15866 U.S. PTO 100705

PTO/SB/05 (05-05)
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UTILITY PATENT APPLICATION TRANSMITTAL

(ONLY FOR NEW NONPROVISIONAL APPLICATIONS UNDER 37 CFR 1.53(B))

Attorney Docket No.	0290672.00128US2
First Inventor	Murali ARAVAMUDAN
Title	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A, etc.
Express Mail Label No.	EV 224760871 US

112948 U.S. PTO 11/246432 100705

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

1. [X] **Fee Transmittal Form** (e.g., PTO/SB/17) *(Submit an original and a duplicate for fee processing)*
2. [X] **Applicant claims small entity status.** See 37 CFR 1.27.
3. [X] **Specification** [*Total Pages* 22]
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
4. [X] **Drawing(s)** *(35 U.S.C. 113)* [*Total Sheets* 10]
5. **Oath or Declaration** [*Total Sheets*]
   a. [ ] Newly executed (original or copy)
   b. [ ] A copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional with Box 18 completed)*
      i. [ ] DELETION OF INVENTOR(S) Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. [X] **Application Data Sheet.** See 37 CFR 1.76
7. [ ] **CD-ROM or CD-R** in duplicate, large table or Computer Program *(Appendix)*
   [ ] Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission** *(if applicable, items a. – c. are required)*
   a. Computer Readable Form (CRF)
      i. [ ] Computer Readable Form (CRF)
      ii. [ ] Transfer Request (37 CFR 1.821(e))
   b. Specification Sequence Listing on:
      i. [ ] CD-ROM or CD-R (2 copies); or ii. [ ] Paper
   c. [ ] Statements verifying identity of above copies

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

ACCOMPANYING APPLICATION PARTS

9. [ ] **Assignment Papers** (cover sheet & document(s))
   Name of Assignee:
10. [ ] **37 CFR 3.73(b) Statement** *(when there is an assignee)* [ ] **Power of Attorney**
11. [ ] **English Translation Document** *(if applicable)*
12. [ ] **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
    [ ] Copies of foreign patent documents, publications, & other information
13. [ ] **Preliminary Amendment**
14. [X] **Return Receipt Postcard** (MPEP 503) *(Should be specifically itemized)*
15. [ ] **Certified Copy of Priority Document(s)** *(if foreign priority is claimed)*
16. [ ] **Nonpublication Request** under 35 U.S.C.122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or equivalent.
17. [ ] Other:

18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*
    [ ] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No.: _____
    Prior application information: Examiner _____ *Art Unit:* _____

19. CORRESPONDENCE ADDRESS

[X] The address associated with Customer Number: 23483 *OR* [ ] Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone		Email Address	

Signature		Date	October 7, 2005
Name (Print/Type)	Rajesh Vallabh	Registration No. (Attorney/Agent)	35,761

Express Mail Label No. EV 224760871 US Dated: October 7, 2005

Veveo Exhibit 2104
Comcast Cable v. Veveo, Inc.
IPR2017-00933
Page 0001

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FEE TRANSMITTAL
For FY 2005

[X] Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 825.00

Complete if Known	
Application Number	Not Yet Assigned
Filing Date	Concurrently Herewith
First Named Inventor	Murali ARAVAMUDAN
Examiner Name	Not Yet Assigned
Art Unit	N/A
Attorney Docket No.	0290672.00128US2

METHOD OF PAYMENT (check all that apply)

[ ] Check [ ] Credit Card [ ] Money Order [ ] None [ ] Other (please identify): _____

[X] Deposit Account Deposit Account Number: 08-0219 Deposit Account Name: Wilmer Cutler Pickering Hale and Dorr LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

[X] Charge fee(s) indicated below
[ ] Charge fee(s) indicated below, **except for the filing fee**
[X] Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17
[X] Credit any overpayments

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fee ($)**	**Small Entity Fee ($)**	**Fees Paid ($)**
Utility	300	150	500	250	200	100	500.00
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	**Fee ($)**	**Small Entity Fee ($)**
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
33	- 20 =	13	x 25.00	=	325.00

Multiple Dependent Claims

Fee ($)	**Fee Paid ($)**

Indep. Claims		**Extra Claims**	**Fee ($)**		**Fee Paid ($)**
3	- 3 =		x	=	

3. APPLICATION SIZE FEE

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32	- 100 =		/50		(round up to a whole number) x		=	

4. OTHER FEE(S) **Fees Paid ($)**

Non-English Specification, $130 fee (no small entity discount)

Other (e.g., late filing surcharge): _____

SUBMITTED BY

Signature		Registration No. (Attorney/Agent)	35,761	Telephone	(617) 526-6000
Name (Print/Type)	Rajesh Vallabh			Date	October 7, 2005

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SUBMITTED BY

Signature		Registration No. (Attorney/Agent) 35,761	Telephone (617) 526-6000
Name (Print/Type)	Rajesh Vallabh		Date October 7, 2005

Express Mail Label No. EV 224760871 US Dated: October 7, 2005

Attorney Docket No.290672-128US2
Express Mail No. EV 224760871 US
Date of Deposit: 10/07/2005

METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

Cross Reference To Related Applications

[0001] This application claims benefit of the following patent application, assigned to the assignee of the present application and which is incorporated by reference herein in its entirety: U.S. Provisional Patent Application Serial No. 60/695,463 filed June 30, 2005, entitled "Method And System For Incremental Search With Minimal Text Entry On Television Where The Relevance Of Results Is A Dynamically Computed Function Of User Input Search String Character Count."

Background Of The Invention

[0002] The present invention relates to data search techniques, and more particularly, to techniques for performing searches for television content and channels and other items.

[0003] User interfaces for finding television content in early television systems were relatively simple. Television viewers could tune to a channel to locate desired content by entering a channel number or clicking channel navigation (up/down) buttons on the television or on a remote control device. User interfaces have evolved over time to more complex and elaborate interfaces such as interactive EPGs (Electronic Program Guides) now commonly used for browsing and searching for television content.

[0004] There has been significant recent proliferation in content choices for television viewers. The increase in content choices has resulted largely from channel proliferation, content disaggregation, and an increase in content source options. With this proliferation of content choices, conventional user interfaces, particularly EPGs, have proven inadequate in helping users quickly and easily find channels and content of interest.

[0005] The number of television channels available to television viewers, e.g.,

subscribers of satellite and cable networks, has proliferated, in many cases beyond double digits and approaching triple digits. This has made it particularly difficult for users to remember the channels by their numbers. Users are more likely to forget the number assigned to a channel than the symbolic name assigned to the channel (e.g., CNN, NBC, PBS etc.). Moreover, when a user is mobile, i.e., not at his or her usual home, and desires to view a given channel, e.g., CNN, his or her memory of the channel number may not be useful since CNN would typically be assigned a different channel number by different operators. Additionally, the growth in the number of channels has also made use of conventional two dimensional grid-based EPG interfaces tedious in finding particular programs of interest and channels.

[0006] Early VCRs (video cassette recorders) enabled users to time-shift programs so that the programs could be watched whenever desired. The advent of PVRs (Personal Video Recorders) has, however, immensely catalyzed this disaggregation of programs, further diminishing the value of the channel paradigm. A direct consequence of this phenomenon is the proliferation of available content that can be viewed at any given time.

[0007] Additionally, there has been a significant increase in content source options for viewers. As the bandwidth for data transmission to homes has increased, new sources of content such as VOD (video-on-demand) and IPTV (Internet Protocol TV) have become available. This has further increased the available content accessible to viewers.

[0008] The success of Google search from a desktop-based PC interface has established the fact that the simplicity of the search interface combined with the correct relevance ordering of results in a flat linear space are important for the ubiquitous adoption of a search engine. Television, PDA devices and other devices with limited input capabilities and display constraints (the display space on a television is insufficient given the large fonts needed to be visible at a distance) pose a challenge to create an easy interface like the desktop-based search, where text entry can be done using a QWERTY keyboard. Text input limitations for television-based search makes it important to facilitate reduced text entry. Furthermore support for dynamic retrieval of results for each character entered is important

for increasing the likelihood of a user arriving at desired result without having to enter the full search text. The relevance ordering of results during dynamic results retrieval for each character entered should be such that the user sees the desired results with the entry of the first few characters.

[0009] This problem is even more challenging when designing a non-intrusive search interface for television where the results display cannot accommodate more than a few results at any point in time, in order to remain non-intrusive. The correct relevance of ordering is important in this case to avoid the user from having to scroll down to see additional results. The display space constraint increases the importance of personalizing the results retrieval so that the user can get to the results with significantly reduced effort.

Summary Of Embodiments Of The Invention

[0010] A method and system in accordance with one or more embodiments of the invention are provided for performing incremental searches with text entry reduced to delimited prefix substrings or acronyms where the relevance ordering of results is computed as a function of the number of characters entered by a user, where the characters represent one or more prefixes of the input query. The search space is divided into multiple subspaces, with the applicability or non-applicability to incremental search at any given instant being dynamically computed as a function of the number of characters entered by the user at that instant. This method enables selective relevance boosting (or suppression) of subspaces via configurable parameters appropriate to the application context of the search, with the boosting (or suppression) of subspaces occurring as a function of the number of characters entered by the user. Embodiments of the present invention also describe a way to allocate display space for one or more key subspaces in the first set of pages of results, such that a broad representation of a plurality of subspaces is shown to the user to increase the likelihood of a desired match. The allocation of display space to subspaces is also a function of the number of characters entered by the user. This allocation of display space is implicitly or explicitly personalized over time.

[0011] In addition to the different subspace biasing methods described above in embodiments of the present invention, the relevance contribution of any term (i.e., an individual word or phrase that is a part of the title, keyword or any other portion of the meta-content) to the computed relevance of any given result for a search query is governed by the information content of that term in relation to other terms describing the same content; this term relevance contribution itself varies as a function of the character count. The method in accordance with various embodiments of the present invention enables the rendering of results from multiple subspaces as a flat linear list without visible subspace partitioning, empowering the user to search and retrieve results across several subspaces without having to either explicitly specify in advance a particular subspace of interest or navigate different subspaces while viewing results. Embodiments of the present invention thus enable the user to find the desired result easily by reducing the effort involved in both the process of searching for results and subsequently navigating the results space.

