

JC857 U.S. PTO
09/625674



455	Subclass	ISSUE CLASSIFICATION
566	Class	

PATENT NUMBER
6278888
6278888

U.S. UTILITY Patent Application

O.I.P.E.	PATENT DATE
SCANNED <i>JDW</i> Q.A. <i>CH</i>	AUG 21 2001

CLASS	SUBCLASS	ART UNIT	EXAMINER
455		2745	

APPLICATION NO.	CONT/PRIOR	CLASS	SUBCLASS	ART UNIT	EXAMINER
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APPLICANTS
John Hayes, Jr.
Curtis Thornton

TITLE
Radiotelephones having contact-sensitive user interfaces and methods of operating same

PTO-2040
12/99

ISSUING CLASSIFICATION

ORIGINAL		CROSS REFERENCE(S)					
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
455	566	455	575	90			
INTERNATIONAL CLASSIFICATION		345	173				
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G 0 9 B	5100						

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<input checked="" type="checkbox"/> TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drwg.	Figs. Drwg.	Print Fig.	Total Claims	Print Claim for O.G.
	89	14	2	36	30
<input type="checkbox"/> The term of this patent subsequent to _____ (date) has been disclaimed.	CHARLES N. APPIAH (Assistant Examiner)			5/7/01 (Date)	
<input checked="" type="checkbox"/> The term of this patent shall not extend beyond the expiration date of U.S. Patent. No. 6,131,047	VIVIAN CHANG SUPERVISORY PATENT EXAMINER TECHNOLOGY CENTER 2800			5/7/01 (Date)	
<input type="checkbox"/> The terminal _____ months of this patent have been disclaimed.	(Primary Examiner)			5/7/01 (Date)	
	(Legal Instruments Examiner)			(Date)	
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			\$1240.00	5.21.01	
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ISSUE FEE IN FILE

Formal Drawings (sheet) set

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TCL EXHIBIT 1006
Page 1 of 115

PATENT APPLICATION



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JC857 U.S. PTO
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INITIALS

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CONTENTS

	Date Received (Incl. C. of M.) or Date Mailed		Date Received (Incl. C. of M.) or Date Mailed
1. Application _____ papers.		42. _____	
2. Pre Amdt A	7/25/00	43. _____	
3. 2 nd Am Final 3mo	1-19-01	44. _____	
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5. Terminal Disclaim	4-2-01	46. _____	
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SEARCHED			
Class	Sub.	Date	Exmr.
455	566, 575 90 95 550	11/8/00	CA
379	433 428		
345	173 156 168		
UPDATED		11/20/00 1/15/01 4/12/01	CA CA
345	184, 123		

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
455	90, 95 550, 566, 575	5/24/01	CA
379	428, 433		
345	93, 153, 168 184, 123		

SEARCH NOTES (INCLUDING SEARCH STRATEGY)		
	Date	Exmr.
Steve Samos	4/20/01	CA
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POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	Smc		8/4/05
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FORMALITY REVIEW			
RESPONSE FORMALITY REVIEW			

INDEX OF CLAIMS

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Claim	Date
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Bib Data Sheet

SERIAL NUMBER 09/625,674	FILING DATE 07/25/2000 RULE -	CLASS 455	GROUP ART UNIT 2745	ATTORNEY DOCKET NO. 8194-123CT
APPLICANTS John Joseph Hayes, Jr., Wake Forest, NC ; Curtis Wayne Thornton, Cary, NC ; ** CONTINUING DATA ***** THIS APPLICATION IS A CON OF 09/001,173 12/30/1997 YES CA ** FOREIGN APPLICATIONS *****				
IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 09/14/2000				
Foreign Priority claimed <input type="checkbox"/> yes <input checked="" type="checkbox"/> no 35 USC 119 (a-d) conditions <input type="checkbox"/> yes <input checked="" type="checkbox"/> no <input type="checkbox"/> Met after met Allowance Verified and Acknowledged <u>Chapman</u> <u>CA</u> Examiner's Signature Initials		STATE OR COUNTRY NC	SHEETS DRAWING 12	TOTAL CLAIMS 40
			INDEPENDENT CLAIMS 5	
ADDRESS				
20792				
TITLE				
Radiotelephones having contact-sensitive user interfaces and methods of operating same				
FILING FEE RECEIVED 1206	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit	

PATENT APPLICATION SERIAL NO. _____

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PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

08/04/2000 SCARNICH 00000026 09625674

01 FC:101	690.00 DP
02 FC:102	156.00 DP
03 FC:103	360.00 DP

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07-26-00

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ATTY DOCKET NO.: 8194-123CT

DATE: July 25 2000

UTILITY PATENT APPLICATION TRANSMITTAL LETTER
AND FEE TRANSMITTAL FORM (37 CFR 1.53(b))



BOX PATENT APPLICATION

Commissioner for Patents

Washington, DC 20231

Sir:

Transmitted herewith for filing under 37 CFR 1.53(b) is:

- ☐ a patent application
☒ a Continuation ☐ a Divisional ☐ a Continuation-in-Part (CIP)
of prior application no.: 09/001,173; filed December 30, 1997.
☐ A Small Entity Statement(s) was filed in the prior application; Status still proper and desired.

Inventor(s) or Application Identifier:

John Joseph Hayes, Jr.
Wake Forest, North Carolina

Curtis Wayne Thornton
Cary, North Carolina

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

Enclosed are:

1. ☒ Application Transmittal Letter and Fee Transmittal Form (*A duplicate is enclosed for fee processing*)
2. ☒ 23 pages of Specification (including 40 claims)
3. ☒ 12 sheets of Formal Drawings (35 USC 113)
4. ☒ Oath or Declaration
 - a. ☐ newly executed (*original or copy*)
 - b. ☒ copy from prior application (37 CFR 1.63(d) (*for continuation/divisional*) [Note Box 5 Below])
 - c. ☐ **DELETION OF INVENTOR(S)** (*Signed statement deleting inventor(s) named in the prior application*)
5. ☒ Incorporation By Reference (*useable if box 4b is checked*)

The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby incorporated by reference therein.
6. ☐ Microfiche Computer Program (*Appendix*)
7. ☒ Assignment papers (*cover sheet(s) and document(s)*) Filed in parent application
8. ☐ Small Entity Statement(s)
9. ☒ Information Disclosure Statement and PTO-1449
10. ☒ Preliminary Amendment (*Please enter all claim amendments prior to calculating the filing fee.*)
11. ☐ English Translation Document
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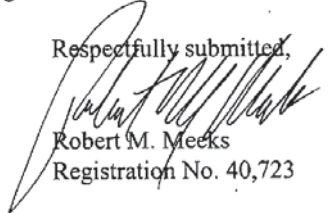
13. ☐ Sequence Listing/ Sequence Listing Diskette
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The fee has been calculated as shown below:

	Column 1 No. Filed	Column 2 No. Extra	Small Entity Rate Fee	Large Entity Rate Fee
BASIC FEE			\$345.00	\$690.00
TOTAL CLAIMS	40 - 20 =	20	x 09 = \$	x 18 = \$360.00
INDEP CLAIMS	5 - 3 =	2	x 39 = \$	x 78 = \$156.00
<input type="checkbox"/> MULTIPLE Dependent Claims Presented			+ 130 = \$	+ 260 = \$
If the difference in Col. 1 is less than zero, Enter "0" in Col. 2			Total \$	Total \$1,206.00

- ☒ Two checks totaling \$1,206.00 to cover the filing fee are enclosed.
- ☐ A check in the amount of \$ is enclosed to cover the filing fee, PLUS the Assignment Recordation fee (\$40.00).
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 50-0220.
- ☒ Any additional filing fees required under 37 CFR 1.16.
- ☒ Any patent application processing fees under 37 CFR 1.17.

Respectfully submitted,

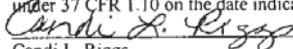

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 Candi L. Riggs
 Date of Signature: July 25, 2000

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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.

5 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
10 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

15 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
20 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
25 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
30 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,

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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,

5 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
10 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.

15 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,
20 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
25 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
30 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

8

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
 5 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,
 10 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
 15 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
 20 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
 25 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
 30 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:

$$T_1 = k(R_{L_1} + R_{L_c});$$

$$T_2 = k(R_{L_2} + R_{L_c}); \text{ and}$$

$$T_3 = k(R_{L_1} + R_{L_2}), \text{ where}$$

$$k = -C \ln(1 - V_i / V_{cc}).$$

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 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 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 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 150a, 150b 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 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

5 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

10 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

15 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

20 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

25 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

30 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)

12

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

5 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,

10 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

15 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).

20 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

25 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

30 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 face 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;
 - 5 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
 - 10 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
 - 5 said displayed plurality of graphical objects based on said output signal of said contact-sensitive transducer.

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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;

5 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
5 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

5 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
5 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
5 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.

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.

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.

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.

32. A radiotelephone according to Claim 31, wherein said means for scrolling comprises:

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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.

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Abstract of the Disclosure

TCL EXHIBIT 1006
Page 31 of 115

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

Attorney Docket No. 8194-123

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a 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

OR

☐ was filed on _____ as United States Application No. or PCT International Application Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate, or of any PCT International application having a filing date before that of the application on which priority is claimed.

None			<input type="checkbox"/> Yes <input type="checkbox"/> No
Number	Country	MM/DD/YYYY Filed	Priority Claimed

			<input type="checkbox"/> Yes <input type="checkbox"/> No
Number	Country	MM/DD/YYYY Filed	Priority Claimed

ENGLISH LANGUAGE DECLARATION CONTINUED

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

None	
Application Number(s)	Filing Date (MM/DD/YYYY)

Application Number(s)	Filing Date (MM/DD/YYYY)

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) or § 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application(s) in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application (37 C.F.R. § 1.63(d)).

None		
Appln. Serial No.	Filing Date	Status Patented/Pending/Abandoned

Appln. Serial No.	Filing Date	Status Patented/Pending/Abandoned

Appln. Serial No.	Filing Date	Status Patented/Pending/Abandoned

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.

ENGLISH LANGUAGE DECLARATION CONTINUED

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following registered attorney(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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Inventor's
Signature: [Signature] Date: 12/19/97

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Citizenship: United States of America

Post Office Address: 103 Indigo Drive
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The diagram illustrates a system 100 for a radiotelephone. A hand 210 is shown interacting with a contact-sensitive transducer 150. The transducer 150 is connected to a controller 155. The controller 155 is connected to a radiotelephone communications transceiver 230 and a display 240. The display 240 shows three phone numbers: 956-5678, 234-5789, and 986-9978. The transducer 150 is also connected to a contact-sensitive transducer 150a. The entire system is labeled 100.

