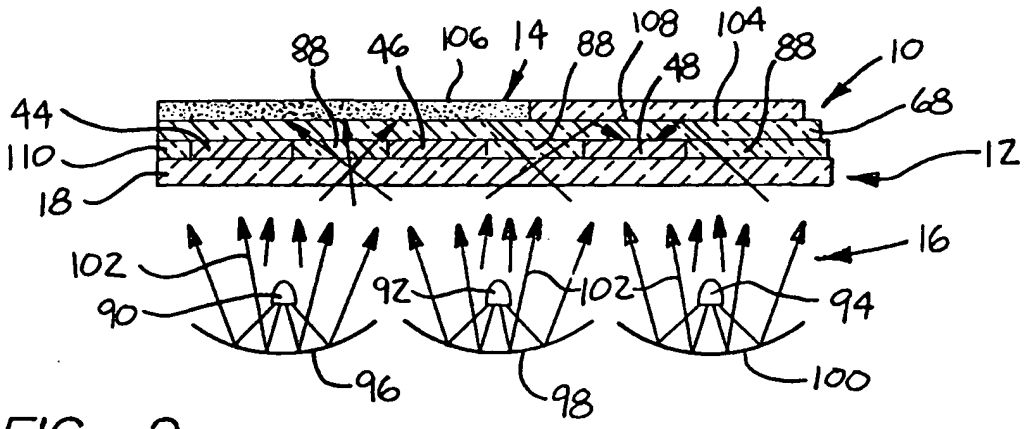



FIG - 2

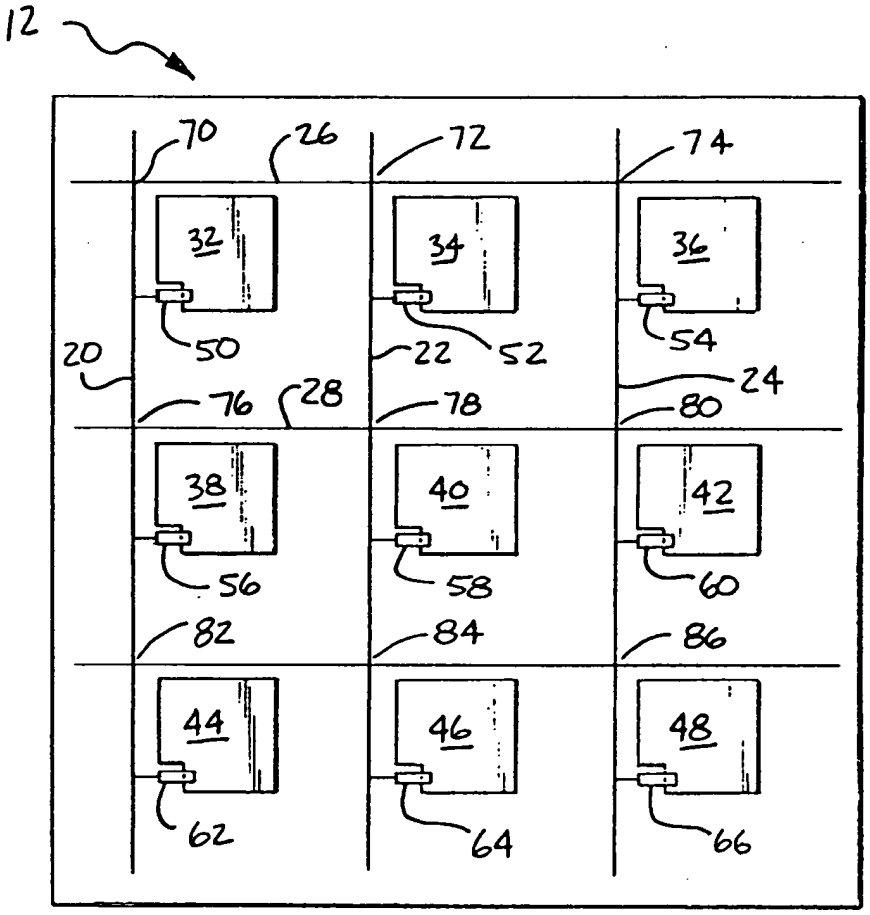



FIG - 3



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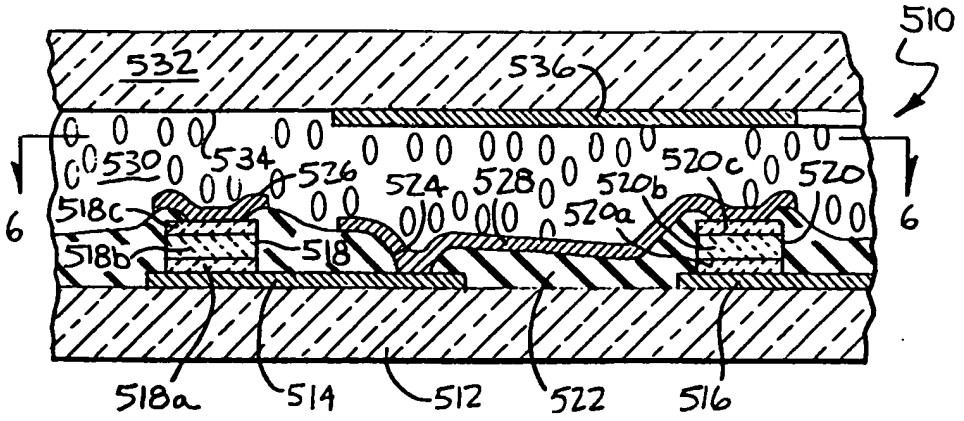



FIG - 5

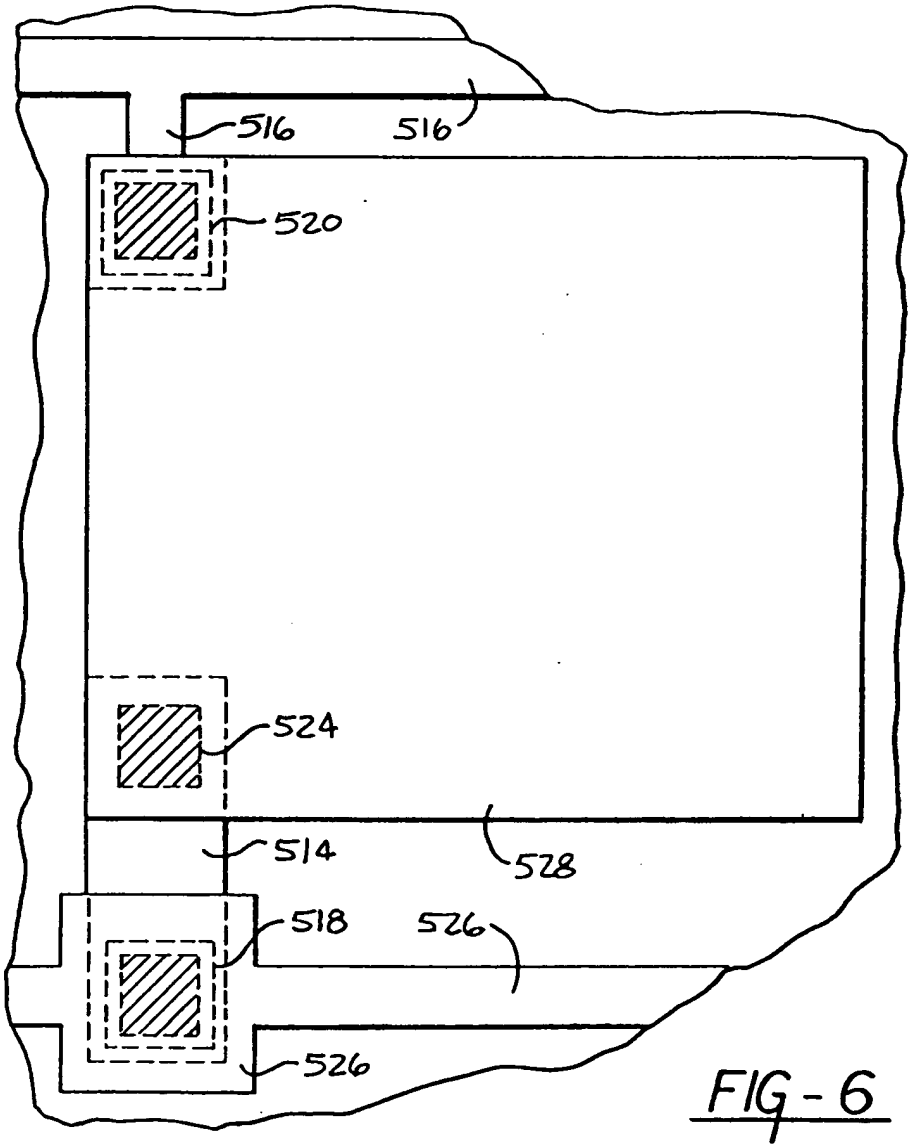
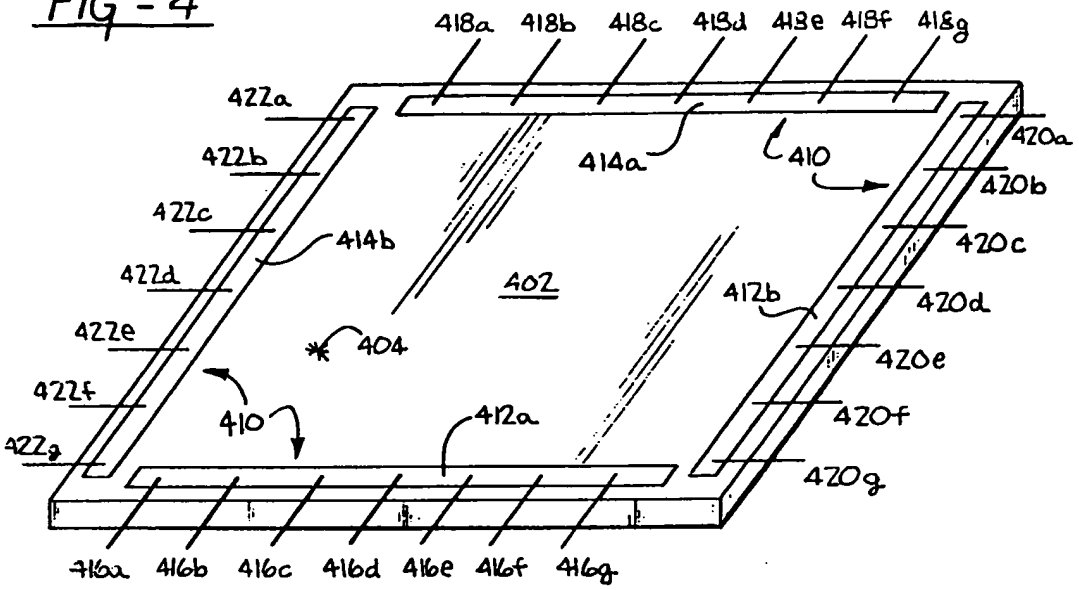



FIG - 6



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FIG - 4



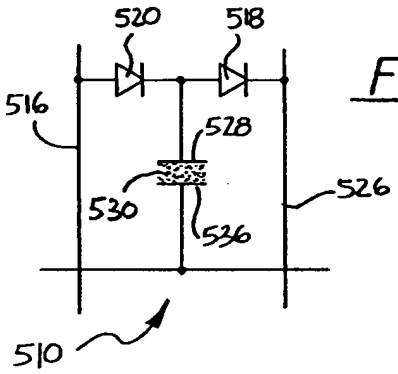




FIG - 7

FIG - 8A

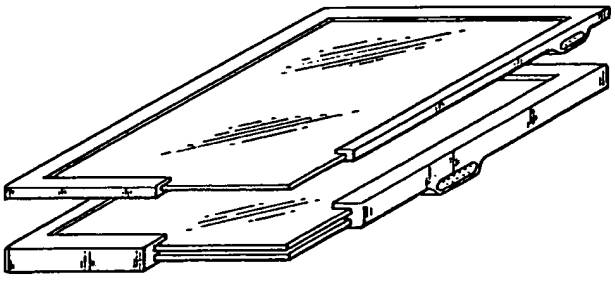
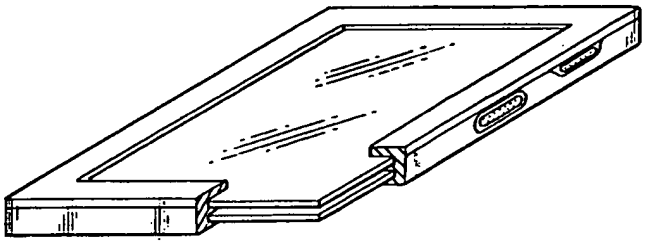


FIG - 8B





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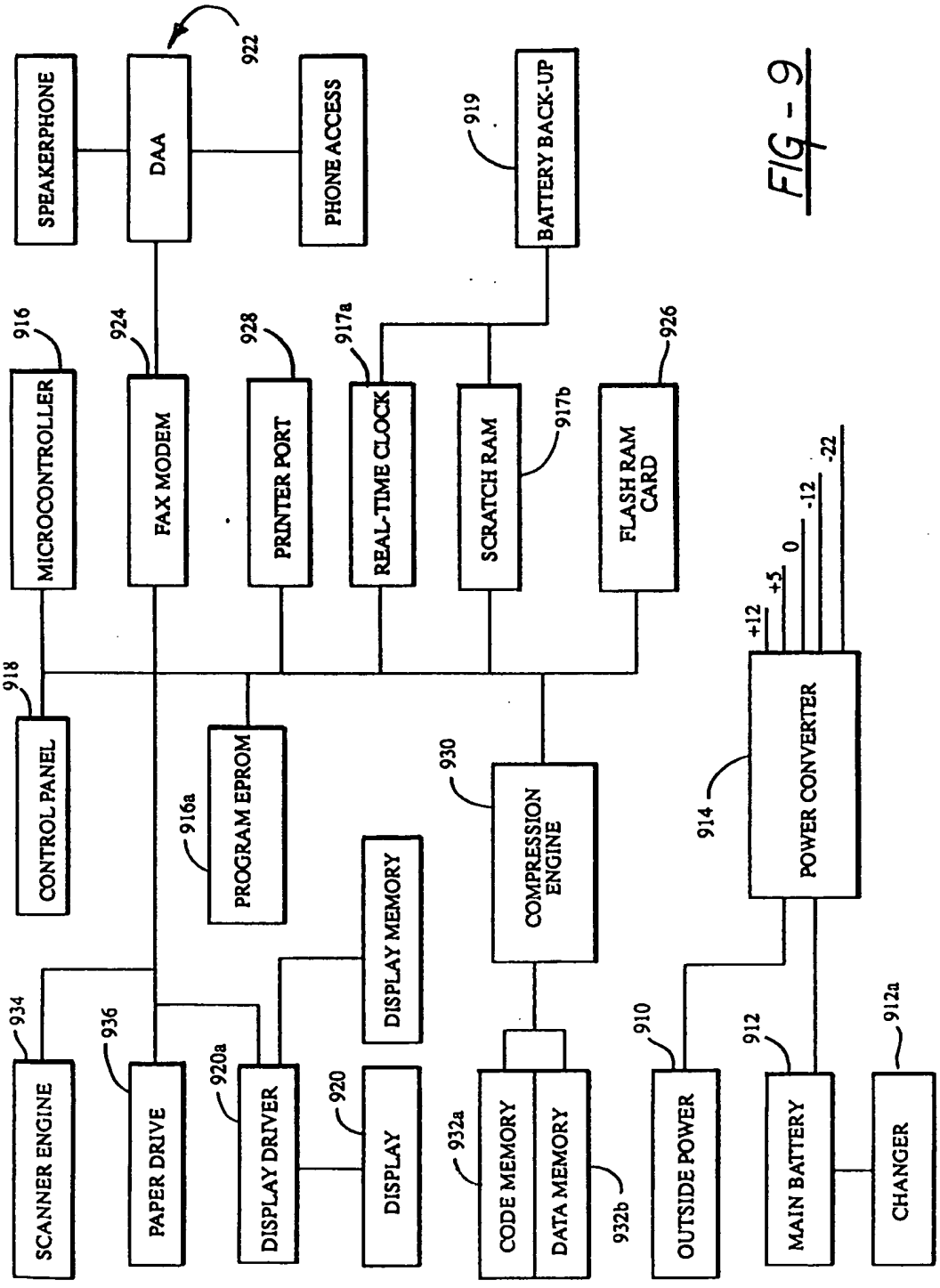



FIG - 9



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H4T TBLM T113 T129 T141 T150
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# (54) Display driver

(57) A display driver suitable for use with touch sensitive displays, and responsive to a wiping motion across the touch sensitive display, is disclosed. Upon detecting a wiping motion across a touch sensitive display the display driver responds by displaying a subsequent page of information which is in sequential correspondence with the page of information displayed when the swipe motion was made. Criteria for determining whether or not a swipe or wiping motion is intended or not are disclosed, and there is provided a description of a flow chart for a method of operation suitable for implementation via a micro-processor. The touch sensitive displays may be used in hand held devices such as mobile telephones.

GB 2 301 217 A

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

Fig.1.

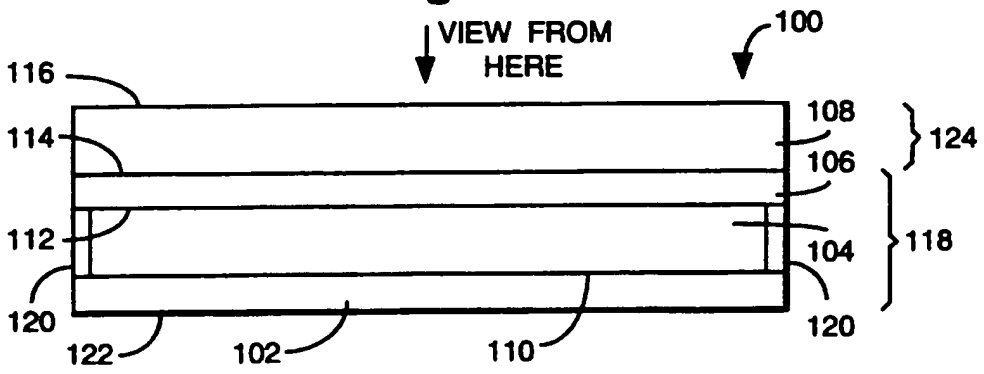



Fig.2A.

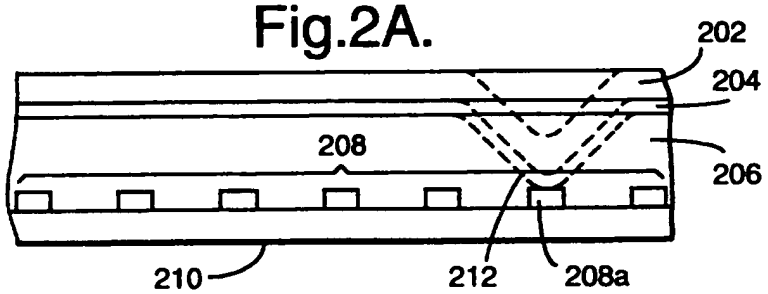



Fig.2B.

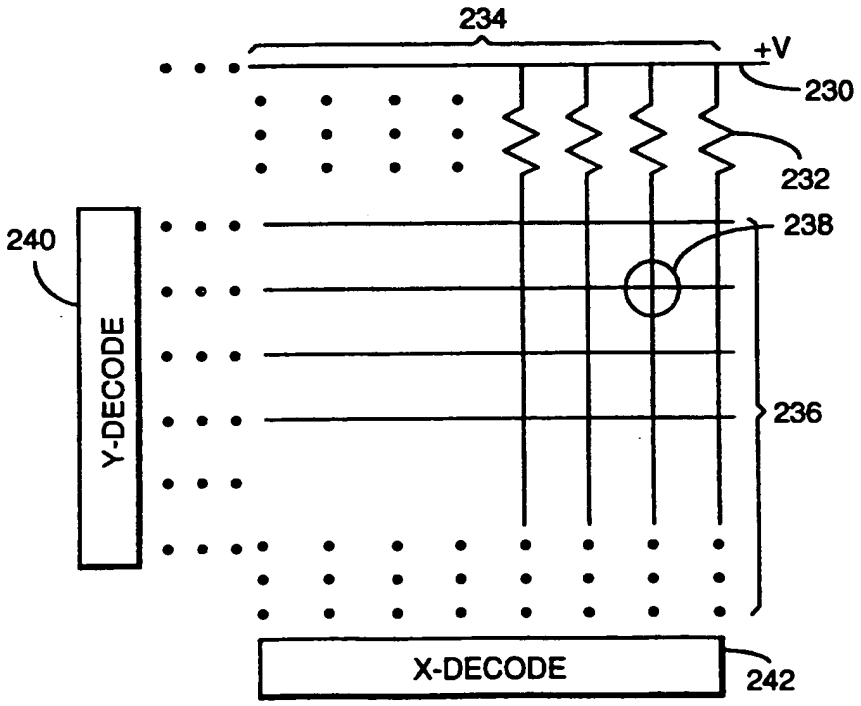


Fig.3.