[0012] In accordance with one or more embodiments of the invention, a method and system are provided for processing a search request received from a user operating a text input device. The search request is directed at identifying a desired item from a set of items. Each of the items of the set of items has one or more associated terms. The method includes receiving a query input from a user directed at identifying the desired item. The query input comprises one or more characters input by the user on the text input device. As each character of the query input is received from the user, a group of items having one or more terms matching the characters received thus far of the query input is dynamically identified. The items in this group of items are ordered based on relevance values of the terms matching the characters and on the number of characters of the query input used in identifying the group of items. Identification of the group of items as ordered is transmitted to the user to be displayed on a device operated by the user.

[0013] These and other features and advantages of the present invention will become readily apparent from the following detailed description, wherein embodiments of the invention are shown and described by way of illustration of the best mode of the invention.

As will be realized, the invention is capable of other and different embodiments and its several details may be capable of modifications in various respects, all without departing from the invention. Accordingly, the drawings and description are to be regarded as illustrative in nature and not in a restrictive or limiting sense, with the scope of the application being indicated in the claims.

Brief Description Of Drawings

[0014] FIGURE 1 illustrates a reduced text entry search system in accordance with one or more embodiments of the invention being used in various device and network configurations.

[0015] FIGURE 2 illustrates various device configuration options for performing searching in accordance with one or more embodiments of the invention.

[0016] FIGURE 3 illustrates the various application contexts along with the search terms specified by the user to retrieve different forms of content in accordance with one or more embodiments of the invention.

[0017] FIGURE 4 illustrates a process of user starting a new search and entering text and arriving at the desired result in accordance with one or more embodiments of the invention.

[0018] FIGURE 5 illustrates a preprocessing step to ascribe priorities to searchable content and the computation of relevance for each term that can retrieve content in accordance with one or more embodiments of the invention.

[0019] FIGURE 6A illustrates the different type of terms or combinations thereof that can retrieve content. The illustration depicts exemplary terms for a movie and a TV serial.

[0020] FIGURE 6B illustrates the relevance of terms as it relates to the popularity of the discoverable documents.

[0021] FIGURE 7 illustrates the dynamic adjustment of subspace biases as each character is entered in accordance with one or more embodiments of the invention.

[0022] FIGURES 8A-8C illustrate the ordering of results as each character is entered

for various exemplary search strings in accordance with one or more embodiments of the invention.

[0023] FIGURE 9 illustrates allocating display space for certain subspaces in accordance with one or more embodiments of the invention.

Description Of The Preferred Embodiments

[0024] Although many of the examples illustrated herein concern a television viewer searching for television content items and television channels, the concepts set forth in these examples are not limited to searching for television content items and channels. In general, these concepts can apply to processing search requests in a variety of environments in which particular data items or content is sought in response to a user query.

[0025] Briefly, as will be described in further detail below, in accordance with one or more embodiments of the invention, methods and systems are provided for identifying data items (such as, e.g., a television content item or channel) desired by a person performing a search on a device (such as, e.g., a television viewer using a remote control or a user of a phone, PDA or other mobile computing device) from a set of available data items.

[0026] Television content items can include a wide variety of video/audio content including, but not limited to, television programs, movies, music videos, video-on-demand, or any other identifiable content that can be selected by a television viewer.

[0027] A user can enter into a search device having a text input interface a reduced text search entry directed at identifying the desired data item. The text can be one or more characters, which can be any alphanumeric character, symbol, space or character separator that can be entered by the user. Each data item has one or more associated descriptors, particularly names in a namespace relating to the desired data items. The descriptors specify information about the data item. If the data item is television content or channel, the information can include, *e.g.*, information on titles, cast, directors, descriptions, and key words. The names are composed of one or more words that can be either ordered or unordered. The user's search entry comprises one or more prefix substrings that represent a

name or names in the namespace. A prefix substring of a word in a name captures information from the word and can be a variable length string that contains fewer than all the characters making up the word.

[0028] FIGURE 1 shows an overall system 100 for search with reduced text entry using a wide range of devices in accordance with one or more embodiments of the invention. Although FIGURE 1 illustrates a network-based search, the concepts described herein are also applicable to a search that a particular search device performs locally. A server farm 101 serves as a source of search data and relevance updates, with the network 102 functioning as the distribution framework. The composition of the actual distribution within the network is not critical – the network 102 could be completely wired, completely wireless, or a combination of wired and wireless connections. Examples of possible networks can include cable television networks, satellite television networks, I.P.-based television networks, and networks for mobile devices such as wireless CDMA and GSM networks. The search devices could have a wide range of interface capabilities such as a hand-held device 103 (e.g., a phone, PDA or other mobile device) with limited display size and overloaded or small QWERTY keypad, a television 104a coupled with a remote 104b having an overloaded or small QWERTY keypad, and a Personal Computer (PC) 105 with a full QWERTY keyboard and large display.

[0029] FIGURE 2 shows several possible configurations of the search device from the system 100 illustrated in FIGURE 1. In one embodiment, a search device such as a PC 105 has a display 201, a processor 202, a volatile memory 203, a text input interface 204 (which is either on the device itself, or is implemented via a wireless remote control 104b), remote connectivity 205 to a server 101 through a network 102, and a persistent storage 206.

[0030] In another embodiment, a search device such as a hand-held device 103 may not include local persistent storage 206. Such a hand-held device 103 would include remote connectivity 205 to submit the query to a server 101 and retrieve results from the server 101. In yet another embodiment, the search device 103 may not include remote connectivity 205. For such an embodiment, the search database may be locally resident on a local persistent

storage 206. The persistent storage 206 may be a removable storage element such as SD, SmartMedia, CompactFlash card, or any of other such storage elements known in the art.

[0031] In one embodiment, a search device includes remote connectivity 205 and persistent storage 206 for search (*e.g.,* a television 104a), and the search device may use the remote connectivity for search relevance data update, or for the case where the search database is distributed on the local storage 206 and on the server 101. In one embodiment, a television 104a may have a set-top box with a one-way link to a satellite. In this embodiment, some or all search data, including relevance updates, may be downloaded to the search device through the satellite link so that a search can be performed locally.

[0032] FIGURE 3 illustrates the various application contexts 301 along with the search string elements 304a – 304e used to retrieve different forms of content. In one embodiment, the application context for search is a non-intrusive interface 302 (an interface that occupies a small portion of the screen and preferably does not significantly occlude or interfere with the simultaneous viewing of content) to search for a program that is available for instant gratification (available for instant viewing) and perform an action on it such as tuning to the program (if it is being broadcast), initiate a recording, or download/stream (if it is an internet based content). One challenge imposed by a non-intrusive interface is that because of its generally small size, there is a limited space available for displaying results, e.g., two to three lines, with the rest of the results being accessible by scrolling down. An intrusive search interface 303 for a television display (an interface that occupies the full screen or a large part of it) poses challenges too, since the number of results that can be displayed with a font that is visible at 10 feet distance, is limited to around 8 results. In the case of the intrusive interface, the application context could be further diversified into smaller context search such as search for a movie or a TV show. Searching for results in any of these application contexts can use search strings 304 that identify the desired content or channel. The text strings include information such as the channel names, TV show names, TV casts and keywords, movie names, casts and/or keywords. The input text strings do not necessarily include complete information blocks. For example, the input text string could be variable

size prefix substrings from one or more of these subspaces. The input text string could alternatively be an acronym or abbreviation that represents the name of a TV show, TV network, etc. The relevance values associated with these strings determines the ordering of results, which can provide direct access to content 305 such as TV broadcast programming, video-on-demand (VOD), etc.

[0033] FIGURE 4 illustrates a process of the user starting a new search, entering characters and arriving at the desired result. A user enters a search string character at 401, which could be a variable size prefix of the intended query. For example, to represent "Brad Pitt," the user may enter B P, BR P, B PI etc.). The system dynamically retrieves results at 402 for the cumulative substring of characters the user enters and orders the collected results based on (i) the relevance of the matched terms (explained in further detail below), and (ii) the number of characters the user entered. The results are displayed in the results window. If the user sees the result in the display window at 403, the user can scroll to the desired result within the displayed window and selects the desired result at 405. If the desired result is the first entry in the display window, it can be selected by default obviating the need to scroll through the display window. The ordering of results in the display window is governed by a relevance function that is a domain specific combination of relevance (e.g., popularity, temporal relevance, and location relevance) and the number of characters entered by the user. In an exemplary embodiment, when a user is searching for a restaurant using a phone or Personal Digital Assistant (PDA) with GPS capabilities, the listings are ordered in descending order of the most popular restaurants in that area. If the user entered "NBA," the system lists the games in order of temporal relevance such as those in progress or are scheduled to begin in the near future are listed first. If the desired result is not in the display window, the user could decide at step 404 to either scroll down the display window linearly or page by page to reveal more results at 406 or enter more characters at 401. If the user does not reach the result due to a misspelled entry or due to the case of a word whose uniqueness (e.g., Tom Brown, Michael Brown) is embedded in the suffix of the words of the query (as opposed to the prefix), the user either goes back to the first word and enters more characters,

or erases one or more of the typed characters and re-enter characters in order to reach the desired result. The dynamic update of results for each character entry enables the user to recover from an error during the text entry process itself, in contrast to discovering there are no results match after typing the entire text.