FIG. 2

FIG. 3

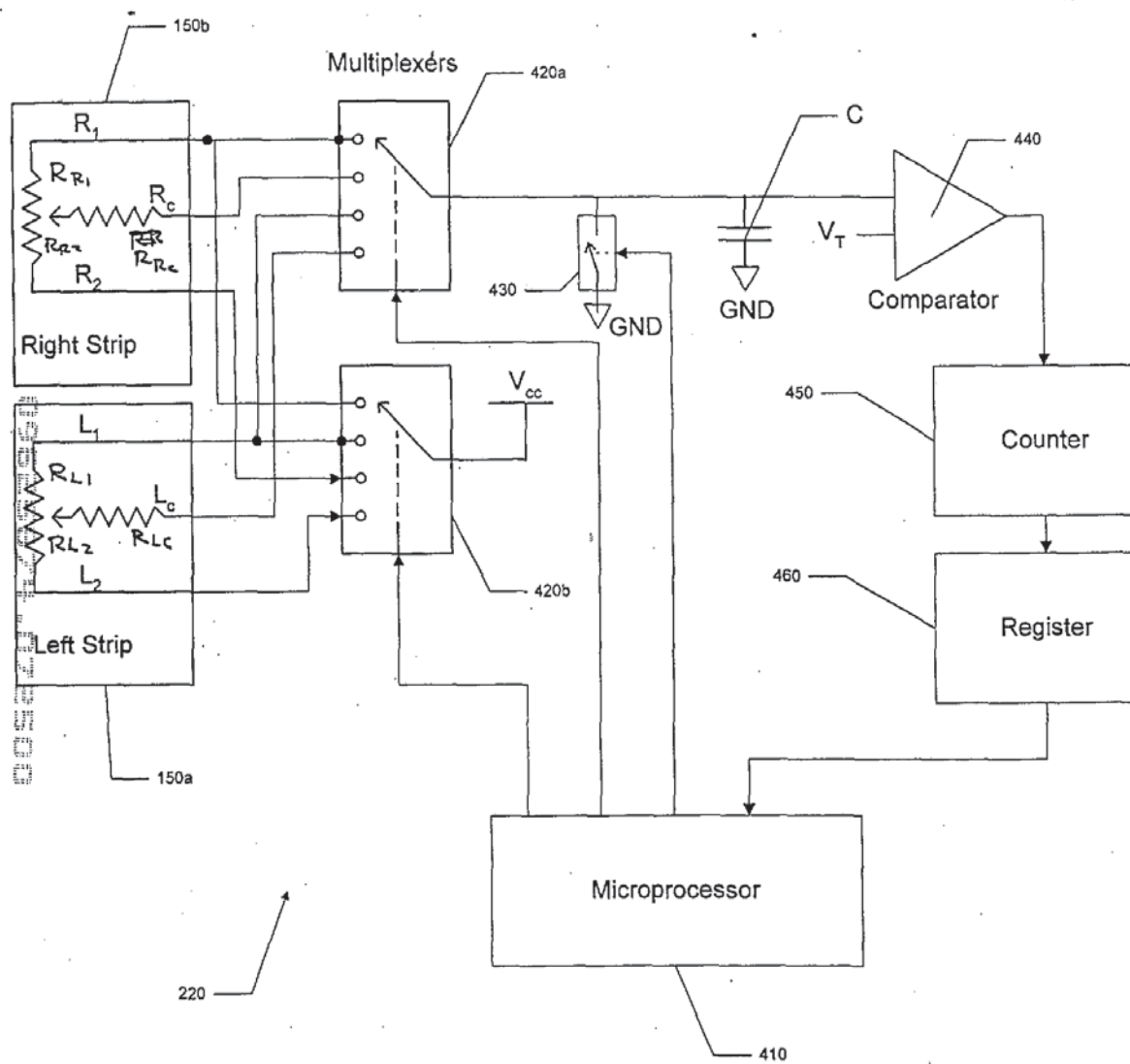


FIG. 4

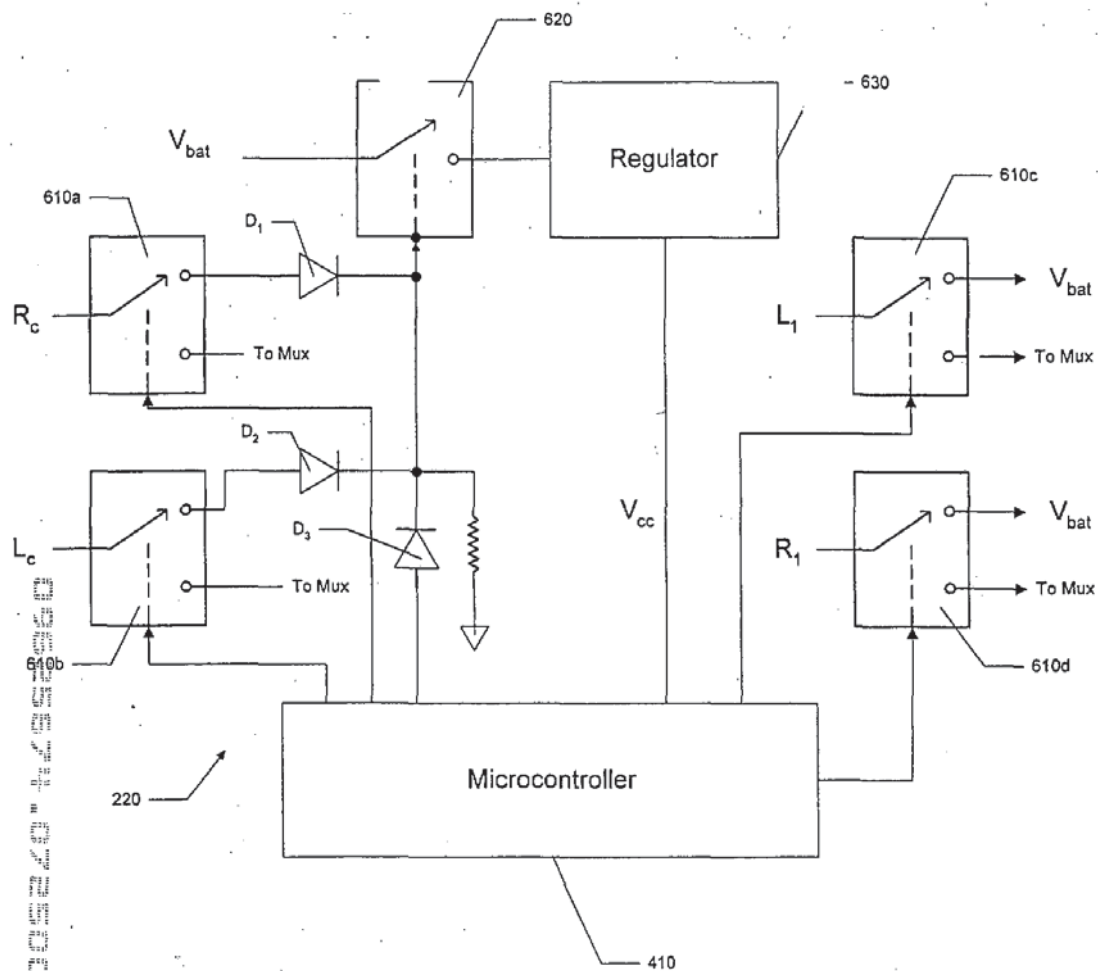


FIG. 6A

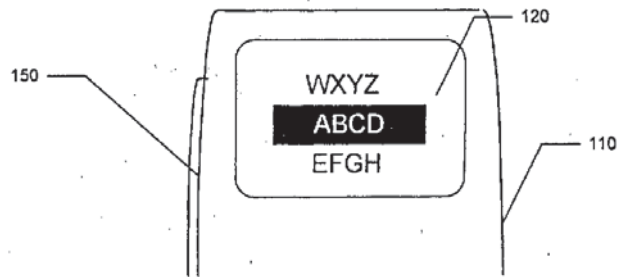


FIG. 7A

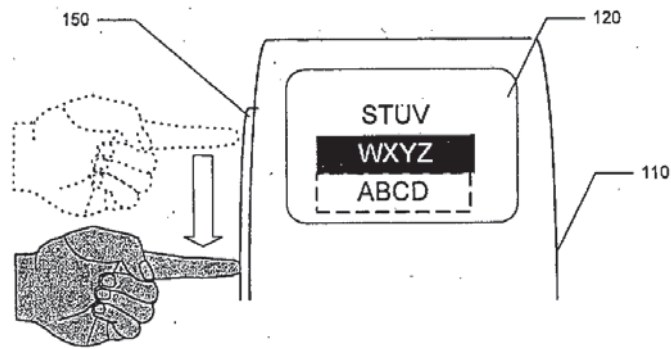


FIG. 7B

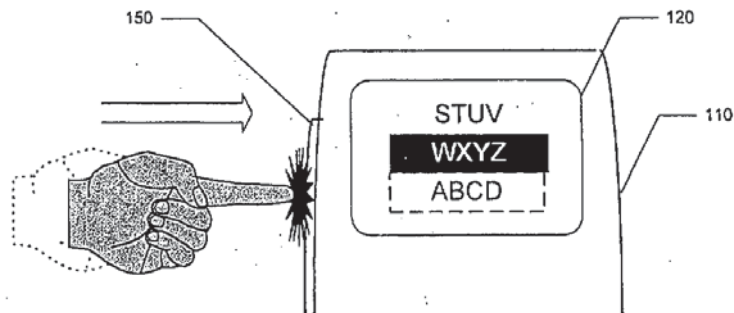


FIG. 7C

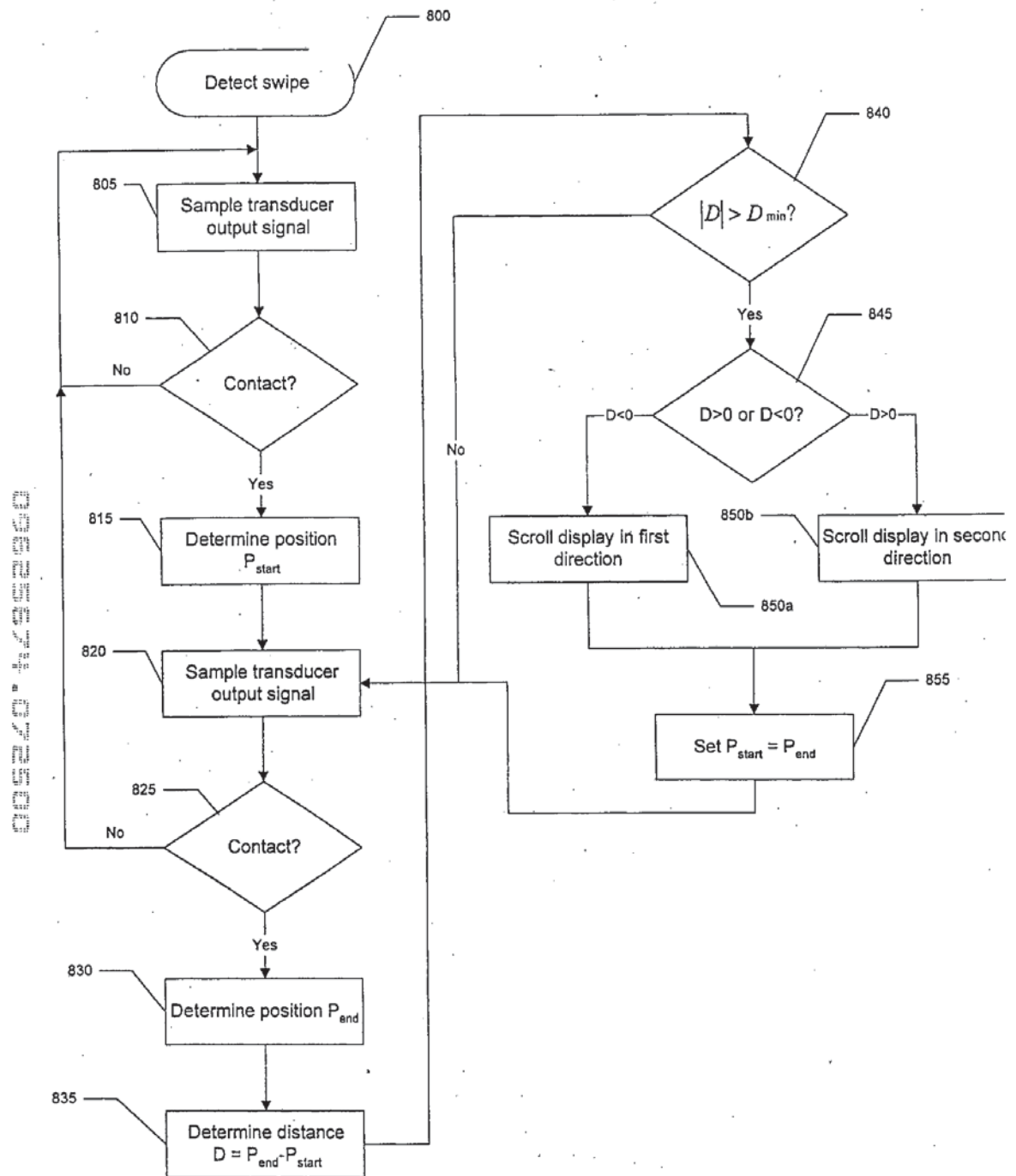


FIG. 8

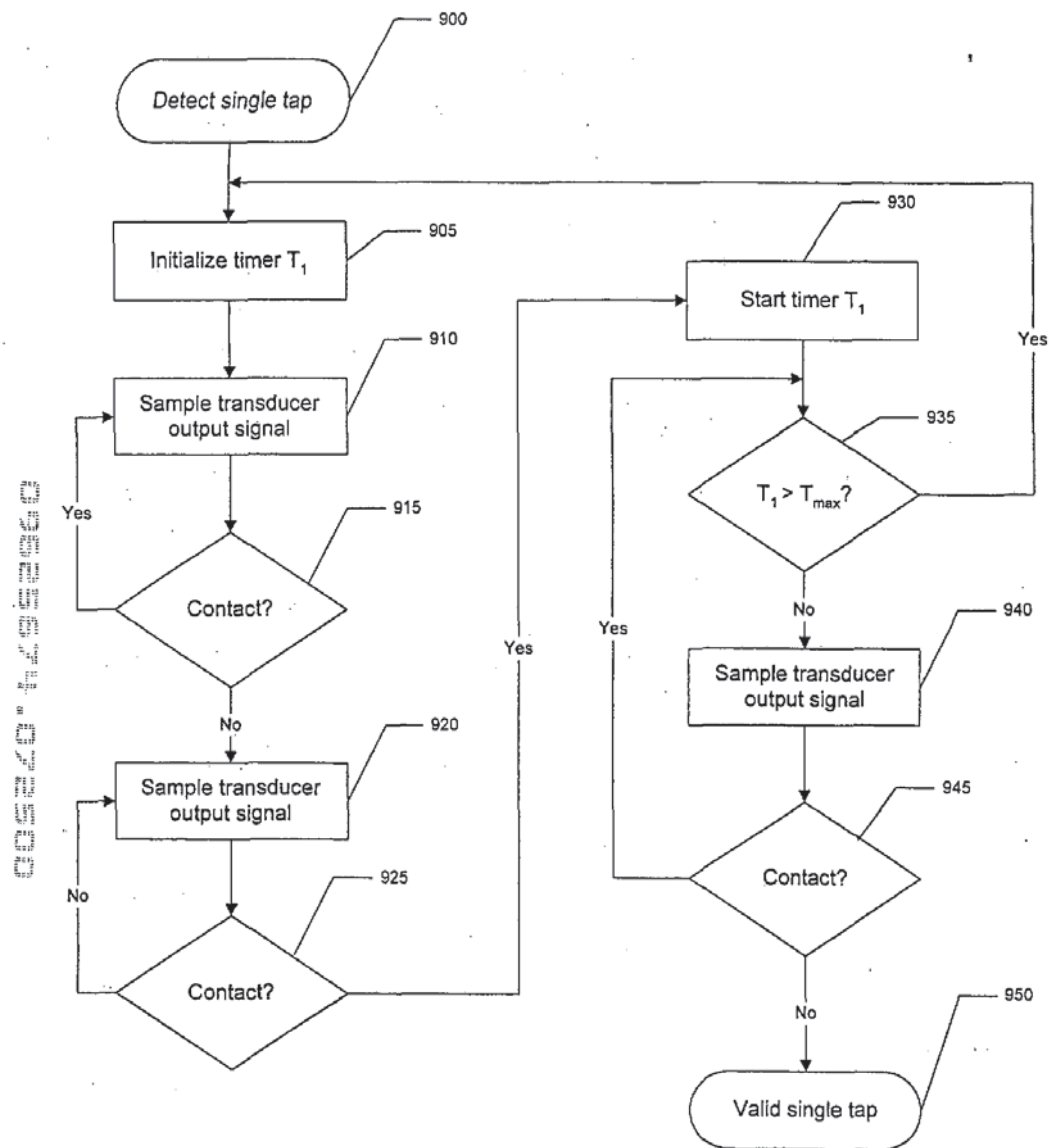


FIG. 9

Author	Year	Country	Sample Size	Study Design	Findings
Smith et al.	2015	USA	1,200	Longitudinal	Increased risk of depression in children of parents with mental illness.
Johnson et al.	2016	UK	800	Cross-sectional	Higher levels of anxiety in children of parents with anxiety disorders.
Lee et al.	2017	Canada	1,500	Longitudinal	Increased risk of substance use in children of parents with substance use disorders.
Chen et al.	2018	China	2,000	Cross-sectional	Higher levels of depression in children of parents with depression.
Miller et al.	2019	Australia	900	Longitudinal	Increased risk of conduct problems in children of parents with conduct disorders.
Wong et al.	2020	USA	1,100	Cross-sectional	Higher levels of anxiety in children of parents with anxiety disorders.
Patel et al.	2021	India	1,300	Longitudinal	Increased risk of depression in children of parents with depression.
Kim et al.	2022	South Korea	1,400	Cross-sectional	Higher levels of anxiety in children of parents with anxiety disorders.
Nguyen et al.	2023	Vietnam	1,600	Longitudinal	Increased risk of depression in children of parents with depression.
Alvarez et al.	2024	Spain	1,700	Cross-sectional	Higher levels of anxiety in children of parents with anxiety disorders.
Costa et al.	2025	Portugal	1,800	Longitudinal	Increased risk of depression in children of parents with depression.