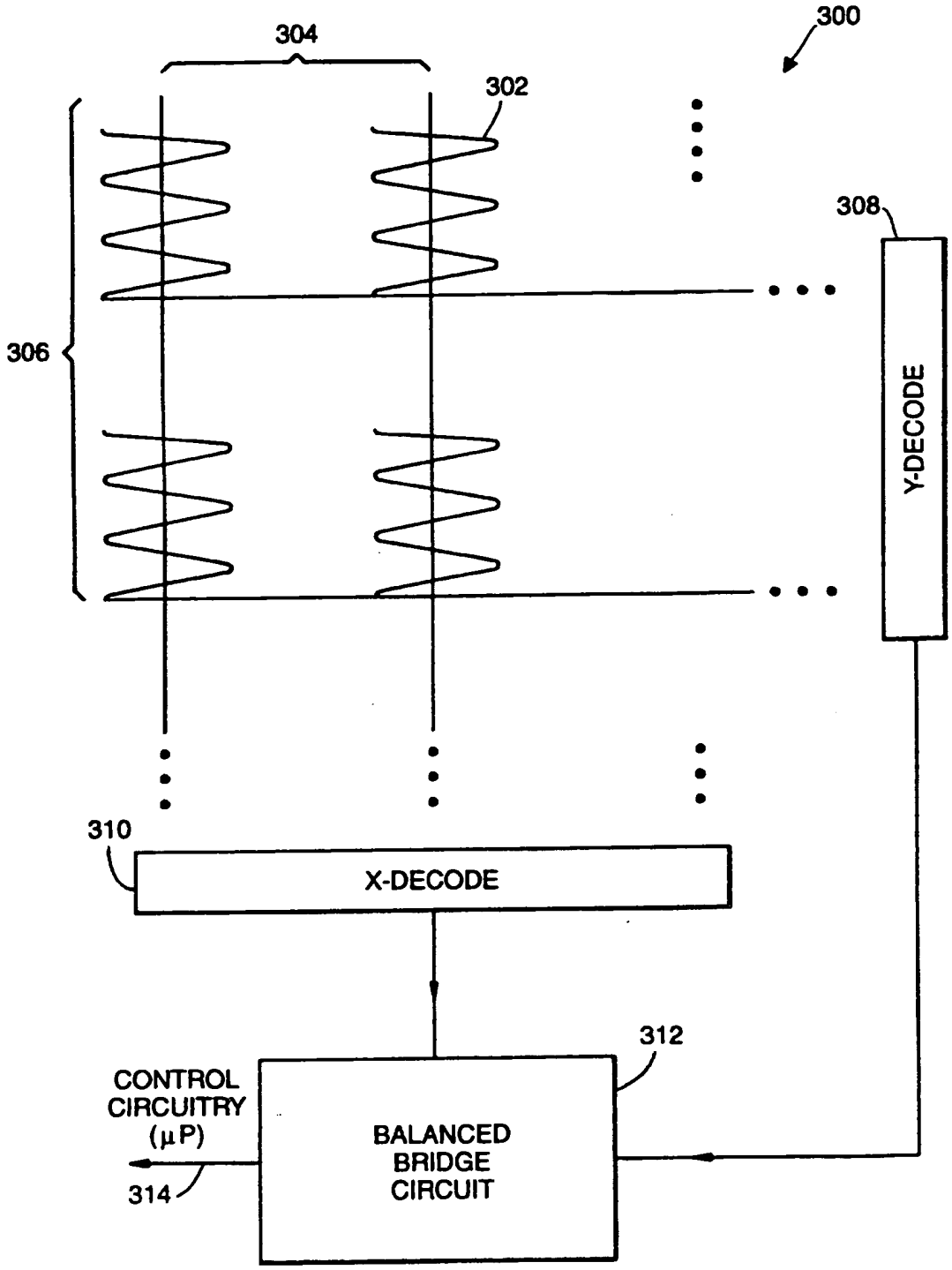

300
304
302
308
306
Y-DECODE
310
X-DECODE
312
CONTROL CIRCUITRY (μP)
314
BALANCED BRIDGE CIRCUIT

Fig.4.

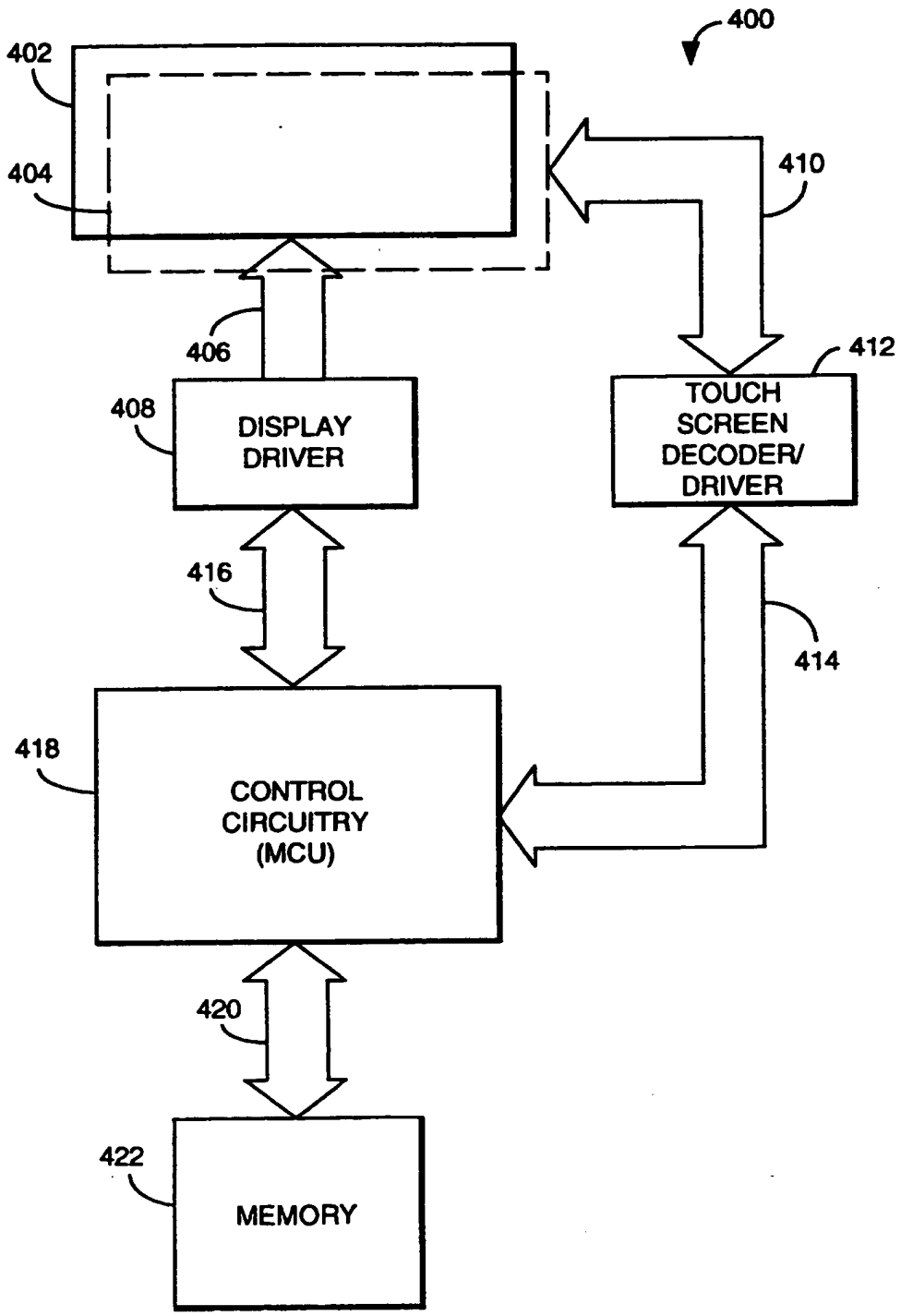

400
402
404
410
406
412
408
DISPLAY DRIVER
TOUCH SCREEN DECODER/ DRIVER
416
414
418
CONTROL CIRCUITRY (MCU)
420
422
MEMORY

Fig.5A.

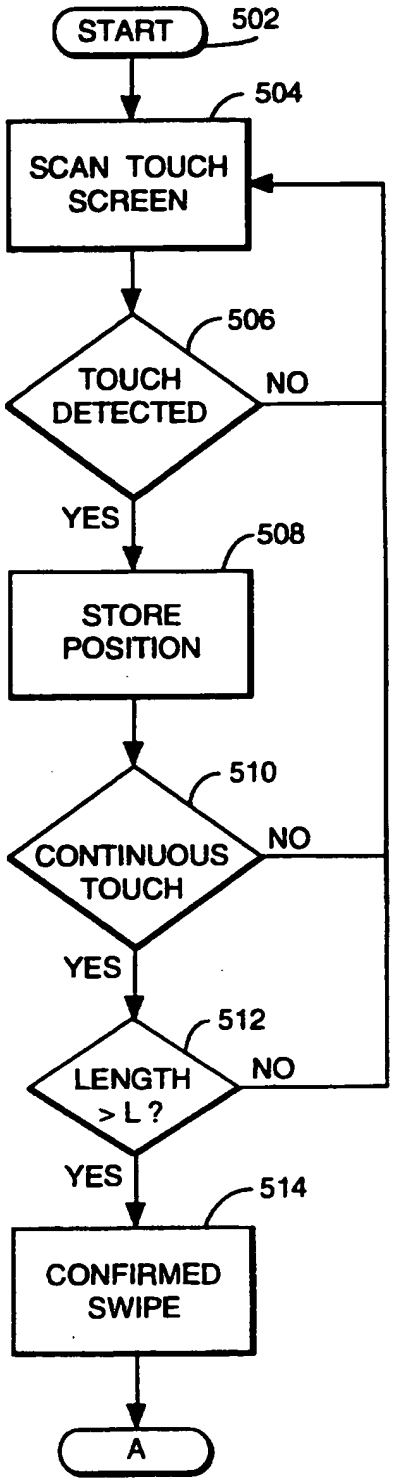
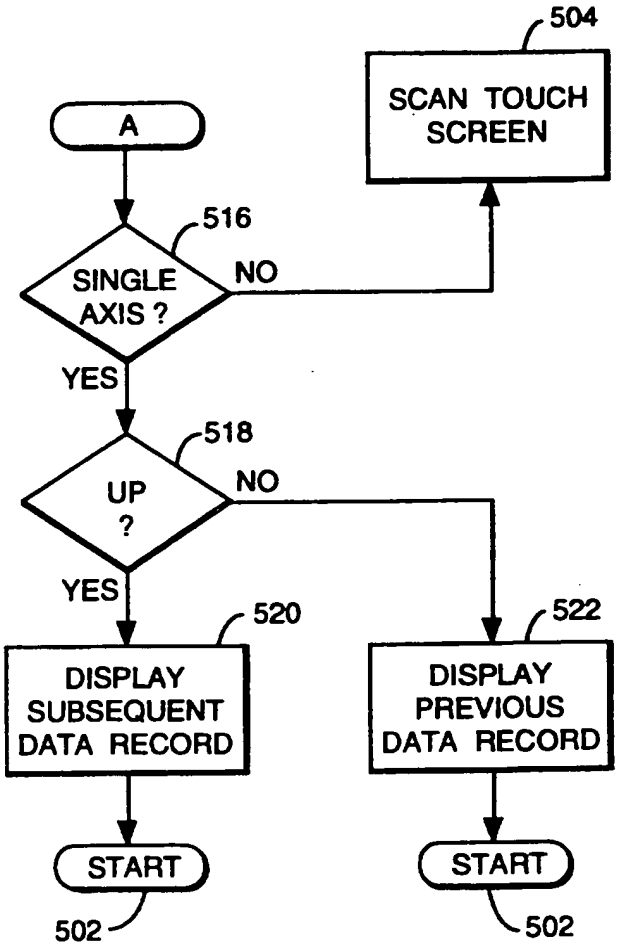

START
502
504
SCAN TOUCH SCREEN
506
TOUCH DETECTED
NO
YES
508
STORE POSITION
510
CONTINUOUS TOUCH
NO
YES
512
LENGTH > L ?
NO
YES
514
CONFIRMED SWIPE
A

Fig.5B.


504
SCAN TOUCH SCREEN
A
516
SINGLE AXIS ?
NO
YES
518
UP ?
NO
YES
520
DISPLAY SUBSEQUENT DATA RECORD
522
DISPLAY PREVIOUS DATA RECORD
START
502
START
502

# DISPLAY DRIVER

The present invention relates to a display driver. In particular, but not exclusively, to a display driver for touch sensitive displays for hand held electronic devices such as palm top computers or organisers, and portable radio telephones.

Touch sensitive displays are well known, and can be split into two basic types. The first type are those that require the display to be touched with a force sufficient to deform the display, or a screen over the display, in the region where the display was touched in order for control circuitry associated with the display to respond to the touch. The second type comprises those which merely require a light touch or the mere presence of a stylus or finger close to the screen in order for the touch sensitive screen to respond. The term "touch sensitive" is intended to encompass display screens requiring actual mechanical contact and those where the mere presence of a stylus or finger causes the control circuitry for or associated with the touch sensitive screen to respond.

A side view of a typical known touch sensitive display 100 is shown in Figure 1. The display is a Liquid Crystal Display (LCD) 118 and comprises opposing glass or plastics transparent plates 102, 106 separated by spacers 120 and having a liquid crystal material 104 disposed between them. On the inner faces 110, 112 of respective glass plates 102, 106 adjacent to the liquid crystal material 104 are disposed electrodes for activating the liquid crystal material 104 thereby forming displayed information. The LCD may be a reflected light display having a reflector disposed adjacent face 122 of glass plate 102, or an illuminated display having a light source disposed adjacent face 122. A touch sensitive screen 124 is disposed on the face of the display 118 closest to a user. The touch sensitive screen 124 comprises an insulator 108 having electrodes disposed on opposing surfaces 114, 116 thereof. The electrodes are arranged in a matrix fashion to form a grid, thereby dividing the screen 124 and hence display 118 into regions.

Conventionally, touch sensitive screens have been used in conjunction with display screens to provide "soft" keyboards. Icons or function labels are displayed on the display, and when a region of a touch sensitive screen disposed over the display and corresponding to an icon or function label is activated electronic apparatus associated with the display, such as a computer, performs the function corresponding to the said icon or label. In some applications, particularly those with small screens, it is necessary to use a thin stylus instead of a finger to obtain the resolution necessary to distinguish between different regions of the display corresponding to respective icons or labels. This can be inconvenient, particularly since the stylus can easily get lost.

In accordance with a first aspect of the present invention there is provided a display driver, comprising detection means responsive to a wipe movement on a touch sensitive pad for displaying next information sequentially corresponding to information displayed prior to the wipe movement on a display associated with the touch sensitive pad; and in accordance with a second aspect of the present invention there is provided a method of driving a display, comprising the steps of detecting a wipe movement on a touch sensitive pad associated with a display, and displaying next information sequentially corresponding to information displayed on the display prior to the wipe movement.

An advantage of the present invention is that information which is typically displayed sequentially, such as database records or menu screens, can be displayed for review or inspection without requiring depression of particular keys on a key pad or key board. The wipe movement or stroke can be similar to the finger or thumb movement typically used to flick through pages of a conventional bound diary, or address book, or a Rolodex file. Thus, users of an electronic device incorporating an embodiment in accordance with the invention who might be unfamiliar or intimidated with conventional modes of operating such devices can use a familiar movement or technique to search through similar types of information contained in screen pages displayed on the display of the electronic device.

Furthermore, because the motion is a wipe movement problems with resolution are obviated.

In a preferred embodiment of the invention the touch sensitive pad is a transparent screen disposed over the display. This has the advantage that a separate region for the touch sensitive screen does not have to be provided, which is particularly useful for small devices since it reduces the size of the electronic device. Furthermore, there is further correspondence with familiar finger and thumb search movements since the actual wipe movement takes place on the " page" of information displayed, much as when diary or address book pages are flicked through to find a particular entry.

Preferably, the detection means is responsive to a wipe movement comprising a substantially continuous coupling to the touch sensitive pad for a predetermined distance across the touch sensitive pad, which advantageously inhibits spurious responses to unintentional touching of the touch sensitive pad. Optionally, the detection means is only responsive to a wipe movement in substantially one axis across the touch sensitive pad, which has similar advantages to those described above. Typically, single axis movements may be up or down, or left to right of the display as viewed by a user.

Suitably, the detection means is responsive to wipe movements in substantially opposing directions to respectively display preceding next or succeeding next information which facilitates moving forwards and backwards through data records or menu screens.

Specific embodiments in accordance with the invention will now be described, by way of example only, and with reference to the accompanying drawings, in which:
Figure 1 shows a conventional touch sensitive display structure;
Figure 2A shows a cross-section of a wire grid touch sensitive screen;
Figure 2B shows a schematic diagram of the drive and decode circuitry for a wire grid touch sensitive screen;

Figure 3 shows a schematic diagram of the drive and decode circuitry for a non-contact touch sensitive screen;
Figure 4 shows apparatus in accordance with an embodiment of the invention; and
Figure 5 shows a flow chart for an appropriately conditioned microcontroller for implementing a second embodiment in accordance with the invention.

Figures 2 and 3 show two different electrode structures typically found in touch sensitive screens. Figure 2A shows a cross-section of a wire grid touch sensitive screen 200. Transparent insulating plates 202 and 210 are disposed opposing each other and have electrodes 204 and 208 disposed on inner faces of respective plates and oriented transverse to each other thereby forming a wire grid. Insulator 206 disposed between the plates 202, 210 and the transverse electrodes 204, 208 is typically fluid such that pressure on a plate 202, 210 causing the plate to deform moves the insulating material 206 to permit electrodes to touch, e.g. 204 and 208a as shown by the dotted lines 212. Plates 202, 210 may be fabricated from plastics or other suitable insulating material in order to allow them to deform in the manner shown by dotted line 212. A schematic diagram of the electrical connections for a wire grid touch sensitive screen is shown in Figure 2B. X axis positions are derived from vertical wires 234 which are respectively coupled via resistors 232 to a power supply line 230 (+V). The wires 234 are coupled to an X-decoder circuit 242. Horizontal wires 236 are used for Y-decoding and are coupled to Y-decoder 240.

The intersection of two wires 238 due to touching of the screen 200 in that region can be detected in a manner well known from the key pad art. The Y lines 236 which are normally floating high, are sequentially grounded by Y-decoder 240 whilst the X-decoder scans the X lines 234 for any short circuits for respective grounding of Y lines 236. When an X-decode input is grounded since the control circuitry recognises or knows which Y line is grounded the exact location of the touching of X and Y lines may be determined.

An alternative touch sensitive display 300 is shown in Figure 3. Similar elements in Figure 3 to those in Figure 2 are given similar reference numerals as those in Figure

2. This display is responsive to a change in capacitance due to the proximity of a stylus or finger to a region of the display 300. The stylus or finger does not have to be in mechanical contact with the touch sensitive display 300. The vertical X-lines 304 are mere wire conductors disposed on a supporting plate 202. Horizontal Y-lines 306 comprise convoluted sections of conductor 302 regularly disposed over a plate 210 disposed opposing plate 202, to define distinct regions. Each position on the X-Y grid defined by X and Y lines 304, 306 is decoded in a similar manner to that described for display 200, using X-decoder 310 and Y-decoder 308. However, each pair of X-Y scanned lines forms an arm of balanced bridge circuit 312 in order to determine whether there is a change in capacitance from the "untouched" or non-perturbed state. The result from the balanced bridge circuit 312 is sent to control circuitry 314 which is typically a microcontroller unit or microprocessor to determine whether a region of the display has been touched. The balanced bridge circuit 312 may be any known bridge capable of detecting changes in capacitance.

Apparatus 400 in accordance with an embodiment of the invention is shown in Figure 4. A display screen 402 has disposed over it a transparent touch sensitive screen 404. For the sake of clarity the display screen 402 and touch sensitive screen 404 are shown offset relative to each other, and the touch sensitive screen 404 is shown in dotted outline.

The display screen 402 is coupled by control bus 406 to a display driver 408 which controls display screen 402. The touch sensitive screen 404 is coupled to decode/drive circuitry 412 by bus 410. Both the display driver 408 and touch sensitive decode/drive circuitry 412 can be conventional circuitry typically supplied as integrated circuits. The display screen 402 and touch sensitive screen 404 may also be conventional devices. A particularly suitable touch screen 404 is that described earlier with reference to Figure 3 of the drawings. Such a touch screen is sensitive to changes in capacitance and does not require physical contact with it to respond. Thus, the screen of Figure 3 can be kept clean and relatively free of contamination typically occurring when a screen is touched. Furthermore, a firm mechanical pressure on the touch screen of Figure 3 is not required, only a mere

brushing at most, which makes the touch screen of Figure 3 particularly suitable for handheld devices since they do not need to be held firm.

The display driver 408 is coupled to control circuitry 418 by bus 416. The control circuitry 418 performs and outputs all the usual functions and signals known to a skilled person to cause information to be displayed via the display driver 408 on the display 402. Touch screen decoder/driver 412 is coupled to control circuitry 418 via bus 414. Touch screen decoder/driver 412 inputs to the control circuitry 418 information corresponding to whether the touch sensitive screen 404 has been touched and the position on the screen 404 corresponding to the touching. The control circuitry 418 is also coupled to a memory 422 via bus 420. The control circuitry 418 is capable of taking data stored in the memory 422 and causing it to be displayed on the display screen 402 via display driver 408, in response to signals received from the touch screen decoder/driver 412. The control circuitry 418 may be discrete logic, medium scale integrated logic or an appropriately conditioned microcontroller unit (MCU). Typically, a MCU 418 would also control other functions of an electronic device associated with the display 402, such as key board functions. Additionally, both or one of the display driver 408 and touch screen decoder/driver 412 may be comprised within the MCU 418.

A method of operating a microcontroller unit 418 in accordance with an embodiment of the invention is shown in Figure 5. The method starts at step 502 and the touch screen is scanned at step 504. At each grid point of the touch screen interrogated during scanning a test is carried out at step 506 by the MCU 418 to determine if the screen has been touched at that grid point. If no touch was detected then the method returns to step 504 and scanning of the screen continues. If a touch was detected then the position of that touch on the screen is noted and stored at step 508. Then it is determined at step 510 whether or not the instant touch forms part of a substantially continuous touch. Whether or not a touch is part of a substantially continuous touch can be tested with reference to empirical data, for example that is to say, a number of wipe movements can be made during a design phase of apparatus embodying the invention to see how often the wiping stylus or finger

loses contact with the touch screen during what a test user intended to be a definite wipe. Such data would set a criteria of a maximum number of times, and for what distance, contact can be lost with the touch screen whilst still being determined a definite wipe movement. If it is determined that there is no continuous touch then the method returns to step 504 and the scanning of the touch screen resumes. However, if it is determined that the instant touch does form a part of a continuous touch, i.e. fulfills the criteria discussed above, then the method proceeds to step 512, where it is determined whether or not the continuous touch exceeds a predetermined distance across the touch screen. If not, then the method returns to step 504 and scanning of the touch screen is resumed, but if yes then a confirmed wipe is recorded at step 514. It is then determined at step 516 whether or not the wipe occurred along substantially a predefined single axis. In the present embodiment the axis has been defined as transverse to the direction of text display on the display screen, i.e. in the vertical direction for conventional displays. If it is determined that the confirmed wipe was not substantially along a vertical axis then the method returns to step 504 and scanning of the touch screen resumes. If the confirmed wipe was substantially along the vertical axis then it is determined at step 518 whether or not the wipe was up or down. If the wipe was in an up direction then the subsequent data record is displayed 520, and if in the down direction the previous data record is displayed 522. After displaying the next data record the method returns to the start 502.