[0034] FIGURE 5 illustrates various steps in the pre-processing phase for ascribing content priorities and term relevance in accordance with one or more embodiments of the invention. The input to this phase is a semi-structured space of any size composed of entities (*e.g.,* titles, cast, directors, description, key words) with associated metadata. This semi-structured search space could range in size from the size of a PDA phone book to a large subspace obtained by a focused web crawl followed by relevant text processing to derive entities. In scenarios where the search space size is large, it is possible to organize the space into smaller sub-spaces based on a categorization scheme. In the example shown in FIGURE 5, the first step 501 is the breaking up of entities into terms (e.g., Tom Hanks, Secret Discoveries in Ancient China). As used herein, a "term" is a set of one or more ordered or unordered words. In one embodiment, the system 100 considers multiple permutations of the words in the entity as candidate terms (e.g., Secret Discoveries of Ancient China, Discoveries of Ancient China, Ancient China, China). Considering multiple permutations allows searching a given entity using variable prefixes of any of the candidate terms. The content item (also referred to herein as a document, e.g., a particular movie) is itself assigned a popularity value 502. In the next step 503, for each term identifying a document, a relevance value is computed based on the information content of term. The instantaneous relevance of any given document to a query string depends on the absolute popularity of that document and the relative relevance contributions of the associated terms matched by the search query. Also, the relevance of that term is not a constant, but is rather a function of the number of characters that forms a prefix of that term. For example, the prefix string "ev" of the term "events" in a TV show "Live Summer Events" would not only have a lower relevance value than that ascribed to the full term "events," it would also have a lower relevance value in comparison to the term "everybody" in "Everybody Loves Raymond." The relevance of a

prefix of a one word term may have a higher relevance than that of a prefix of a multi-word term. (For example, the prefix "ev" may have a higher relevance to represent a movie called "Eve" than that of the relevance of "ev" to represent "Live Summer Events"). The next step 504, involves identifying various subspaces of interest. The creation of subspaces may be based on a wide range of criteria including, but not limited to, (1) broad genre based subspace categorization, (2) individual term weighting-based categorization, or (3) personal search history (time sensitive and/or user specific) based categorization. These subspaces may be optionally exposed as filters (although with the proper ordering, the user would not need to use this filter) for search and can be explicitly applied by the user before, during, or after a search string entry. The categorization into subspaces enables a flattened linear output of results even on a system with small display space, since each subspace can be selectively biased on a per character basis as described below, to enable optimal ordering of results on the display.

[0035] The final phase 505 involves ascribing a subspace-specific bias. This bias is a function of the number of characters entered. This bias causes certain subspace results to have a higher relevance than other subspaces. As is illustrated in greater detail below, a channel name subspace may have a relevance boost for the first character to ensure, e.g., that only channels appear first in the results space when only one character is entered.

[0036] FIGURE 6A illustrates a searchable document 601, in this case a movie (The Gods Must Be Crazy), along with the terms that lead to its discovery by search. Each term set (title 602, casts 603, and keywords 604) belongs to a separate subspace, so that the relevance for a subspace can be selectively biased. FIGURE 6A also illustrates an example of a TV serial (Seinfeld 605) shown with episode title terms 606, cast terms 607 and keyword terms 608.

[0037] FIGURE 6B illustrates two documents 610, 612 having popularity values D1 and D2. The documents are discoverable by terms 616 (T1 through T7). The relevance values 614 (R1 through R9) are computed as a function of the document relevance it links to. A term may have different relevance values for different documents 610, 612 as illustrated by terms

T3 (R3 and R4) and T6 (R7 and R8). For example, the term "lost" in "lost in translation" could have a different relevance in "raiders of the lost ark." The discoverability of a document relies on the relevance of its terms. The search query string 618 is shown linking to the term T1 through different relevance values 620, depending upon the number of characters entered.

[0038] FIGURE 7 illustrates this selective biasing of different subspaces 701-705 as a function of the number of characters entered. In this exemplary embodiment, the bias value of a subspace is the output of a nonlinear function. A personalized search history subspace 706 is dynamically created and is composed of items from other subspaces. The relevance of elements in this subspace would be a function of the both time, content availability and popularity. For example, a user may type "C" in the mornings to access the children's program "Caillou", but in the evening user may type "C" to access the news network "CNN." The key role of subspace biasing is to facilitate access to the desired results on the visible results list within the entry of a small number of characters, e.g., the first 3 to 4 characters. Beyond this, the entered string generally becomes sufficiently unique for the result to percolate up to the top of the shelf, regardless of the subspace the term belongs. A static character count independent of any subspace biasing would relegate some subspaces to always be occluded by results from the boosted subspace results. For example, if the channel space were given a sufficiently large bias over other subspaces such that even the lowest relevance channel is higher than any other subspace element, then even when the user enters "SE", low popularity channels such as SETANT or SEASON would occlude "SEINFELD" from showing up on the displayed results – the user would have to scroll down to get to Seinfeld, if only two characters were entered. The selective biasing of the described embodiment enables the "TV show" subspace to get a boost after the first character is entered so that it can contend and supersede the low popularity channel names, or even all the channel names, if the biasing is appropriately set. The character-based relevance biasing of subspaces provides the flexibility in controlling what is displayed in an easily configurable and scalable manner.

[0039] As used herein, the biasing of one subspace over another refers to the relative preferential positioning of subspaces by boosting or suppression.

[0040] One advantage of a user-entered character count based subspace relevance biasing in accordance with one or more embodiments of the invention is described further below:

[0041] Consider an example in which the user enters a prefix string $P = C_1, C_2, C_3, ..C_i... C_N$. where $1 \leq i \leq N$. One or more of the characters C_i ($1 \leq i \leq N$), could be a word separator (e.g., space character) – the query string could thus be a multi-prefix query string. Let P_i denote a multi-prefix string where $1 \leq i \leq N$. Let the subspaces be $S_1, S_2, \ldots S_M$ and the initial bias of the subspaces be $Si^{min} \geq Sj^{max}$, $1 \leq i,j \leq M$, i.e., the lowest relevance element in S_i has a higher relevance than the most relevant element in S_j. Consider the display space size to be D_{max}. The user would have to scroll down if the number of results exceeds D_{max}.

[0042] Case 1: P_i ($1 \leq i < N$) has a no match ($Match[P_i,S_j] = \emptyset$, $1 \leq j \leq K\text{-}1$) with strings from subspaces $S_1,... S_{K-1}$ ($1 < K \leq M$) but P_{i+1} has a match ($Match[P_{i+1},S_K] = \{m_K^1, m_K^2... m_K^r\}$ where $1 \leq r \leq n(S_K)$ (with n standing for the cardinality of S_K, $1 \leq i < N$), with strings from subspace S_K, $1 < K \leq M$. In this case "the character count based subspace biasing" system offers no distinct advantage in comparison to a static character count independent biasing of subspaces.

[0043] Case 2: Pi ($1 \leq i < N$) has a match with strings from subspaces S1,... SK-1 ($Match[Pi,Sj] = \{m_j^1, m_j^2... m_j^r\}$ where $1 \leq r \leq n(S_j)$, n standing for the cardinality of S_j, and $1 \leq j \leq K\text{-}1$) and P_{i+1} has a match with strings from Subspace S_K ($Match[P_{i+1},S_K] = \{m_K^1, m_K^2... m_K^r\}$ where $1 \leq r \leq n(S_K)$, n standing for the cardinality of S_K). In this case if $\Sigma\, n(Match[P_i,S_j]) \geq D_{max}$ ($1 \leq j \leq K\text{-}1$), then the result from S_K would be occluded by the matched elements from the subspace $S_1,... S_{K-1}$ (note it may be occluded even for a value of $j < K\text{-}1$, if multiple results from a subspace match). The user would have to scroll down to view the result from S_K. It is this occlusion that character count based biasing in accordance with one or more embodiments of the invention addresses. The biasing allows for selective occlusion for a certain number of initial characters, and then makes the relevance space a

level playing field for all subspaces gradually as the entered character count increases. By modifying the subspace biasing for each character, in this case, by increasing the bias of S_K, the result of S_K has some likelihood of showing up within the top D_{max} results. This promotion to the display list, might have happened at the exclusion of a result from one of the subspaces $S_1,\ldots S_{K-1}$. This may be a preferred behavior, *i.e.*, no result is allowed to hold on to the precious display estate beyond a particular character count. As the subspaces are all made equal with the increase in character count, preference could be given for the results from the new subspaces, since the others would have been monopolizing the display space in this scenario. Also note that an excluded result that fell from its position in the top displayed set, would work its way back again into view if sufficient characters that form a larger prefix of that result is entered. This reclamation of lost position will naturally occur, with the entry of more characters – the uniqueness of the string would help bring it back up.

[0044] The other two cases, (1) both P_i and P_{i+1} having no match with subspaces and (2) P_i ($1 \leq i < N$) has a match with strings from subspaces $S_1,\ldots S_{K-1}$ but P_{i+1} has no match, are not examined since they are uninteresting boundary cases offering no more information than the cases described above.

[0045] FIGURES 8A-8C illustrate examples of the ordering of results as each character is entered for various search strings. The first example (FIGURE 8A) illustrates the case of a low popularity channel being superseded by a popular TV show "Everybody loves Raymond" on the entry of the second character. However, the first character entry only brings up channels since the subspace biasing for the first character as shown in FIGURE 7 boosts the majority of channel names over all other subspaces. The second example (FIGURE 8B) illustrates the user finding CNBC after entering three characters. The figure illustrates the scenario where the user is entering CNBC for the first time – the search history subspace has not been populated with this search yet. After regular sustained access to CNBC, over a period of time this term is added to the personal search history, and the relevance of this term continues to increase. At some point, the relevance of this item is boosted sufficiently to even supersede the popular channels with the same prefix as shown in FIGURE 8C. Character

count based biasing is independent of the number of terms represented by the input characters. For example, in the case of "Everybody Loves Raymond" user could have entered "E L" (E<space>L) instead of the query "EV". The biasing logic is the same in both cases and is independent of the fact that in one case the input characters represented one prefix (Everybody Loves...), while the other represented two prefixes ("EveryBody Loves...")

[0046] FIGURE 9 illustrates an embodiment where instead of biasing subspaces, certain number of rows on the display space 902 are allocated for certain subspaces 904. One advantage of this scheme is that regardless of the number of the results that match the term entered in text entry field 906, results from each subspace are guaranteed space in the display in the first set of pages of results, if any results qualify from these subspaces. This method enables the displayed results to represent a cross-section of the results, thereby increasing the likelihood that a particular result may be of interest to the user. The choice of subspaces that are allocated shelf space may change dynamically over time and usage of the system. For example, when a user enters "S" in the morning, the results display may be populated with "Sesame street" (for kids), "SBX morning news", etc., representing children and adults. The choice of subspaces to be used may be determined by knowledge of the household demographics, or implicitly with usage (i.e., information about tuning and recording usage patterns).