TCL EXHIBIT 1006
Page 46 of 115



TCL EXHIBIT 1006
Page 47 of 115

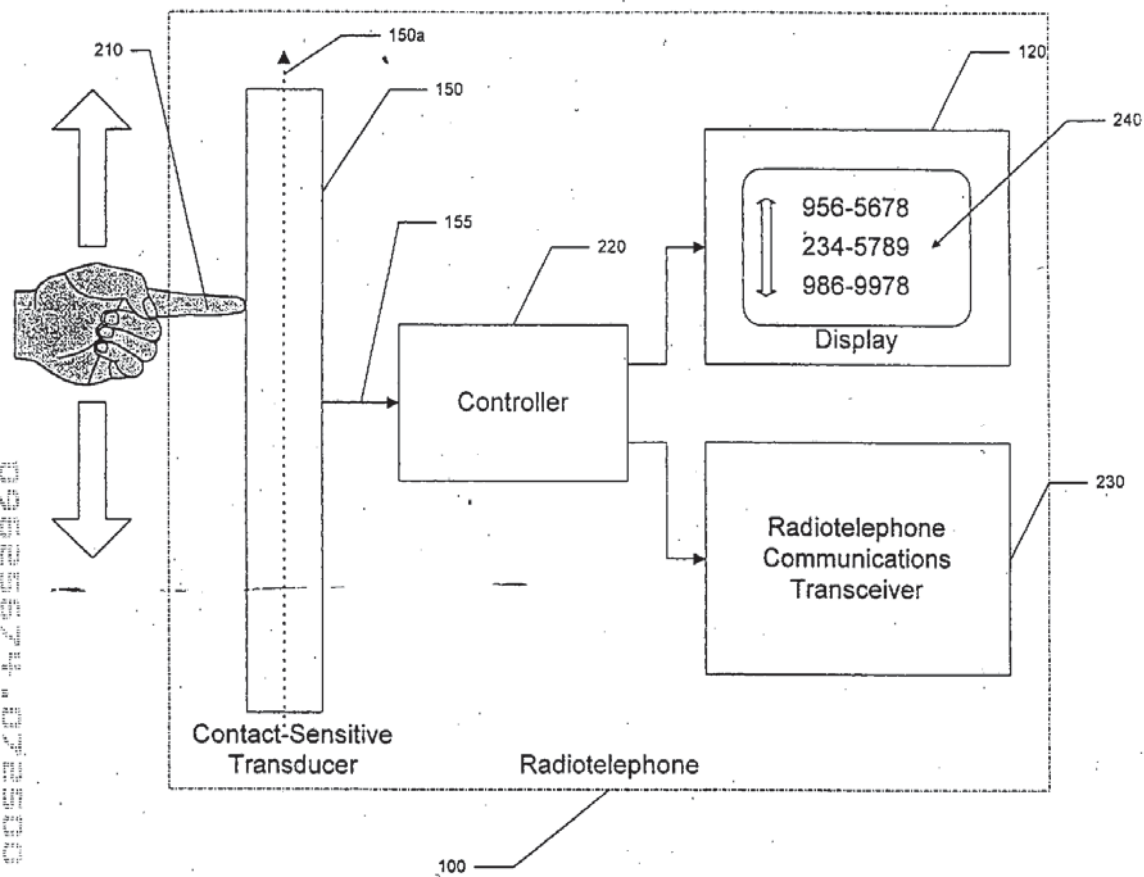


FIG. 2

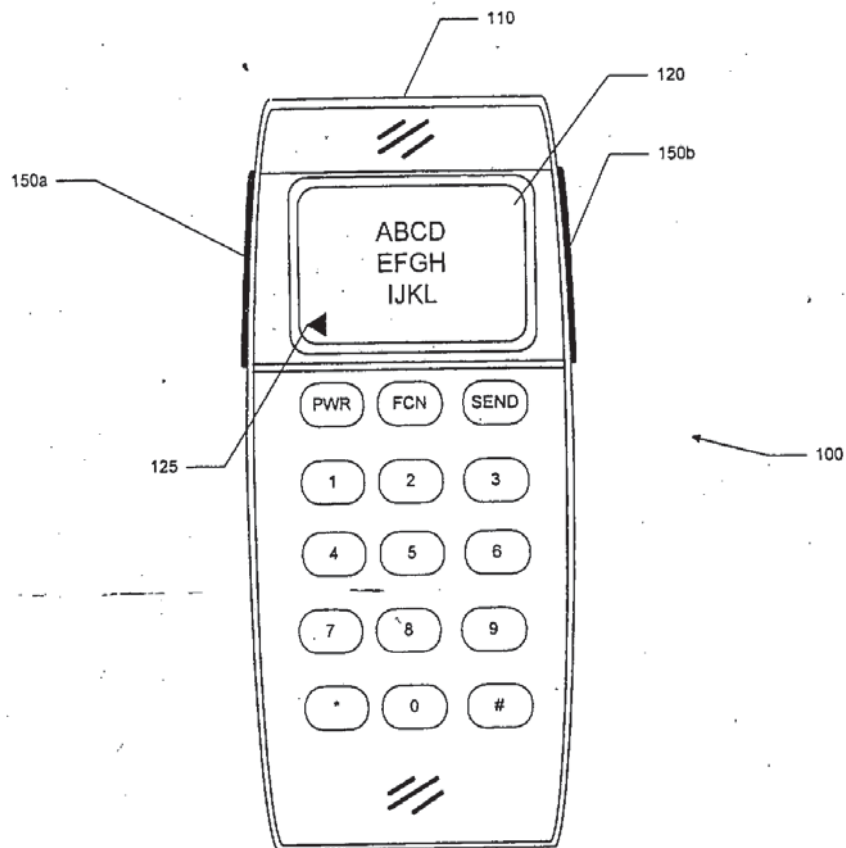


FIG. 3

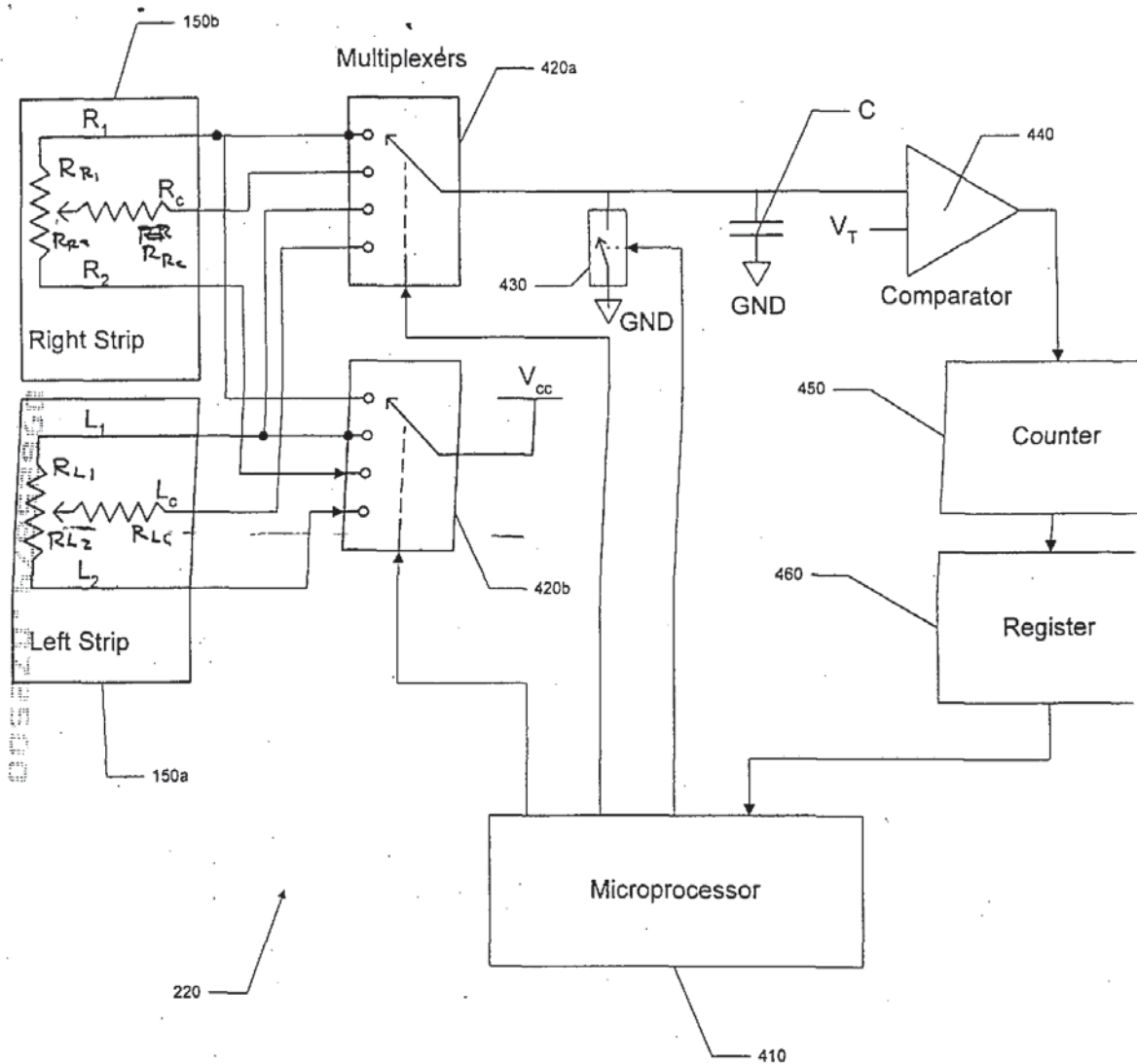


FIG. 4

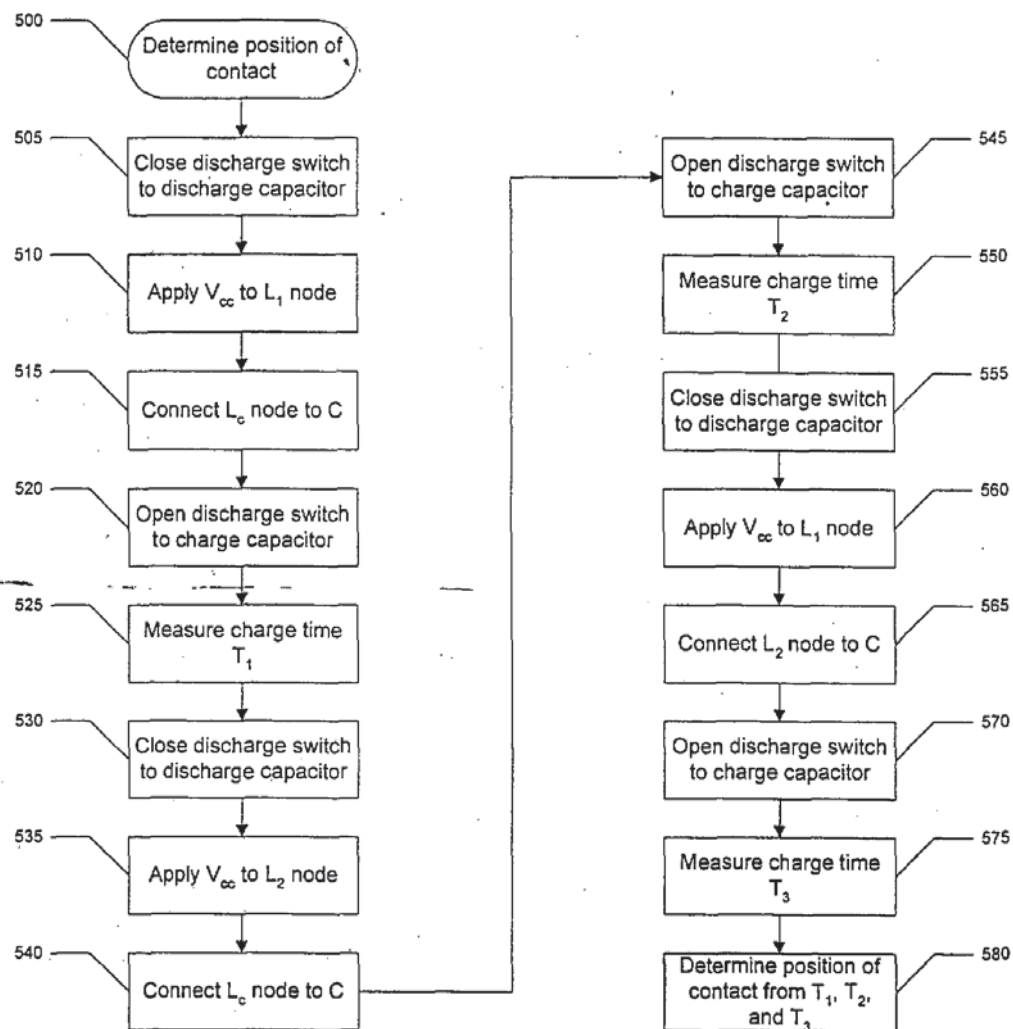


FIG. 5

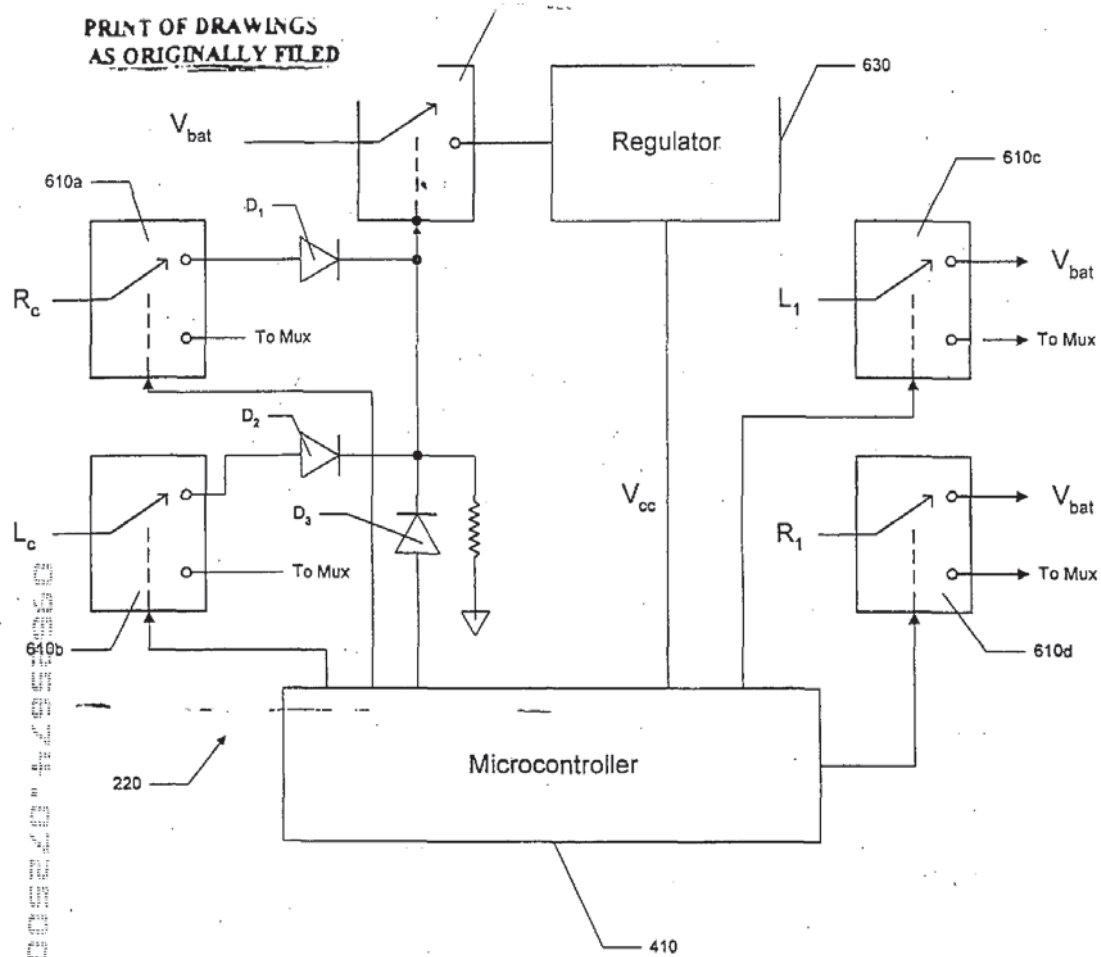
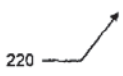