The above described apparatus and method are particularly useful for searching through electronic address books or other databases where the data records are sequential, i.e. alphabetically stored. Each time a confirmed up or down wipe is determined the subsequent or previous address can be displayed on the display. Similarly for menu screens or telephone directories.

In view of the foregoing description it will be evident to a person skilled in the art that various modifications may be made within the scope of the invention. For example, any touch sensitive screen can be used in an embodiment of this invention, and the touch sensitive screen does not have to be placed over the display.

Additionally, the defined axis can be from left to right across a screen, with the particular direction resulting in a forward or backward progression through the stored data records. For the avoidance of doubt, the term "touch sensitive" includes screens where it is not necessary to mechanically contact the screen to activate it.

The scope of the present disclosure includes any novel feature or combination of features disclosed therein either explicitly or implicitly or any generalisation thereof irrespective of whether or not it relates to the claimed invention or mitigates any or all of the problems addressed by the present invention. The applicant hereby gives notice that new claims may be formulated to such features during prosecution of this application or of any such further application derived therefrom.

**CLAIMS**

1. A display driver, comprising detection means responsive to a wipe movement on a touch sensitive pad for displaying next information sequentially corresponding to information displayed prior to the wipe movement on a display associated with the touch sensitive pad.

2. A display driver according to claim 1, wherein the touch sensitive pad is a transparent touch sensitive screen disposed over the display means.

3. A display driver according to claim 1 or claim 2, wherein the detection means is responsive to a wipe movement comprising a substantially continuous coupling to the touch sensitive pad for a predetermined distance across the touch sensitive pad.

4. A display driver according to any preceding claim, wherein the detection means is only responsive to a wipe movement in substantially one axis across the touch sensitive pad.

5. A display driver according to claim 4, wherein the detection means is responsive to wipe movements in substantially respective opposing directions to respectively display preceding or succeeding next information.

6. A display driver substantially as hereinbefore described and with reference to respective embodiments shown in the drawings.

7. A method of driving a display, comprising the steps of detecting a wipe movement on a touch sensitive pad associated with a display, and displaying next information sequentially corresponding to information displayed on the display prior to the wipe movement.

8. A method according to claim 7, further comprising detecting a wipe movement comprising a substantially continuous coupling to the touch sensitive pad for a predetermined distance across the touch sensitive pad.

9. A method according to claim 7 or claim 8, further comprising detecting only a wipe movement in substantially one axis across the touch sensitive pad.

10. A method according to claim 9, yet further comprising detecting wipe movements in substantially respective opposing directions to respectively display preceding or succeeding next information.

11. A method substantially as hereinbefore described and with reference to Figure 5 of the drawings.

The Patent Office

| | | | |
|---|---|---|---|
| **Application No:** | GB 9510766.0 | **Examiner:** | Mr.G.M Pitchman |
| **Claims searched:** | 1 to 11 | **Date of search:** | 25 August 1995 |

## Patents Act 1977
## Search Report under Section 17

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.N): G5C(CHB) H4T(TAFA, TBLM)

Int Cl (Ed.6): G06F 3/033

Other: ONLINE: EDOC WPI JAPIO

**Documents considered to be relevant:**

| Category | Identity of document and relevant passage | | Relevant to claims |
|---|---|---|---|
| X | GB 2154349 | (HEWLETT-PACKARD)-see abstract | 1,2,3,7,8 |
| X | EP 0536554 | (IBM)-see abstract | 1,2,3,7,8 |
| X | US 5404458 | (IBM)-see abstract | 1,2,3,7,8 |
| X | US 5059959 | (SEVEN OAKS)-see abstract | 1,2,3,7,8 |

| | | | |
|---|---|---|---|
| X | Document indicating lack of novelty or inventive step | A | Document indicating technological background and/or state of the art. |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category. | P | Document published on or after the declared priority date but before the filing date of this invention. |
| & | Member of the same patent family | E | Patent document published on or after, but with priority date earlier than, the filing date of this application. |



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## Index of Claims

| Application/Control No. | Applicant(s)/Patent under Reexamination |
|---|---|
| 11/078,916 | HAYES ET AL. |
| **Examiner** | **Art Unit** |
| Charles N. Appiah | 2686 |

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|---|---|---|---|---|---|---|---|
| √ | Rejected | – | (Through numeral) Cancelled | N | Non-Elected | A | Appeal |
| = | Allowed | + | Restricted | I | Interference | O | Objected |

| Claim | | Date | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Final | Original | 3/14/06 | | | | | | | | |
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| Final | Original | 3/14/06 | | | | | | | | |
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| | 67 | v | | | | | | | | |
| | 68 | V | | | | | | | | |
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Bib Data Sheet

**CONFIRMATION NO. 1137**

| SERIAL NUMBER | FILING DATE | CLASS | GROUP ART UNIT | ATTORNEY DOCKET NO. |
|---|---|---|---|---|
| 11/078,916 | 03/11/2005<br>RULE | 455 | 2686 | ERI-888RI |

APPLICANTS

John Joseph Hayes JR., Wake Forest, NC;

Curtis Wayne Thornton, Cary, NC;

** CONTINUING DATA **********

This application is a REI of 09/625,674 07/25/2000 PAT 6,278,888 which is a CON of 09/001,173 12/30/1997 PAT 6,131,047

YES CA

** FOREIGN APPLICATIONS **********

NONE CA

IF REQUIRED, FOREIGN FILING LICENSE GRANTED
** 04/08/2005

| | | | | | |
|---|---|---|---|---|---|
| Foreign Priority claimed ☐ yes ☑ no<br>35 USC 119 (a-d) conditions met ☐ yes ☑ no ☐ Met after Allowance<br>Verified and Acknowledged Examiner's Signature Initials | STATE OR COUNTRY NC | SHEETS DRAWING 9 | TOTAL CLAIMS 73 | INDEPENDENT CLAIMS 6 |

ADDRESS
Steven H Slater
Slater & Matsil LLP
17950 Preston Road
Suite 1000
Dallas , TX
75252

TITLE
Radiotelephones having contact-sensitive user interfaces and methods of operating same

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|---|---|---|
| FILING FEE | FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT | ☐ All Fees.<br>☐ 1.16 Fees ( Filing )<br>☐ 1.17 Fees ( Processing Ext. of time ) |



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## Search Notes

| Application/Control No. | Applicant(s)/Patent under Reexamination | |
|---|---|---|
| 11/078,916 | HAYES ET AL. | |
| **Examiner** | **Art Unit** | |
| Charles N. Appiah | 2686 | |

| SEARCHED | | | |
|---|---|---|---|
| Class | Subclass | Date | Examiner |
| 455 | 566,90.1-90.3, 95, 575.1-575.5 | 3/13/2006 | CA |
| 345 | 173,174 | | |
| | 156,168, | | |
| | 123,184 | | |
| 455 | 550.1 | | |
| 379 | 433.1 | | |
| | 433.3 | | |
| | 428 | | |
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| INTERFERENCE SEARCHED | | | |
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| Class | Subclass | Date | Examiner |
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| SEARCH NOTES (INCLUDING SEARCH STRATEGY) | | |
|---|---|---|
| | DATE | EXMR |
| 455/566,90.1-90.3,575.1-575.5,550.1 | 3/13/2006 | CA |
| 345/156,168, 173,174,123,184 | | |
| 379/433.1,433.3,428. | | |
| EPO, Derwent, JPO | | |
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# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 8 | contact near sensitive near transducer | US-PGPUB; USPAT | OR | OFF | 2006/03/14 09:58 |
| L2 | 16 | touch near sensitive near transducer | US-PGPUB; USPAT | OR | OFF | 2006/03/14 09:58 |
| L3 | 15 | ("3641431" \| "4353056" \| "4641350" \| "4958129" \| "5325442" \| "5369228" \| "5374787" \| "5495077" \| "5543588" \| "5543590" \| "5543591" \| "5648642" \| "5861583" \| "5943044" \| "6166370").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/14 10:07 |
| L4 | 62 | ("5543588").URPN. | USPAT | OR | OFF | 2006/03/14 10:09 |
| L5 | 6 | ("5793303").URPN. | USPAT | OR | OFF | 2006/03/14 10:12 |
| L6 | 3 | ("D378211").URPN. | USPAT | OR | OFF | 2006/03/14 10:23 |
| L7 | 6 | ("5305017" \| "5469194" \| "5495077" \| "5583539" \| "5628031" \| "5644516").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/14 10:36 |
| L8 | 40 | ("5305017").URPN. | USPAT | OR | OFF | 2006/03/14 10:52 |
| L9 | 51 | (contact touch) near sensitive same transducer$1 | EPO; JPO; DERWENT | OR | OFF | 2006/03/14 11:22 |
| L10 | 1953 | (contact touch) near sensitive and menu with display | US-PGPUB; USPAT | OR | OFF | 2006/03/14 11:22 |
| L11 | 490 | (contact touch) near sensitive same menu with display | US-PGPUB; USPAT | OR | OFF | 2006/03/14 11:22 |
| L12 | 113 | (contact touch) near sensitive same menu near display | US-PGPUB; USPAT | OR | OFF | 2006/03/14 11:22 |
| L13 | 0 | (contact touch) near sensitive same menu near display near rows | US-PGPUB; USPAT | OR | OFF | 2006/03/14 11:23 |
| L14 | 11 | (contact touch) near sensitive same menu near display and rows | US-PGPUB; USPAT | OR | OFF | 2006/03/14 11:24 |
| L15 | 0 | (contact touch) near sensitive same menu near display and rows | EPO; DERWENT | OR | OFF | 2006/03/14 11:24 |
| L16 | 12 | (contact touch) near sensitive same menu near display | EPO; DERWENT | OR | OFF | 2006/03/14 11:28 |
| L17 | 54 | (contact touch) near sensitive same menu near display | USPAT | OR | OFF | 2006/03/14 11:28 |
| L18 | 14 | 17 and highlight$ | USPAT | OR | OFF | 2006/03/14 11:28 |
| L19 | 2137 | display$ with alphanumeric and menu | USPAT | OR | OFF | 2006/03/14 11:32 |
| L20 | 480 | display$ with alphanumeric same menu | USPAT | OR | OFF | 2006/03/14 11:34 |


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# EAST Search History

| | | | | | | |
|---|---|---|---|---|---|---|
| L21 | 1 | 20 and contact near sensitive | USPAT | OR | OFF | 2006/03/14 11:33 |
| L22 | 8 | ("5057025" \| "5270848" \| "5573435" \| "5746607" \| "5888076" \| "6025644" \| "6031590" \| "6265986").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/14 11:33 |
| L23 | 831 | display$ with alphanumeric same menu | US-PGPUB; USPAT | OR | OFF | 2006/03/14 11:34 |
| L24 | 105 | 23 and "455"/$.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/03/14 11:35 |
| L25 | 8 | 24 and (touch contact) near sensitive | US-PGPUB; USPAT | OR | OFF | 2006/03/14 11:35 |

# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 1352 | (contact touch) near sensitive same (thumb side) | US-PGPUB; USPAT; EPO; DERWENT | OR | OFF | 2006/03/13 12:20 |
| L2 | 681 | (contact touch) near sensitive with (thumb side) | US-PGPUB; USPAT; EPO; DERWENT | OR | OFF | 2006/03/13 12:20 |
| L3 | 367 | 2 and (mobile portable cellular radio wireless) | US-PGPUB; USPAT; EPO; DERWENT | OR | OFF | 2006/03/13 12:21 |
| L4 | 146 | 2 and (mobile portable cellular radio wireless) near (terminal device phone) | US-PGPUB; USPAT; EPO; DERWENT | OR | OFF | 2006/03/13 12:21 |
| L5 | 7 | ("5237311" \| "5510813" \| "5638061" \| "5670755" \| "5680160" \| "5742894" \| "6034672").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 12:25 |
| L6 | 4 | ("5719936" \| "6128475" \| "6149442" \| "D410645").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 12:26 |
| L7 | 14 | ("4987411" \| "5339388" \| "5598183" \| "5642131" \| "5719936" \| "5748512" \| "5805159" \| "5825353" \| "6005573" \| "6349220" \| "6415138" \| "6433801" \| "6473069" \| "6526296").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 13:47 |
| L8 | 4 | ("20020180712" \| "5159159" \| "6078274" \| "6441807").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 13:48 |
| L9 | 52 | ("5159159").URPN. | USPAT | OR | OFF | 2006/03/13 13:53 |
| L10 | 110346 | pressure near sensitive | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2006/03/13 13:54 |
| L11 | 4304 | 10 and (mobile cellular wireless portable) and display | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2006/03/13 13:56 |
| L12 | 2071 | 10 and (mobile cellular wireless portable) same display | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2006/03/13 13:56 |


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|---|---|---|---|---|---|---|
| L13 | 281 | 12 and transducer | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2006/03/13 13:56 |
| L14 | 55 | 13 and thumb | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2006/03/13 13:57 |
| L15 | 14 | ("3921166" \| "4079194" \| "4314227" \| "4315238" \| "4489302" \| "4550221" \| "4739299" \| "4810992" \| "4988837" \| "4988982" \| "5374787" \| "5414413" \| "5469194" \| "5521336").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 13:58 |
| L16 | 45 | ("4489302").URPN. | USPAT | OR | OFF | 2006/03/13 14:03 |
| L17 | 3066 | "345"/$.ccls. and (touch contact pressure) near sensitive | US-PGPUB; USPAT | OR | OFF | 2006/03/13 14:03 |
| L18 | 598 | 17 and (portable cellular mobile wireless radio) near (station device terminal station phone) | US-PGPUB; USPAT | OR | OFF | 2006/03/13 14:04 |
| L19 | 579 | 18 and display | US-PGPUB; USPAT | OR | OFF | 2006/03/13 14:05 |
| L20 | 37 | 19 and "455"/$.ccls. | US-PGPUB; USPAT | OR | OFF | 2006/03/13 14:05 |
| L21 | 382 | ("4916441").URPN. | USPAT | OR | OFF | 2006/03/13 14:06 |
| L22 | 15 | ("5616906").URPN. | USPAT | OR | OFF | 2006/03/13 14:08 |
| L23 | 7 | ("5729219").URPN. | USPAT | OR | OFF | 2006/03/13 14:15 |
| L24 | 7 | ("5184314" \| "5663748" \| "5729219" \| "5847698" \| "5900867" \| "5942733" \| "6020878").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 14:18 |
| L25 | 31 | ("20010023499" \| "20010043189" \| "20020140680" \| "20020158838" \| "5278779" \| "5374942" \| "5530455" \| "5542138" \| "5543588" \| "5598527" \| "5615384" \| "5729219" \| "5742476" \| "5771038" \| "5825349" \| "5943052" \| "5949408" \| "5952994" \| "5999169" \| "6025832" \| "6031518" \| "6104334" \| "6184864" \| "6201947" \| "6211856" \| "6323883" \| "6359615" \| "6369803" \| "6407749" \| "6484011" \| "6570583").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 14:20 |


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# EAST Search History

| | | | | | | |
|---|---|---|---|---|---|---|
| L26 | 14 | ("4017848" \| "4085302" \| "4310839" \| "4471177" \| "4879548" \| "5121091" \| "5177328" \| "5526023" \| "5594471" \| "5598527" \| "5724069" \| "5742241" \| "5757361" \| "5910802").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 14:21 |
| L27 | 12 | ("3123676" \| "4092640" \| "4310839" \| "4566001" \| "4697231" \| "4821029" \| "4920237" \| "5162785" \| "5177327" \| "5266949" \| "5270710").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 14:24 |
| L28 | 73 | ("4310839").URPN. | USPAT | OR | OFF | 2006/03/13 14:25 |
| L29 | 29 | ("4516112").URPN. | USPAT | OR | OFF | 2006/03/13 14:26 |
| L30 | 24 | ("4085302").URPN. | USPAT | OR | OFF | 2006/03/13 14:32 |
| L31 | 15 | ("4085302" \| "4313108" \| "4816811" \| "4901074" \| "5418760" \| "5572573" \| "5584054" \| "5613137" \| "5674018" \| "5742894" \| "5818924" \| "5887995" \| "5909211" \| "5910009" \| "5917906").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 14:34 |
| L32 | 5 | ("4916275" \| "5337346" \| "5357065" \| "5371790" \| "5584054").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 14:34 |
| L33 | 6 | ("4763356" \| "5189632" \| "5257310" \| "5303291" \| "5526411" \| "5625673").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 14:35 |
| L34 | 5 | ("4481382" \| "4675903" \| "4725694" \| "5189632" \| "D332604").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 14:39 |
| L35 | 4 | ("4119810" \| "4220820" \| "4356519" \| "4399331").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 14:39 |
| L36 | 31 | ("4313108").URPN. | USPAT | OR | OFF | 2006/03/13 14:45 |
| L37 | 3155 | 345/156,172,173.ccls. | USPAT | OR | OFF | 2006/03/13 14:45 |
| L38 | 850 | 37 and (touch contact pressure) near sensitive | USPAT | OR | OFF | 2006/03/13 14:45 |
| L39 | 5 | 38 and 455/575.1-575.5.ccls. | USPAT | OR | OFF | 2006/03/13 15:03 |
| L40 | 15681 | (contact touch pressure) near sensitive | JPO | OR | OFF | 2006/03/13 15:05 |
| L41 | 7 | 40 and (portable mobile cellular wireless radio) near phone | JPO | OR | OFF | 2006/03/13 15:04 |

# EAST Search History

| | | | | | | |
|---|---|---|---|---|---|---|
| L42 | 222 | (contact touch pressure) near sensitive | IBM_TDB | OR | OFF | 2006/03/13 15:05 |
| L43 | 6 | 42 and (mobile cellular wireless portable radio) near (station terminal phone) | IBM_TDB | OR | OFF | 2006/03/13 15:13 |
| L44 | 10 | "2154349" "536554" "5404458" | EPO; DERWENT | OR | OFF | 2006/03/13 16:24 |
| L45 | 28 | (contact pressure touch) near sensitive with scroll$3 | EPO; DERWENT | OR | OFF | 2006/03/13 16:42 |
| L46 | 114 | (contact pressure touch) near sensitive with scroll$3 | USPAT | OR | OFF | 2006/03/13 17:04 |
| L47 | 8 | "698845" "707257" | EPO; DERWENT | OR | OFF | 2006/03/13 17:36 |
| L48 | 0 | "4870677".pn. and menu | USPAT | OR | OFF | 2006/03/13 17:36 |
| L49 | 17 | "4870677".uref. and menu | USPAT | OR | OFF | 2006/03/13 17:38 |
| L50 | 576 | (touch contact) near sensitive and menu near display$3 | USPAT | OR | OFF | 2006/03/13 17:38 |

# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 1352 | (contact touch) near sensitive same (thumb side) | US-PGPUB; USPAT; EPO; DERWENT | OR | OFF | 2006/03/13 12:20 |
| L2 | 681 | (contact touch) near sensitive with (thumb side) | US-PGPUB; USPAT; EPO; DERWENT | OR | OFF | 2006/03/13 12:20 |
| L3 | 367 | 2 and (mobile portable cellular radio wireless) | US-PGPUB; USPAT; EPO; DERWENT | OR | OFF | 2006/03/13 12:21 |
| L4 | 146 | 2 and (mobile portable cellular radio wireless) near (terminal device phone) | US-PGPUB; USPAT; EPO; DERWENT | OR | OFF | 2006/03/13 12:21 |
| L5 | 7 | ("5237311" \| "5510813" \| "5638061" \| "5670755" \| "5680160" \| "5742894" \| "6034672").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 12:25 |
| L6 | 4 | ("5719936" \| "6128475" \| "6149442" \| "D410645").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 12:26 |
| L7 | 14 | ("4987411" \| "5339388" \| "5598183" \| "5642131" \| "5719936" \| "5748512" \| "5805159" \| "5825353" \| "6005573" \| "6349220" \| "6415138" \| "6433801" \| "6473069" \| "6526296").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 13:47 |
| L8 | 4 | ("20020180712" \| "5159159" \| "6078274" \| "6441807").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/13 13:48 |
| L9 | 52 | ("5159159").URPN. | USPAT | OR | OFF | 2006/03/13 13:53 |
| L10 | 110346 | pressure near sensitive | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2006/03/13 13:54 |
| L11 | 4304 | 10 and (mobile cellular wireless portable) and display | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2006/03/13 13:56 |
| L12 | 2071 | 10 and (mobile cellular wireless portable) same display | US-PGPUB; USPAT; EPO; JPO; DERWENT | OR | OFF | 2006/03/13 13:56 |