[0047] Methods of processing search queries from users in accordance with various embodiments of the invention are preferably implemented in software, and accordingly one of the preferred implementations is as a set of instructions (program code) in a code module resident in the random access memory of a computer. Until required by the computer, the set of instructions may be stored in another computer memory, e.g., in a hard disk drive, or in a removable memory such as an optical disk (for eventual use in a CD ROM) or floppy disk (for eventual use in a floppy disk drive), or downloaded via the Internet or some other computer network. In addition, although the various methods described are conveniently implemented in a general purpose computer selectively activated or reconfigured by software, one of ordinary skill in the art would also recognize that such methods may be carried out in

hardware, in firmware, or in more specialized apparatus constructed to perform the specified method steps.

[0048] The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of the equivalency of the claims are therefore intended to be embraced therein. Method claims set forth below having steps that are numbered or designated by letters should not be considered to be necessarily limited to the particular order in which the steps are recited.

Claims

1. A method of processing a search request received from a user operating a text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

(a) receiving a query input from a user directed at identifying the desired item, the query input comprising one or more characters input by the user on the text input device;

(b) as each character of the query input is received from the user, dynamically identifying a group of items having one or more terms matching the characters received thus far of the query input;

(c) ordering the items in the group of items identified in step (b) based on relevance values of the one or more terms matching the characters and on the number of characters of the query input used in identifying the group of items; and

(d) transmitting identification of the group of items as ordered in step (c) to be displayed on a device operated by the user.

2. The method of claim 1 wherein the method steps are performed by a server computer remote from the user.

3. The method of claim 1 wherein the method steps are performed by the device operated by and proximate the user.

4. The method of claim 1 further comprising organizing said terms into a plurality of subspaces, and wherein step (c) comprises selectively applying a relevance bias to said subspaces in accordance with the number of characters of the query input.

5. The method of claim 4 wherein said plurality of subspaces include a personalized history subspace containing terms from previous searches conducted by said user.

6. The method of claim 1 further comprising organizing said terms into a plurality of subspaces, and wherein said device operated by the user includes a display area for displaying

search results, and wherein step (c) comprises ordering said items in the group of items such that items associated with given subspaces appear in said display area.

7. The method of claim 6 wherein said given subspaces are allocated space in said display area.

8. The method of claim 1 wherein step (c) comprises ordering said items also in accordance with the popularity of each item in the group of items.

9. The method of claim 1 wherein said relevance values are based on popularity, temporal relevance or location relevance.

10. The method of claim 1 wherein said text input device is a phone, a mobile computing device, or a remote control device for a television.

11. The method of claim 1 wherein said text input device includes a set of overloaded keys generating an ambiguous text input.

12. A system for processing a search request received from a user operating a text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

a memory for storing identification of said set of items and associated terms;

a device input for receiving a query input from a user directed at identifying the desired item, the query input comprising one or more characters input by the user on the text input device;

a processor for dynamically identifying a group of items having one or more terms matching the characters received of the query input as each character of the query input is received from the user; and ordering the items in the group of items based on relevance values of the one or more terms matching the characters and on the number of characters of the query input used in identifying the group of items; and

a device output for transmitting identification of the group of items as ordered to be displayed on a device operated by the user.

13. The system of claim 12 wherein the system comprises a server computer remote from the user.

14. The system of claim 12 wherein the system comprises a device operated by and proximate the user.

15. The system of claim 12 wherein the processor further organizes said terms into a plurality of subspaces, and orders the items by selectively applying a relevance bias to said subspaces in accordance with the number of characters of the query input.

16. The system of claim 15 wherein said plurality of subspaces include a personalized history subspace containing terms from previous searches conducted by said user.

17. The system of claim 12 said terms are organized into a plurality of subspaces, and wherein said device operated by the user includes a display area for displaying search results, and wherein the processor orders said items in the group of items such that items associated with given subspaces appear in said display area.

18. The system of claim 17 wherein said given subspaces are allocated space in said display area.

19. The system of claim 12 wherein the items are also ordered in accordance with the popularity of each item in the group of items.

20. The system of claim 12 wherein said relevance values are based on popularity, temporal relevance or location relevance.

21. The system of claim 12 wherein said text input device is a phone, a mobile computing device, or a remote control device for a television.

22. The system of claim 12 wherein said text input device includes a set of overloaded keys generating an ambiguous text input.

23. A computer program product for processing a search request received from a user operating a text input device, the search request being directed at identifying a desired item

from a set of items, each of the items having one or more associated terms, said computer program product residing on a computer readable medium and having a plurality of instructions stored thereon which, when executed by a processor, cause that processor to:

receive a query input from a user directed at identifying the desired item, the query input comprising one or more characters input by the user on the text input device;

as each character of the query input is received from the user, dynamically identify a group of items having one or more terms matching the characters received thus far of the query input;

order the items in the group of items based on relevance values of the one or more terms matching the characters and on the number of characters of the query input used in identifying the group of items; and

transmit identification of the group of items as ordered to be displayed on a device operated by the user.

24. The computer program product of claim 23 wherein the processor is in a server computer remote from the user.

25. The computer program product of claim 23 wherein the processor is in a device operated by and proximate the user.

26. The computer program product of claim 23 wherein the computer program product further causes the processor to organize said terms into a plurality of subspaces, and selectively apply a relevance bias to said subspaces in accordance with the number of characters of the query input.

27. The computer program product of claim 26 wherein said plurality of subspaces include a personalized history subspace containing terms from previous searches conducted by said user.

28. The computer program product of claim 23 wherein said terms are organized into a plurality of subspaces, and wherein said device operated by the user includes a display area

for displaying search results, and wherein said items in the group of items are ordered such that items associated with given subspaces appear in said display area.

29. The computer program product of claim 28 wherein said given subspaces are allocated space in said display area.

30. The computer program product of claim 23 wherein said items are ordered also in accordance with the popularity of each item in the group of items.

31. The computer program product of claim 23 wherein said relevance values are based on popularity, temporal relevance or location relevance.

32. The computer program product of claim 23 wherein said text input device is a phone, a mobile computing device, or a remote control device for a television.

33. The computer program product of claim 23 wherein said text input device includes a set of overloaded keys generating an ambiguous text input.

METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

Abstract of the Disclosure

[0049] A method and system are provided for processing a search request received from a user operating a text input device. The search request is directed at identifying a desired item from a set of items. Each of the items of the set of items has one or more associated terms. The method includes receiving a query input from a user directed at identifying the desired item. The query input comprises one or more characters input by the user on the text input device. As each character of the query input is received from the user, a group of items having one or more terms matching the characters received thus far of the query input is dynamically identified. The items in this group of items are ordered based on relevance values of the terms matching the characters and on the number of characters of the query input used in identifying the group of items. Identification of the group of items as ordered is transmitted to the user to be displayed on a device operated by the user.