FIG. 6A



DOI: 10.1002/for

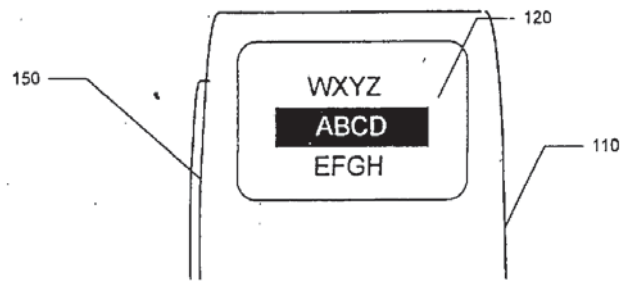


FIG. 7A

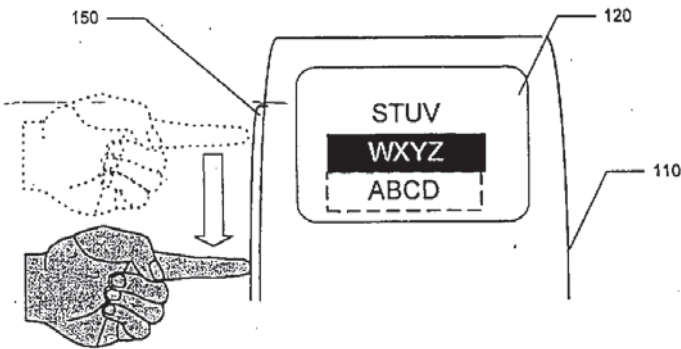


FIG. 7B

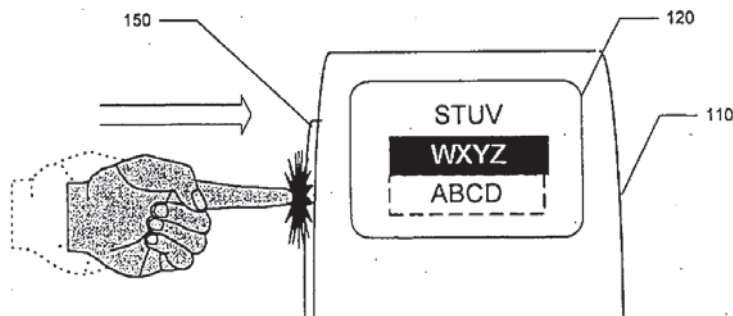


FIG. 7C

PRINT OF DRAWINGS
AS ORIGINALLY FILED

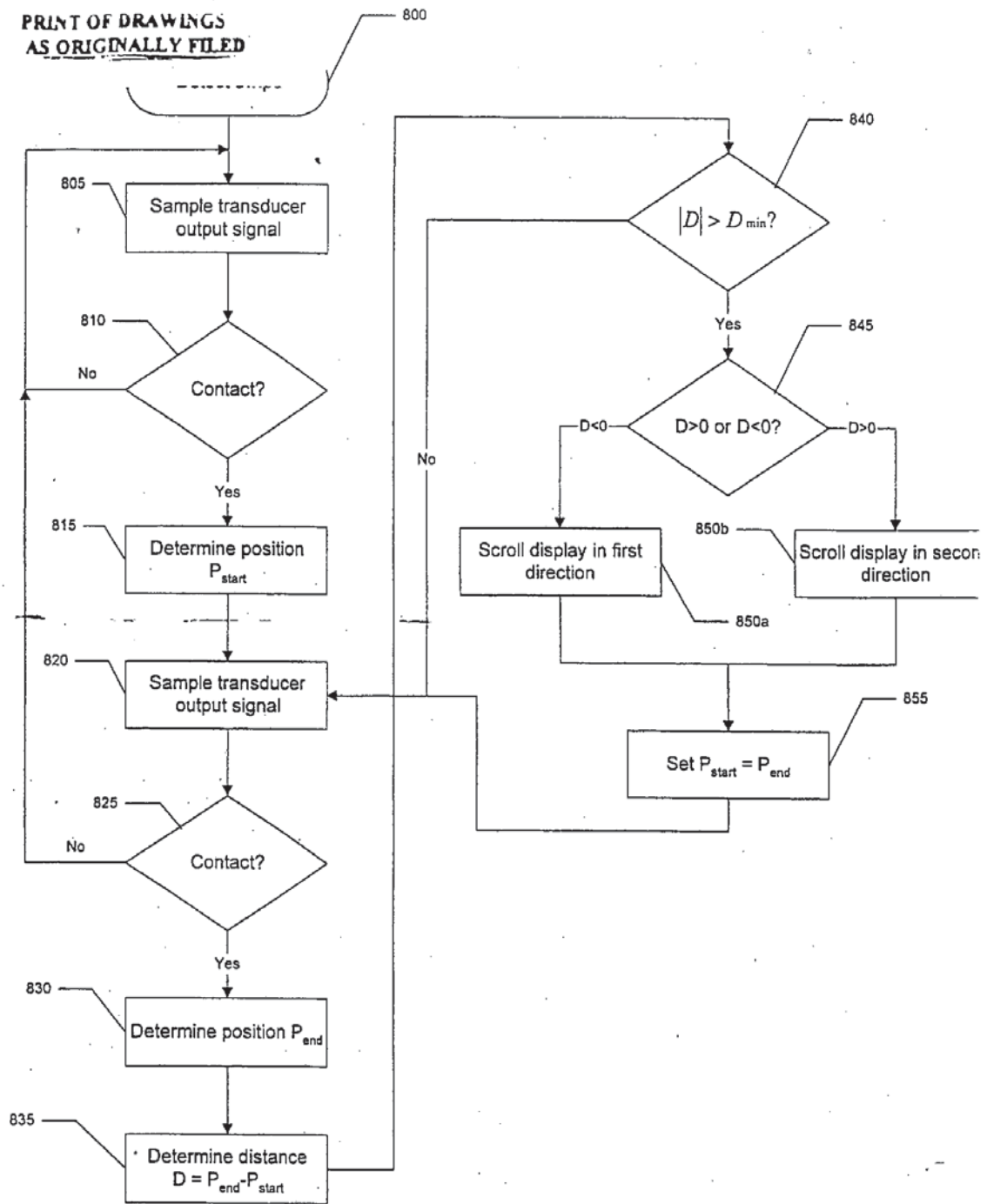


FIG. 8

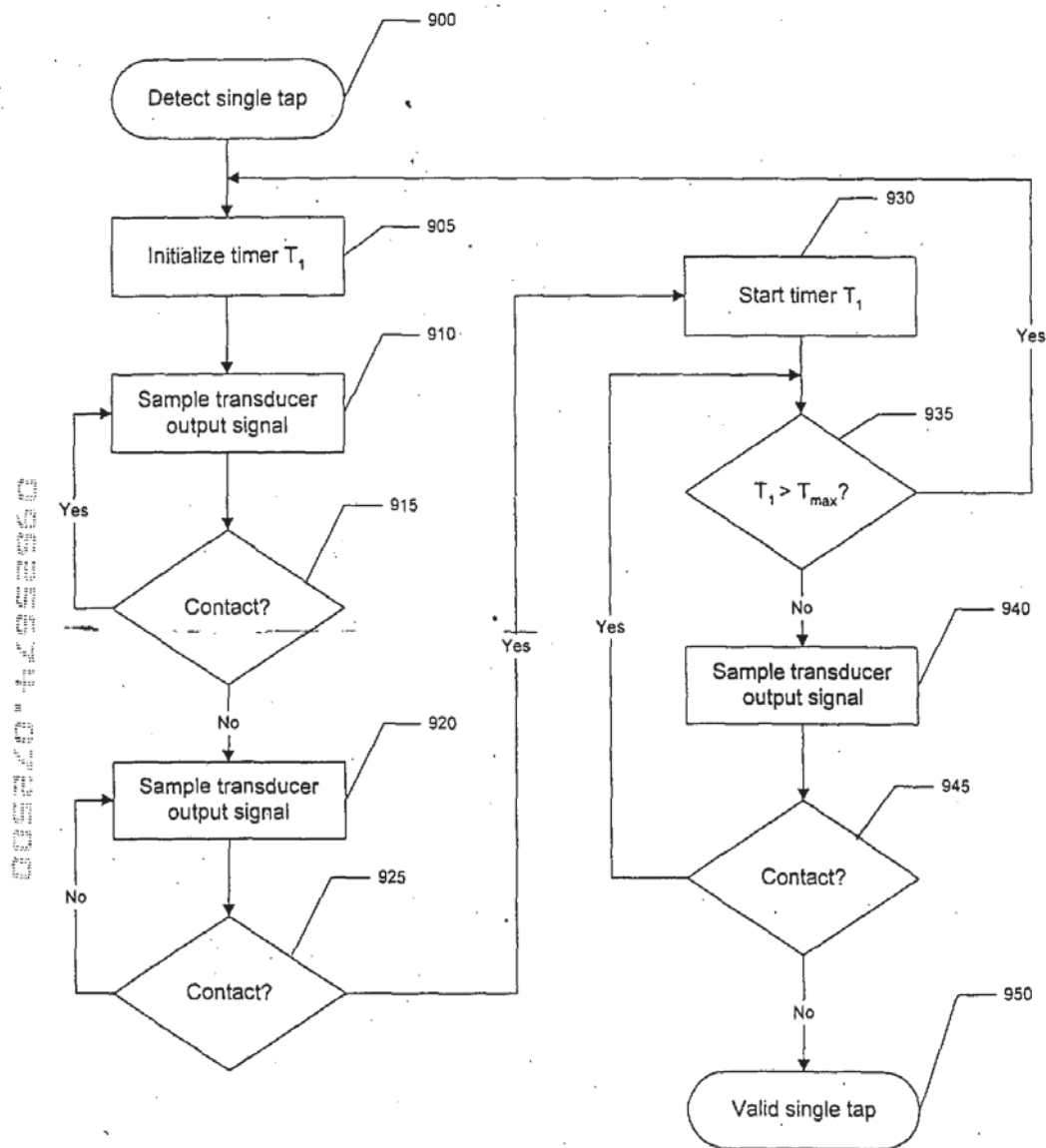


FIG. 9

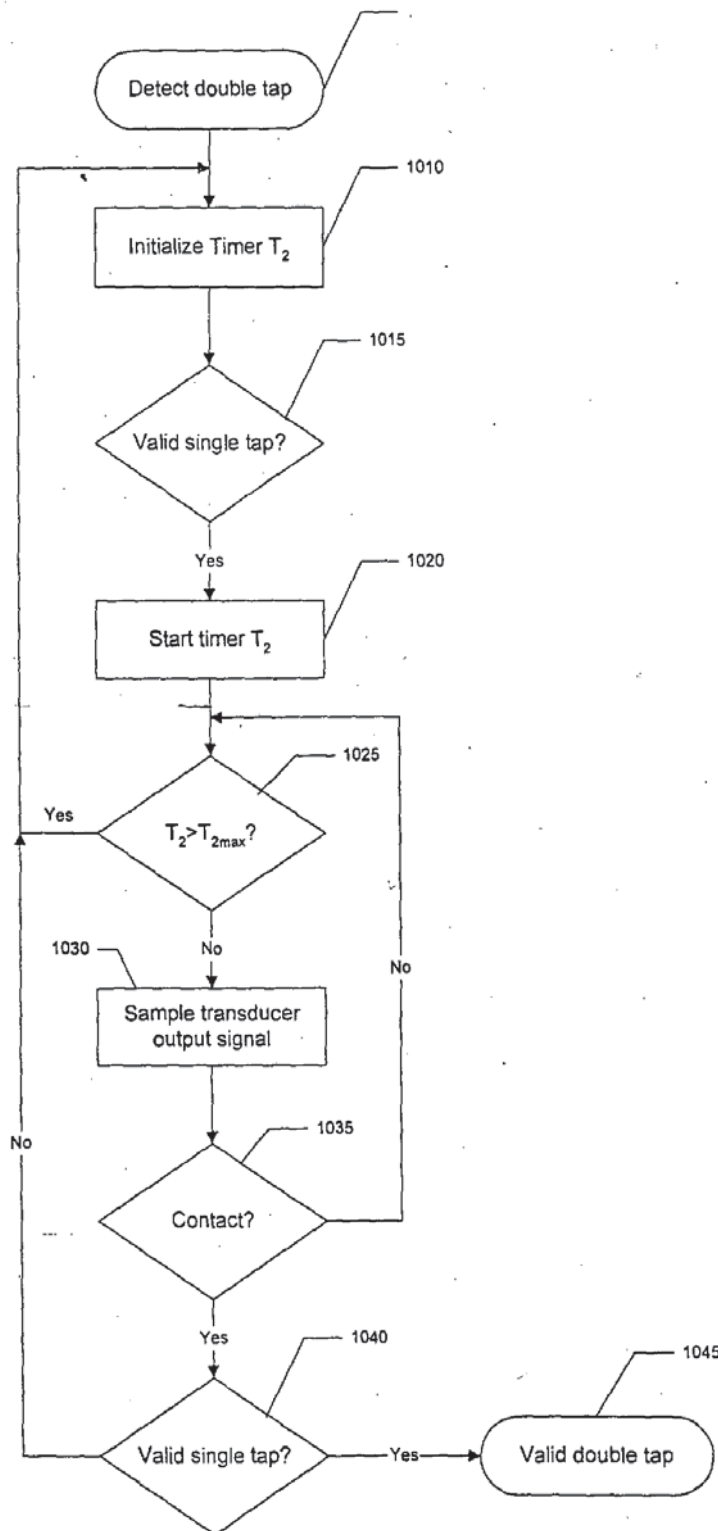


FIG. 10

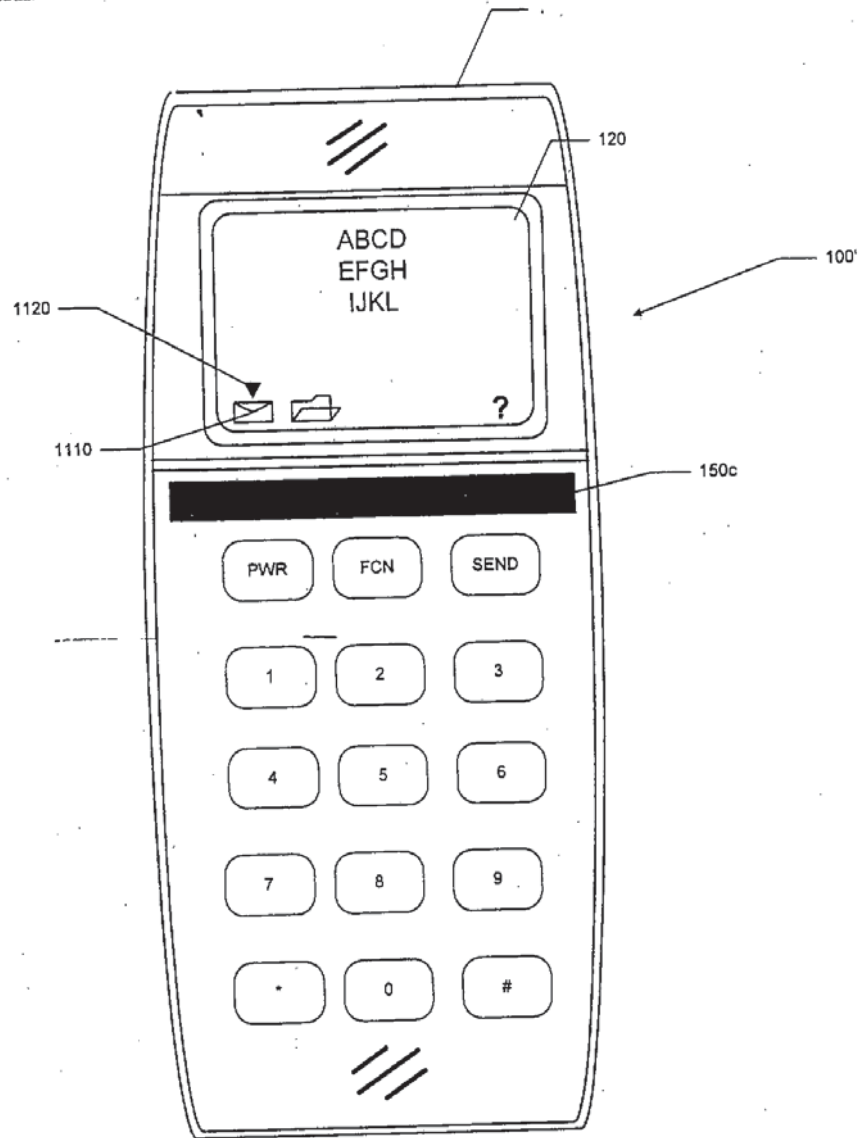


FIG. 11

Attorney's Docket No. 8194-123CT

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Continuation of: Hayes, Jr. et al.

Parent Appn. Serial No.: 09/001,173

Parent Appn. Filed: December 30, 1997

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

June 25, 2000

Box PATENT APPLICATION

Commissioner for Patents

Washington, DC 20231

PRELIMINARY AMENDMENT

Dear Sirs:

Please enter the following Preliminary Amendment before examining the
present application.

In the Specification:

Before the first paragraph of the application please insert:

This is a continuation application of Application Serial No. 09/001,173, filed
December 30, 1997.

In the Claims:

Please cancel Claims 1-40.

Please add the following new claims:

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;

10 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

15 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
42. A radiotelephone according to Claim 41, 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
43. A radiotelephone according to Claim 41, wherein the controller is operative to selectively display an image on the display according to the output signal of the contact-sensitive transducer.

4
44. A radiotelephone according to Claim 43, 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
45. A radiotelephone according to Claim 44, wherein the controller is operative to selectively display a row on the display according to the output signal of the contact-sensitive transducer.

6
46. A radiotelephone according to Claim 44, 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
47. A radiotelephone according to Claim 44, 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
5 contact to thereby identify the graphical object.

⁸
~~48~~. A radiotelephone according to Claim ⁷~~47~~, 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
~~49~~. A radiotelephone according to Claim ⁷~~47~~, 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
~~50~~. A radiotelephone according to Claim ⁷~~47~~, 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
5 further operative, responsive to the contact-sensitive transducer, to initiate the action
associated with the identified graphical object.

¹¹
~~51~~. A radiotelephone according to Claim ¹⁰~~50~~, 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
~~52~~. A radiotelephone according to Claim ¹¹~~51~~, 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
~~53~~. A radiotelephone according to Claim ¹~~41~~, 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

¹⁴
54. A radiotelephone according to Claim ¹³ 53, 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
55. A radiotelephone according to Claim ¹ 41, wherein the contact-sensitive transducer comprises one of a resistive transducer, a capacitive transducer and a semiconductive transducer.

¹⁶
56. 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;

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

10 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

15 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
57. An apparatus according to Claim ¹⁶ 56, 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
58. An apparatus according to Claim ¹⁶ 56, wherein the controller is operative to selectively display an image on the display responsive to the output signal of the contact-sensitive transducer.

¹⁹
~~59.~~ An apparatus according to Claim ¹⁸~~58~~, 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
~~60.~~ An apparatus according to Claim ¹⁹~~59~~, wherein the controller is operative to selectively display a row on the display responsive to the output signal of the contact-sensitive transducer.

²¹
~~61.~~ An apparatus according to Claim ¹⁹~~59~~, 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.

5 ²²
~~62.~~ An apparatus according to Claim ¹⁹~~59~~, 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
10 graphical object.

²³
~~63.~~ An apparatus according to Claim ²²~~62~~, 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
~~64.~~ An apparatus according to Claim ²²~~62~~, 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
~~65.~~ An apparatus according to Claim ²⁴~~64~~, 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.

24 25
66. An apparatus according to Claim 65, 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
5 on the detected moving contact.

27 19
67. An apparatus according to Claim 69, 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 27
68. An apparatus according to Claim 67, 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 22
69. An apparatus according to Claim 62, wherein the contact-sensitive
transducer comprises one of a resistive transducer, a capacitive transducer and a
semiconductive transducer.

70. An apparatus, comprising:
a housing;
a display, supported by the housing, that displays an image at a front surface
of the housing;
5 first and second contact-sensitive transducers, supported by the housing,
which produce respective first and second output signals that characterize contact
along respective ones of the contact-sensitive surfaces of the first and second contact-
sensitive transducers; and
a controller, responsive to the first and second contact-sensitive transducers
10 and operatively associated with the display, which controls the display according to at
least one of the first and second output signals of the first and second contact-sensitive
transducers, wherein the controller has a first mode wherein the controller is
responsive to the first contact-sensitive transducer and unresponsive to the second

22

15 contact-sensitive transducer, and a second mode wherein the controller is responsive to the second contact-sensitive transducer and unresponsive to the first contact-sensitive transducer.

71. An apparatus according to Claim 70, further comprising a radiotelephone communications transceiver, supported by the housing, and wherein the controller is operative to control at least one of the display and the radiotelephone communications transceiver according to at least one of the first and second output signals of the first and second contact-sensitive transducers.

72. An apparatus according to Claim 70, wherein the controller is operative to place itself in one of the first mode or the second mode responsive to at least one of the first and second contact-sensitive transducers.