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Page 1092 of 1144

# EAST Search History

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|---|---|---|---|---|---|---|
| L1 | 1 | "6131047".pn. | US-PGPUB; USPAT | OR | OFF | 2006/03/11 11:16 |
| L2 | 1 | ("6131047").URPN. | USPAT | OR | OFF | 2006/03/11 11:16 |
| L3 | 21 | ("3777222" \| "4177421" \| "4566001" \| "4647916" \| "4739299" \| "4810992" \| "4870677" \| "5184120" \| "5422656" \| "5452240" \| "5459776" \| "5572573" \| "5584054" \| "5598527" \| "5710810" \| "5715524" \| "5719936" \| "5815142" \| "5859629" \| "5915228" \| "5920310").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 11:17 |
| L4 | 5 | ("5237311" \| "5305374" \| "5436954" \| "5627531" \| "5715524").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 11:17 |
| L5 | 5 | ("5859629").URPN. | USPAT | OR | OFF | 2006/03/11 11:19 |
| L6 | 18 | ("5815142").URPN. | USPAT | OR | OFF | 2006/03/11 11:21 |
| L7 | 1 | ("6278888").URPN. | USPAT | OR | OFF | 2006/03/11 11:22 |
| L8 | 25 | ("5189632" \| "5262763" \| "5266949" \| "5408060" \| "5436954" \| "5584054" \| "5646649" \| "5715524" \| "5797089" \| "5805084" \| "5877709" \| "5884185" \| "5905235" \| "5915228" \| "5956656" \| "6046730" \| "6047196" \| "6085112" \| "6128475" \| "6173194" \| "6208876" \| "6208879" \| "6215474" \| "6230028" \| "6278888").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 11:23 |
| L9 | 20 | ("5151946" \| "5337346" \| "5450619" \| "5465401" \| "5584054" \| "5603100" \| "5634196" \| "5642102" \| "5657370" \| "5659890" \| "5669069" \| "5710576" \| "5745579" \| "5754960" \| "5758295" \| "5848356" \| "5852783" \| "5870683" \| "5890073" \| "5943055").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 11:29 |
| L10 | 8 | ("4653086" \| "5151946" \| "5175759" \| "5283862" \| "5335276" \| "5337346" \| "5363089" \| "5436954").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 11:54 |



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Page 1093 of 1144

# EAST Search History

| | | | | | | |
|---|---|---|---|---|---|---|
| L11 | 2100 | (touch contact) near sensitive and transducer | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2006/03/11 11:54 |
| L12 | 1107 | (touch contact) near sensitive and transducer same display$3 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2006/03/11 11:55 |
| L13 | 758 | (touch contact) near sensitive same transducer same display$3 | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2006/03/11 11:55 |
| L14 | 119 | 13 and (terminal pda palm adj pilot) | US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT | OR | OFF | 2006/03/11 11:55 |
| L15 | 5 | ("5020090" \| "5375076" \| "5491507" \| "5537343" \| "5584054").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:01 |
| L16 | 8 | ("4653086" \| "5151946" \| "5175759" \| "5283862" \| "5335276" \| "5337346" \| "5363089" \| "5436954").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:05 |
| L17 | 12721 | ( touch contact) near sensitive and display$3 | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:06 |
| L18 | 9962 | ( touch contact) near sensitive same display$3 | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:06 |
| L19 | 473 | ((touch contact) near sensitive same display$3).ab. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:06 |
| L20 | 6 | ((touch contact) near sensitive same display$3 and axis).ab. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:06 |

# EAST Search History

| | | | | | | |
|---|---|---|---|---|---|---|
| L21 | 28 | ("4960256" \| "5103376" \| "5168426" \| "5179502" \| "5200913" \| "5206790" \| "5267123" \| "5268817" \| "5345362" \| "5375076" \| "5383138" \| "5396399" \| "5402151" \| "5534891" \| "5548478" \| "5559670" \| "5583742" \| "5636101" \| "5644469" \| "5657258" \| "5712760" \| "5742475" \| "5754395" \| "5777281" \| "5796575" \| "6016248" \| "6052279" \| "D394848").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:07 |
| L22 | 6 | ("5126725" \| "5139439" \| "5227615" \| "5268817" \| "5372441" \| "5428355").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:09 |
| L23 | 22 | ("5227615").URPN. | USPAT | OR | OFF | 2006/03/11 12:11 |
| L24 | 6 | ("5126725" \| "5139439" \| "5227615" \| "5268817" \| "5372441" \| "5428355").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:13 |
| L25 | 22 | ("5227615").URPN. | USPAT | OR | OFF | 2006/03/11 12:14 |
| L26 | 13 | ("5657258").URPN. | USPAT | OR | OFF | 2006/03/11 12:15 |
| L27 | 16 | ("5636101").URPN. | USPAT | OR | OFF | 2006/03/11 12:19 |
| L28 | 48 | ("5402151").URPN. | USPAT | OR | OFF | 2006/03/11 12:21 |
| L29 | 13 | ("4366475" \| "4686332" \| "4821030" \| "4914624" \| "5402151" \| "5563632" \| "5596346" \| "5638060" \| "5687331" \| "5736974" \| "5736976" \| "5761485" \| "5838973").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 12:22 |
| L30 | 98 | ("4686332").URPN. | USPAT | OR | OFF | 2006/03/11 12:24 |
| L31 | 14 | ("4071691" \| "4246452" \| "4455452" \| "4495485" \| "4550221" \| "4587378" \| "4672154" \| "4686332" \| "4736191" \| "4740781" \| "4743895" \| "4873400" \| "4975830" \| "5305017").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 14:40 |
| L32 | 37 | ("4740781").URPN. | USPAT | OR | OFF | 2006/03/11 14:47 |
| L33 | 13 | ("5510813").URPN. | USPAT | OR | OFF | 2006/03/11 14:54 |
| L34 | 98 | ("4686332").URPN. | USPAT | OR | OFF | 2006/03/11 14:57 |
| L35 | 92 | ("5231381").URPN. | USPAT | OR | OFF | 2006/03/11 14:59 |


TCL EXHIBIT 1007
Page 1095 of 1144

# EAST Search History

| | | | | | | |
|---|---|---|---|---|---|---|
| L36 | 25 | ("4686332" \| "4922061" \| "4929934" \| "4988837" \| "5016002" \| "5045645" \| "5117071" \| "5138118" \| "5177472" \| "5218343" \| "5231381" \| "5349139" \| "5355100" \| "5369227" \| "5389745" \| "5526023" \| "5557076" \| "5567920" \| "5608390" \| "5679930" \| "5706000" \| "5730602" \| "5799107" \| "5883338" \| "Re34187").PN. | US-PGPUB; USPAT; USOCR | OR | OFF | 2006/03/11 15:15 |
| L37 | 36 | "396190" "421025" "472361" "499012" | EPO; DERWENT | OR | OFF | 2006/03/11 15:49 |
| L38 | 829 | (touch contact) near (sensitive screen) and (phone portable) | EPO; DERWENT | OR | OFF | 2006/03/11 15:50 |
| L39 | 496 | (touch contact) near (sensitive screen) same (phone portable) | EPO; DERWENT | OR | OFF | 2006/03/11 15:50 |
| L40 | 192 | (touch contact) near (sensitive screen) same (phone portable) with display | EPO; DERWENT | OR | OFF | 2006/03/11 15:51 |
| L41 | 160 | (touch contact) near (sensitive screen) with (phone portable) with display | EPO; DERWENT | OR | OFF | 2006/03/11 15:52 |
| L42 | 2 | 41 and transduc$3 | EPO; DERWENT | OR | OFF | 2006/03/11 15:51 |
| L43 | 41 | (touch contact) near (sensitive screen) with (portable radio wireless cellular mobile) near phone with display | EPO; DERWENT | OR | OFF | 2006/03/11 15:57 |
| L44 | 19 | "215434" "536554" "5404458" "5059959" | EPO; DERWENT | OR | OFF | 2006/03/11 15:57 |

# Slater & Matsil, L.L.P.

Suite 1000
17950 Preston Road
Dallas, Texas 75252-5793
Phone: 972-732-1001 Facsimile: 972-732-9218


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## FACSIMILE COVER SHEET

| | |
|---|---|
| To Commissioner for Patents<br>Mail Stop Missing Parts | Total Pages Sent: 7<br>(including cover sheet) |
| Facsimile Number: 703-746-4060 | Transmission Date: May 18, 2005 |

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | | |
|---|---|---|---|
| Applicant: | Hayes, Jr., *et al.* | Docket No.: | ERI-888RI |
| Serial No: | 11/078,916 | Art Unit: | 2681 |
| Date Filed: | March 11, 2005 | | |
| Title: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

## CERTIFICATION OF FACSIMILE TRANSMISSION

I hereby certify that the following papers are being transmitted by facsimile to the U.S. Patent and Trademark Office at 703-746-4060 on the date shown above:

- Certification of Facsimile Transmission (1 page)
- Response to Notice to File Missing Parts of Reissue Application (1 original & 1 copy = 2 pages)
- Reissue Application: Consent of Assignee: Statement of Non-Assignment (1 page)
- Statement Under 37 CFR 3.73(b) (1 page)
- Copy of Notice to File Missing Parts of Reissue Application (2 pages)

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Respectfully submitted,

Judy A. Betts
Legal Assistant

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| | | | |
|---|---|---|---|
| Applicant: | Hayes, Jr., *et al.* | Docket No.: | ERI-888RI |
| Serial No: | 11/078,916 | Art Unit: | 2681 |
| Date Filed: | March 11, 2005 | | |
| Title: | Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same | | |

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P.O. Box 1450
Alexandria, VA 22313-1450

**Response to Notice to File Missing Parts of Reissue Application**

Dear Sir:

In response to the Notice to File Missing Parts of Reissue Application mailed April 11, 2005 (copy attached), Applicants respectfully submit the Consent of Assignee signed and dated by the assignee.

Please charge the required $130.00 late oath or declaration surcharge; $200.00 for 3 independent claims over the original patent and $800.00 for 53 total claims over the higher of 20 to Deposit Account No. 50-1065. Please charge any other fees or credit any overpayments to the same. A duplicate copy of this sheet is enclosed.

05/19/2005 JBALINAN 00000067 11078916

01 FC:1051 130.00 DA
02 FC:1204 200.00 DA
03 FC:1205 800.00 DA

Respectfully submitted,

May 18, 2005

Steven H. Slater
Reg. No. 35,361
Attorney for Applicants

Slater & Matsil, L.L.P.
17950 Preston Rd., Suite 1000
Dallas, TX 75252
Tel: 972-732-1001
Fax: 972-732-9218

PTO/SB/53 (04-04)
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| REISSUE APPLICATION: CONSENT OF ASSIGNEE; STATEMENT OF NON-ASSIGNMENT | Docket Number (Optional) ERI-888RI |
|---|---|

This is part of the application for a reissue patent based on the original patent identified below.

Name of Patentee(s)
John Joseph Hayes, Jr.; Curtis Wayne Thorton

| Patent Number 6,278,888 | Date Patent Issued August 21, 2001 |
|---|---|

Title of Invention
Radiotelephones Having Contact-Sensitive User Inerfaces and Methods of Operating Same

1. [X] Filed herein is a statement under 37 CFR 3.73(b). (Form PTO/SB/96)

2. [ ] Ownership of the patent is in the inventor(s), and no assignment of the patent is in effect.

One of boxes 1 or 2 above must be checked. If multiple assignees, complete this form for each assignee. If box 2 is checked, skip the next entry and go directly to "Name of Assignee".

The written consent of all assignees and inventors owning an undivided interest in the original patent is included in this application for reissue.

The assignee(s) owning an undivided interest in said original patent is/are Ericsson, Inc., and the assignee(s) consents to the accompanying application for reissue.

Name of assignee/inventor (if not assigned)
Ericsson, Inc.

| Signature | Date 5-17-05 |
|---|---|

Typed or printed name and title of person signing for assignee (if assigned)
John Hana, Assistant Secretary

This collection of information is required by 37 CFR 1.172. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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## STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Ericsson Inc.

Application No./Patent No.: 6,278,888 B1 Filed/Issue Date: August 21, 2001

Entitled: RadioTelephones Having Contact-Sensitive User Interfaces and Methods of Operating Same

Ericsson Inc., a corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☑ the assignee of the entire right, title, and interest; or

2. ☐ an assignee of less than the entire right, title and interest.
The extent (by percentage) of its ownership interest is _____ %

in the patent application/patent identified above by virtue of either:

A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 008951, Frame 0747, or for which a copy thereof is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

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2. From: _____ To: _____
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The document was recorded in the United States Patent and Trademark Office at
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☐ Additional documents in the chain of title are listed on a supplemental sheet.

☐ Copies of assignments or other documents in the chain of title are attached.
[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

| | |
|---|---|
| Signature | 3-08-05<br>Date |
| John Han<br>Printed or Typed Name | 972-583-7686<br>Telephone Number |
| Assistant Secretary<br>Title | |

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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| APPLICATION NUMBER | FILING OR 371 (c) DATE | FIRST NAMED APPLICANT | ATTORNEY DOCKET NUMBER |
|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI |

CONFIRMATION NO. 1137

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Steven H Slater
Slater & Matsil LLP
17950 Preston Road
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Date Mailed: 04/11/2005

# NOTICE TO FILE MISSING PARTS OF REISSUE APPLICATION

## *Filing Date Granted*

An application number and filing date have been accorded to this reissue application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- To avoid abandonment, a late filing fee or oath or declaration surcharge as set forth in 37 CFR 1.16(f) of $130 for a non-small entity, must be submitted with the missing items identified in this letter.
- Consent of assignee is missing. 37 CFR 1.172 requires that a reissue oath/declaration be accompanied by the written consent of all assignees.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of **$1000** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.

**SUMMARY OF FEES DUE:**

Total additional fee(s) required for this application is **$1130** for a Large Entity

- **$130** Late oath or declaration Surcharge.

- Total additional claim fee(s) for this application is **$1000**
  - **$200** for **3** independent claims over the original patent.
  - **$800** for **53** total claims over the higher of 20, or the amount in the original patent.

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05/19/2005 JBALINAN 00000066 501065 11078916
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03 FC:1202 800.00 DA

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| APPLICATION NUMBER | FILING OR 371 (c) DATE | FIRST NAMED APPLICANT | ATTORNEY DOCKET NUMBER |
|---|---|---|---|
| 11/078,916 | 03/11/2005 | John Joseph Hayes JR. | ERI-888RI |

**CONFIRMATION NO. 1137**

Steven H Slater
Slater & Matsil LLP
17950 Preston Road
Suite 1000
Dallas, TX 75252

**FORMALITIES LETTER**

*OC000000015698581*

*OC000000015698581*

Date Mailed: 04/11/2005

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### *Filing Date Granted*

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**SUMMARY OF FEES DUE:**

Total additional fee(s) required for this application is **$1130** for a Large Entity

- **$130** Late oath or declaration Surcharge.

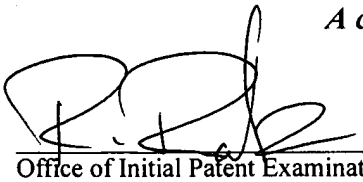
- Total additional claim fee(s) for this application is **$1000**
  - **$200** for **3** independent claims over the original patent.
  - **$800** for **53** total claims over the higher of 20, or the amount in the original patent.

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# REISSUE PATENT APPLICATION TRANSMITTAL

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| | |
|---|---|
| Attorney Docket No. | ERI-888RI |
| First Named Inventor | Hayes, et al. |
| Original Patent Number | 6,278,888 |
| Original Patent Issue Date (Month/Day/Year) | 08/21/2001 |
| Express Mail Label No. | EV 396902719 US |

**APPLICATION FOR REISSUE OF:** (Check applicable box) ☑ Utility Patent ☐ Design Patent ☐ Plant Patent

## APPLICATION ELEMENTS (37 CFR 1.173)

1. ☑ Fee Transmittal Form *(PTO/ SB/ 56)* (Submit an original, and a duplicate for fee processing)
2. ☐ Applicant claims small entity status. See 37 CFR 1.27.
3. ☑ Specification and Claims in double column copy of patent format *(amended, if appropriate)*
4. ☑ Drawing(s) *(proposed amendments, if appropriate)*
5. ☑ Reissue Oath/Declaration (original or copy) *(37 C.F.R. § 1.175) (PTO/SB/51 or 52)*
6. ☐ Power of Attorney
7. Original U.S. Patent currently assigned? ☑ Yes ☐ No
   *(If Yes, check applicable box(es))*
   - ☐ Written Consent of all Assignees *(PTO/SB/53)*
   - ☑ 37 C.F.R. § 3.73(b) Statement (PTO/SB/96)
8. ☐ CD-ROM or CD-R in duplicate, Computer Program (Appendix) or large table
9. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all of the following are necessary)*
   - a. ☐ Computer Readable Form (CRF)
   - b. Specification Sequence Listing on:
     - i ☐ CD-ROM (2 copies) or CD-R (2 copies); **or**
     - ii ☐ paper
   - c. ☐ Statements verifying identity of above copies

## ACCOMPANYING APPLICATION PARTS

10. ☑ Statement of status and support for all changes to the claims. See 37 CFR 1.173 (c).
11. ☐ Original U.S. Patent for surrender
    - ☐ Ribboned Original Patent Grant
    - ☐ Statement of Loss (PTO/SB/55)
12. ☐ Foreign Priority Claim *(35 U.S.C. 119) (if applicable)*
13. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
14. ☐ English Translation of Reissue Oath/Declaration *(if applicable)*
15. ☑ Preliminary Amendment
16. ☑ Return Receipt Postcard *(MPEP 503)* *(Should be specifically itemized)*
17. Other:_____

113260 U.S. PTO 11/078916 031105

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# REISSUE APPLICATION FEE TRANSMITTAL FORM

Docket Number (Optional): ERI-888RI

## Claims as Filed - Part 1

| Claims in Patent | | Number Filed in Reissue Application | (3) Number Extra | Small Entity Rate | Small Entity Fee | | Other than a Small Entity Rate | Other than a Small Entity Fee |
|---|---|---|---|---|---|---|---|---|
| (A) 36 | Total Claims (37 CFR 1.16(j)) | (B) 73 | ****37 = | x $____ = | | or | x $ 50 = | 1850.00 |
| (C) 4 | Independent claims (37 CFR 1.16(i)) | (D) 6 | * 2 = | x $____ = | | | x $ 200 = | 400.00 |
| | | | | Basic Fee (37 CFR 1.16(h)) | $____ | | | $300.00 |
| | | | | Total Filing Fee | $ | | OR | $2550.00 |

## Claims as Amended - Part 2

| | (1) Claims Remaining After Amendment | | (2) Highest Number Previously Paid For | (3) Extra Claims Present | Small Entity Rate | Small Entity Fee | | Other than a Small Entity Rate | Other than a Small Entity Fee |
|---|---|---|---|---|---|---|---|---|---|
| Total Claims (37 CFR 1.16(j) | *** | MINUS | ** | * = | x $____ = | | | x $____ = | |
| Independent Claims (37 CFR 1.16(i)) | *** | MINUS | ***** | = | x $____ = | | | x $____ = | |
| | | | | | Total Additional Fee | $ | | OR | $ |

* If the entry in (D) is less than the entry in (C), Write "0" in column 3.

** If the "Highest Number of Total Claims Previously Paid For" is less than 20, Write "20" in this space.

*** After any cancellation of claims.

**** If "A" is greater than 20, use (B - A); if "A" is 20 or less, use (B - 20).

***** "Highest Number of Independent Claims Previously Paid For" or Number of Independent Claims in Patent (C).

☐ Applicant claims small entity status. See 37 CFR 1.27.

☑ Please charge Deposit Account No. 50-1065 in the amount of 2550.00.
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☑ The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 or 1.17 which may be required, or credit any overpayment to Deposit Account No. 50-1065.
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03/11/2005
Date

Signature of Applicant, Attorney or Agent of Record

Steven H. Slater, Reg. No. 35,361
Typed or printed name

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re: Reissue Application of

U.S. Patent No.: 6,278,888 to

Hayes, Jr. et al.

Serial No. Unassigned

Filed: Concurrently herewith

For: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

Group Art Unit: Unassigned

Examiner: Unassigned

Attorney Docket No.: ERI-888RI

## Certificate of Mailing via Express Mail

**EXPRESS MAIL** mailing label number: EV 396902719 US

Date of Deposit: March 11, 2005

I hereby certify that the following documents, which are enclosed, are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. § 1.10 on the date indicated above in an envelope addressed to: Mail Stop: Reissue, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450:

Certificate of Mailing via Express Mail (1 page)
Reissue Patent Application Transmittal (1 page)
Reissue Application Fee Transmittal Form (1 original & 1 copy = 2 pages)
Copy of Issued Patent 6,278,888 B1 (18 pages)
Declaration in Support of Reissue Application (3 pages)
Statement Under 37 CFR 3.73(b) (1 page)
Preliminary Amendment (14 pages)
Return Postcard

Respectfully submitted,

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# RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME

This is a continuation application of Application Ser. No. 09/001,173, filed Dec. 30, 1997.

## FIELD OF THE INVENTION

The present invention relates to radiotelephones and methods of operation thereof, and more particularly, to apparatus and methods for providing user input to radiotelephones.

## BACKGROUND OF THE INVENTION

Radiotelephone terminals typically include a radio transceiver integrated with a user interface mechanism within a handheld case. The user interface typically includes a plurality of keys similar to those provided. on conventional wireline telephones, as well as additional function keys for controlling functions associated with radiotelephone operations. The keys provide a means for entering commands, telephone numbers or other data for processing by the radiotelephone. A display may be used to display information a user has entered at the keys, e.g., telephone numbers, menu selections, and the like, as well as to display messages or other information received from a radiotelephone system with which the radiotelephone is communicating. The display may also be used to display information stored in memory located in the radiotelephone.

Commonly, the display is configured to display one or more graphical objects, e.g. a list of commands in a command menu or a list of telephone numbers that are stored in the radiotelephone memory that the user may select for communication. The graphical objects may be selectively displayed, for example, by displaying a selected number of entries in a list of telephone numbers or command options. The list may be "scrolled" in response to a user input to allow a large list to be displayed on a small display.

In some conventional radiotelephones, control of the scrolling of graphical objects on the display may be controlled by one or more keys, the operation of which may be similar to the "arrow" keys provided on computer keyboard. Other keys may be provided to invoke particular selections. In other conventional radiotelephone designs, a wheel-like input device may be mounted on the radiotelephone case that may be turned by a user to effect scrolling of graphical objects on the display. The wheel device may also be configured to select items on the display in response to user application of radial pressure to the wheel.

Each of these conventional techniques for control of a radiotelephone display has its limitations. Keys for scrolling and invoking display selections may be awkward to use, and may consume valuable space on the keypad of the radiotelephone. A wheeled input device may provide faster and more intuitive scrolling control, but such a device may take up an inordinate amount of space and require moving parts which may be more prone to failure. Accordingly, there is a need for improved input devices for radiotelephones.