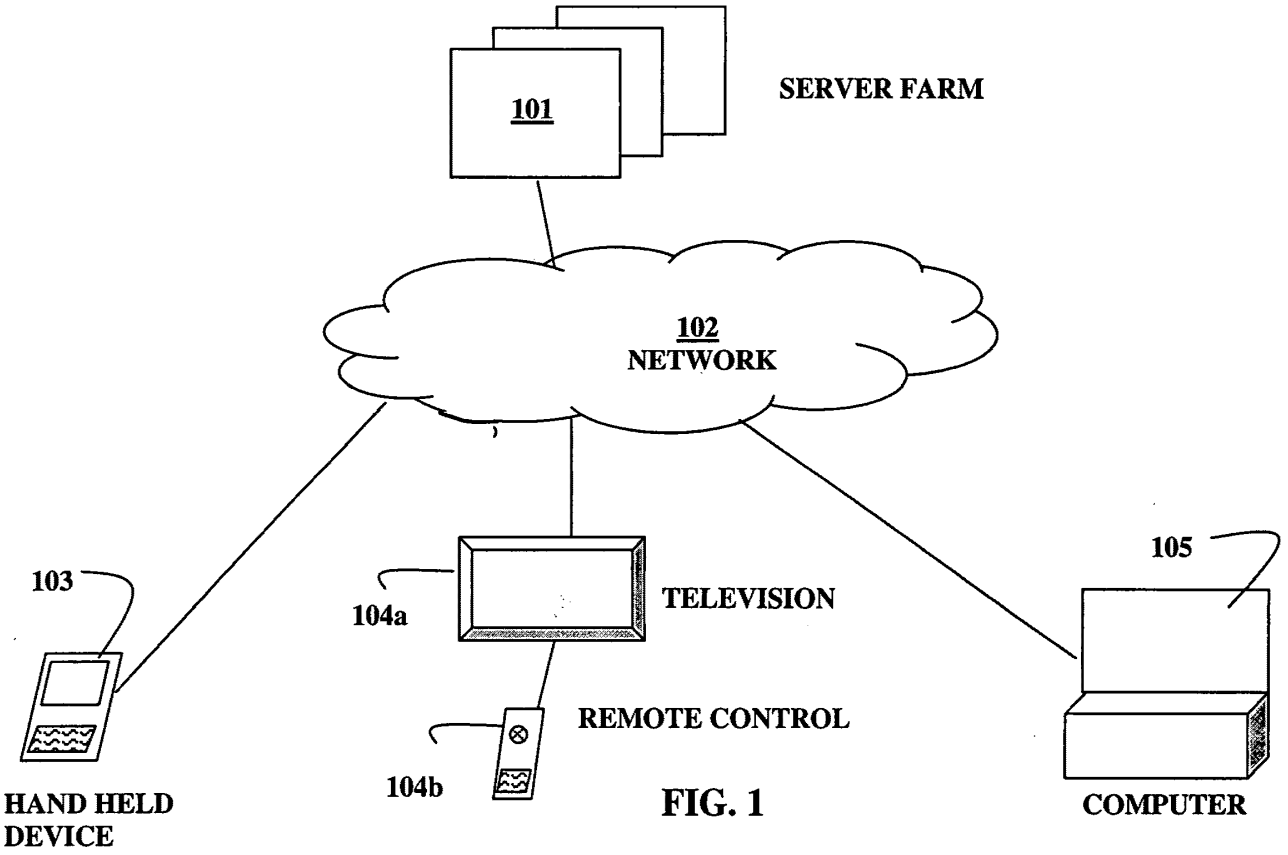

FIG. 1

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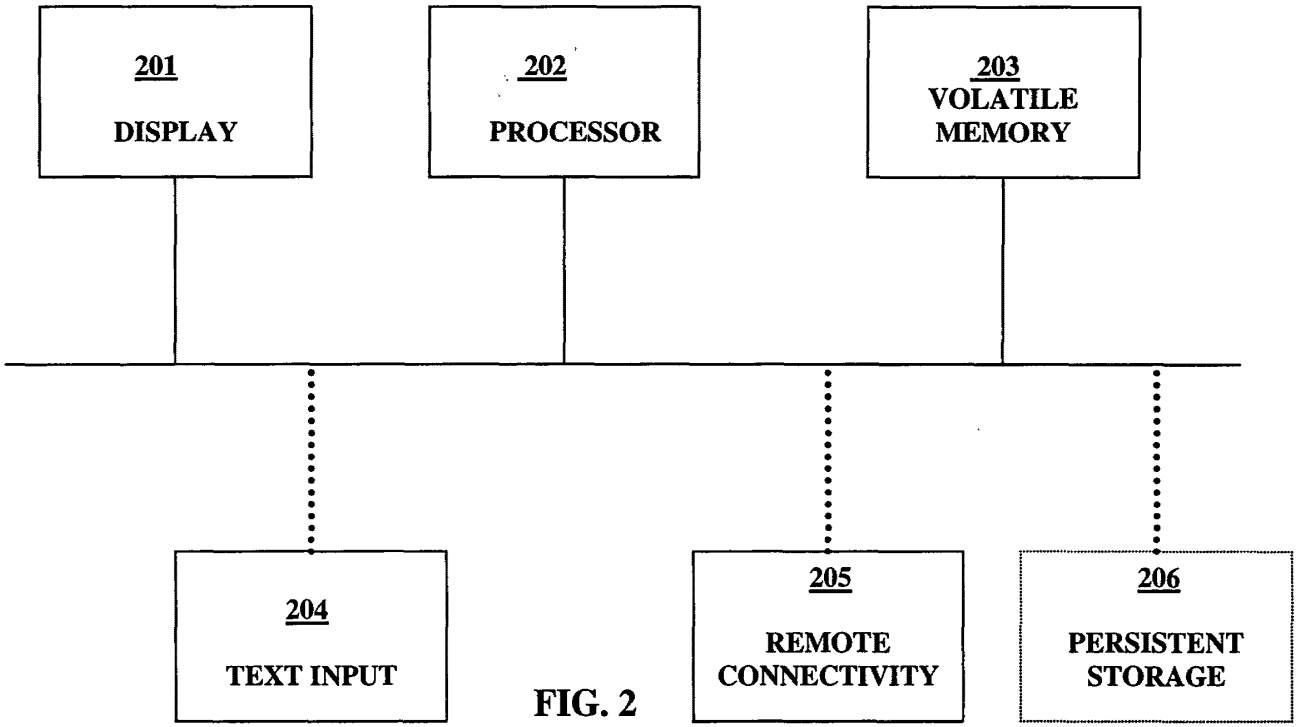

FIG. 2

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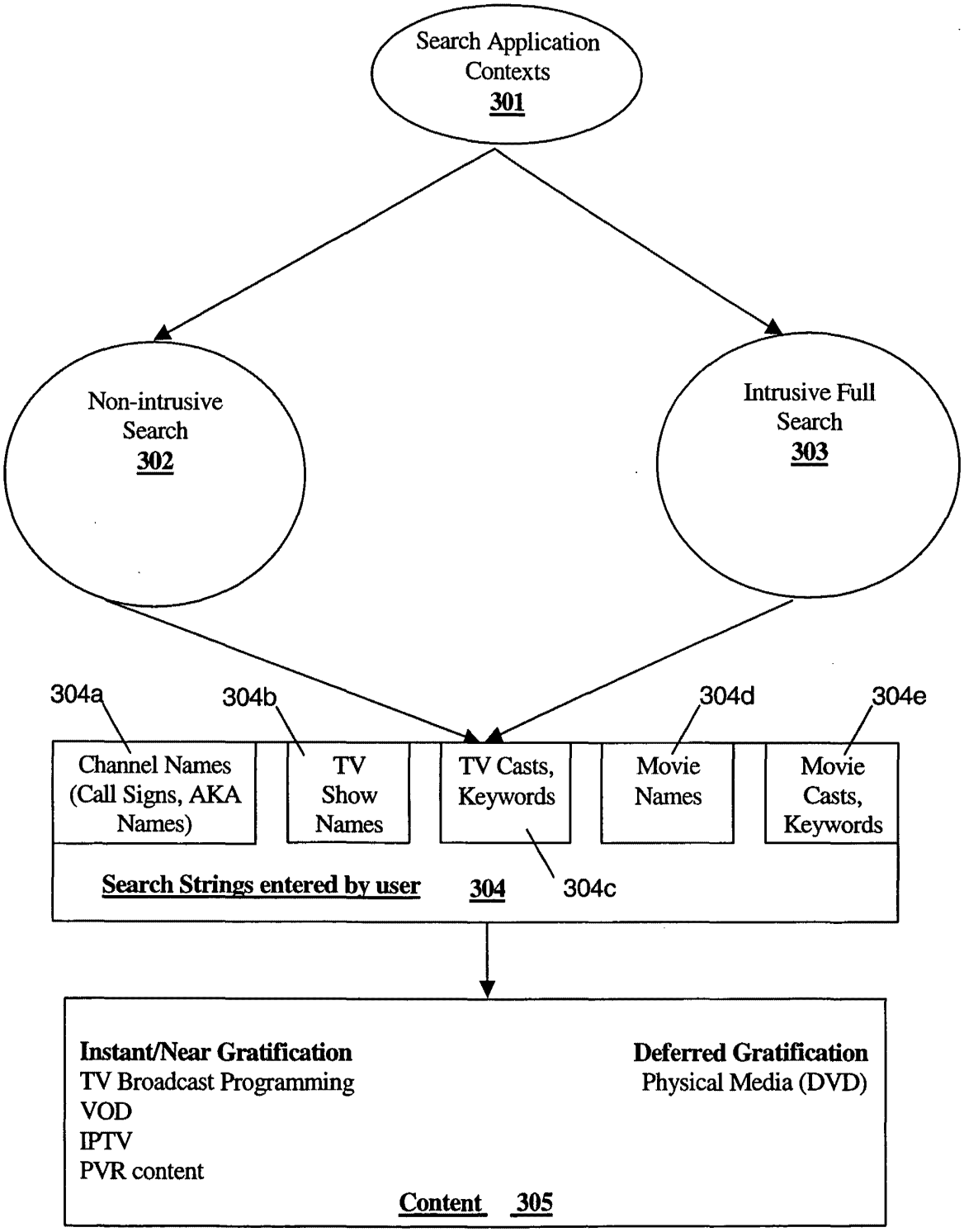
Search Application Contexts
301
Non-intrusive Search
302
Intrusive Full Search
303
304a
304b
304d
304e
Channel Names (Call Signs, AKA Names)
TV Show Names
TV Casts, Keywords
Movie Names
Movie Casts, Keywords
Search Strings entered by user
304
304c
Instant/Near Gratification
TV Broadcast Programming
VOD
IPTV
PVR content
Deferred Gratification
Physical Media (DVD)
Content
305

FIG. 3

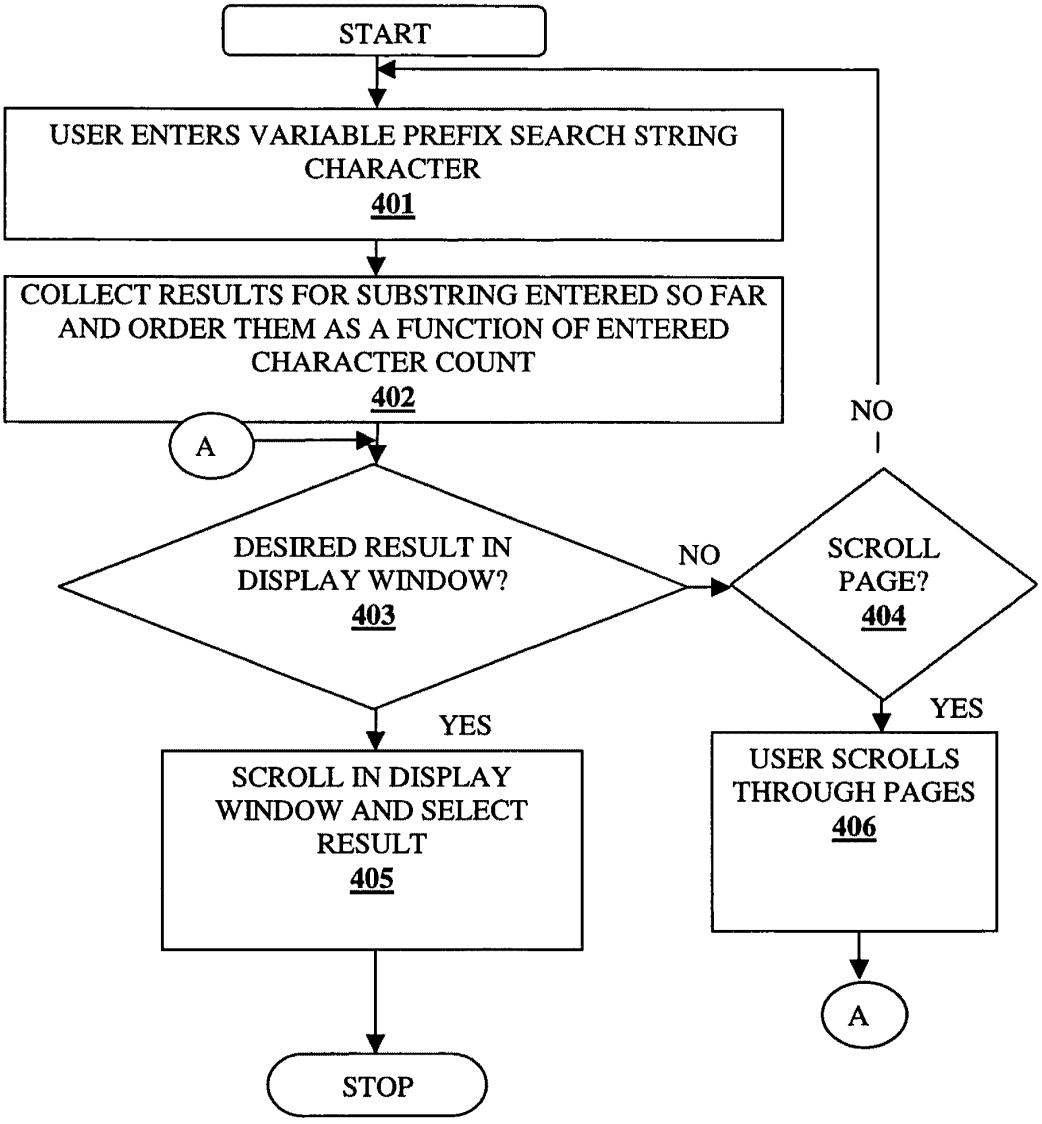
START
USER ENTERS VARIABLE PREFIX SEARCH STRING CHARACTER
401
COLLECT RESULTS FOR SUBSTRING ENTERED SO FAR AND ORDER THEM AS A FUNCTION OF ENTERED CHARACTER COUNT
402
A
DESIRED RESULT IN DISPLAY WINDOW?
403
NO
SCROLL PAGE?
404
NO
YES
YES
SCROLL IN DISPLAY WINDOW AND SELECT RESULT
405
USER SCROLLS THROUGH PAGES
406
A
STOP