73. An apparatus according to Claim 70, wherein the first and second contact-sensitive transducers comprise respective first and second contact-sensitive strips.

30
74. An apparatus, comprising:
a housing;
a display, supported by the housing, that displays an image at a front surface of the housing;
5 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
10 signal of the contact-sensitive transducer.

31 30
75. An apparatus according to Claim 74, 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 30
76. An apparatus according to Claim 74, 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
77. 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 33
78. A method according to Claim 77, 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 33
79. A method according to Claim 77, 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

In re Continuation of *Hayes, Jr. et al.*
Parent Appn. Serial No.: 09/001,173
Parent Appn. Filed: December 30, 1997
Page 9

- 5 controlling at least one of the radiotelephone communications transceiver and the display according to the output signal of the contact-sensitive transducer.

*Ad
canceled.*

- ³⁶ 80. A method according to Claim ³³ 77, wherein the step of controlling comprises the step of selectively displaying an image on the display according to the output signal of the contact-sensitive transducer.

REMARKS

Favorable examination and allowance of the present continuation application is respectfully requested.


Respectfully submitted,


Robert M. Meeks
Registration No. 40,723

Myers Bigel Sibley & Sajovec, P.A.
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Raleigh, NC 27627
Telephone (919) 854-1400
Facsimile (919) 854-1401

"Express Mail" mailing label number EL481739237US
Date of Deposit: July 25, 2000

I hereby certify that this paper or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Box PATENT APPLICATION, Commissioner of Patents and Trademarks, Washington, DC 20231.


Candi L. Riggs
Date of Signature: July 25, 2000



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/625,674 07/25/00 HAYES, JR. J 8194-123CT

020792 WM02/0119
MYERS BIGEL SIBLEY & SAJOVEC
PO BOX 37428
RALEIGH NC 27627

EXAMINER

APPIAH, C

ART UNIT	PAPER NUMBER
----------	--------------

2682

3

DATE MAILED: 01/19/01

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

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/625,674	Applicant(s) Hayes, Jr. et al.
	Examiner Charles Appiah	Group Art Unit 2682

☒ Responsive to communication(s) filed on Jul 25, 2000

☐ This action is FINAL.

☐ 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*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire three month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) 41-80 is/are pending in the application.

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

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 41-80 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

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

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 2682

DETAILED ACTION

Double Patenting

1. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

2. Claims 70-73 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 6- of prior U.S. Patent No. 6,131,047. This is a double patenting rejection.

The features recited in the instant application with respect to claims 70-73 such as "a housing ... and unresponsive to the first contact-sensitive transducer" (claim 70) are clearly anticipated by claim 6 of the prior U.S. Patent.

3. Claims 41-69 and 74-80 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 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 features of "a contact sensitive transducer, supported by the housing ..." and "a controller responsive to the output signal and operatively associated with the display, which scrolls displayed rolls along an axis of the display based on the output of signal of the contact-

Art Unit: 2682

sensitive transducer", recited in the claims of the instant application are clearly anticipated by claims 1 and 2. The feature of "the housing configured to be held in a user's hand such that the rear surface confronts the user's palm" or "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" are obvious very well known features (or obvious modification) of a conventional radiotelephone and as such claims 1-3 of U. S. Patent No. 6,131,047 read on the inventions of the instant application.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Umezawa et al. (5,491,507), discloses a handy video telephone which can be held in a user's hand such that the rear surface confronts the user's palm

Vantilla (6,173,194), discloses a mobile terminal with an improved user interface.

Sudo et al. (5,999,827), discloses a communication terminal apparatus with a controller for controlling a display unit's operation.

5. Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231 or faxed to:

(703) 305-9051, (for formal communications intended for entry) Or:

(703) 305-9508 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Application/Control Number: 09/625,674

Page 4


Art Unit: 2682

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Appiah whose telephone number is (703) 305-4772. The examiner can normally be reached on Monday through Friday (first week of bi-week) and Monday through Thursday (second week of bi-week) from 8:30 a.m. to 6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chang, can be reached on (703) 308-6739. The fax phone number for this Group is (703) 308-6306 or 308-6296.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-4700.


VIVIAN CHANG
PRIMARY EXAMINER

Serial Number: 09/625,674

CA
Charles Appiah

January 15, 2001

FORM PTO-892		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 09/625,674	GROUP ART UNIT 2682	ATTACHMENT TO PAPER NO. 3	
NOTICE OF REFERENCES CITED				APPLICANT(S) Hayes, Jr. et al.			
U.S. PATENT DOCUMENTS							
*		DOCUMENT NO.	DATE	NAME	CLASS	SUB- CLASS	FILING DATE
	A	5,491,597	2/1996	Bennin et al.	360	104	
	B	5,999,827	12/1999	Sudo et al.	455	564	
	C	6,173,194	1/2001	Vantila	455	566	
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						
FOREIGN PATENT DOCUMENTS							
*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB- CLASS
	L						
	M						
	N						
	O						
	P						
	Q						
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)							
	R						
	S						
	T						
	U						
EXAMINER Charles Appiah			DATE January 15, 2001		Form 892ccs2106b		
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05(a).)							



68P-26828

Attorney's Docket No. 8194-123CT

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: John Joseph Hayes, Jr. et al.

Group Art Unit: 2682

Serial No.: 09/625,674

Examiner: C. Appiah

Filed: July 25, 2000

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

March 29, 2001

Commissioner for Patents
Washington, DC 20231

RECEIVED
APR 06 2001
Technology Center 2600

AMENDMENT

Dear Sirs:

This Amendment is responsive to the Office Action of January 19, 2001.

In the Claims:

Please cancel Claims 70-73 without prejudice or disclaimer.

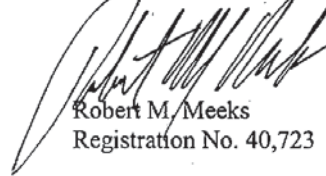
REMARKS

Applicants appreciate the thorough examination of the present application. To expedite allowance and issue of the present application, Applicants have canceled Claims 70-73 without prejudice or disclaimer. In response to the nonobviousness rejections of Claims 41-69 and 74-80, Applicants submit concurrently herewith an appropriate terminal disclaimer with respect to U.S. Patent No. 6,131,047. Therefore, Applicants submit that all outstanding rejections to remaining Claims 41-69 and 74-80 have been overcome, and that Claims 41-69 and 74-80 now stand in condition for allowance. Accordingly, Applicants respectfully request allowance of the claims and passing of the application to issue in due course.

Applicants further request the Examiner's acknowledgment of the Information Disclosure Statement filed June 25, 2000, by return of an initialed copy of the form PTO-1449.

In re: John Joseph Hayes, Jr. et al.
Serial No.: 09/625,674
Filed: July 25, 2000
Page 2

Respectfully submitted,

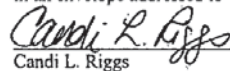


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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, Washington, DC 20231, on March 29, 2001.



Candi L. Riggs

Date of Signature: March 29, 2001



Attorney's Docket No. 8194-123CT

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: John Joseph Hayes, Jr. et al.

Group Art Unit: 2682

Serial No.: 09/625,674

Examiner: C. Appiah

Filed: July 25, 2000

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

March 29, 2001

Commissioner for Patents
Washington, DC 20231

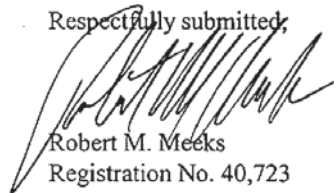
RECEIVED
APR 06 2001
Technology Center 2600

SUBMISSION OF TERMINAL DISCLAIMER
UNDER 37 C.F.R. § 1.321(b)

Sir:

Applicant hereby submits the enclosed Terminal Disclaimer Under 37 C.F.R. § 1.321 for the above referenced application. Also enclosed is a check in the amount of \$110.00 [37 C.F.R. § 1.20(d)] to cover the fee for filing a Terminal Disclaimer. The Examiner is authorized to charge Deposit Account No. 50-0220 for any additional fee that may be required or credit any overpayment.

Respectfully submitted,

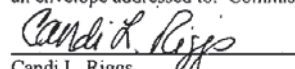


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Candi L. Riggs
Date of Signature: March 29, 2001



Attorney's Docket No. 8194-123CT

PATENT

#5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: John Joseph Hayes, Jr. et al.

Group Art Unit: 2682

Serial No.: 09/625,674

Examiner: C. Appiah

Filed: July 25, 2000

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

March 29, 2001

Commissioner for Patents
Washington, DC 20231

RECEIVED
APR 06 2001
Technology Center 2600

TERMINAL DISCLAIMER UNDER 37 C.F.R. 1.321(b)

Sir:

I, Robert M. Meeks, am an attorney of record of the disclaimant, Ericsson Inc., and am authorized to execute this disclaimer on behalf of the disclaimant. The disclaimant having a principal place of business at 7001 Development Drive, Research Triangle Park, North Carolina 27709, is the owner of all right, title, and interest in the above-identified application, by Assignment filed December 30, 1997, and recorded at Reel 8951, Frame 747.

The disclaimant hereby disclaims the terminal part of any patent granted on the above-identified application which would extend beyond the expiration date of the full statutory term of United States Patent No. 6,131,047 (corresponding to United States Application Serial No. 09/001,173, filed December 30, 1997), entitled *Radiotelephones Having Contact Sensitive User Interfaces and Methods of Operating Same*, which patent was assigned to the above-identified disclaimant by an Assignment recorded on December 30, 1997, and recorded at Reel 8951, Frame 747.

Disclaimant further agrees that any patent so granted on the above-identified application, which is the subject of this disclaimer, shall be enforceable only for and during such period that the legal title to said patent shall be the same as the legal title to U.S. Patent No. 6,131,047, this agreement to run with any patent granted on the above-identified application and to be binding upon the grantee, its successors, or assigns.

Nothing herein shall be construed as a disclaimer of any terminal part of any patent granted on the above-identified application which is prior to the expiration of the full statutory term of U.S. Patent No. 6,131,047 in the event that it later expires for failure to pay

04/04/2001 EEKUBAY1 00000140 09625674

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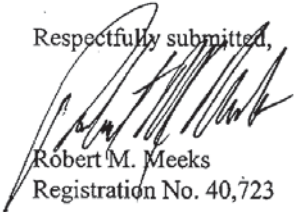
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1-10 Atto

In re: John Joseph Hayes, Jr. et al.
Serial No.: 09/625,674
Filed: July 25, 2000
Page 2

a maintenance fee, is held unenforceable, is found invalid, is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321(a), has all claims canceled by a reexamination certificate, or is otherwise terminated prior to expiration of its statutory term as presently shortened by any terminal disclaimer, except for the separation of legal title stated above.

Respectfully submitted,


Robert M. Meeks
Registration No. 40,723

Myers Bigel Sibley & Sajovec
PO Box 37428
Raleigh NC 27627
Telephone: (919) 854-1400
Facsimile: (919) 854-1401

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, Washington, DC 20231, on March 29, 2001.



Candi L. Riggs

Date of Signature: March 29, 2001

Attorney's Docket No. 8194-123CT

#0
TLR
PATENT 5/7/01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Continuation of Hayes, Jr. et al..

Serial No. To Be Assigned

Filed: Concurrently Herewith.

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

July 25, 2000

Box PATENT APPLICATION

Commissioner for Patents

Washington, DC 20231



INFORMATION DISCLOSURE STATEMENT
CITATION UNDER 37 C.F.R. § 1.97

Sir:

Attached is a list of documents on form PTO-1449. Items 1-27 listed on the PTO-1449 were cited in parent application Serial No. 09/001,173, filed December 30, 1997. Since the benefit of this application is claimed under 35 U.S.C. §120, no copies need to be furnished in accordance with 37 C.F.R. §1.98(d); however, copies will be furnished on request. It is requested that these documents be considered by the Examiner and officially made of record in accordance with the provisions of 37 C.F.R. §1.97 and Section 609 of the MPEP.

Respectfully submitted,

Robert M. Meeks
Registration No. 40,723

Myers Bigel Sibley & Sajovec, P.A.

P.O. Box 37428

Raleigh, NC 27627

Tel (919) 854-1400

Fax (919) 854-1401

CERTIFICATE OF EXPRESS MAILING

Express Mail Label No. EL481739237US

Date of Deposit: July 25, 2000

I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to Box Patent Application, Assistant Commissioner For Patents, Washington, DC 20231.

Candi L. Riggs; Date of Signature: July 25, 2000

FORM PTO-1449 U.S. Department of Commerce Patent and Trademark Office LIST OF DOCUMENTS CITED BY APPLICANT (Use several sheets if necessary)				Attorney Docket Number 8194-123CT <i>09/6 25674</i>		Serial No. To Be Assigned	
				• Applicants: John Joseph Hayes, Jr., Curtis Wayne Thornton			
				Filing Date Concurrently Herewith		Group	
<i>CA</i>	24	59 153342 A	1/10/85	Japan (Abstract)	<input checked="" type="checkbox"/>		
<i>CA</i>	25	08 030378 A	3/31/98	Japan (Abstract)	<input checked="" type="checkbox"/>		
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)							
<i>CA</i>	26	VersaPad™, VersaPad Finished DataSheet, http://www.interlinkelec.com/magic/page02g.htm , 10/9/97, pages 1-3					
<i>CA</i>	27	International Search Report, PCT/US98/27042, May 11, 1999					

EXAMINER
 *EXAMINER

ch Appal

DATE CONSIDERED

5/7/07

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 copy of this form with next communication to applicant.

Notice of Allowability	Application No. 09/625,674	Applicant(s) Hayes, Jr. et al.
	Examiner Charles Applah	Art Unit 2682

TS

--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 and Issue Fee Due 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 amendment and terminal disclaimer filed on 4/2/01
2. ☒ The allowed claim(s) is/are 41-69 and 74-80
3. ☐ The drawings filed on _____ are acceptable as formal drawings.
4. ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
 - 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: _____

5. ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

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 FOR SUBMITTING NEW FORMAL DRAWINGS, OR A SUBSTITUTE OATH OR DECLARATION.** This three-month period for complying with the REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL is extendable under 37 CFR 1.136(a).

6. ☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.
7. ☒ Applicant MUST submit NEW FORMAL DRAWINGS
 - (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☒ hereto or 2) ☐ Paper No. _____
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment/Comment or in the Office action of Paper No. _____

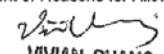
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

8. ☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any reply to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

1 <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 3 <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 5 <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449), Paper No(s). <u>6</u> 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material 9 <input type="checkbox"/> Other	2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____ 6 <input type="checkbox"/> Examiner's Amendment/Comment 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance
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VIVIAN CHANG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Allowable Subject Matter

1. Claims 41-69 and 74-80 are allowed.
2. The following is an examiner's statement of reasons for allowance:

With respect to claims 41, 56 and 77 the prior art of record fail to teach or fairly suggest a radiotelephone, an apparatus and a method of providing a user input in an apparatus that include a housing, a radiotelephone communications transceiver, a display and a contact sensitive transducer, supported by the housing and having a contact-sensitive surface disposed at least one of a first and second side surfaces of the housing and produces an output signal that characterizes contact of an object along the contact-sensitive transducer and a controller responsive to the output signal and operatively associated with the display and the radiotelephone communications transceiver to control at least one of the display and the radiotelephone communications transceiver according to the output signal of the contact-sensitive transducer.

With respect to claim 74, the prior art of record fail to teach alone or in combination, an apparatus that include a housing, a display, a contact-sensitive transducer and a controller, which responds to an output signal produced by the contact-sensitive transducer as a result of contact of an object along the contact-sensitive surface of the contact-sensitive transducer, and operatively associated with the display, to scroll displayed rows along an axis of the display based on the output signal of the contact-sensitive transducer.

Art Unit: 2682

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."

CITATION OF PERTINENT ART

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cline et al. (6,069,626) discloses a method for improved scrolling functionality in a graphical user interface utilizing a transparent scroll bar icon.

Nakagawa et al. (6,128,014) discloses a human interactive display system.

Singh (6,154,194) discloses a device with an adjustable touch-based display.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Appiah whose telephone number is (703) 305-4772. The examiner can normally be reached on M-F from 7:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chang, can be reached on (703) 308-6739.

Application/Control Number: 09/625,674

Page 4

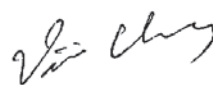
Art Unit: 2682

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-4700. The Group fax numbers are (703) 308-6306 and (703) 308-6296.

Serial Number: 09/625,674

Charles Appiah

May 6, 2001.