## SUMMARY OF THE INVENTION

In light of the foregoing, it is an object of the present invention to provide radiotelephones and methods of operation thereof which provide reliable, intuitive and efficient display control.

This and other objects, features and advantages are provided according to the present invention by radiotelephones and methods of operation thereof in which control of a radiotelephone's display and/or radiotelephone communications transceiver is effected using a contact-sensitive transducer such as a resistive or capacitive touch strip mounted on the radiotelephone. The contact-sensitive transducer produces an output signal that characterizes contact, e.g., contact of an object such as a user's finger, with a surface of the transducer. The output signal may be processed by a controller to control display of information on the display and to initiate actions associated with displayed items. For example, the contact-sensitive transducer may be used to control display of graphical objects such as rows or columns on the display, and initiation of functions associated with the graphical objects. Preferably, the contact-sensitive transducer comprises an elongate strip and produces an output signal that characterizes contact with the strip along its elongate axis. In one embodiment, two of such elongate strips are mounted on respective sides of the radiotelephone. In another embodiment, an elongate strip is mounted on a front face of the radiotelephone.

Using a contact-sensitive transducer to control a radiotelephone offers several advantages. Because a contact-sensitive transducer may be configured to have a thin profile, the transducer may be mounted at a surface of the radiotelephone without taking up an inordinate amount of valuable space. Because characteristic types of contact with the transducer can be detected, such as swiping motions or taps, the transducer may be used to perform display movements such as scrolling or cursor movement, as well as for selection of items displayed on the display. In addition, because a contact-sensitive transducer may be fabricated without moving parts, reliability may be improved.

In particular, according to an aspect of the present invention, a radiotelephone includes a frame. The frame supports a radiotelephone communications transceiver and a display. A contact-sensitive transducer such as a resistive transducer, a capacitive transducer or a semiconductive transducer, is supported by the frame, e.g., mounted at a surface of a housing, and produces an output signal that characterizes contact along a contact-sensitive surface of the contact-sensitive transducer. A controller is responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, and controls at least one of the display and the radiotelephone communications transceiver according to the output signal of the contact-sensitive transducer.

In an embodiment of the present invention, the controller is configured to selectively display an image, e.g., a graphical object such as a row of alphanumeric characters, on the display responsive to the output signal of the contact-sensitive transducer. The controller may include means for displaying of a plurality of graphical objects on the display, and means, responsive to the contact sensitive transducer, for identifying one of the displayed plurality of graphical objects based on the output signal of the contact-sensitive transducer.

According to another embodiment, the controller comprises means, responsive to the contact-sensitive transducer, for determining a position of contact along the axis of the contact-sensitive transducer. Means are also provided, responsive to the means for determining a position of contact, for selectively displaying a graphical object based on the determined position of contact to thereby identify the graphical object, e.g., by highlighting one of a plurality of displayed graphical objects or by displaying a cursor that indicates one of a plurality of displayed graphical objects.

In yet another embodiment of the present invention, the controller is configured to cause the display or the radio-

telephone communications transceiver to perform a plurality of actions. An action of the plurality of actions may be associated with an identified graphical object, and the controller may further comprise means, responsive to the contact-sensitive transducer, for initiating the action associated with the identified graphical object. The means for initiating an action may include means, responsive to the contact-sensitive transducer, for detecting a momentary contact with the transducer. Means may be provided, responsive to the means for detecting a momentary contact, for initiating the action associated with the identified graphical object. The means for initiating an action may include means for initiating the action in response to detection of a predetermined number of momentary contacts occurring within a predetermined time interval.

According to another embodiment of the present invention, the controller includes means, responsive to the contact-sensitive transducer, for scrolling displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer. The means for scrolling may include means, responsive to the output signal of contact-sensitive transducer, for detecting moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and means, responsive to the means for detecting moving contact, for scrolling displayed rows along the axis of the display based on the detected movement.

In yet another embodiment of the present invention, the controller has a first mode wherein the controller is responsive to contact with the contact-sensitive transducer and a second mode wherein the controller is unresponsive to contact with the contact-sensitive transducer. The radiotelephone further comprises means for placing the controller in one of the first mode or the second mode in response to an input from a user.

Another embodiment according to the present invention includes a power supply electrically connected to the contact-sensitive transducer. The controller comprises a first control circuit, responsive to the contact-sensitive transducer, which controls the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer, and a second control circuit, responsive to the contact-sensitive transducer, which controls power transfer from the power supply to the first control circuit according to the output signal from the contact-sensitive transducer. The first control circuit may include a microcontroller, and the second control circuit may control power transfer from the power supply to the microcontroller according to the output signal of the contact-sensitive transducer.

In another embodiment according to the present invention, the radiotelephone frame includes a housing and the contact-sensitive transducer comprises an elongate contact-sensitive strip mounted at a surface of the housing. The housing may have a front face and an adjoining first side, the display may be mounted at the front face, and the elongate contact-sensitive strip may be mounted at the first side adjoining the front face. A second contact-sensitive strip may be mounted at a second side of the radiotelephone housing, adjoining the front face and opposite the first side. According to another embodiment, a contact-sensitive transducer may be mounted at the front face of the housing.

According to method aspects of the present invention, user input is provided to a radiotelephone using a contact-sensitive transducer that produces an output signal that characterizes contact of an object on a contact-sensitive surface of the contact-sensitive transducer. At least one of a radiotelephone communications transceiver and a display of the radiotelephone may be controlled according to the output signal of the contact-sensitive transducer. An image may be selectively displayed on the radiotelephone display according to the output signal of the contact-sensitive transducer. Improved user interfaces for radiotelephones are thereby provided.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a radiotelephone according to an embodiment of the present invention.

FIG. **2** is a schematic diagram illustrating a radiotelephone according to an embodiment of the present invention.

FIG. **3** illustrates a radiotelephone with dual contact-sensitive strips according to another embodiment of the present invention.

FIG. **4** is a schematic diagram illustrating a circuit for controlling a display using a contact-sensitive transducer according to another embodiment of the present invention.

FIG. **5** is a flowchart illustration of operations for determining a position of contact of an object with a contact-sensitive transducer according to an aspect of the present invention.

FIG. **6** is a schematic diagram illustrating a circuit for controlling power supply to a radiotelephone using a contact-sensitive transducer according to another embodiment of the present invention.

FIGS. **7A–7C** illustrate operations for scrolling displayed items and selecting functions associated with a displayed item according to another aspect of the present invention.

FIG. **8** is a flowchart illustration of operations for detecting a swiping contact with a contact-sensitive transducer according to another aspect of the present invention.

FIGS. **9–10** are flowchart illustrations of operations for detecting contacts with a contact-sensitive transducer according to aspects of the present invention.

FIG. **11** illustrates a radiotelephone with a horizontally mounted contact-sensitive strip according to another embodiment of the present invention.

## DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which embodiments of the invention are shown. Those skilled in the art will appreciate that the invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. In the drawings, like numbers refer to like elements throughout. It will be understood that when a first object, e.g., a contact-sensitive transducer strip, is referred to as mounted "at" a surface of a second object, e.g., a housing or the like, the first object may be mounted directly on the surface of the second object, on a structural element or frame underlying the surface of the second object which allows a surface of the first object accessible through an opening in the surface of the second object, and the like.

FIG. **1** illustrates a radiotelephone **100** in which the apparatus and methods according to an embodiment of the present invention may be embodied. The radiotelephone includes a frame, here shown as including a housing **110**.

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The housing **110** supports a display **120** and a plurality of keys **130**. Those skilled in the art will appreciate that also included but not illustrated are a radiotelephone communications transceiver for communicating with a radiotelephone system, e.g., transmitter, receiver and associated control circuits for communicating with a cellular system via an antenna **140**. The radiotelephone communications transceiver and the display **120** are controlled by a contact-sensitive transducer **150** mounted at a side surface of the radiotelephone housing **110**, adjacent the display **120**. It will be appreciated that the contact-sensitive transducer **150** may be attached to the housing **110** in a variety of different ways. For example, the transducer **150** may be attached to an outer surface of the housing **110**, attached to a boss or similar structure attached to an outer surface of the housing **110**, attached to a circuit board or similar structure mounted within the housing **110** and extending through an opening in a surface of the housing **110**, or the like.

Referring now to FIG. **2**, the contact-sensitive transducer **150** produces an output signal **155** that characterizes contact of an object, such as a user's finger **210**, along an axis **150***a* of the transducer **150**. A controller **220** is responsive to the output signal **155** and operatively associated with the display **120** and a radiotelephone communications transceiver **230**. The controller **220** selectively display an image, such as one or more rows **240** of alphanumeric characters, on the display **120** based on the output signal **155** produced by the contact-sensitive transducer **150**. The controller also controls the radiotelephone communications transceiver **230** according to the output signal **155**. The contact-sensitive transducer **150** may comprise a variety of different contact-sensitive devices, including resistive, capacitive or semiconductive strips. For example, the contact-sensitive transducer **150** may be implemented using a semiconductive pad-type transducer of the type manufactured by Interlink Corp.

FIG. **3** illustrates an embodiment of the present invention, in which dual contact sensitive strips **150***a*, **150***b* are attached on opposite sides of a radiotelephone housing **110**, adjacent the display **120**. By providing strips on both sides of the radiotelephone housing **110**, the radiotelephone **100** may be used in either a right-handed or left-handed fashion. Preferably, only one of the strips **150***a*,**150***b* is active at any given time, i.e., one of the strips is inactivated to prevent inadvertent generation of signals to the controller caused by gripping of the radiotelephone. The active strip may be indicated by, for example, displaying an icon **125** near the edge of the display **120** closest the active strip **150***a*.

FIG. **4** illustrates an exemplary embodiment of the controller **220** that includes a circuit connected to nodes $R_1$, $R_2$, $R_c$, $L_1$, $L_2$, $L_c$, of the transducers **150***a*, **150***b*. Voltages between the nodes $R_1$ and $R_c$ and nodes $L_1$ and $L_c$ are sampled under the control of a microcontroller **410** which controls multiplexers **420***a*, **420***b* and a discharge switch **430**, selectively applying the voltages at the nodes $R_1$, $R_2$, $R_c$, $L_1$, $L_2$, $L_c$, to capacitor C. A comparator **440**, in conjunction with a counter **450**, determines the time required to charge the capacitor C to a threshold voltage $V_T$ after a node of one of the transducers **150***a*, **150***b* is connected to the capacitor C. A trio of charge times is sampled for a given transducer, providing a measure of a position of contact of an object with the transducer, as will be described in detail below. The counts produced by the counter **150**, representing contact position samples, are latched into a register **460**, and in turn conveyed to the microcontroller **410** for further processing.

Those skilled in the art will appreciate that a wide variety of apparatus other than the illustrated embodiment of FIG. **4** may be used with the present invention. For example, a different type of contact-sensitive transducer may be employed which utilizes a different kind of controller circuitry to processes output signals produced by the contact-sensitive transducer. In general, it will be appreciated that a controller **220** for processing output signals produced by a contact-sensitive transducer and for controlling a display **120** and a radiotelephone communications transceiver **230** according to the output signal, as described with respect to FIG. **2**, may be implemented using special purpose hardware, software or firmware running on general-purpose or special-purpose computing apparatus, or combinations thereof.

The flowchart illustration of FIG. **5** illustrates methods and apparatus for determining a position of contact with a contact-sensitive transducer according to an aspect of the present invention. It will be understood that blocks of the flowchart illustration, and combinations of blocks in the flowchart illustration, can be implemented by computer program instructions which may be loaded onto a computer or other programmable data processing apparatus to produce a machine such that the instructions which execute on the computer or other programmable data processing apparatus create means for implementing the functions specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart block or blocks. Accordingly, blocks of the flowchart illustration support combinations of means for performing the specified functions and combinations of steps for performing the specified functions. It will also be understood that each block of the flowchart illustrations, and combinations of blocks in the flowchart illustration, can be implemented by special purpose hardware which performs the specified functions or steps, or combinations of special purpose hardware such as the microcontroller **410** of FIG. **4**, microprocessors, digital signal processing (DSP) chips, application-specific integrated circuits (ASICS) or the like, which execute computer instructions.

FIG. **5** illustrates exemplary detailed operations (Block **500** et seq.) for determining a position of contact of an object with the. left contact strip **150***a* of FIG. **3**. The discharge switch **430** is closed to discharge the capacitor C (Block **505**). The power supply voltage $V_{cc}$ is then applied to the $L_1$ node (Block **510**), and the $L_c$, node is connected to the capacitor C (Block **515**). The discharge switch **430** is then opened to charge the capacitor C (Block **520**), and a first capacitor charge time $T_1$, is measured (Block **525**). The capacitor C is then discharged by closing the switch **430** again (Block **530**). The power supply voltage $V_{cc}$ is next applied to the $L_2$ node (Block **535**), and the $L_c$ node is connected to the capacitor C (Block **540**). The discharge switch **430** is then opened (Block **545**), and a second capacitor charge time $T_2$ is measured (Block **550**). The capacitor C is discharged once again by closing the discharge switch **430** (Block **555**). The power supply voltage $V_{cc}$ is then applied to the $L_1$ node (Block **560**), and the $L_2$ node is connected to the capacitor C (Block **565**). The discharge switch **430** is opened (Block **570**), and a third capacitor charge time $T_3$ is measured (Block **575**). The first, second and third capacitor charge times $T_1$, $T_2$, $T_3$ are then used to determine a position of contact with the transducer **520***b* (Block **580**).

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In particular, three equations are applicable to the measurements described with respect to FIG. **5**:

$$T_1=k(R_{L_1}+R_{L_c});$$

$$T_2=k(R_{L_2}+R_{L_c}); \text{ and}$$

$$T_3=k(R_{L_1}+R_{L_2}), \text{ where}$$

$$k=-C\ln(1-V_t/V_{cc}).$$

These equations may be solved for $R_{L_1}$, $R_{L_2}$, and $R_{L_c}$, and the position of contact P can be determined as:

$$P=\frac{R_{L_1}}{R_{L_1}+R_{L_2}}.$$

Those skilled in the art will appreciate that similar operations may be performed to determine a position of contact with the right contact strip **150***a*. It will also be understood that by application of appropriate control signals to the multiplexers **420***a*, **420***b*, either one of the transducers **150***a*, **150***b* may be disconnected from the capacitor C, effectively preventing input from the disconnected transducer.

FIG. **6**A illustrates another embodiment of the present invention, specifically a circuit which may be used in conjunction with the control circuit illustrated in FIG. **4** to control power transfer from a power supply, e.g., a battery supplying a battery voltage $V_{bat}$, to the microcontroller **410** and/or other circuits in a radiotelephone based on input signals from a contact-sensitive transducer. Additional switches **610***a*–**610***d* may be provided in the signal paths connecting the nodes $R_c$, $L_c$, $R_1$, $L_1$. These switches may be used to connect the associated nodes to the control input for the switch **620** via diodes $D_1$, $D_2$ (in the case of nodes $R_c$, $L_c$) and to the battery voltage $V_{bat}$ (in the case of nodes $R_1$, $L_1$) in an "off" state, as shown. In the off state, a power switch **620** disconnects the battery voltage $V_{bat}$ from a regulator **630** that provides a regulated power supply voltage $V_{cc}$ to the microcontroller **410**.

When either of the right or the left strips **150***a*, **150***b* is pressed such that a voltage is produced sufficient to overcome the drop across the associated diode $D_1$, $D_2$ and the input activation voltage of the power switch **620**, the power switch **620** closes and applies the battery voltage $V_{bat}$ to the regulator **630**. Power is thus provided to the microcontroller **410**. The microcontroller may then latch the power switch **620** into a sustained "on" state by driving a third diode $D_3$ and by applying control signals to the switches **610***a*–**610***d* to connect the nodes $R_c$, $L_c$, $R_1$, $L_1$ the appropriate multiplexers as illustrated in FIG. **4**. The microcontroller **410** may return the power switch **620** to the "off" state by inverting the logic on the line driving the third diode $D_3$. Because a specific voltage is needed to activate the power switch **620**, accidental activation of the radiotelephone can be prevented. According to another embodiment illustrated in FIG. **6**B, the circuit of FIG. **6**A may be modified such pressure on both of the strips **150***a*, **150***b* is required to power up the regulator **630**. When the right strip **150***b* is pressed, the battery voltage $V_{bat}$ is applied from $R_1$ and $R_c$ to $L_1$. If the left strip **150***a* is simultaneously pressed, the voltage is also applied to the control input of the power switch **620** through $D_2$. Otherwise, the operation of the circuit of FIG. **6**B is similar to that described with respect to the circuit of FIG. **6**A.

The conceptual illustrations of FIGS. **7**A–**7**B and the flowchart illustrations of FIGS. **8**–**10** illustrate methods and apparatus for determining contact with a contact-sensitive transducer to identify graphical objects on a display and for initiating functions associated with the identified objects. It will be understood that blocks of the flowchart illustrations, and combinations of blocks in the flowchart illustrations, can be implemented by computer program instructions which may be loaded onto a computer or other programmable data processing apparatus to produce a machine such that the instructions which execute on the computer or other programmable data processing apparatus create means for implementing the functions specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart block or blocks. Accordingly, blocks of the flowchart illustrations support combinations of means for performing the specified functions and combinations of steps for performing the specified functions. It will also be understood that each block of the flowchart illustrations, and combinations of blocks in the flowchart illustration, can be implemented by special purpose hardware which performs the specified functions or steps, or combinations of special purpose hardware such as microcontrollers, microprocessors, digital signal processing (DSP) chips, application-specific integrated circuits (ASICS) or the like, which execute computer instructions.

FIGS. **7**A–**7**C illustrate operations for controlling display of an image on a radiotelephone display according to another aspect of the present invention, in particular, operations for "scrolling" graphical objects, here shown as rows, on a radiotelephone display **120**, and for initiating a function associated with a graphical object identified on the display **120**. At least one graphical object is displayed on a radiotelephone display **120**. As illustrated in FIG. **7**B, a user makes a swiping or displacement motion in contact with a contact-sensitive strip **150** mounted on a side of the radiotelephone **100**, causing the display rows to "scroll" along the direction of the user's movement. Those skilled in the art will appreciate that "scrolling" in a generic sense refers to selective display of a row on the display **120**, and may be encompass a number of different graphical operations. For example, as depicted in FIGS. **7**A–**7**C, a plurality of rows may be displayed on the display **120**, and a selected one of displayed rows may be highlighted or otherwise identified in response to the user input. Different rows may be sequentially displayed on the display **120**, giving the appearance of a scrolling movement. In addition, actions such as scrolling by sequentially highlighting rows or other graphical objects or moving a cursor to sequentially indicate rows or other graphical objects responsive to a swiping motion on the transducer **150** may also be employed.

As illustrated in FIG. **7**C, a function associated with an item identified by, for example, highlighting or cursor positioning, is initiated with the user performs a predetermined number of momentary contacts or taps on the contact-sensitive transducer **150**, as illustrated in FIG. **7**C. These momentary contacts or taps may occur anywhere along the contact-sensitive transducer **150**. Those skilled in the art will appreciate that a number of variations on the above-described operations may be performed within the scope of the present invention. For example, instead of providing multi-graphical object display, the display **120** may be configured to display only one row at a time, sequentially displaying rows stored in memory to give the appearance of scrolling.

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FIG. 8 illustrates exemplary operations for detecting a swiping contact with a contact-sensitive transducer (Blocks 800 et seq.). The transducer output signal is sampled (Block 805). If the sample indicates contact of an object with the transducer, a starting position $P_{start}$ of contact is next determined (Blocks 810–815). The transducer output signal is again sampled (Block 820), and if contact is still detected, an ending position $P_{end}$ is determined (Blocks 825–830). A distance D is then determined from the starting and ending positions $P_{start}$, $P_{end}$ (Block 835). If the magnitude of the distance D is less than a minimum distance $D_{min}$, the movement is disregarded and another sample obtained (Blocks 840–820). If the distance D is sufficiently large, however, the controller determines the direction of the movement by looking at the sign of the distance D (Block 845). If the distance D is negative, the display is scrolled in a first direction (Block 850*a*); if the distance D is positive, however, the display is scrolled in a second direction (Block 850*b*). The ending position is then used as a new starting position (Block 855).

FIG. 9 illustrates exemplary operations (Blocks 900 et seq.) for detecting a momentary contact or tap on a contact-sensitive transducer according to another aspect of the present invention. Generally speaking, a momentary contact or tap is detected by satisfaction of a series of three conditions: (1) absence of contact with the contact-sensitive transducer; (2) contact with the contact-sensitive transducer; and (3) termination of contact with the contact-sensitive transducer within a predetermined time period. In the exemplary operations shown, a timer $T_1$(for example, a software timer implemented in the microcontroller 410 of FIG. 4) is initialized (Block 905). The output signal from a contact-sensitive transducer is sampled (Block 910). If the sampled output signal indicates that an object is in contact with the transducer, the output signal is repeatedly sampled until contact is not detected (Blocks 910–915). Once no contact is detected, the first condition for a tap is satisfied. A second round of sampling is then initiated, with the output being sampled until contact is again detected (Blocks 920–925). Once contact is again detected, the second condition for a tap is satisfied. The timer $T_1$ is then started (Block 930). As long as contact continues and the time measured by the timer $T_1$ is less than a predetermined maximum time interval $T_{max}$, the output of the transducer is repeatedly sampled (Blocks 935–945). If contact ceases before the timer $T_1$ exceeds the maximum time $T_{max}$, the third condition for a tap has been satisfied, and a valid single tap has been detected (Block 550). However, if the timer $T_1$ exceeds the maximum time $T_{max}$ before contact ceases, the timer $T_1$ is reinitialized (Block 905) and the detection process begins anew.