FIG. 4

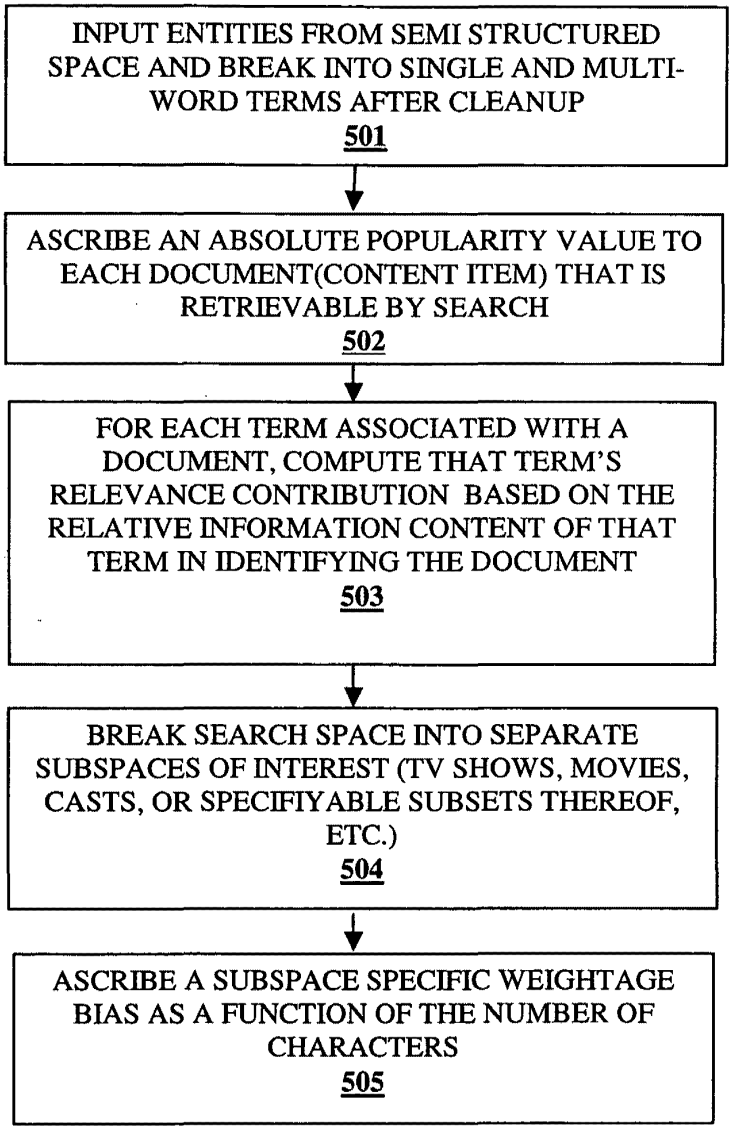
INPUT ENTITIES FROM SEMI STRUCTURED SPACE AND BREAK INTO SINGLE AND MULTI-WORD TERMS AFTER CLEANUP
501
ASCRIBE AN ABSOLUTE POPULARITY VALUE TO EACH DOCUMENT(CONTENT ITEM) THAT IS RETRIEVABLE BY SEARCH
502
FOR EACH TERM ASSOCIATED WITH A DOCUMENT, COMPUTE THAT TERM'S RELEVANCE CONTRIBUTION BASED ON THE RELATIVE INFORMATION CONTENT OF THAT TERM IN IDENTIFYING THE DOCUMENT
503
BREAK SEARCH SPACE INTO SEPARATE SUBSPACES OF INTEREST (TV SHOWS, MOVIES, CASTS, OR SPECIFIYABLE SUBSETS THEREOF, ETC.)
504
ASCRIBE A SUBSPACE SPECIFIC WEIGHTAGE BIAS AS A FUNCTION OF THE NUMBER OF CHARACTERS
505

FIG. 5

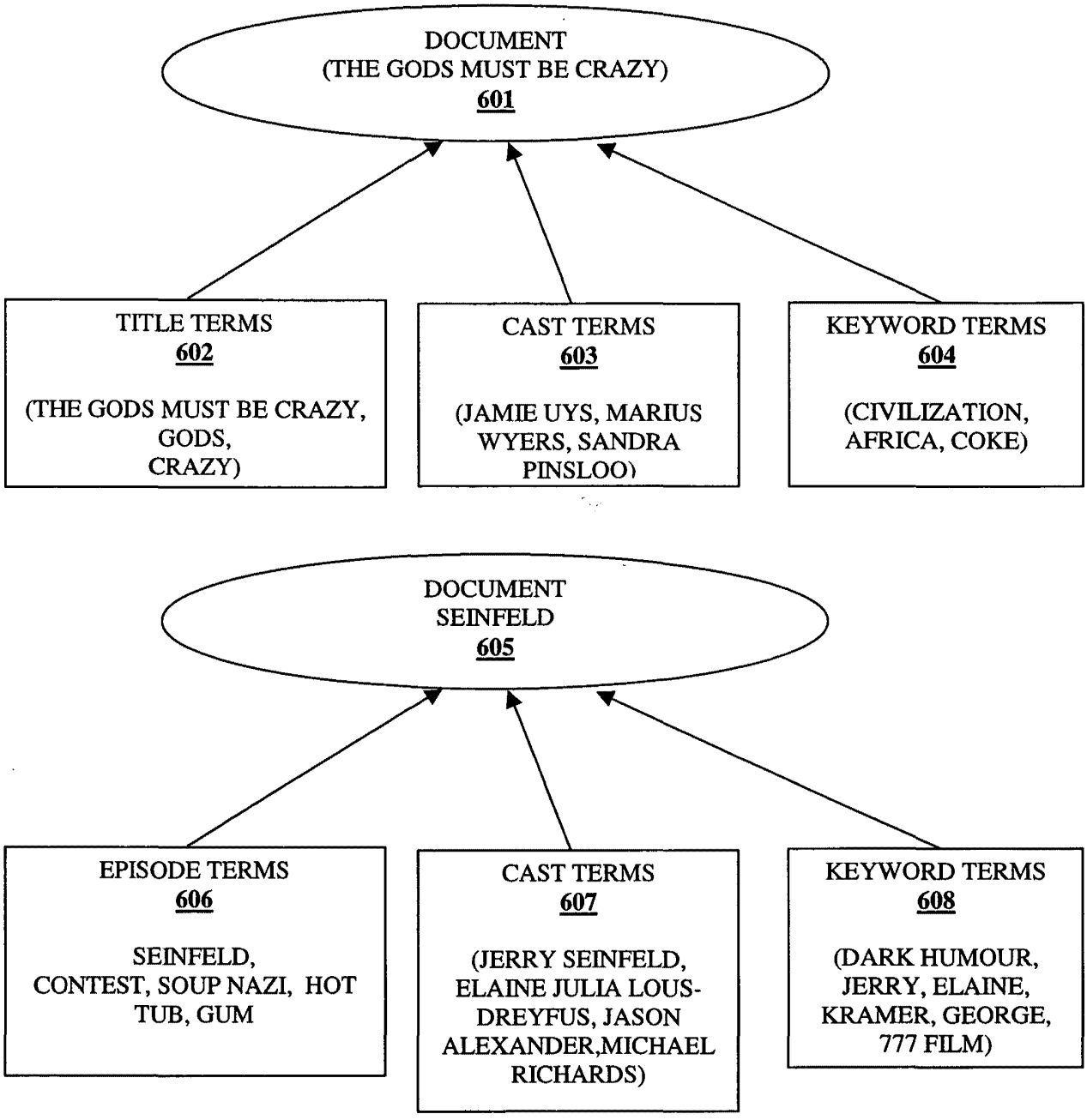
DOCUMENT
(THE GODS MUST BE CRAZY)
601
TITLE TERMS
602
(THE GODS MUST BE CRAZY, GODS, CRAZY)
CAST TERMS
603
(JAMIE UYS, MARIUS WYERS, SANDRA PINSLOO)
KEYWORD TERMS
604
(CIVILIZATION, AFRICA, COKE)
DOCUMENT
SEINFELD
605
EPISODE TERMS
606
SEINFELD, CONTEST, SOUP NAZI, HOT TUB, GUM
CAST TERMS
607
(JERRY SEINFELD, ELAINE JULIA LOUS-DREYFUS, JASON ALEXANDER,MICHAEL RICHARDS)
KEYWORD TERMS
608
(DARK HUMOUR, JERRY, ELAINE, KRAMER, GEORGE, 777 FILM)