VIVIAN CHANG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

FORM PTO-892		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		SERIAL NO. 09/625,674	GROUP ART UNIT 2682	ATTACHMENT TO PAPER NO. 76	
NOTICE OF REFERENCES CITED				APPLICANT(S) Hayes, Jr. et al.			
U.S. PATENT DOCUMENTS							
*		DOCUMENT NO.	DATE	NAME	CLASS	SUB-CLASS	FILING DATE
*	A	6,069,626	5/2000	Cline et al.	345	341	
*	B	6,128,014	10/2000	Nakagawa et al.	345	341	
*	C	6,154,194	11/2000	Singh	345	131	
	D						
	E						
	F						
	G						
	H						
	I						
	J						
	K						
FOREIGN PATENT DOCUMENTS							
*		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUB-CLASS
	L						
	M						
	N						
	O						
	P						
	Q						
OTHER REFERENCES (Including Author, Title, Date, Pertinent Pages, Etc.)							
	R						
	S						
	T						
	U						
EXAMINER Charles Appiah			DATE May 7, 2001		Form892ccs2106b		
* A copy of this reference is not being furnished with this office action. (See Manual of Patent Examining Procedure, section 707.05(a).)							

09/625674

NOTICE OF DRAFTPERSON'S PATENT DRAWING REVIEW

The drawing filed (insert date) 7/25/00 are:A. not objected to by the Draftperson under 37 CFR 1.84 or 1.152.B. X objected to by the Draftperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings where necessary. Corrected drawings must be submitted according to the instructions on the back of this notice.

<p>1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink. Color. _____ Color drawing are not acceptable until petition is granted. Fig(s) _____ _____ Pencil and non black ink is not permitted. Fig(s) _____</p> <p>2. PHOTOGRAPHS. 37 CFR 1.84(b) _____ Photographs are not acceptable until petition is granted, _____ 3 full-tone sets are required. Fig(s) _____ _____ Photographs not properly mounted (must bristol board or photographic double-weight paper). Fig(s) _____ _____ Poor quality (half-tone). Fig(s) _____</p> <p>3. TYPE OF PAPER. 37 CFR 1.84(c) _____ Paper not flexible, strong, white and durable. Fig(s) _____ _____ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not acceptable. (too thin) _____ Mylar, vellum paper is not acceptable (too thin). Fig(s) _____</p> <p>4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes: _____ 21.0 cm by 29.7 cm (DIN size A4) _____ 21.6 cm by 27.9 cm (8 1/2 x 11 inches) _____ All drawings sheets not the same size. Sheet(s) _____</p> <p>5. MARGINS. 37 CFR 1.84(g): Acceptable margins: Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm SIZE: A4 Size Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm SIZE: 8 1/2 x 11 _____ Margins not acceptable. Fig(s) <u>24-7A, 8-11</u> Top (T) <u>X</u> Left (L) <u>X</u> Right (R) _____ Bottom (B)</p> <p>6. VIEWS. CFR 1.84(h) REMINDER: Specification may require revision to correspond to drawing changes. _____ Views connected by projection lines or lead lines. Fig(s) _____ Partial views. 37 CFR 1.84(h)(2) _____ Brackets needed to show figure as one entity. Fig(s) _____ _____ Views not labeled separately or properly. Fig(s) _____ _____ Enlarged view not labeled separately or properly. Fig(s) _____</p>	<p>7. SECTIONAL VIEWS. 37 CFR 1.84(h)(3) _____ Hatching not indicated for sectional portions of an object. Fig(s) _____ _____ Sectional designation should be noted with Arabic or Roman numbers. Fig(s) _____</p> <p>8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i) _____ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned, so that the top becomes the right side, except for graphs. Fig(s) _____ _____ Views not on the same plane on drawing sheet. Fig(s) _____</p> <p>9. SCALE. 37 CFR 1.84(k) _____ Scale not large enough to show mechanism with crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____</p> <p>10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(l) <u>X</u> Lines, numbers & letters not uniformly thick and well defined, clean, durable and black (poor line quality). Fig(s) <u>114</u></p> <p>11. SHADING. 37 CFR 1.84(m) _____ Solid black areas pale. Fig(s) _____ _____ Solid black shading not permitted. Fig(s) _____ _____ Shade lines, pale, rough and blurred. Fig(s) _____</p> <p>12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.48(p) _____ Numbers and reference characters not plain and legible. Fig(s) _____ _____ Figure legends are poor. Fig(s) _____ _____ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(3) Fig(s) _____ _____ English alphabet not used. 37 CFR 1.84(p)(3) Fig(s) _____ _____ Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s) _____</p> <p>13. LEAD LINES. 37 CFR 1.84(q) _____ Lead lines cross each other. Fig(s) _____ _____ Lead lines missing. Fig(s) _____</p> <p>14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.48(t) _____ Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Fig(s) _____</p> <p>15. NUMBERING OF VIEWS. 37 CFR 1.84(u) _____ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____</p> <p>16. CORRECTIONS. 37 CFR 1.84(w) _____ Corrections not made from PTO-948 dated _____</p> <p>17. DESIGN DRAWINGS. 37 CFR 1.152 _____ Surface shading shown not appropriate. Fig(s) _____ _____ Solid black shading not used for color contrast. Fig(s) _____</p>
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COMMENTS

REVIEWER

DATE

TELEPHONE NO.

TCL EXHIBIT 1006

ATTACHMENT TO PAPER NO.

7

Page 87 of 115



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

020792 WM01/0508
MYERS BIGEL SIBLEY & SAJOVED
PO BOX 37428
RALEIGH NC 27627

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/625,674	07/25/00	036	APPIAH, C	2682 05/08/01
First Named Applicant	HAYES, JR., 35 USC 154(b) term ext. = 0 Days.			

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

ATTYS DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
8 8194-123CT	455-566.000	608	UTILITY	NO	\$1240.00	08/08/01

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE 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.

HOW TO RESPOND TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give application number and batch number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

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.

PATENT AND TRADEMARK OFFICE COPY

PTOL-85 (REV. 10-96) Approved for use through 06/30/99. (0651-0033)



Attorney's Docket No. 8194-123CT

#8 L-
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: John Joseph Hayes, Jr., et al.

Serial No.: 09/625,674

Allowed: May 8, 2001

Filed: July 25, 2000

Issue Batch No.: G08

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

May 17, 2001

Box ISSUE FEE

Commissioner for Patents

Washington, DC 20231

Attn: Drawing Review Branch

SUBMITTAL OF FORMAL DRAWINGS

Sir:

In response to the requirement for new drawings as set forth in Paper No. 7 in the above application, there is enclosed herewith one set (9 sheets) of new formal drawings. It is requested that these new drawings be substituted for the originally filed informal drawings.

Respectfully submitted,

Robert M. Meeks

Registration No. 40,723

Myers Bigel Sibley & Sajovec

Post Office Box 37428

Raleigh, NC 27627

Telephone (919) 854-1400

Facsimile (919) 854-1401

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Box ISSUE FEE, Commissioner for Patents, Washington, DC 20231, Attn: Drawing Review Branch, on May 17, 2001.

Candi L. Riggs

Date of Signature: May 17, 2001

6278888

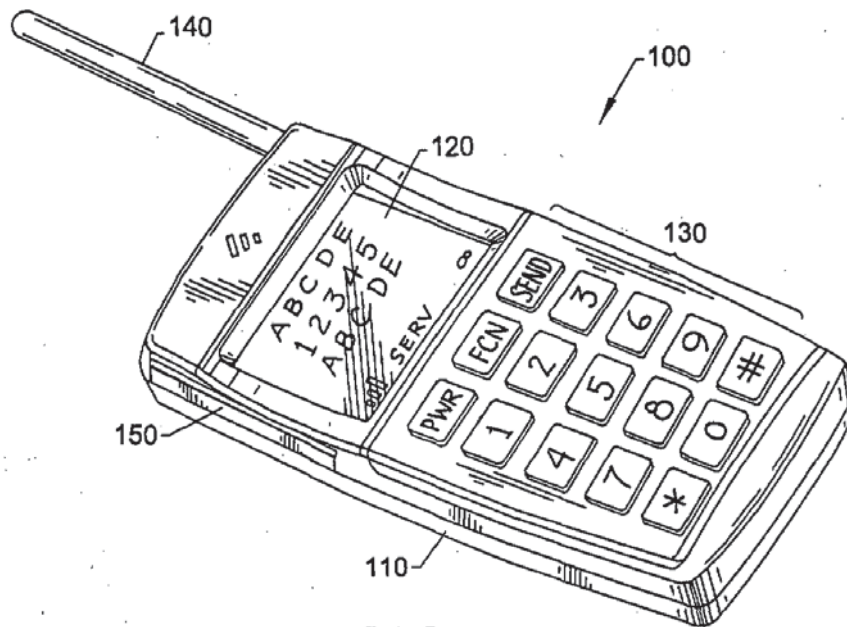


FIG. 1.

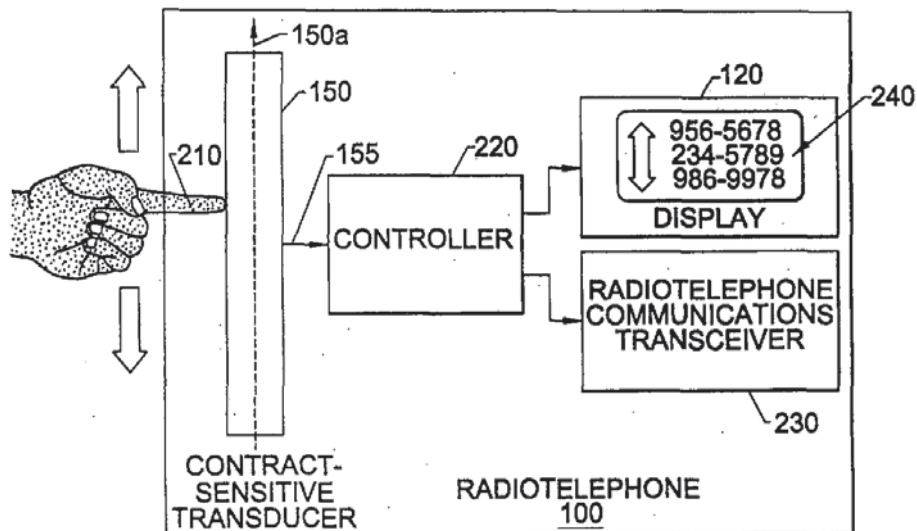


FIG. 2.

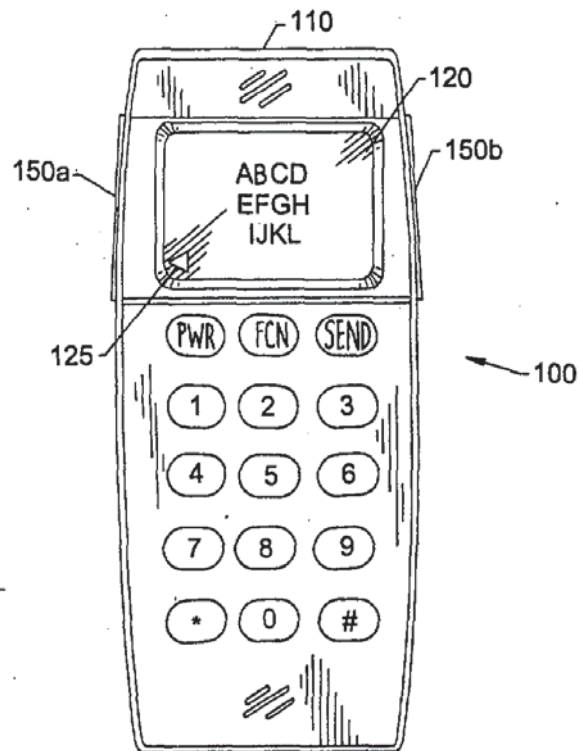


FIG. 3.

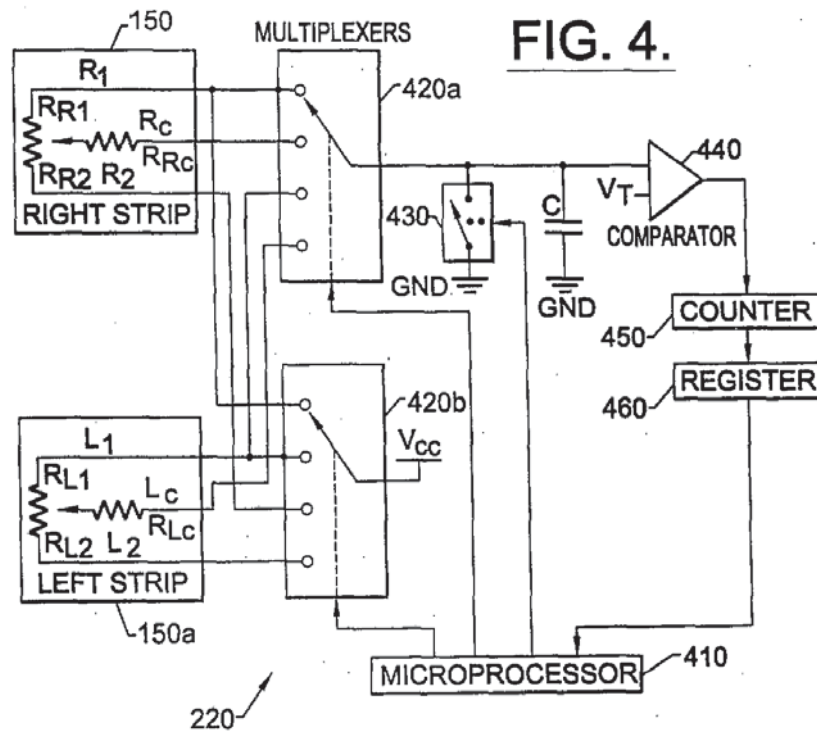


FIG. 4.