FIG. 10 illustrates operations (Block 1000 et seq.) for detecting a double tap on the contact-sensitive transducer. A second timer $T_2$ is initialized (Block 110). Once a valid single tap is detected, the second timer $T_2$ is started (Blocks 1015–1020). As long as the time measured by the second time $T_2$ remains less than a second maximum time interval $T_{2max}$, and no contact with the transducer is detected, the transducer is repeatedly sampled (Blocks 1025–1035). If the timer has yet to expire when contact is detected, it is next determined whether the contact constitutes a valid single tap (Block 1040). If a valid single tap is detected, a valid double tap has occurred (Block 1045). If not, the second timer $T_2$ is reinitialized (Block 1005), starting the detection process anew.

FIG. 11 illustrates another embodiment according to the present invention, a radiotelephone 100' which includes a horizontally-arranged contact-sensitive transducer 150*c*, here shown mounted on a front fact of the radiotelephone housing 110, near the display 120. In a manner similar to that described with respect to the side-mounted transducers of FIG. 3, the transducer 150*c* may be used to selectively display column-organized graphical objects on the display 120 based on contact of an object, e.g., a finger or stylus, with the contact-sensitive transducer 150*c*. For example, as illustrated in FIG. 11, icons 1110 may be displayed in columns on the display 120, and may be selectively identified according to contact with the contact sensitive transducer 150*c*, using apparatus and operations similar to those described with respect to FIGS. 4–10. An icon may be identified by several techniques, such as by highlighting or by displaying a cursor 1120 adjacent the identified icon. A function associated with the identified icon may be selected using apparatus and operations manner similar to those described with respect to FIGS. 7A–7C. Those skilled in the art will also appreciate that other embodiments may include side-mounted contact-sensitive strips such as those illustrated in FIG. 3 in combination with a horizontally-mounted contact-sensitive strip as illustrated in FIG. 11 to provide both row and column-oriented controls for the display 120.

In the drawings and specification, there have been disclosed typical embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being set forth in the following claims.

That which is claimed is:

1. A radiotelephone, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a radiotelephone communications transceiver, supported by the housing;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, which controls at least one of the display and the radiotelephone communications transceiver according to the output signal of the contact-sensitive transducer.

2. A radiotelephone according to claim 1, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

3. A radiotelephone according to claim 1, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.

4. A radiotelephone according to claim 3, wherein the controller is operative to selectively display a graphical object on the display according to the output signal of the contact-sensitive transducer.

5. A radiotelephone according to claim 4, wherein the controller is operative to selectively display a row on the

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display according to the output signal of the contact-sensitive transducer.

6. A radiotelephone according to claim 4, wherein the controller is operative to display a plurality of graphical objects on the display and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

7. A radiotelephone according to claim 4, wherein the controller is operative to determine a position of contact of an object along an axis of the contact-sensitive transducer responsive to the output signal of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

8. A radiotelephone according to claim 7, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

9. A radiotelephone according to claim 7, wherein the controller is operative display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

10. A radiotelephone according to claim 7, wherein the controller is operative to cause at least one of the display or the radiotelephone communications transceiver to perform a plurality of actions, wherein an action of the plurality of actions is associated with the identified graphical object and wherein the controller is further operative, responsive to the contact-sensitive transducer, to initiate the action associated with the identified graphical object.

11. A radiotelephone according to claim 10, wherein the controller is operative, responsive to the contact-sensitive transducer to detect a momentary contact with the contact-sensitive transducer and to initiate the action associated with the identified graphical object responsive to detection of the momentary contact.

12. A radiotelephone according to claim 11, wherein the controller is operative to initiate the action in response to detection of a plurality of momentary contacts occurring within a predetermined time interval.

13. A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.

14. A radiotelephone according to claim 13, wherein the contact-sensitive transducer further comprises a first contact-sensitive strip mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

15. A radiotelephone according to claim 1, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

16. An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at the front surface of the housing;

a contact-sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at at least one of the first and second side surfaces, which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which is configured to control the display according to the output signal of the contact-sensitive transducer.

17. An apparatus according to claim 16, wherein the contact-sensitive surface, when the housing is held within the user's hand such that the rear surface confronts the user's palm, confronts a finger or a thumb of the holding hand.

18. An apparatus according to claim 16, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

19. An apparatus according to claim 18, wherein the controller is operative to selectively display a graphical object on the display responsive to the output signal of the contact-sensitive transducer.

20. An apparatus according to claim 19, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

21. An apparatus according to claim 19, wherein the controller is operative to display a plurality of graphical objects on the display, and to identify one of the displayed plurality of graphical objects responsive to the output signal of the contact-sensitive transducer.

22. An apparatus according to claim 19, wherein the controller is operative, responsive to the contact-sensitive transducer, to determine a position of contact along the axis of the contact-sensitive transducer, and to selectively display a graphical object based on the determined position of contact to thereby identify the graphical object.

23. An apparatus according to claim 22, wherein the controller is operative to highlight one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

24. An apparatus according to claim 22, wherein the controller is operative to display a cursor that indicates one of a plurality of displayed graphical objects responsive to the output signal of the contact-sensitive transducer.

25. An apparatus according to claim 24, wherein the controller is operative, responsive to the contact-sensitive transducer, to scroll displayed rows along an axis of the display responsive to the output signal of the contact-sensitive transducer.

26. An apparatus according to claim 25, wherein the controller is operative, responsive to the output signal of contact-sensitive transducer, to detect moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer, and to scroll displayed rows along the axis of the display based on the detected moving contact.

27. An apparatus according to claim 19, wherein the contact-sensitive transducer comprises an elongate contact-sensitive strip disposed at at least one of the first and second side surfaces of the housing.

28. An apparatus according to claim 27, wherein the contact-sensitive transducer comprises a first contact-sensitive surface mounted at the first side surface and a second contact-sensitive strip mounted at the second side surface.

29. An apparatus according to claim 22, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

30. An apparatus, comprising:

a housing;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

31. An apparatus according to claim 30, further comprising a radiotelephone communications transceiver supported by the housing, and wherein the controller is operative to control the radiotelephone communications transceiver according to the output signal.

32. An apparatus according to claim 30, wherein the contact-sensitive transducer comprises a contact-sensitive strip disposed at side surface of the housing, the side surface disposed adjacent the front surface and inclined away from the front surface.

33. In an apparatus including a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite edges of the front surface and extending from the respective opposite edges of the front surface to respective opposite edges of the rear surface, a display that displays an image at the front surface, and a controller that controls the display, a method of providing user input comprising the steps of:

holding the housing in a user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm; and

providing user input to the controller using a contact-sensitive transducer having a contact-sensitive surface disposed at at least one of the first and second side surfaces of the housing, the transducer being operable to produce an output signal that characterizes contact with the contact-sensitive surface of the contact-sensitive transducer.

34. A method according to claim 33, wherein the step of providing comprises the step of contacting the contact-sensitive transducer with a thumb or finger of the holding hand while holding the housing in the user's hand such that the rear surface confronts the user's palm and the display projects away from the user's palm.

35. A method according to claim 33, wherein the apparatus is a radiotelephone that further includes a radiotelephone communications transceiver, wherein the controller is operative to control the radiotelephone communications transceiver, and wherein the step of providing user input comprises the step of controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

36. A method according to claim 33, wherein the step of controlling comprises the step of selectively displaying an image or the display according to the output signal of the contact-sensitive transducer.

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(12) **United States Patent**
**Hayes, Jr. et al.**

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(45) **Date of Patent: *Aug. 21, 2001**

(54) **RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME**

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( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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(22) Filed: **Jul. 25, 2000**

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(51) **Int. Cl.**[7] ..... **H04B 1/38**; G09B 5/00

(52) **U.S. Cl.** ..... **455/566**; 455/575; 455/90; 345/173

(58) **Field of Search** ..... 455/566, 575, 455/90, 95, 550; 379/433, 428; 345/173, 156, 168, 184, 123

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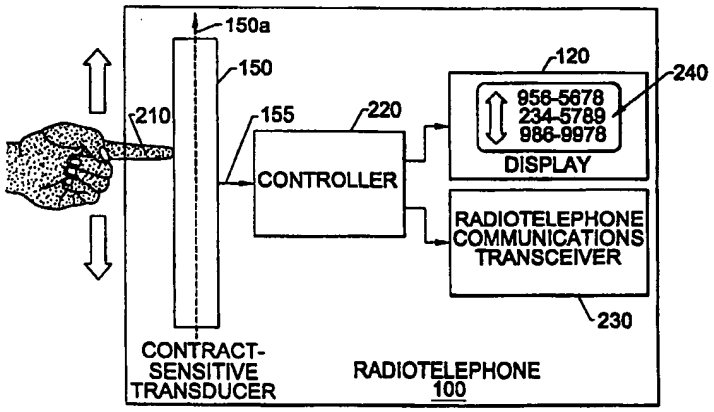
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*Assistant Examiner*—Charles N. Appiah
(74) *Attorney, Agent, or Firm*—Myers Bigel Sibley & Sajovec

(57) **ABSTRACT**

A radiotelephone includes a housing, and a radiotelephone communications transceiver and display are attached to the housing. A contact-sensitive transducer such as a resistive transducer, a capacitive transducer or a semiconductive transducer, is attached to the housing and produces an output signal that characterizes contact with a contact-sensitive surface of the contact-sensitive transducer. A controller is responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver, and controls at least one of the display and the radiotelephone communications transceiver according to the output signal of the contact-sensitive transducer. The controller, responsive to the contact-sensitive transducer, may determine a position of contact along an axis of the contact-sensitive transducer. A graphical object is selectively displayed based on the determined position of contact to thereby identify the graphical object, e.g., by highlighting one of a plurality of displayed graphical objects or by displaying a cursor that indicates one of a plurality of displayed graphical objects. In yet another embodiment, the controller is configured to cause the display or the radiotelephone communications transceiver to perform a plurality of actions. An action of the plurality of actions may be associated with an identified graphical object, and the controller may initiate the action associated with the identified graphical object in response to, for example, detection of a momentary contact of an object with the contact-sensitive transducer.

**36 Claims, 9 Drawing Sheets**



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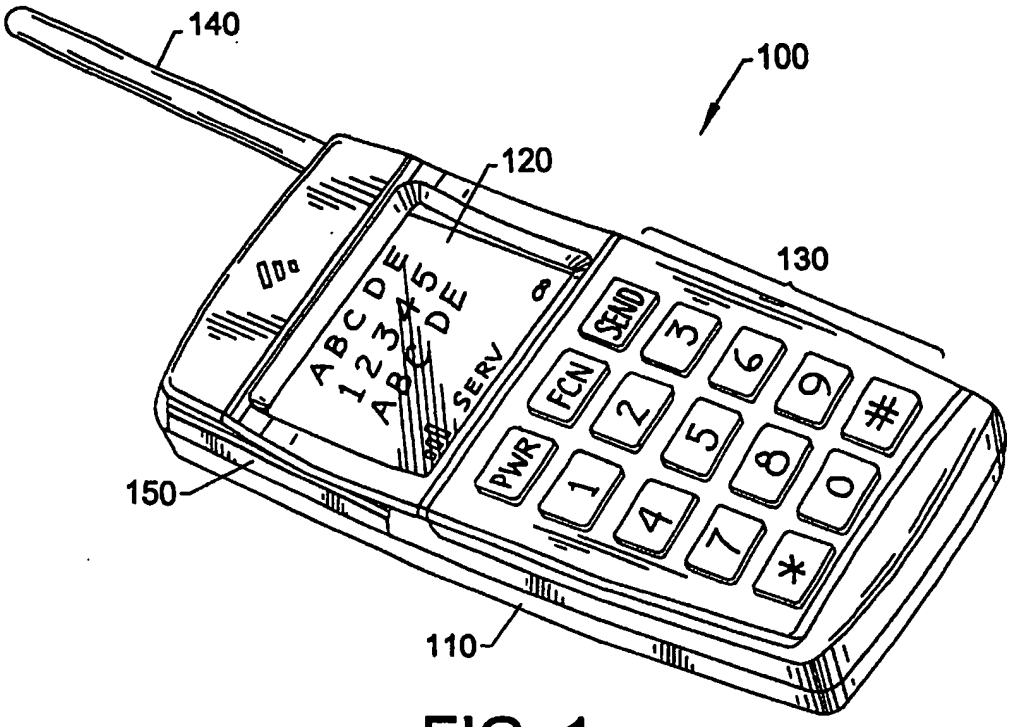

140
100
120
130
150
110
SEND
FCN
PWR
SERV

FIG. 1.

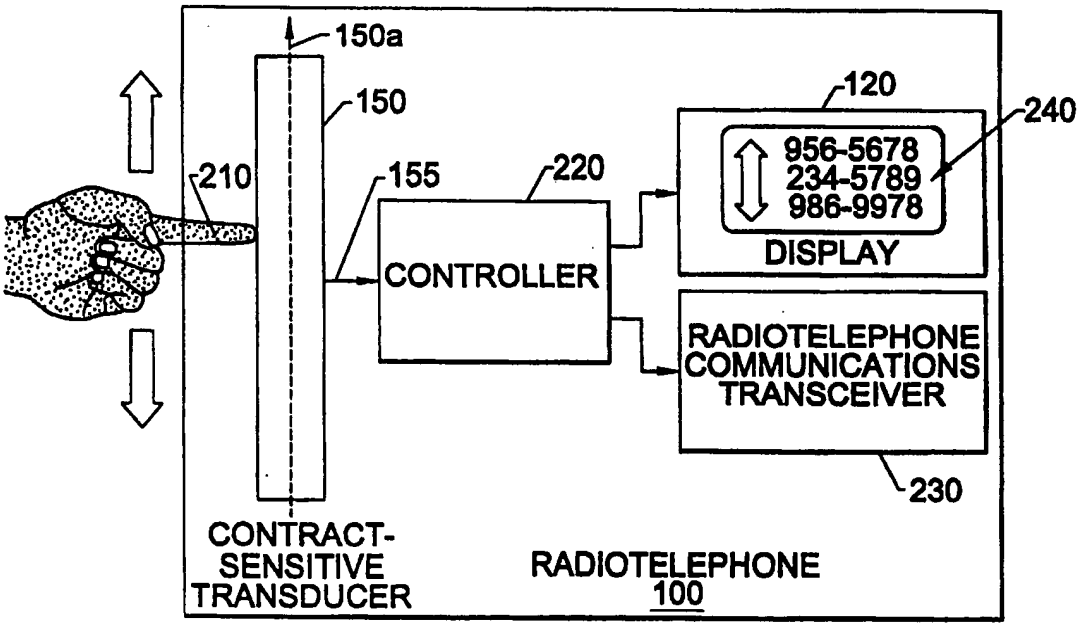

150a
150
210
155
220
120
240
956-5678
234-5789
986-9978
DISPLAY
CONTROLLER
RADIOTELEPHONE
COMMUNICATIONS
TRANSCEIVER
230
CONTRACT-
SENSITIVE
TRANSDUCER
RADIOTELEPHONE
100

FIG. 2.

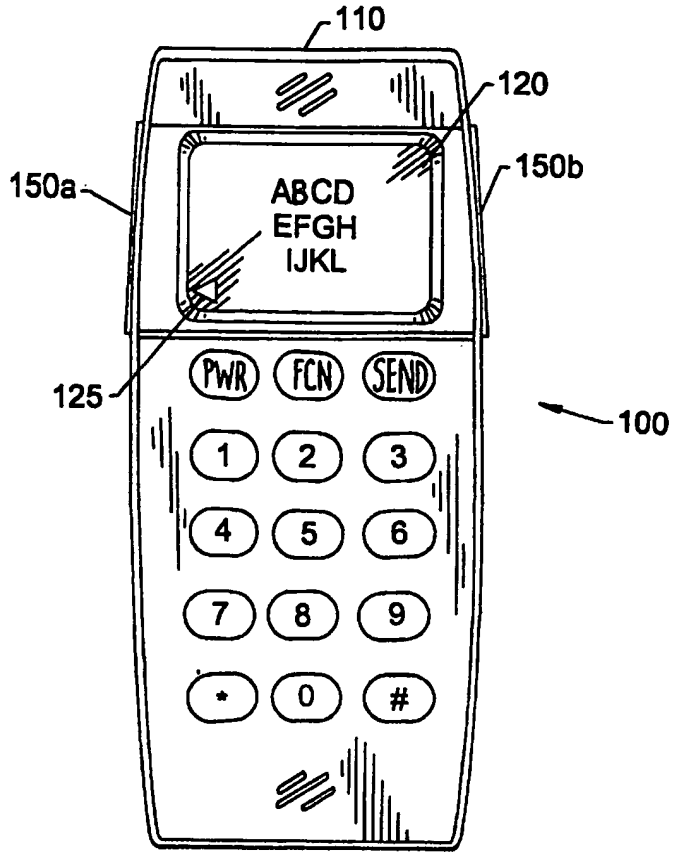

110
120
150a
150b
ABCD
EFGH
IJKL
125
PWR
FCN
SEND
100
1
2
3
4
5
6
7
8
9
*
0
#

FIG. 3.

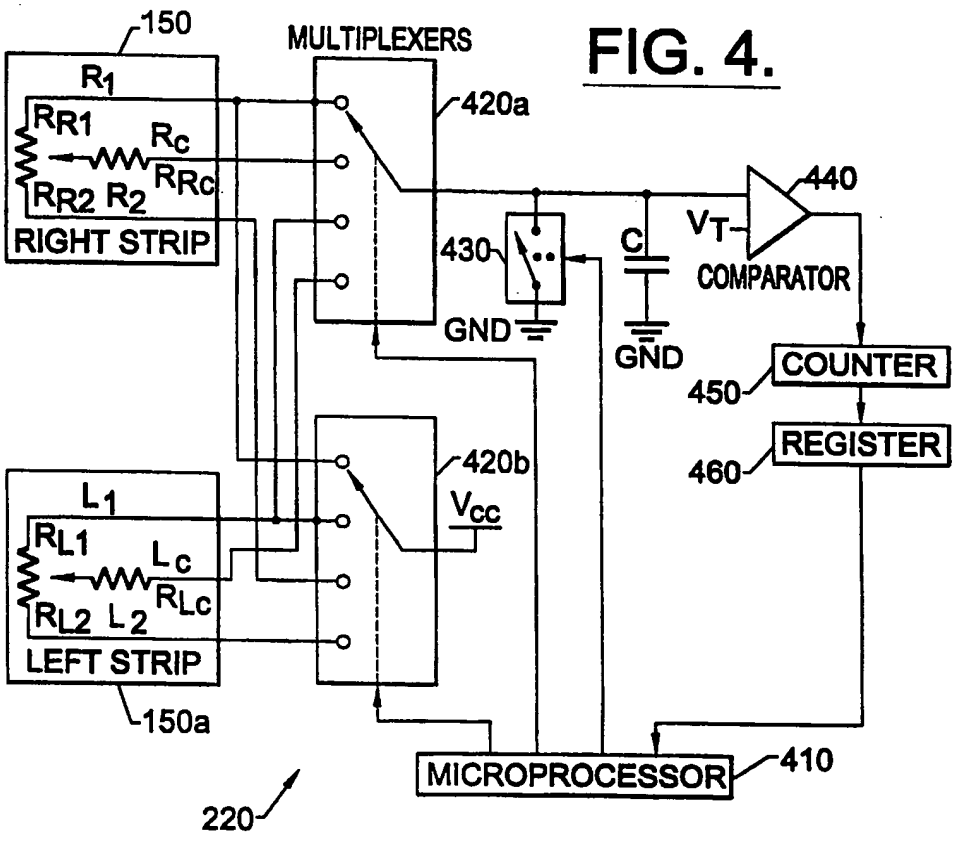

150
MULTIPLEXERS
R1
RR1
Rc
RRc
RR2 R2
RIGHT STRIP
420a
440
VT
COMPARATOR
430
C
GND
GND
COUNTER
450
REGISTER
460
420b
Vcc
L1
RL1
Lc
RLc
RL2 L2
LEFT STRIP
150a
MICROPROCESSOR
410
220

FIG. 4.

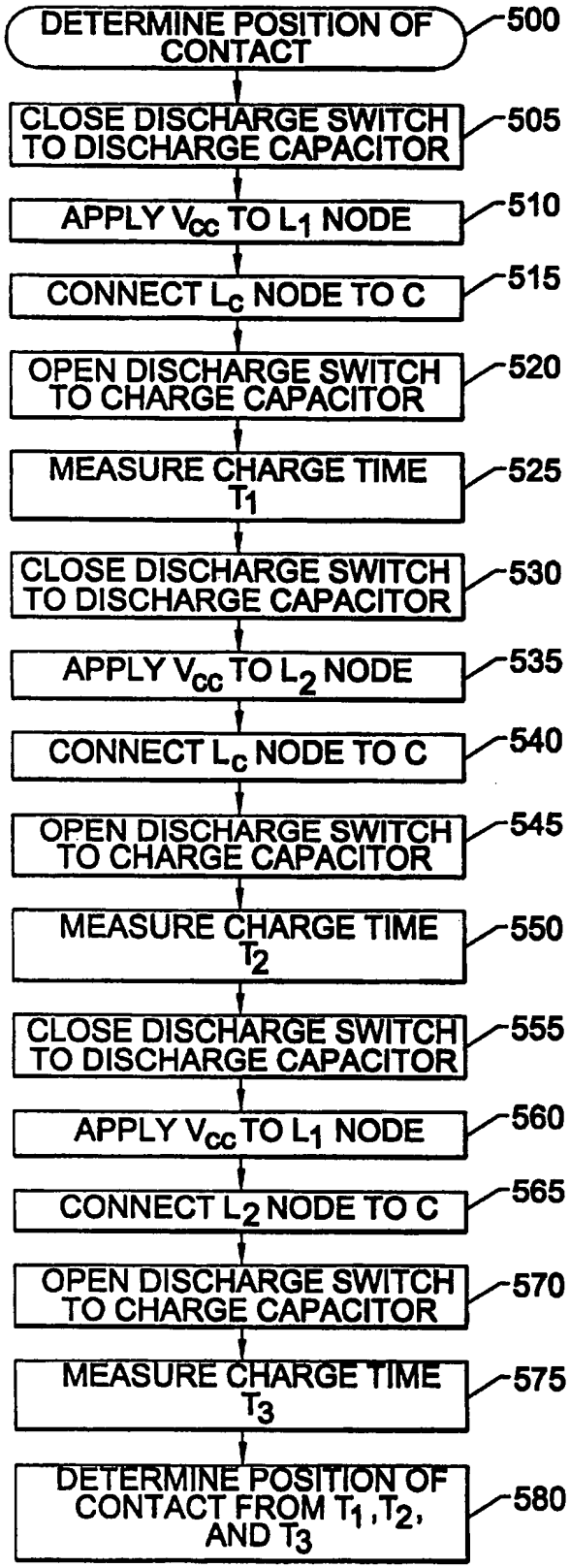

DETERMINE POSITION OF CONTACT
500
CLOSE DISCHARGE SWITCH TO DISCHARGE CAPACITOR
505
APPLY $V_{cc}$ TO $L_1$ NODE
510
CONNECT $L_c$ NODE TO C
515
OPEN DISCHARGE SWITCH TO CHARGE CAPACITOR
520
MEASURE CHARGE TIME $T_1$
525
CLOSE DISCHARGE SWITCH TO DISCHARGE CAPACITOR
530
APPLY $V_{cc}$ TO $L_2$ NODE
535
CONNECT $L_c$ NODE TO C
540
OPEN DISCHARGE SWITCH TO CHARGE CAPACITOR
545
MEASURE CHARGE TIME $T_2$
550
CLOSE DISCHARGE SWITCH TO DISCHARGE CAPACITOR
555
APPLY $V_{cc}$ TO $L_1$ NODE
560
CONNECT $L_2$ NODE TO C
565
OPEN DISCHARGE SWITCH TO CHARGE CAPACITOR
570
MEASURE CHARGE TIME $T_3$
575
DETERMINE POSITION OF CONTACT FROM $T_1$, $T_2$, AND $T_3$
580

FIG. 5.