FIG. 6A

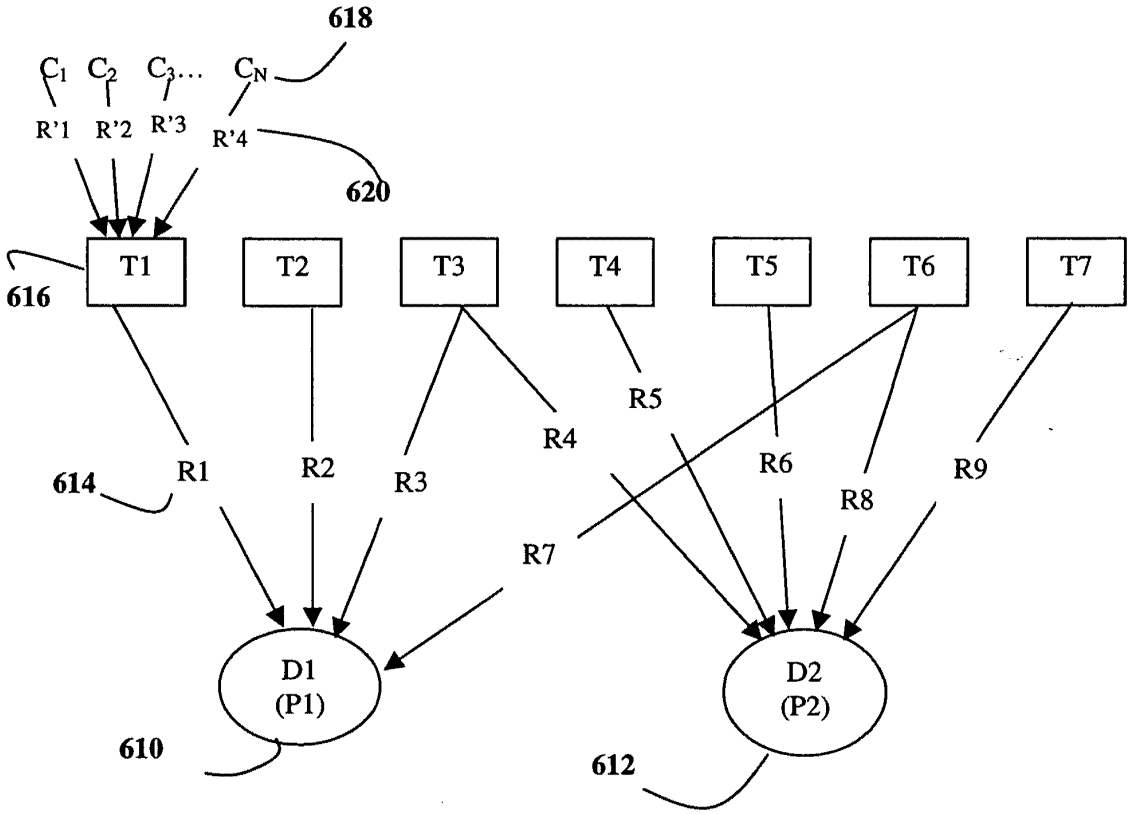
618
C1 C2 C3... CN
R'1 R'2 R'3 R'4
620
T1
T2
T3
T4
T5
T6
T7
616
R1
R2
R3
R4
R5
R6
R7
R8
R9
614
D1
(P1)
D2
(P2)
610
612

FIG. 6B

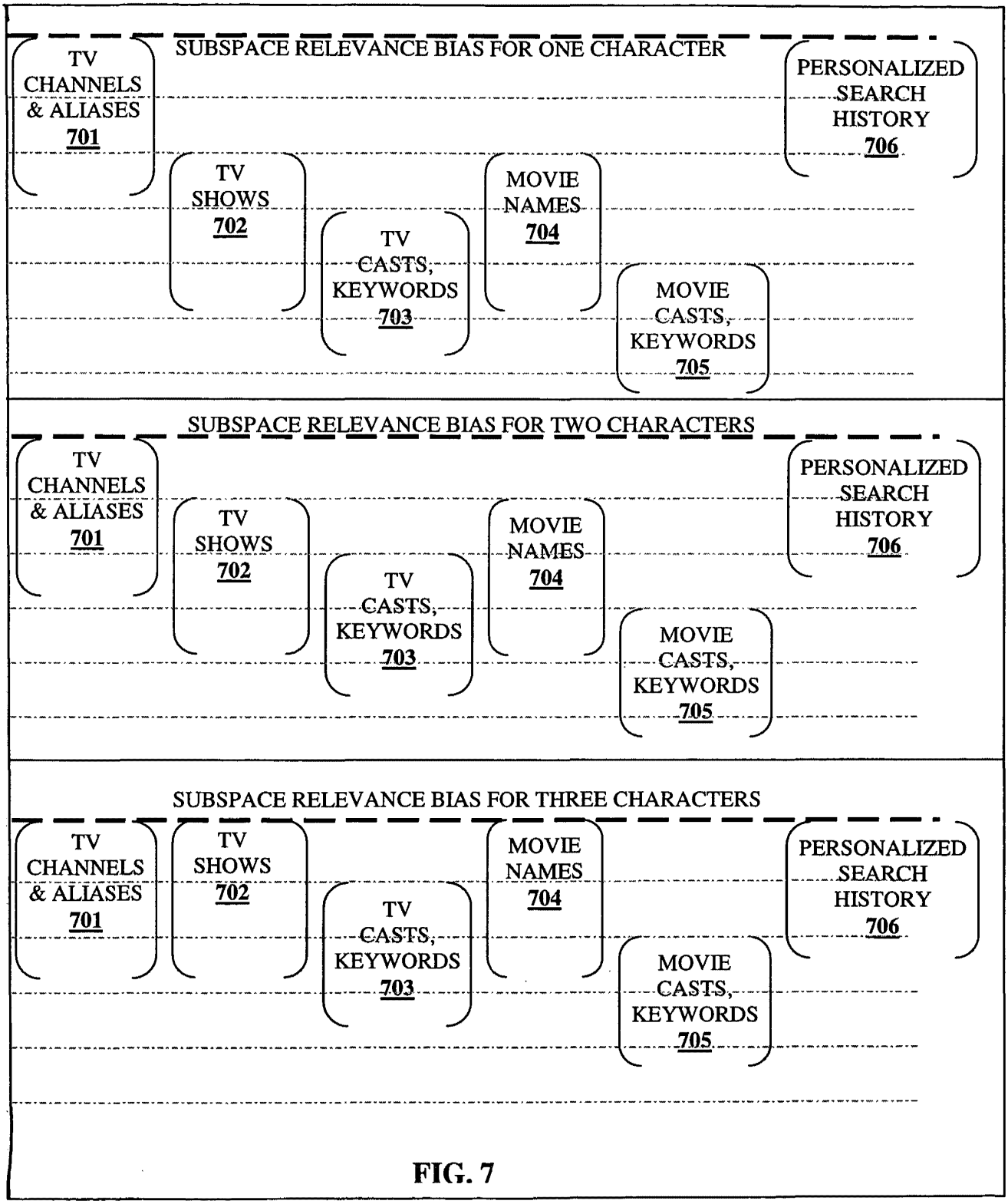
SUBSPACE RELEVANCE BIAS FOR ONE CHARACTER
TV CHANNELS & ALIASES 701
TV SHOWS 702
TV CASTS, KEYWORDS 703
MOVIE NAMES 704
MOVIE CASTS, KEYWORDS 705
PERSONALIZED SEARCH HISTORY 706
SUBSPACE RELEVANCE BIAS FOR TWO CHARACTERS
TV CHANNELS & ALIASES 701
TV SHOWS 702
TV CASTS, KEYWORDS 703
MOVIE NAMES 704
MOVIE CASTS, KEYWORDS 705
PERSONALIZED SEARCH HISTORY 706
SUBSPACE RELEVANCE BIAS FOR THREE CHARACTERS
TV CHANNELS & ALIASES 701
TV SHOWS 702
TV CASTS, KEYWORDS 703
MOVIE NAMES 704
MOVIE CASTS, KEYWORDS 705
PERSONALIZED SEARCH HISTORY 706

FIG. 7

Fig. 8A

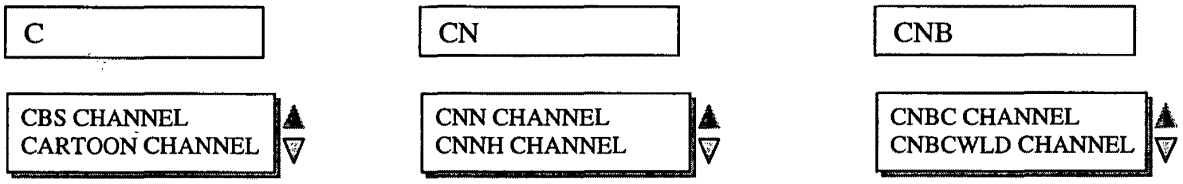

Fig. 8B

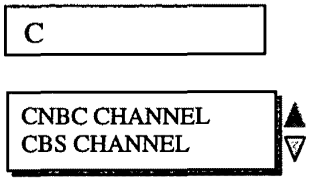

Fig. 8C

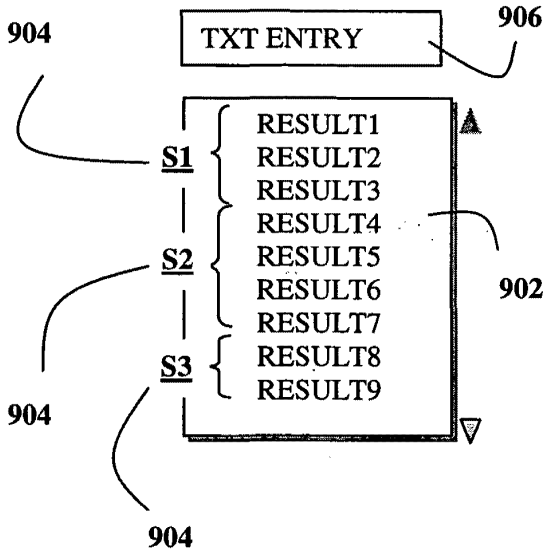
904
TXT ENTRY
906
S1
S2
S3
RESULT1
RESULT2
RESULT3
RESULT4
RESULT5
RESULT6
RESULT7
RESULT8
RESULT9
902
904
904