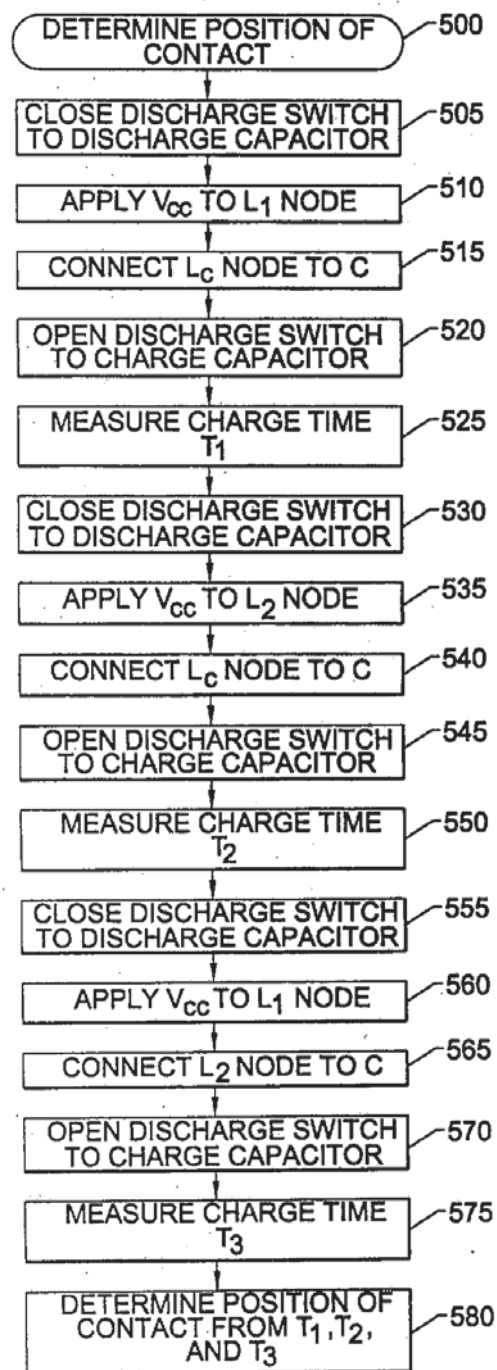
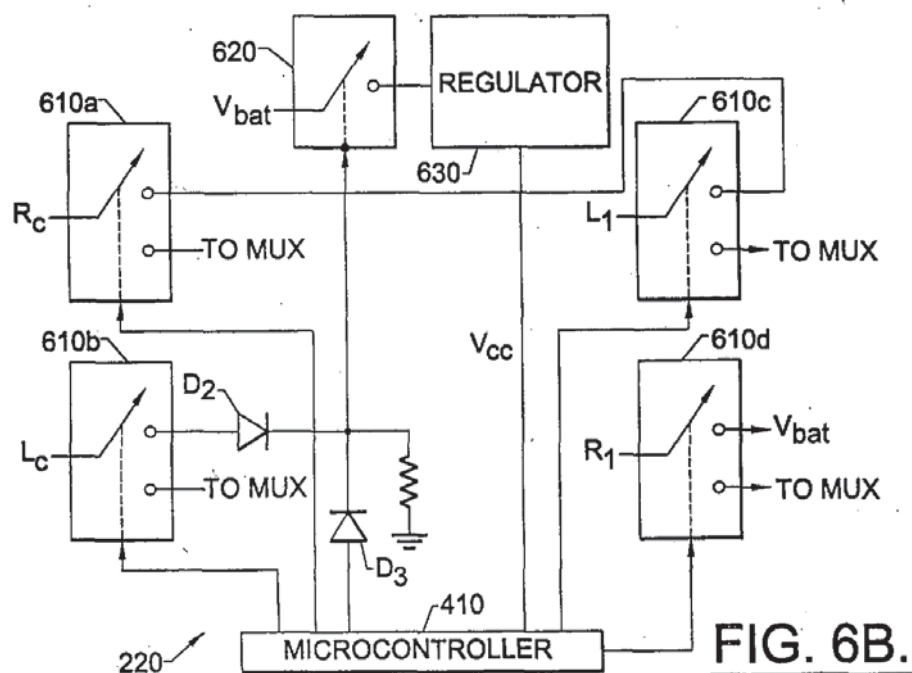
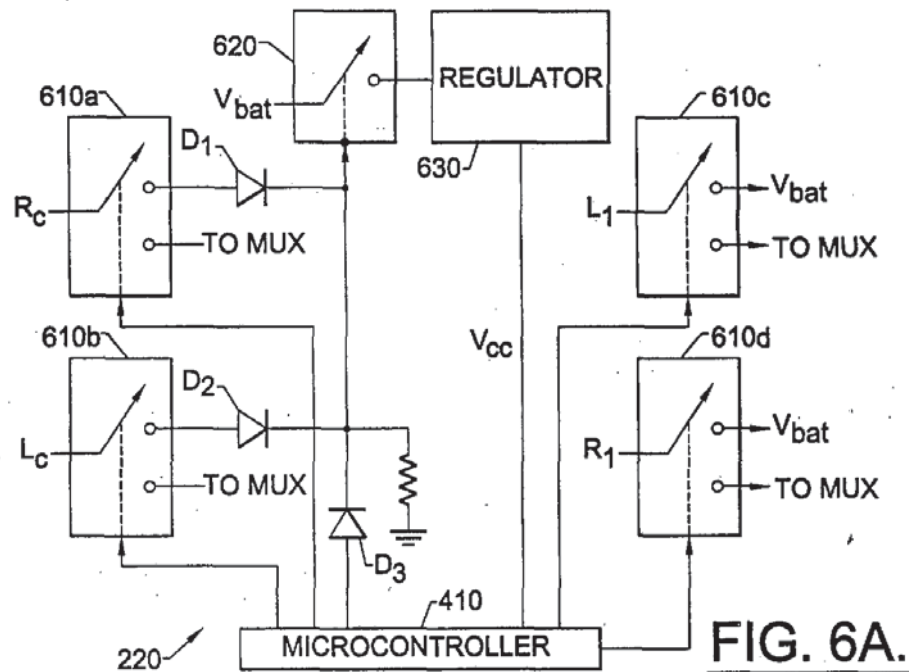
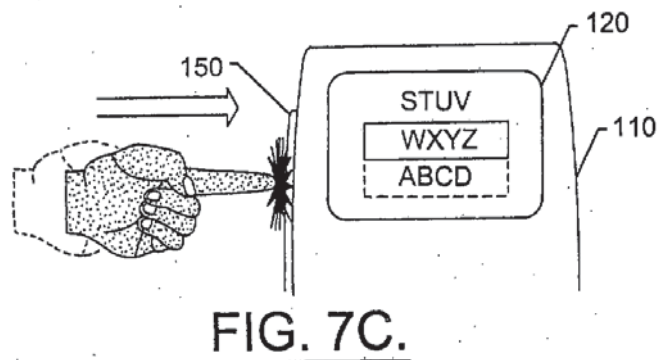
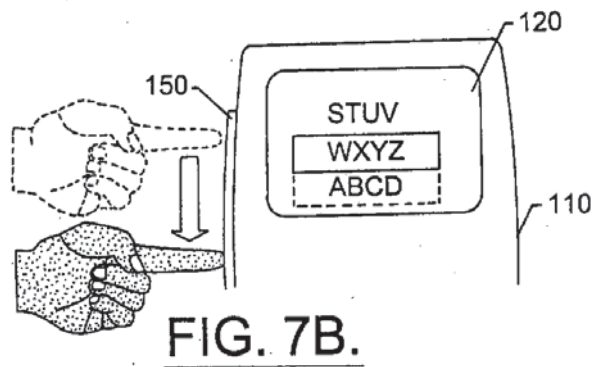
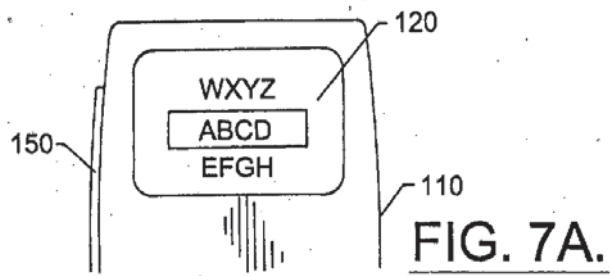


FIG. 5.





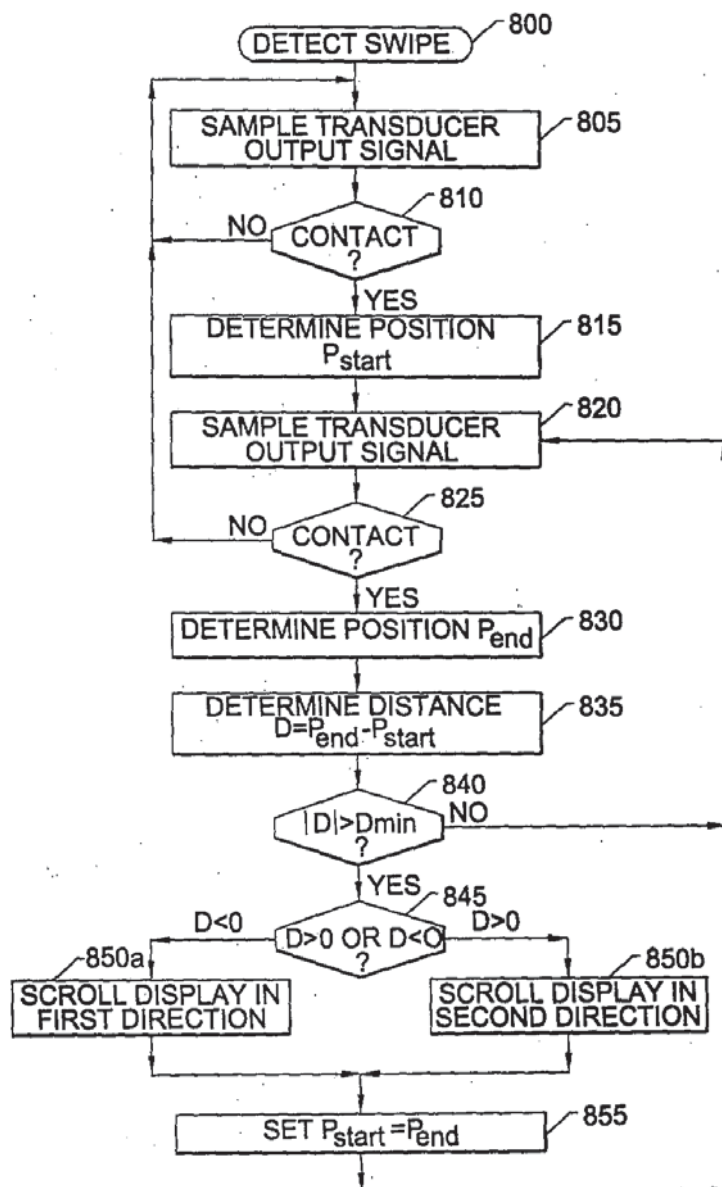


FIG. 8.

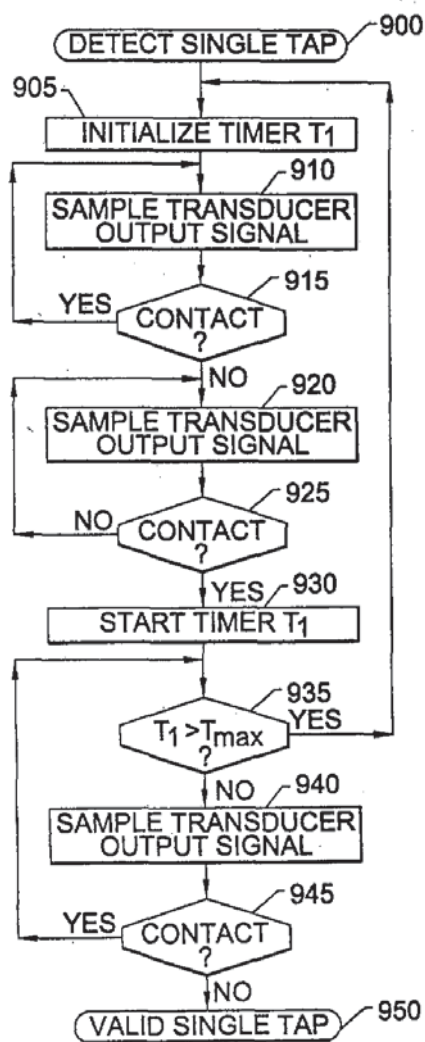


FIG. 9.

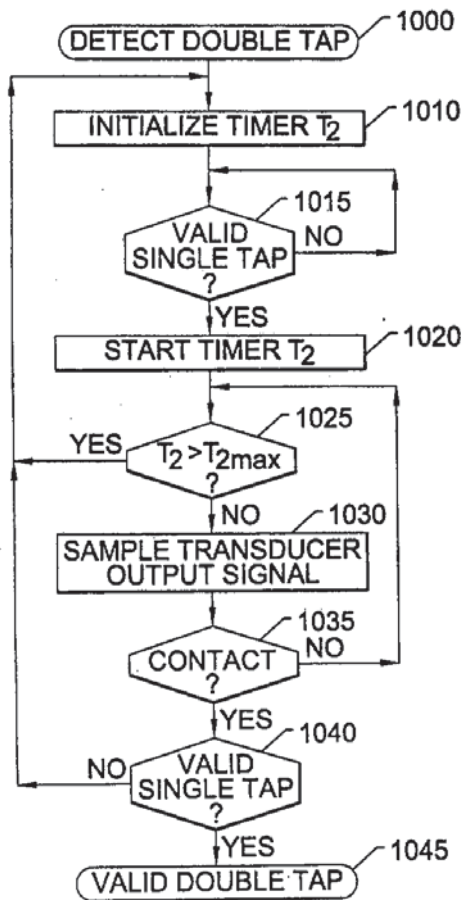


FIG. 10.

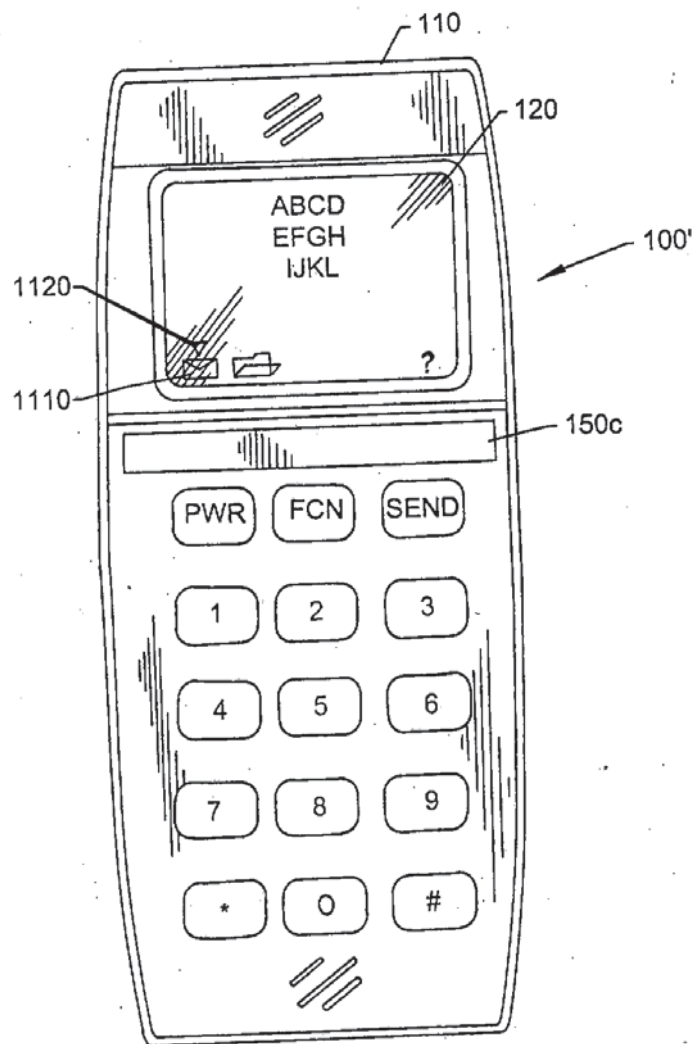


FIG. 11.

PART B—ISSUE FEE TRANSMITTAL

Complete and mail this form, together with applicable fees, to: **Box ISSUE FEE**
Assistant Commissioner for Patents
Washington, D.C. 20231

MAILING INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE. Blocks 1 through 4 should be completed where appropriate. All further correspondence including the Issue Fee Receipt, 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: Legibly mark-up with any corrections or use Block 1)

020792 WM01/0508
MYERS BIGEL SIBLEY & SAJOVEC
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RALEIGH NC 27627

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05-10-01 A10:14 OUT
Robert A. Weeks #49,723 (Depositor's name)

(Signature)

May 17, 2001 (Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/625,674	07/25/00	036	APPIAH, C	2682 05/08/01
First Named Applicant	HAYES, JR., 35 USC 154(b) term ext. = 0 Days.			

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

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
3 8194-123CT	455-566.000	G08	UTILITY	NO	\$1240.00	08/08/01

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.

- ☐ 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) attached.

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.

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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. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

Ericsson Inc.

(B) RESIDENCE: (CITY & STATE OR COUNTRY)

Research Triangle Park, NC

Please check the appropriate assignee category indicated below (will not be printed on the patent)

☐ Individual ☒ corporation or other private group entity ☐ government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):

- ☒ Issue Fee
☒ Advance Order - # of Copies **5**

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The COMMISSIONER OF PATENTS AND TRADEMARKS IS requested to apply the Issue Fee to the application identified above.

(Authorized Signature) (Date)
5/17/01

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Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD Effective December 29, 1999				Application or Docket Number <div style="font-size: 1.2em; margin-top: 5px;">09/625674</div>																																				
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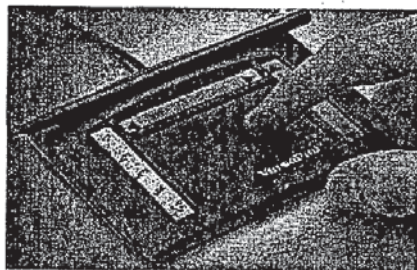
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*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

VersaPad_{tm}



Touchpad Versatility You Can Really Use **NEW** *Order Direct!*

VersaPad's patented Semiconductive Technology delivers versatility previously unavailable in conventional touchpads.

- New Semiconductive Technology for smooth, precise cursor control with finger or stylus—even gloves
- Pressure sensitive Pan and Scroll Bars for one-touch browsing and editing
- Personalize-able Toolbar
- Pop-UP utility to capture sketches and signatures

Versatile Cursor Control

Use your finger—even with a glove—for smooth cursor control. Or use an ordinary stylus for applications requiring drawing or precision pointing (included).

Built-in Click and Drag

For a "mouse" click, simply tap on the pad. Tap twice for a double click. Tap and hold to drag a selection. Drag to the edge of the pad and dragging continues until you lift. (Or, if you prefer, use the mechanical click buttons.)

One-touch Pan and Scroll Speed Control*

Pressure-sensitive pan and scroll arrows allow you to regulate pan and scroll speed—press harder to go faster, decrease pressure to decelerate. To control scrolling, you can swipe within the Scroll bar.

Personalize-able Toolbar

Create your own command center by programming tools for common functions, keystrokes and shortcuts (pre-programmed as shown). For convenience, the Toolbar can be placed on the right side with the Scroll Bar on the left.

Unique Graphics Capture Utility

Pop-up the graphics capture window to sketch small graphics or sign your name. Then paste it into your application.