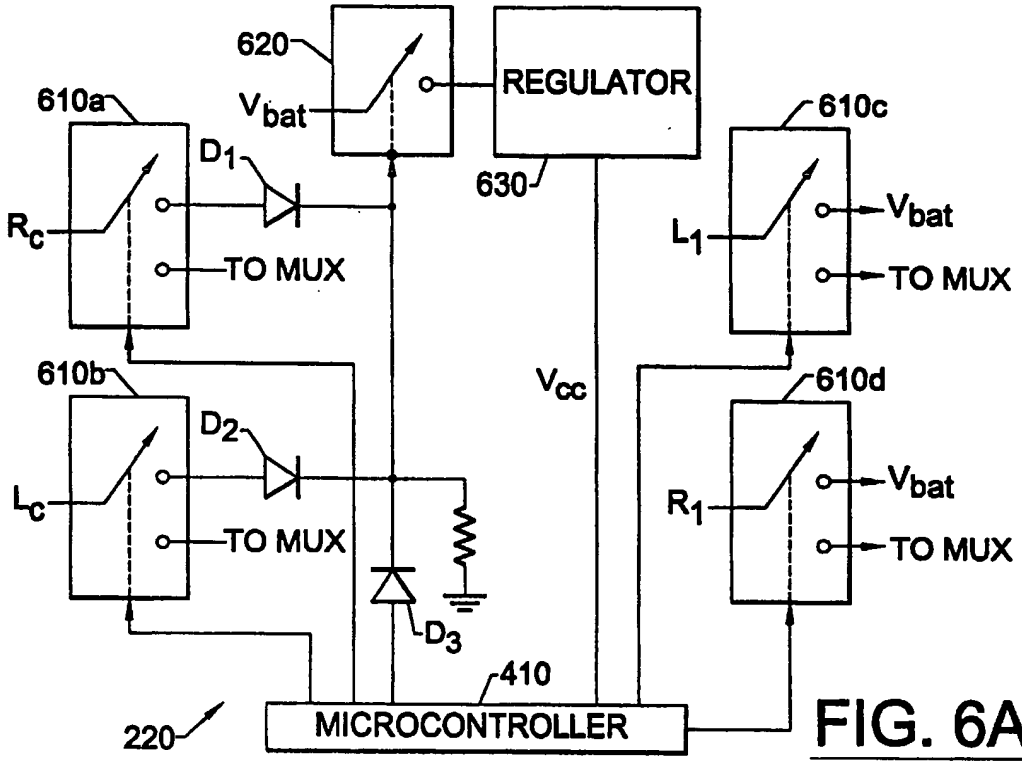

620
REGULATOR
610a
$V_{bat}$
$D_1$
630
610c
$R_C$
TO MUX
$L_1$
$V_{bat}$
TO MUX
610b
$V_{cc}$
610d
$D_2$
$L_C$
$R_1$
$V_{bat}$
TO MUX
TO MUX
$D_3$
410
220
MICROCONTROLLER

FIG. 6A.

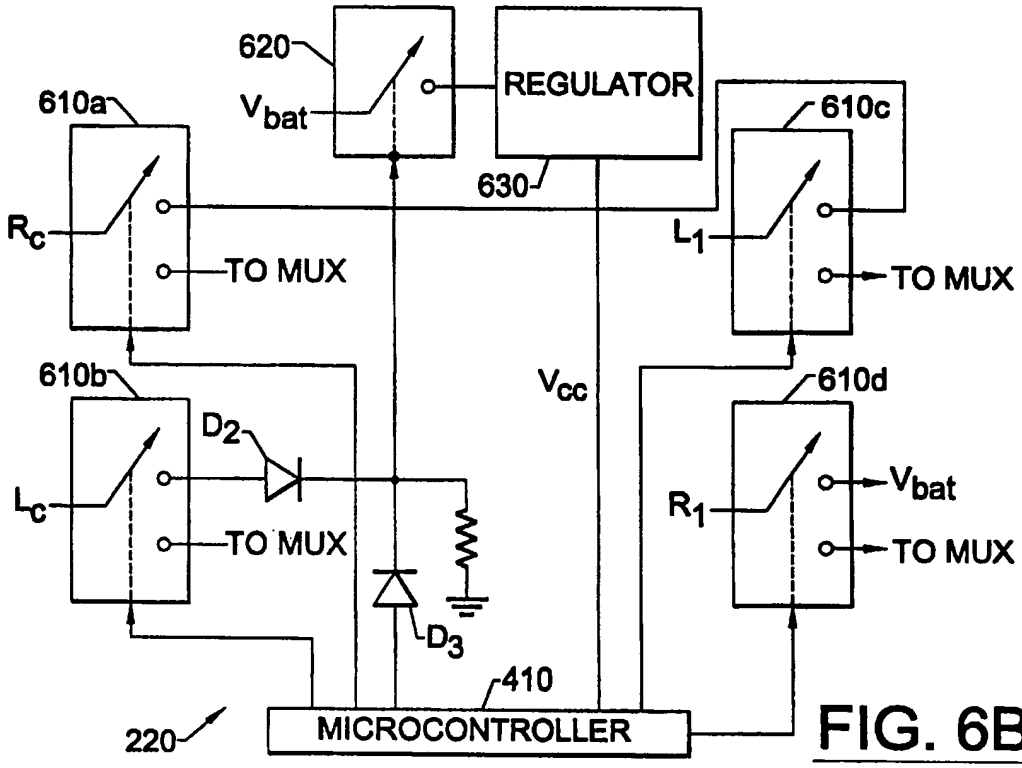

620
REGULATOR
610a
$V_{bat}$
630
610c
$R_C$
TO MUX
$L_1$
TO MUX
610b
$V_{cc}$
610d
$D_2$
$L_C$
$R_1$
$V_{bat}$
TO MUX
TO MUX
$D_3$
410
220
MICROCONTROLLER

FIG. 6B.

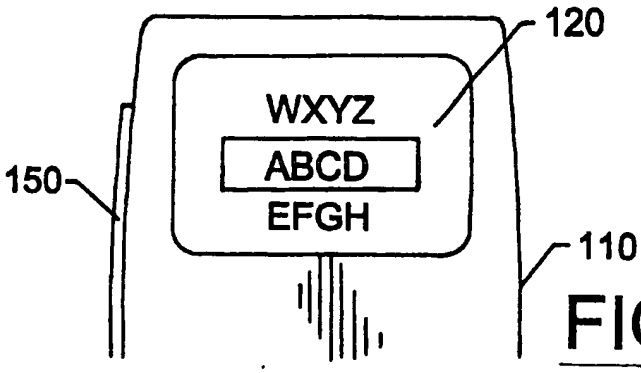



FIG. 7A.

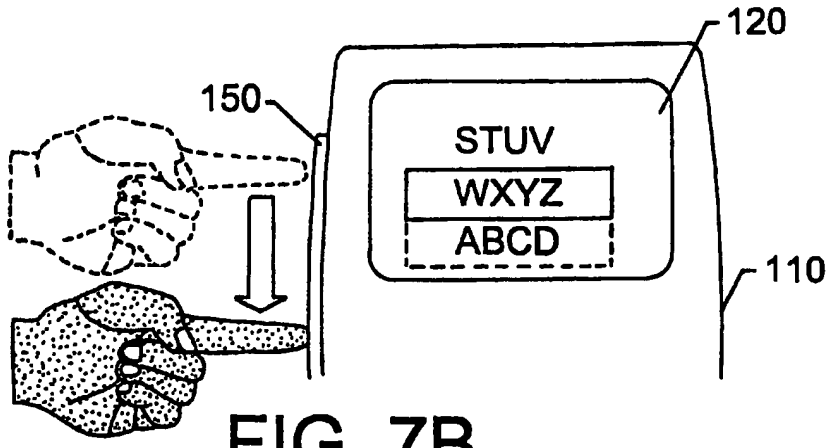



FIG. 7B.

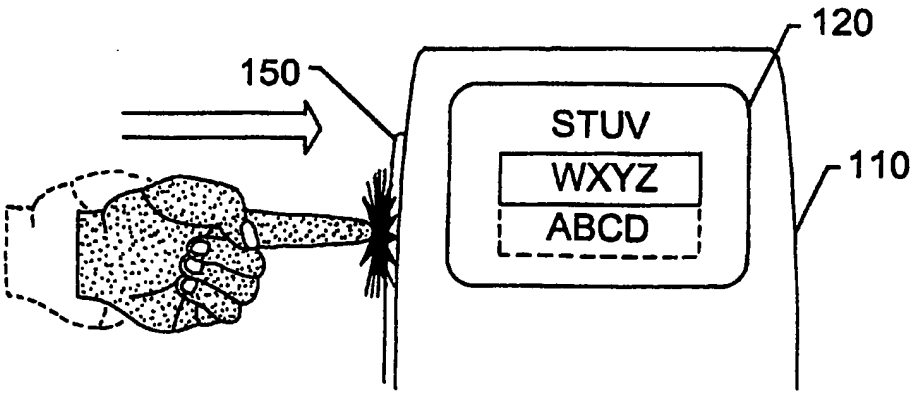



FIG. 7C.

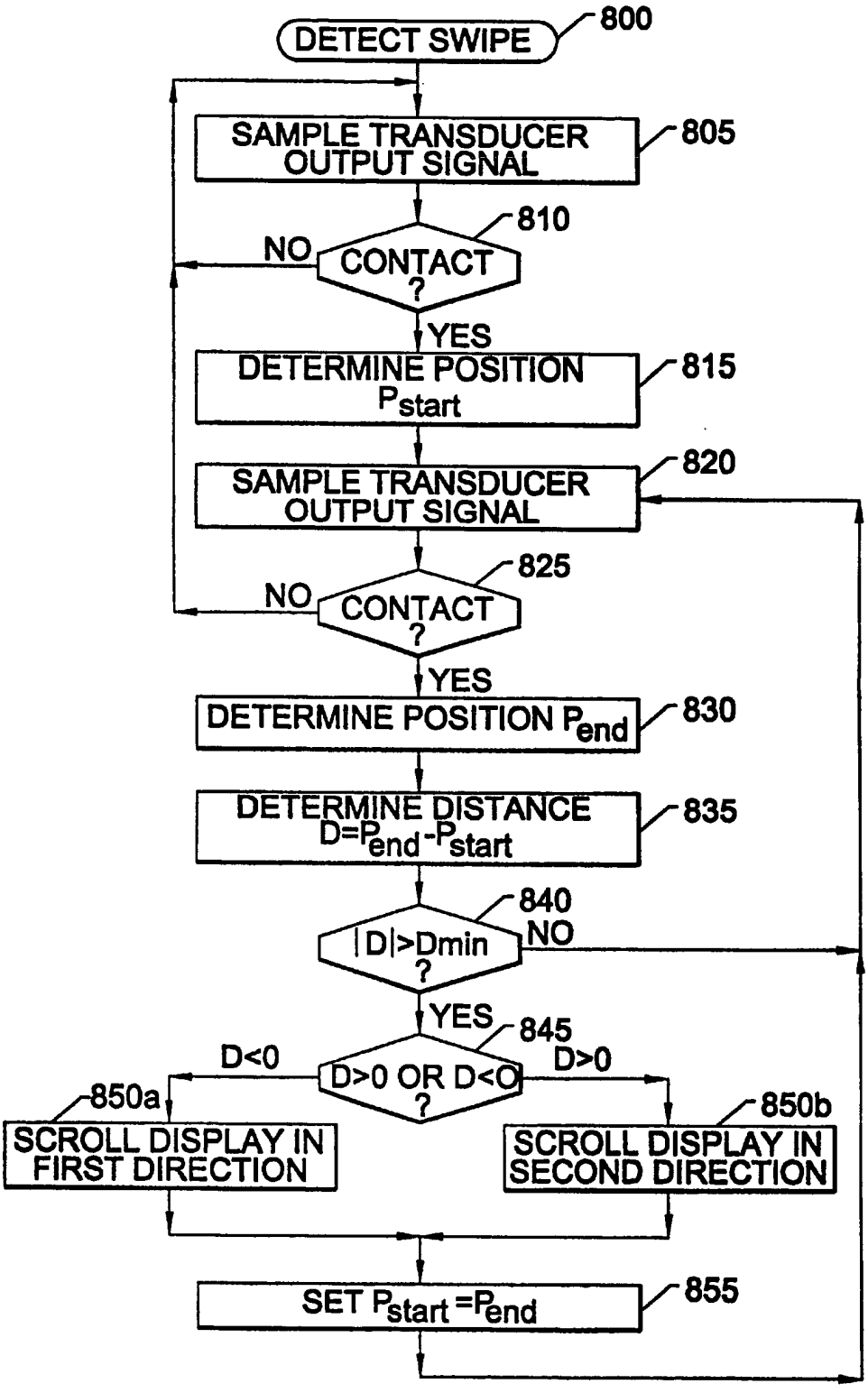

DETECT SWIPE
800
SAMPLE TRANSDUCER OUTPUT SIGNAL
805
CONTACT ?
810
NO
YES
DETERMINE POSITION Pstart
815
SAMPLE TRANSDUCER OUTPUT SIGNAL
820
CONTACT ?
825
NO
YES
DETERMINE POSITION Pend
830
DETERMINE DISTANCE D=Pend-Pstart
835
|D|>Dmin ?
840
NO
YES
D<0
D>0 OR D<0 ?
845
D>0
850a
SCROLL DISPLAY IN FIRST DIRECTION
850b
SCROLL DISPLAY IN SECOND DIRECTION
SET Pstart=Pend
855

FIG. 8.

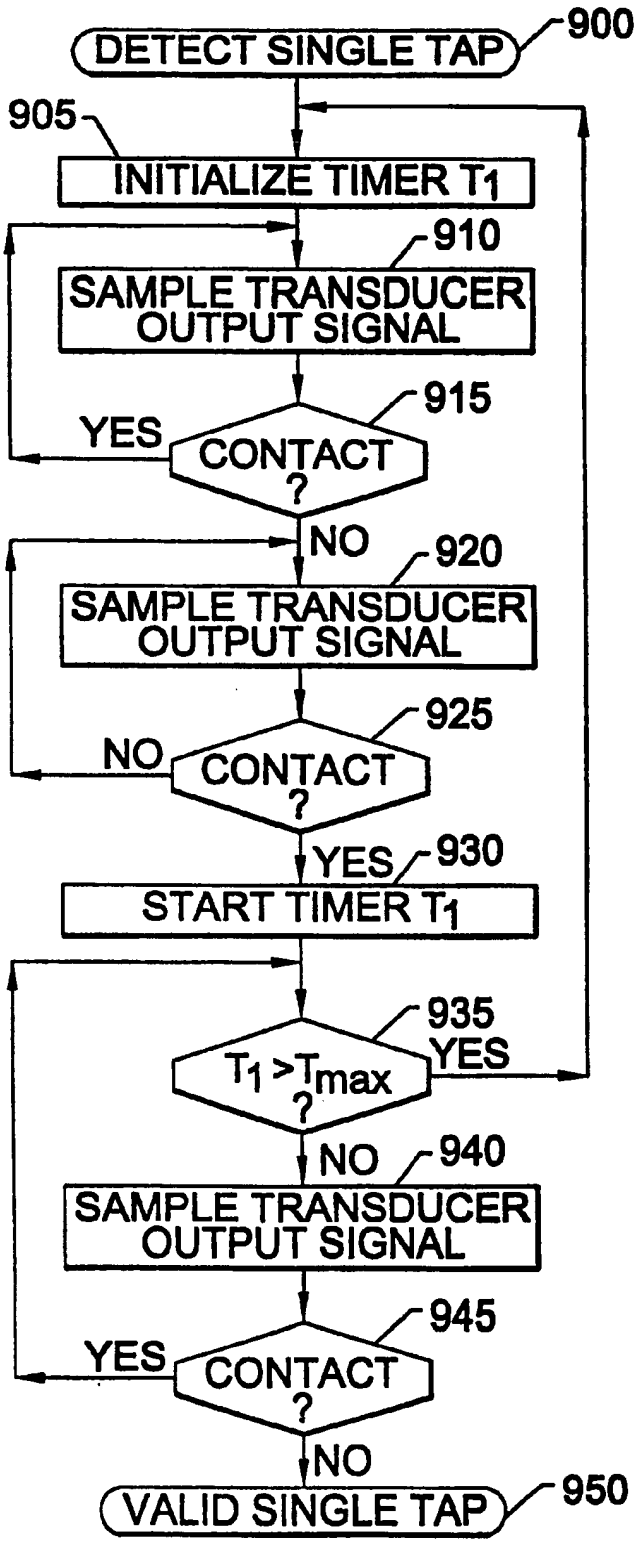

DETECT SINGLE TAP
900
905
INITIALIZE TIMER T1
910
SAMPLE TRANSDUCER OUTPUT SIGNAL
915
YES
CONTACT ?
NO
920
SAMPLE TRANSDUCER OUTPUT SIGNAL
925
NO
CONTACT ?
YES
930
START TIMER T1
935
T1 > Tmax ?
YES
NO
940
SAMPLE TRANSDUCER OUTPUT SIGNAL
945
YES
CONTACT ?
NO
VALID SINGLE TAP
950

FIG. 9.

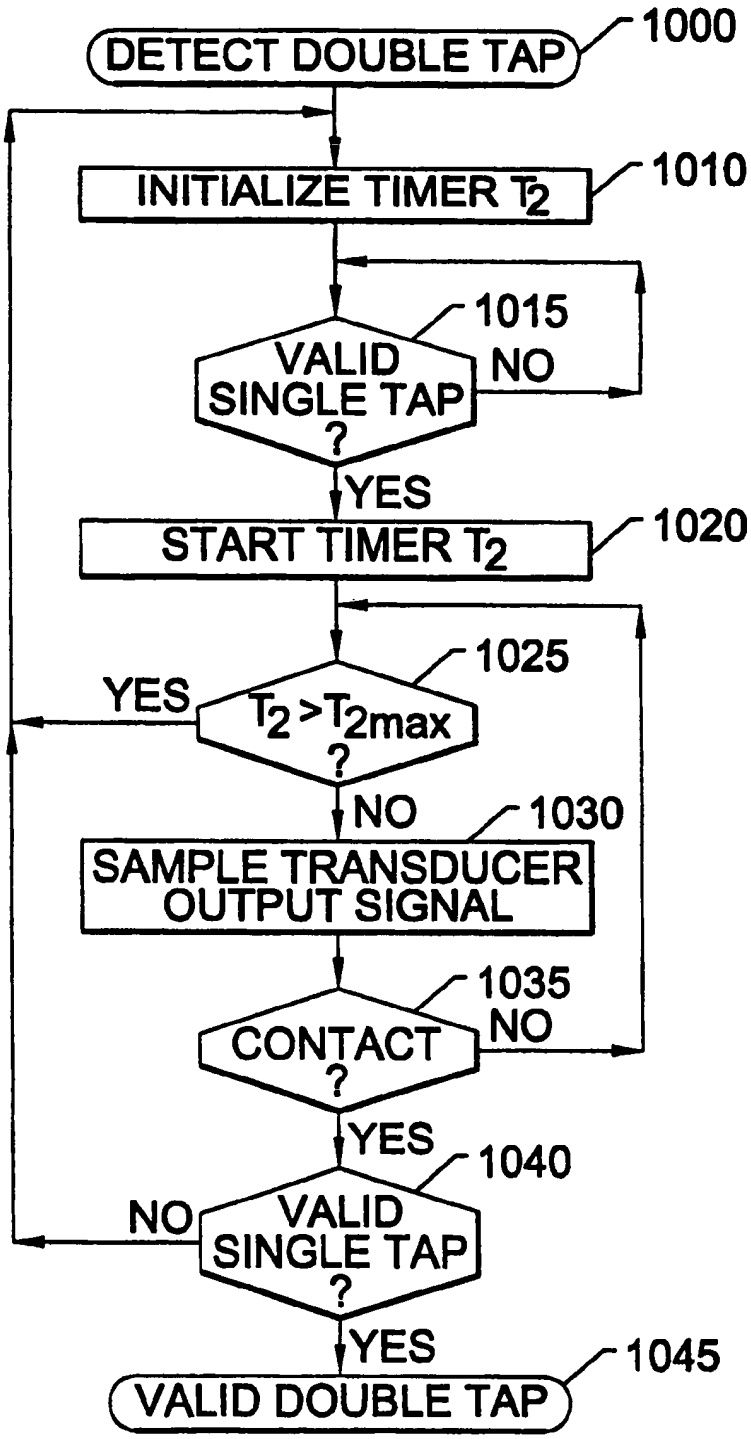

DETECT DOUBLE TAP
1000
INITIALIZE TIMER $T_2$
1010
VALID SINGLE TAP ?
1015
NO
YES
START TIMER $T_2$
1020
$T_2 > T_{2max}$ ?
1025
YES
NO
SAMPLE TRANSDUCER OUTPUT SIGNAL
1030
CONTACT ?
1035
NO
YES
VALID SINGLE TAP ?
1040
NO
YES
VALID DOUBLE TAP
1045

FIG. 10.

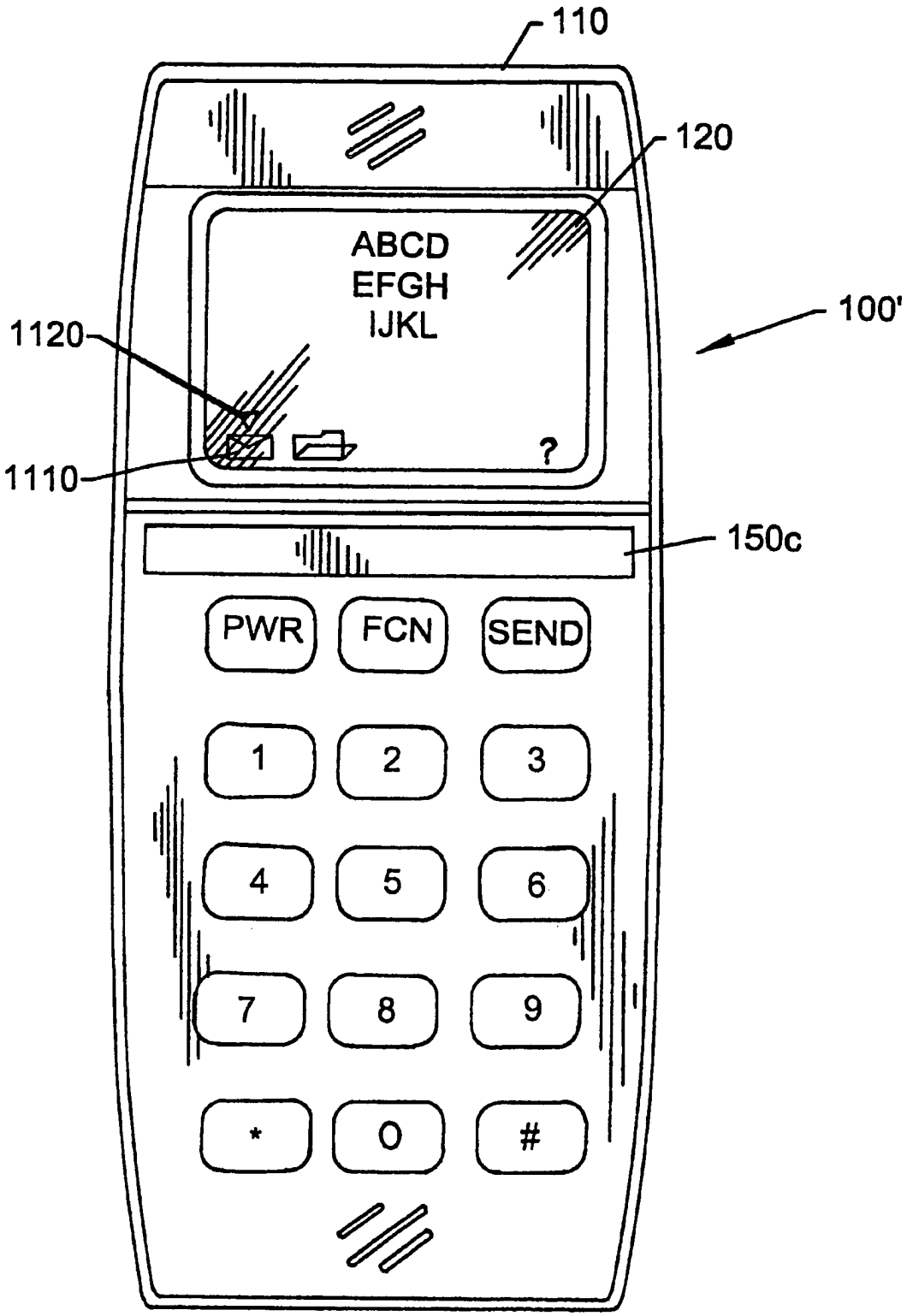

110
120
ABCD
EFGH
IJKL
100'
1120
1110
?
150c
PWR
FCN
SEND
1
2
3
4
5
6
7
8
9
*
0
#

FIG. 11.

Patent
Attorney's Docket No. _____

# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| In re Reissue Application of | § | |
| | § | |
| U.S. Patent No. 6,278,888 to | § | Group Art Unit: Unassigned |
| | § | |
| HAYES, JR. ET AL. | § | Examiner: Unassigned |
| | § | |
| Serial No.: Unassigned | § | |
| | § | |
| Filed: Concurrently herewith | § | |
| | § | |
| For: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME | § | |

## DECLARATION IN SUPPORT OF REISSUE APPLICATION

Honorable Commissioner of Patents and Trademarks
Washington, DC 20231

Sir:

I hereby declare that:

(1) The last known residence, mailing address and the citizenship of the inventors are stated below.

(2) I am authorized to act on behalf of the assignee, Ericsson, Inc. and the title of my position with said assignee is Assistant Secretary.

(3) The entire title to the patent identified below is vested in said assignee.

(4) The first named inventor is John Joseph Hayes Jr.; residence address; 2408 Canonbie Lane, Wake Forest, North Carolina 27587, citizenship - United States of America.

(5) The second named inventor is Curtis Wayne Thornton; residence address; 103 Indigo Drive, Cary, North Carolina 27513, citizenship - United States of America.





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Page 1126 of 1144

(6) The Patent No. is 6,278,888.

(7) The Date of Patent Issue is August 21, 2001.

(8) I believe said inventors to be the original and first inventors of the subject matter which is described and claimed in said patent, for which a reissue patent is sought on the invention entitled: Radiotelephones Having Contact-Sensitive User Interfaces and Methods of Operating same, the specification of which is attached hereto.

(9) I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

(10) I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

(11) I verily believe the original patent to be wholly or partly inoperative or invalid by reason of the patentee claiming more or less than he had the right to claim in the patent.

(12) At least one error upon which reissue is based is described as follows:

Claim 30 of the patent is believed to be wholly or partially invalid in that it claims more than patentee is entitled to.

(13) All errors corrected in this reissue application arose without any deceptive intention on the part of the applicant.

(14) Assignee hereby offers to surrender U.S. Patent No. 6,278,888 upon allowance of the subject reissue application.

(15) I hereby appoint the following as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith.

Steven Slater, registration no. 35361
Glenn Boisbrun, registration no. 39615
Brian Carlson, registration no. 37793
Binh Dao, registration no. 43576
Barry Dove, registration no. 45862
Kay Houston, registration no. 38495
James Kesterson, registration no. 25882
Roger Knapp, registration no. 46836
Ira Matsil, registration no. 35272
Gregory Neugebauer, registration no. 53378

(16) Direct all communications about the application to:

Steven H. Slater
Slater & Matsil, L.L.P.
17950 Preston Road
Suite 1000
Dallas, TX 75252
telephone: 972-732-1001
facsimile 972-732-9218

(17) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed.

Date: 3-00-05

By: _____
John Han, Assistant Secretary





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Page 1128 of 1144

PTO/SB/96 (09-04)
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# STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Ericsson Inc.

Application No./Patent No.: 6,278,888 B1 Filed/Issue Date: August 21, 2001

Entitled: RadioTelephones Having Contact-Sensitive User Inerfaces and Methods of Operating Same

Ericsson Inc., a corporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. [x] the assignee of the entire right, title, and interest; or

2. [ ] an assignee of less than the entire right, title and interest.
The extent (by percentage) of its ownership interest is_____ %

in the patent application/patent identified above by virtue of either:

A. [ ] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 008951, Frame 0747, or for which a copy thereof is attached.

**OR**

B. [ ] A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as shown below:

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The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From:_____ To:_____
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[ ] Additional documents in the chain of title are listed on a supplemental sheet.

[ ] Copies of assignments or other documents in the chain of title are attached.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, if the assignment is to be recorded in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

_____ 3-08-05
Signature Date

John Han 972-583-7686
Printed or Typed Name Telephone Number

Assistant Secretary
Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

*If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.*

PATENT APPLICATION SERIAL NO. _____

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PATENT AND TRADEMARK OFFICE
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| 02 FC:1114 | 500.00 | DA |
| 03 FC:1314 | 600.00 | DA |
| 04 FC:1204 | 400.00 | DA |
| 05 FC:1205 | 1850.00 | DA |

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*U.S. Government Printing Office: 2002 — 489-267/69033

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

| | | |
|---|---|---|
| In re: Resissue Application of | § | Group Art Unit: Unassigned |
| U.S. Patent No.: 6,278,888 to | § | Examiner: Unassigned |
| Hayes, Jr. *et al.* | § | Attorney Docket No.: ERI-888RI |
| Serial No. Unassigned | § | |
| Filed: Concurrently herewith | § | |
| For: RADIOTELEPHONES HAVING CONTACT-SENSITIVE USER INTERFACES AND METHODS OF OPERATING SAME | § | |

PRELIMINARY AMENDMENT

Dear Sir:

Applicants respectfully request entry and consideration for the following amendment prior to examination of the application on the merits.



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30. (Amended) An apparatus, comprising:

a housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

37. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

38. (New) An apparatus according to claim 30, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.



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39. (New) An apparatus according to claim 38, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

40. (New) An apparatus according to claim 39, wherein the contact-sensitive transducer is an elongate strip.

41. (New) An apparatus according to claim 30, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

42. (New) An apparatus according to claim 30, which also includes additional user input interface devices for the apparatus on the front surface of the housing.

43. (New) An apparatus according to claim 42 wherein the additional interface devices are contact-sensitive.

44. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the axis of the contact-sensitive transducer.

45. (New) An apparatus according to claim 30, wherein the output signal is produced in response to moving contact with the contact-sensitive transducer along the surface of the contact-sensitive transducer.

46. (New) An apparatus according to claim 30, wherein the output signal is produced in response to detection of momentary contact with said contact-sensitive transducer.

47. (New) An apparatus according to claim 30, wherein the output signal is produced in response to detection of a predetermined number of momentary contacts with said contact-sensitive transducer within a predetermined time interval.



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48. (New) An apparatus according to claim 43, wherein an output signal is produced in response to moving contact with the additional contact-sensitive transducer along the axis of the contact-sensitive transducer.

49. (New) An apparatus according to claim 43, wherein an output signal is produced in response to detection of momentary contact with said additional contact-sensitive transducer.

50. (New) An apparatus according to claim 43, wherein an output signal is produced in response to detection of a predetermined number of momentary contacts with said additional contact-sensitive transducer within a predetermined time interval.

51. (New) An apparatus according to claim 30 further comprising:

a second contact-sensitive transducer, supported by the housing, which produces a second output signal that characterizes contact of an object along the contact-sensitive surface of the second contact-sensitive transducer; and

a controller, responsive to the second output signal for controlling a function of the apparatus.

52. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of momentary contact with said second contact-sensitive transducer.

53. (New) An apparatus according to claim 51, wherein the second output signal is produced in response to detection of a predetermined number of momentary contacts with said second contact-sensitive transducer within a predetermined time interval.



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54. (New) An apparatus according to claim 30, wherein said controller scrolls the displayed rows by identifying successive ones of the rows displayed along the axis of said display based on the output signal from said transducer.

55. (New) An apparatus according to claim 54, wherein the direction of scroll is transverse to the direction that said rows extend across the display.

56. (New) An apparatus according to claim 54, wherein said rows consist of alphanumeric characters comprising menu selections.

57. (New) An apparatus according to claim 54, wherein said controller identifies successive ones of the rows displayed along the axis of said display by highlighting successive said rows.

58. (New) An apparatus according to claim 30 further comprising a power supply disposed inside said housing.

59. (New) An apparatus according to claim 58, wherein said power supply comprises a battery.

60. (New) An apparatus according to claim 59 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

61. (New) An apparatus according to claim 30 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

62. (New) An apparatus for providing user input to a hand-held electronic device, comprising:

a housing for containing the electronics for performing the intended user functions of the device, said housing having a front surface, a rear surface and first and second side surfaces adjoining respective opposite sides of the front surface and extending from the respective opposite sides of the front surface to respective opposite sides of the rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display located on the front surface of the housing for displaying user-interface information for the electronic device, said information including an image of rows of menu selectable items;

a contact-sensitive transducer, supported by the front surface of the housing, which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows of said menu selectable items along an axis of the display based upon the output signal of the contact-sensitive transducer to enable selection of a particular item by the user to provide input to the electronic device.

63. (New) An apparatus according to claim 62, wherein the displayed rows of menu selectable items comprise a plurality of items in a list.

64. (New) An apparatus according to claim 62 further comprising a power supply disposed inside said housing.

65. (New) An apparatus according to claim 64, wherein said power supply comprises a battery.



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66. (New) An apparatus according to claim 65 further comprising a circuit which controls power transfer from the power supply to another circuit based on the output signal of the contact-sensitive transducer.

67. (New) An apparatus according to claim 62 further comprising a mode of operation wherein the controller is unresponsive to contact with the contact-sensitive transducer.

68. (New) An apparatus, comprising:

a housing having a front surface and a rear surface, the housing configured to be held in a user's hand such that the rear surface confronts the user's palm;

a display, supported by the housing, that displays an image at a front surface of the housing;

a contact-sensitive transducer, supported by the housing, which produces an output signal that characterizes contact of an object along the contact-sensitive surface of the contact-sensitive transducer; and

a controller, responsive to the output signal and operatively associated with the display, which scrolls displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

69. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by the thumb of the holding hand.

70. (New) An apparatus according to claim 68, wherein the surface of the contact-sensitive transducer, when the housing is held within the user's hand such that the rear surface confronts the user's palm, can be engaged by a finger of or other object held in the other hand of the user than the holding hand.



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71. (New) An apparatus according to claim 70, wherein the contact-sensitive transducer is disposed on the front surface of the housing.

72. (New) An apparatus according to claim 71, wherein the contact-sensitive transducer is an elongate strip.

73. (New) An apparatus according to claim 68, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

## REMARKS

Claims 1-29 are un-amended from their form in U.S. Patent No. 6,278,888 as issued. Original claim 30 has been preliminarily amended herein. Claims 31-73 have been added to more comprehensively claim the subject invention. No new subject matter has been added by the claims, which are fully supported by the specification as shown in the attached appendix entitled Status of Claims and Support for claim changes, as required under 37 C.F.R. 1.173(c).

The support shown in the Appendix is by way of example only and Applicants make no representation that the identified support is the only or best support for the claims. Other support than that specifically cited in the Appendix may be found in the specification, drawings, and original claims, as well.

Please enter the above amendments before consideration of this application. Applicants believe the claims are in condition for allowance and respectfully request that Examiner pass the case to reissuance. Examiner is invited to contact the undersigned to address any questions or concerns regarding the present reissue application.

Respectfully submitted,

March 11, 2005
Date

Steven H. Slater
Attorney for Applicant
Reg. No. 35,361

Slater & Matsil, L.L.P.
17950 Preston Rd.
Suite 1000
Dallas, Texas 75252
Tel. 972-732-1001
Fax: 972-732-9218

## APPENDIX A

| Claims Added in Reissue Application | Status | Specification Support in '888 Patent for Claims |
|---|---|---|
| 1-29. | Pending | Unamended |
| 30. | Pending | Figs. 1, 2, 7A, 7B, 7C and 11.<br>Figs. 1 and 11<br>Claims 1 and 2 (Col. 10, lines 35-37 and lines 55-57).<br>Col. 5, lines 1-2.<br>Claim 30, lines 6-9.<br>Col. 5, lines 18-22.<br>Col. 10, lines 2-7.<br>Claim 30 (Col. 13, lines 10-13).<br>Col. 5, lines 18-35. |
| 31-36. | Pending | Unamended. |
| 37. | Pending | Figs. 1 and 11<br>Claims 1 and 2 (Col. 10, lines 35-37; and lines 55-57) |
| 38. | Pending | Figs. 1, 2, 7B, 7C and 11.<br>Claims 1 and 2 (Col. 10, lines 35-37; and lines 55-57).<br>Col. 10, lines 2-7. |
| 39. | Pending | Fig. 11, item 150C<br>Col. 9, line 65 - Col. 10, line 7. |
| 40. | Pending | Fig. 11, item 150C<br>Col. 9, line 65 - Col. 10, line 7. |
| 41. | Pending | Col. 5, lines 29-34.<br>Claim 15. |

| Claims Added in Reissue Application | Status | Specification Support in '888 Patent for Claims |
|---|---|---|
| 42. | Pending | Fig. 1, keys for "PWR", "FCN", "SEND" and numeric characters. Col. 1, lines 1-2.<br>Fig. 11, keys for "PWR", "FCN", "SEND" and numeric characters. Col. 1, lines 1-2.<br>Col. 5, lines 1-2. |
| 43. | Pending | Fig. 1, keys for "PWR", "FCN", "SEND" and numeric characters. Col. 1, lines 1-2.<br>Fig. 11, keys for "PWR", "FCN", "SEND" and numeric characters. Col. 1, lines 1-2.<br>Col. 5, lines 1-2.<br>Figs. 3, 4.<br>Col. 5, lines 36-39, 48-49 |
| 44. | Pending | Col. 5, lines 19-22.<br>Col. 3, lines 20-26.<br>Claim 26 |
| 45. | Pending | Col. 5, lines 19-22<br>Col. 8, lines 36-40. |
| 46. | Pending | Col. 9, lines 21-50. |
| 47. | Pending | Col. 9, lines 51-64. |
| 48. | Pending | Fig. 11<br>Col. 10, lines 13-21. |
| 49. | Pending | Fig. 11<br>Col. 10, lines 13-21.<br>Col. 9, lines 21-50. |
| 50. | Pending | Fig. 11<br>Col. 10, lines 13-21.<br>Col. 9, lines 51-64. |

| Claims Added in Reissue Application | Status | Specification Support in '888 Patent for Claims |
|---|---|---|
| 51. | Pending | Col. 11.<br>Col. 10, lines 13-21.<br>Col. 5, lines 19-22.<br>Fig. 2, item 220.<br>Col. 5, lines 22-24. |
| 52. | Pending | Col. 9, lines 21-50.<br>Col. 8, lines 54-59. |
| 53. | Pending | Col. 9, lines 51-64.<br>Col. 8, lines 54-59. |
| 54. | Pending | Col. 8, lines 43-53. |
| 55. | Pending | Fig. 7A-7C.<br>Col. 8, lines 29-53. |
| 56. | Pending | Figs. 7A-7C.<br>Col. 5, lines 25-26. |
| 57. | Pending | Col. 8, lines 49-50. |
| 58. | Pending | Fig. 1, "PWR" key.<br>Col. 5, lines 48-65.<br>Col. 6, lines 44-67.<br>Col. 7, lines 24-63. |
| 59. | Pending | Col. 5, lines 48-65.<br>Col. 6, lines 44-67.<br>Col. 7, lines 24-63. |
| 60. | Pending | Fig. 1, "PWR" key.<br>Col. 5, lines 48-65.<br>Col. 6, lines 44-67.<br>Col. 7, lines 24-63. |
| 61. | Pending | Col. 5 ,lines 42-45.<br>Col. 3, lines 27-35. |

| Claims Added in Reissue Application | Status | Specification Support in '888 Patent for Claims |
|---|---|---|
| 62. | Pending | Figs. 1, 2, 7A, 7B, 7C and 11.<br>Figs. 1 and 11<br>Claims 1 and 2 (Col. 10, lines 35-37 and lines 55-57).<br>Col. 5, lines 1-2.<br>Claim 30, lines 6-9.<br>Col. 5, lines 18-22.<br>Col. 10, lines 2-7.<br>Claim 30 (Col. 13, lines 10-13).<br>Col. 5, lines 18-35. |
| 63. | Pending | Col. 5, lines 18-35.<br>Col. 8, lines 29-53. |
| 64. | Pending | Fig. 1, "PWR" key.<br>Col. 5, lines 48-65.<br>Col. 6, lines 44-67.<br>Col. 7, lines 24-63. |
| 65. | Pending | Fig. 1, "PWR" key.<br>Col. 5, lines 48-65.<br>Col. 6, lines 44-67.<br>Col. 7, lines 24-63. |



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| Claims Added in Reissue Application | Status | Specification Support in '888 Patent for Claims |
|---|---|---|
| 66. | Pending | Fig. 1, "PWR" key.<br>Col. 5, lines 48-65.<br>Col. 6, lines 44-67.<br>Col. 7, lines 24-63. |
| 67. | Pending | Col. 5, lines 42-45.<br>Col. 3, lines 27-35. |
| 68. | Pending | Fig. 1 7A, 7B, 7C and 11.<br>Claims 1 and 2 (Col. 10, lines 35-37, and lines 55-57.)<br>Col. 5, lines 1-2.<br>Claim 30, lines 6-9.<br>Col. 5, lines 18-22.<br>Col. 10, lines 2-7.<br>Claim 30 (Col. 15, lines 10-13)<br>Fig. 2, item 220<br>Col. 5, lines 18-35. |
| 69. | Pending | Figs. 1 and 11.<br>Claims 1 and 2 (Col. 10, lines 35-37 and lines 55-57). |
| 70. | Pending | Figs. 1, 2, 7A, 7B, 7C and 11.<br>Claims 1 and 2 (Col. 10, lines 35-37 and lines 55-57).<br>Col. 10, lines 2-7. |
| 71. | Pending | Fig. 11<br>Col. 9, lines 65 - Col. 10, line 2. |
| 72. | Pending | Fig. 11<br>Col. 9, lines 65 - Col. 10, line 2. |
| 73. | Pending | Col. 5, lines 29-34.<br>Claim 15. |