In The Press (reviews)

Where to Buy the VersaPad

Retail Stores . . . Distributors

Interlink Electronics
546 Flynn Rd., Camarillo CA 93012
(800) 340-1331 or (805) 484-1331, fax (805) 484-8989
Or email Product Support

In Japan: call 81-3-3863-6493 or fax 81-3-3863-6442

VersaPad Model No. VP6100 Specifications:

- Compatibility: PC compatible computer Microsoft® compatible mouse driver
- Hardware Interface: Serial or PS/2 port
- Pad Functionality: Tap, Double Tap, Tap & Drag, Drag Edge Motion
- Active Area: 2.025 x 2.65 inches
- Temperature: Operating: 32° F to 122° F, (0° C to 50° C)
- Storage: -40° F to 158° F (-40° C to 70° C)
- Humidity: 5 - 95% RH, non-condensing
- Overall Dimensions: 4.0" x 5.5" x 0.7"
- Weight: One (1) lb.

System Requirements:

To use VersaPad's Pan and Scroll bars, personalize-able toolbar and other advanced features, you will need a PC compatible computer with:

- Windows™ 95
- Serial or PS/2 mouse port
- 2.0 MB available hard disk space
- 3.5" floppy drive

VersaPad can also be used as a standard two button mouse. You will need a PC compatible computer with:

- MS-DOS® 3.0 or later, or
- Windows 3.1 or later, or
- Windows 95/NT
- Serial or PS/2 port
- Microsoft compatible mouse driver (not included)

VersaPad includes:

- VersaPad touchpad pointing device with 6 foot serial cable and PS/2 adapter
- Stylus for drawing and precision pointing
- VersaPad Win'95 driver diskette 3.5"
- VersaPad User's Guide
- Toolbar labels and plastic inserts
- Limited lifetime warranty

*Pan and Scroll Bars require application software programs that support Panning and Scrolling, such as Microsoft Office 97. Some software, especially older applications, may not Pan and Scroll, or may not function as described above.

VersaPad is tested to comply with FCC standards for home or office use.
All specifications are subject to change without notice. VersaPad, VersaPoint and Interlink Electronics are registered trademarks of Interlink Electronics, Inc. All other trademarks are the property of their respective owners. VersaPad is protected by one or

more of the following patents: 4,489,302; 4,314,277; 4,739,299; 5,292,837 and other US and foreign patents and patents pending.

Other Finished Pointing Products

- VersaPoint Wireless Keyboard **NEW!**
- RemotePoint[®] Plus Programmable Cordless Mouse
- RemotePoint Cordless Mouse
- ProPoint[®] Interactive Handheld Mouse
- DeskStick[™] Stationary Desktop Mouse
- SuperMouse[®] (a desktop, notebook, and handheld mouse)
- DuraPoint[®] (the toughest mouse in the world!)

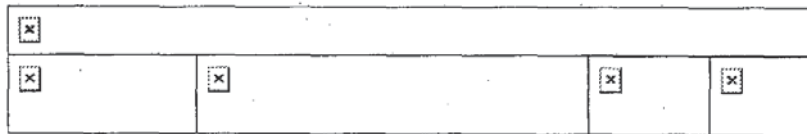
OEM Integrated Pointing Solutions

- VersaPad[™] (semiconductive OEM touchpad) **NEW!**
- MicroModule[®] (for ruggedized pointing applications)
- MicroJoystick[®] (for consumer notebook and 101-style keyboards)

HOME CORPORATE PRODUCTS TECHNOLOGY PRESS SUPPORT

For site information, contact the WebMaster at Interlink Electronics
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Last revised: 10/07/97



Casio announces new handheld PC with built-in windows CE at Comdex

CASSIOPEIA™ will be available at retail starting November 18

LAS VEGAS, NEV., Nov. 18-- CASIO COMPUTER CO., LTD., in conjunction with CASIO, INC., announced today the release of a new Handheld PC (HPC), called "CASSIOPEIA," at the Las Vegas COMDEX '96 Show. The price of the standard configuration will be under \$500.

The pocket-size CASSIOPEIA weighs less than a pound and features a 480 x 240-dot LCD display with a backlight, a pen touch sensitive screen, an easy-to-use keyboard, and a standard PC card expansion slot. CASSIOPEIA also features a CPU, which was optimized for the Microsoft® Windows® CE platform, through joint development with Casio and Hitachi. The CPU is based on the SH-3 processor which is one of Hitachi's high performance SuperH™ RISC engine.

CASSIOPEIA comes built-in with Windows CE, a Windows-based operating system specially developed by Microsoft Corp. The result is a high level of data compatibility between CASSIOPEIA and Windows-based desktop computers. It also offers the same user interface as found in Windows for the desktop. The open architecture of the system helps ensure a rich supply of software applications from third-party developers.

CASSIOPEIA comes pre-installed with a number of other useful applications, including Information Manager (which is synchronized with Microsoft Schedule+ for Windows 95), Microsoft Pocket Word and Microsoft Pocket Excel -- HPC versions of well-known PC software applications, such as Microsoft Word and Microsoft Excel, a world clock, and a calculator. In addition, e-mail capabilities and Microsoft Pocket Internet Explorer, together with various ports perform powerful data communications. CASSIOPEIA comes bundled with a selection of business-oriented applications that will allow fax transmission, remote e-mail access, information service reception using a 1-way pager, wireless e-mail for use with a 2-way pager. The CASSIOPEIA will also include QV Camera Connection software and a financial calculator.

CASSIOPEIA is designed and engineered as a companion to Windows-based desktop PCs for "mobile professionals." CASSIOPEIA's portability, PC connectivity and communication capabilities, enables the user to update or edit data anywhere.

As the first manufacturer of the Digital Diary, Casio was able to draw upon years of experience in developing the next-generation mobile information hardware. In addition, the Windows CE platform and CASSIOPEIA are the result of a three-year collaboration between Casio and Microsoft, the world leader in the development of computer operating systems. Both companies plan to work closely together in further development of Windows CE and the Handheld PC.

"In today's office, everything from personal data to official documents is being stored and managed using personal computers," said Mr. Kazuo Kashio, president of Casio Computer Co., Ltd. "Next-generation mobile information devices will make it possible to freely access these resources no matter where you might happen to be. CASSIOPEIA is a revolutionary new tool that expands the range of PC-stored data to on-site applicability for worldwide usage."

"Microsoft applauds Casio's introduction of CASSIOPEIA, a new Handheld PC from a world leader in consumer electronics," said Craig Mundie, senior vice president, consumer platforms division at Microsoft. "The introduction of CASSIOPEIA, which incorporates and complements the Windows CE platform, helps pave the way for the success of the HPC category."

One of the greatest assets of the Windows CE-based unit is that it is an open platform. A number of software vendors have announced their support for this platform, which will enrich the selection of HPC versions of major PC software packages. Casio will continue to support and cooperate with these software vendors to further develop the HPC category.

Though Windows CE is a ROM-based operating system, future updating will be available through a Casio ROM Upgrade Service. This means that users will have access to the latest versions of the CASSIOPEIA software.

Casio Computer Co., Ltd., is one of the leading consumer electronics companies in the world. Since its establishment in 1957, Casio has been active in the development of electronic calculators, timepieces, musical instruments, LCD TVs, pagers and other communications devices. Casio's corporate activities are guided by the motto: "Creativity and Contribution." (www.casio.co.jp)

Casio, Inc., Dover, NJ, is the U.S. subsidiary of Casio Computer Co., Ltd., Tokyo, Japan. Casio with sales over \$500-million, markets calculators, watches, business organizers, musical keyboards, audio and video products, toys, electronic cash registers, digital imaging products and other consumer electronic products. (www.casio.com for Casio, Inc. Homepage or the CASSIOPEIA Homepage at www.casiohpc.com)

CASIO and CASSIOPEIA are trademarks of CASIO COMPUTER CO., LTD. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corp. in the United States and/or other countries.

SuperH is a trademark of Hitachi, Ltd.

Software

In addition to the standard HPC software, the CASSIOPEIA also comes with six other business applications. All HPC applications provide users with a familiar operating environment similar to Windows. The HPC Explorer software when installed on the desktop PC gives you full compatibility with your CASSIOPEIA.

Standard Software Information Manager is synchronized with the Windows 95 version of Schedule+ 7.0a or later. It provides: **Contacts** for telephone and address management; **Calendar** for schedule management; and **Tasks** for management of a to-do list. By simply connecting the HPC to a PC running Windows 95, the user can automatically update the information in both the HPC and PC. **Microsoft Pocket Word** and **Microsoft Pocket Excel** are HPC versions of Microsoft's popular word processor and spreadsheet applications. Files can be uploaded and downloaded between a desktop PC and the HPC quickly and easily with drag-and-drop. **Inbox** provides e-mail capabilities, and it can be employed by users of Microsoft Exchange to transfer messages between a desktop PC and the HPC. This means users can send and receive messages by HPC through PCs. Using Inbox in combination with a card modem or a wireless 2-way pager makes it possible to send and receive e-mail messages directly over the Internet. **Microsoft Pocket Internet Explorer** is an Internet browser application for the HPC. In addition to the above applications, the HPC also includes a **world clock**, **calculator**, and other utilities.

bFAX™ (bsquare development)

Fax transmission of text and bitmap files. An optionally enhanced version lets you send formatted Microsoft Pocket Word documents as they appear, as well as digital camera images.

QV Camera Connection (Casio Computer Co., Ltd.)

The Casio QV Digital camera software can import images, add text and store images in CASSIOPEIA memory, and display images on the CASSIOPEIA screen.

SkyTel Messenger™ (SkyTel Corporation) Demo Version SkyTel 2-WaySM

Pager for wireless sending and receiving of e-mail messages over the Internet. When used in combination with the Inbox e-mail application, you can compose messages, recall pre-stored addressees, and manage your e-mail with ease.

PageCard™ for Windows CE (Socket Communications, Inc.)

Optional Socket Page Card allows access to the entire nationwide GTE pager network service. Receive e-mail, stock quotes, market news, and any other information anywhere.

Virtual Courier™ (MicroBurst, Inc.) E-mail server software allows remote access to your office's Microsoft Mail, or Microsoft Exchange-based network, or cc:Mail™ network. An optional enhanced version is also available.

LandWare Financial Consultant™ (LandWare, Inc.)

An on-screen multi-functional calculator for financial analysis. An enhanced

version, which includes a total of over 100 functions, for science, engineering, business and other applications is also available.

Hardware

The CASSIOPEIA's backlit full-screen LCD display makes it easy to read. Touch screen capabilities provide access to the Windows graphic user interface by using a stylus that comes with the unit. The CASSIOPEIA is available with either 2MB or 4MB of RAM. Built-in interfaces include RS-232C, data communication jack, PC card slot, and IrDA infrared port, for powerful combination of connectivity, communicability, and expandability. The CASSIOPEIA can operate for up to 20 hours on 2 "AA" batteries, making it the perfect productivity tool for mobile professionals.

Specifications Model: A-10/A-11

Display: 480 x 240 dots, FSTN LCD, 4 greyscales

CPU: SH-3

Memory:

A-10 RAM: 2M bytes

ROM: 4M bytes

A-11 RAM: 4M bytes

ROM: 4M bytes

Speaker: Sound

Interfaces: RS-232C (115.2kBPS); data communication jack, PC card slot, infrared port (IrDA Ver. 1.0 compliance)

Battery Life:

Main: Two AA-size alkaline dry cell batteries: 20 hours

Back-up: 5 years (when main battery is replaced immediately after appearance of low battery message)

or one month (when unit is left without main batteries)

Dimensions:

Unfolded: 15.0H x 175.0W x 175.0D mm (5/8"H x 6 7/8"W x 6 7/8"D)

Folded: 26.5H x 175.0W x 92.0D mm (1"H x 6 7/8"W x 3 5/8"D)

Weight: 380g (13.4oz) including batteries

Optional Accessories

UT-S11 Set: Large terminal, rechargeable battery pack, battery charger, AC adapter

AC-S10 Set: Mini terminal, AC adapter

bFAX is a trademark of bsquare development. SkyTel Messenger is a trademark of SkyTel Corporation. PageCard for Windows CE is a trademark of Socket Communications, Inc. Virtual Courier is a trademark of MicroBurst, Inc. cc:Mail is a trademark of Lotus Development. LandWare Financial Consultant is a trademark of LandWare, Inc. All other marks and trademarks are the property of their respective companies. (Color transparencies of CASSIOPEIA available upon request.)

[Visit the Cassiopeia Web Site]

version, which includes a total of over 100 functions, for science, engineering, business and other applications is also available.

Hardware

The CASSIOPEIA's backlit full-screen LCD display makes it easy to read. Touch screen capabilities provide access to the Windows graphic user interface by using a stylus that comes with the unit. The CASSIOPEIA is available with either 2MB or 4MB of RAM. Built-in interfaces include RS-232C, data communication jack, PC card slot, and IrDA infrared port, for powerful combination of connectivity, communicability, and expandability. The CASSIOPEIA can operate for up to 20 hours on 2 "AA" batteries, making it the perfect productivity tool for mobile professionals.

Specifications Model: A-10/A-11

Display: 480 x 240 dots, FSTN LCD, 4 greyscales

CPU: SH-3

Memory:

A-10 RAM: 2M bytes

ROM: 4M bytes

A-11 RAM: 4M bytes

ROM: 4M bytes

Speaker: Sound

Interfaces: RS-232C (115.2kBPS); data communication jack, PC card slot, infrared port (IrDA Ver. 1.0 compliance)

Battery Life:

Main: Two AA-size alkaline dry cell batteries: 20 hours

Back-up: 5 years (when main battery is replaced immediately after appearance of low battery message)

or one month (when unit is left without main batteries)

Dimensions:

Unfolded: 15.0H x 175.0W x 175.0D mm (5/8"H x 6 7/8"W x 6 7/8"D)

Folded: 26.5H x 175.0W x 92.0D mm (1"H x 6 7/8"W x 3 5/8"D)

Weight: 380g (13.4oz) including batteries

Optional Accessories

UT-S11 Set: Large terminal, rechargeable battery pack, battery charger, AC adapter

AC-S10 Set: Mini terminal, AC adapter

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[Visit the Cassiopeia Web Site]

PATENT COOPERATION TREATY

05-11-99 09:40 RCVD

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

(PCT Rule 44.1)

To:
MYERS, BIGEL, SIBLEY & SAJOVEC, P.A
Attn. MEEKS, R.
P.O. Box 37428
Raleigh, North Carolina 27627
UNITED STATES OF AMERICA

Date of mailing (day/month/year)	11/05/1999
Applicant's or agent's file reference 8194.123.WO	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US 98/ 27042	International filing date (day/month/year) 18/12/1998
Applicant ERICSSON, INC.	

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Grace Casuga
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Form PCT/ISA/220 (July 1998)

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 8194.123.W0	FOR FURTHER ACTION <small>see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</small>	
International application No. PCT/US 98/ 27042	International filing date (day/month/year) 18/12/1998	(Earliest) Priority Date (day/month/year) 30/12/1997
Applicant ERICSSON, INC.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☒ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

2
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No.

CT/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 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



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "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

"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

29 April 1999

Date of mailing of the international search report

11/05/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651, epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Delangue, P

INTERNATIONAL SEARCH REPORT

International Application No

CT/US 98/27042

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) 19 September 1995	1,2, 17-19, 21-24, 33-37
A	see column 4, line 8 - column 8, line 58; figures 1-9	3-7, 9-13, 25-29, 31,32
X	----- PATENT ABSTRACTS OF JAPAN vol. 009, no. 004 (E-288), 10 January 1985 & JP 59 153342 A (TOUYOU TSUUSHINKI KK), 1 September 1984	38,39
A	see abstract	1,23
A	----- PATENT ABSTRACTS OF JAPAN vol. 098, no. 007, 31 March 1998 & JP 08 030378 A (HEWLETT PACKARD), 2 February 1996 see abstract	1-3, 23-26
A	----- EP 0 707 257 A (AT & T CORP) 17 April 1996 see column 4, line 5 - column 6, line 48; figures 1-5 -----	1-3, 23-26, 38-40

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

CT/US 98/27042

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0698845 A	28-02-1996	CN 1129889 A JP 8125724 A US 5815142 A	28-08-1996 17-05-1996 29-09-1998
US 5184120 A	02-02-1993	NONE	
US 5452240 A	19-09-1995	AU 1173395 A EP 0730761 A WO 9514964 A US 5739744 A	13-06-1995 11-09-1996 01-06-1995 14-04-1998
EP 0707257 A	17-04-1996	CN 1131761 A JP 9146677 A SG 33487 A	25-09-1996 06-06-1997 18-10-1996