FIG. 9

PATENT APPLICATION SERIAL NO _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

10/13/2005 WASFAW1 00000020 080219 11246432

01 FC:2011	150.00	DA
02 FC:2111	250.00	DA
03 FC:2311	100.00	DA
04 FC:2202	325.00	DA

PTO-1556
(5/87)

U.S. Government Printing Office: 2002 — 466-247/68033

PTO/SB/06 (12-04)
Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875 Effective December 8, 2004

Application or Docket Number: 11246432

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	150.00		N/A	300.00
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	$250		N/A	$500
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	$100		N/A	$200
TOTAL CLAIMS (37 CFR 1.16(i))	33 minus 20 =	13	X$ 25 =	325	OR	X$50 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	X100 =			X200 =	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			+180=			+360=	
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	825		TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT A	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X$ 25 =		OR	X$50 =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X100 =		OR	X200 =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					+180=		OR	+360=	
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT B	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X$ 25 =		OR	X$50 =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X100 =		OR	X200 =	
Application Size Fee (37 CFR 1.16(s))									
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					+180=		OR	+360=	
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Application Data Sheet

Application Information

Application Type::	Regular
Subject Matter::	Utility
Suggested Group Art Unit::	N/A
CD-ROM or CD-R?::	None
Sequence submission?::	None
Computer Readable Form (CRF)?::	No
Title::	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT
Attorney Docket Number::	0290672.00128US2
Request for Early Publication?::	No
Request for Non-Publication?::	No
Suggested Drawing Figure::	7
Total Drawing Sheets::	10
Small Entity?::	Yes
Petition included?::	No
Secrecy Order in Parent Appl.?::	No

Applicant Information

Applicant Authority Type::	Inventor
Primary Citizenship Country::	US
Status::	Full Capacity
Given Name::	Murali
Family Name::	ARAVAMUDAN
City of Residence::	Windham

Initial 10/07/05

State or Province of Residence::	NH
Country of Residence::	US
Street of mailing address::	3 Squire Armour Road
City of mailing address::	Windham
State or Province of mailing address::	NH
Postal or Zip Code of mailing address::	03087

Applicant Authority Type::	Inventor
Primary Citizenship Country::	India
Status::	Full Capacity
Given Name::	Rakesh
Family Name::	BARVE
City of Residence::	Bangalore
Country of Residence::	India
Street of mailing address::	204 LaHacienda
	2 Papanna Street
City of mailing address::	Bangalore
Country of mailing address::	India
Postal or Zip Code of mailing address::	560001

Applicant Authority Type::	Inventor
Primary Citizenship Country::	India
Status::	Full Capacity
Given Name::	Sashikumar
Family Name::	VENKATARAMAN
City of Residence::	Bangalore
Country of Residence::	India
Street of mailing address::	#2 Bel Air
	Brookefields; Kundanahalli
City of mailing address::	Bangalore
Country of mailing address::	India

Postal or Zip Code of mailing address::	560037

Applicant Authority Type::	Inventor
Primary Citizenship Country::	US
Status::	Full Capacity
Given Name::	Ajit
Family Name::	RAJASEKHARAN
City of Residence::	West Windsor
State or Province of Residence::	NJ
Country of Residence::	US
Street of mailing address::	5 Le Parc Court
City of mailing address::	West Windsor
State or Province of mailing address::	NJ
Postal or Zip Code of mailing address::	08550

Correspondence Information

Correspondence Customer Number::	23483

Representative Information

Representative Customer Number::	23483

Domestic Priority Information

Application::	Continuity Type::	Parent Application::	Parent Filing Date::
This Application	An application claiming the benefit under 35 USC 119(e)	60/695463	06/30/05

Foreign Priority Information

Assignee Information

Assignee name::	Veveo, Inc.
Street of mailing address::	40 Shattuck Road, Suite 303
City of mailing address::	Andover
State or Province of mailing address::	MA
Postal or Zip Code of mailing address::	01810

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2

CONFIRMATION NO. 5356

23483
WILMER CUTLER PICKERING HALE AND DORR LLP
60 STATE STREET
BOSTON, MA 02109

FORMALITIES LETTER

Date Mailed: 11/07/2005

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **$65** for a Small Entity

- **$65** Surcharge.

Replies should be mailed to: Mail Stop Missing Parts
Commissioner for Patents

P.O. Box 1450
Alexandria VA 22313-1450

A copy of this notice MUST be returned with the reply.

Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 3 - OFFICE COPY

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

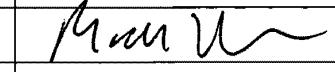
Application Number	11/246432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	2161
Examiner Name	Not Yet Assigned
Total Number of Pages in This Submission	
Attorney Docket Number	0290672.00128US2

ENCLOSURES (*Check all that apply*)

- [x] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment/Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
  - [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
  - [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):
  - Postcard
  - Part 2, Notice to File Missing Parts
  - Declaration and Power of Attorney

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	WILMER CUTLER PICKERING HALE AND DORR LLP		
Signature			
Printed name	Rajesh Vallabh		
Date	12-8-05	Reg. No.	35,761

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail, in an envelope addressed to: Mail Stop Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: 12/8/05 Signature: Marijke W. Abbes (Marijke W. Abbes)

5416376

OIPE IAP21 DEC 12 2005 PATENT & TRADEMARK OFFICE

PTO/SB/17 (12-04v2)
Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

[X] Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 65.00

Complete if Known	
Application Number	11/246432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Examiner Name	Not Yet Assigned
Art Unit	2161
Attorney Docket No.	0290672.00128US2

METHOD OF PAYMENT (check all that apply)

[ ] Check [ ] Credit Card [ ] Money Order [ ] None [ ] Other (please identify): _____

[X] Deposit Account Deposit Account Number: 08-0219 Deposit Account Name: Wilmer Cutler Pickering Hale and Dorr LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

[X] Charge fee(s) indicated below
[ ] Charge fee(s) indicated below, **except for the filing fee**
[X] Charge any additional fee(s) or underpayment of fee(s) under 37 CFR 1.16 and 1.17
[X] Credit any overpayments

FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

	FILING FEES		SEARCH FEES		EXAMINATION FEES		
Application Type	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fee ($)	Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 (including Reissues)	50	25
Each independent claim over 3 (including Reissues)	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
33	- 33 = _____	x _____	= _____

Multiple Dependent Claims	
Fee ($)	Fee Paid ($)

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
3	- 3 = _____	x _____	= _____

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
_____ - 100 =	_____ /50	_____ (round up to a whole number) x	_____	= _____

4. OTHER FEE(S)

	Fees Paid ($)
Non-English Specification, $130 fee (no small entity discount)	
Other (e.g., late filing surcharge): 2051 Surcharge-Late oath or declaration	65.00

SUBMITTED BY

Signature	Rajesh Vallabh	Registration No. (Attorney/Agent)	35,761	Telephone	(617) 526-6000
Name (Print/Type)	Rajesh Vallabh			Date	12-8-05

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail, in an envelope addressed to: Mail Stop Missing Parts, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: 12/8/05 Signature: Marijke W. Abbes (Marijke W. Abbes)

5416374

OIPE IAP21 DEC 12 2005

IFW

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371 (c) DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2

CONFIRMATION NO. 5356

23483
WILMER CUTLER PICKERING HALE AND DORR LLP
60 STATE STREET
BOSTON, MA 02109

FORMALITIES LETTER

Date Mailed: 11/07/2005

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

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- The oath or declaration is missing. *A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.*
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

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- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $65 for a small entity in compliance with 37 CFR 1.27, must be submitted with the missing items identified in this letter.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **$65** for a Small Entity

- **$65** Surcharge.

Replies should be mailed to: Mail Stop Missing Parts
Commissioner for Patents

12/13/2005 EAYALEW1 00000023 080219 11246432
01 FC:2051 65.00 DA

P.O. Box 1450
Alexandria VA 22313-1450

A copy of this notice MUST be returned with the reply.

Office of Initial Patent Examination (571) 272-4000, or 1-800-PTO-9199, or 1-800-972-6382
PART 2 - COPY TO BE RETURNED WITH RESPONSE

OIPE IAP21 DEC 19 2005 PATENT & TRADEMARK OFFICE

DECLARATION AND POWER OF ATTORNEY
(Attorney Docket No. 290672.128 US2)

As below-named inventors, we hereby declare that:

Our residences, post office addresses and citizenship are as stated below our names.
We believe that we are the original and first inventors of the subject matter, which is claimed and for which a patent is sought on the invention entitled:

Method and System for Incremental Search with Reduced Text Entry Where the Relevance of Results is a Dynamically Computed Function of User Input Search String Character Count

the specification of which (check only one):

[ ] is attached hereto.

[X] was filed as United States Patent Application
Application No. 11/246,432
on October 7, 2005
and was amended
on _____
(if applicable)

[ ] was filed as PCT Patent Application
Serial No. _____
on _____
and was amended under PCT Article 19
on _____
(if applicable)

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

We acknowledge the duty to disclose information, which is material to the patentability of the claims of this application in accordance with Title 37 CFR §1.56(a) and §1.56(b). We also acknowledge the duty to disclose all information which is material to the patentability as defined in 37 CFR §1.56, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

We 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(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by us on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. §119(a)-(d) or 365(b):

COUNTRY (if PCT indicate PCT)	APPLICATION NUMBER	DATE OF FILING	PRIORITY CLAIMED UNDER 35 U.S.C. §119(a)-(b) or 365(b) (YES/NO)

We hereby claim the benefit under 35 U.S.C. §119(e) of any United States provisional patent application(s) listed below:

APPLICATION NUMBER	DATE OF FILING	STATUS: (PENDING OR ABANDONED)
60/695,463	June 30, 2005	Pending

We 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(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, we acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56 which occurred between the filing date of the prior applications and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATION OR PCT INTERNATIONAL APPLICATION(S) DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. § 120 or 365(c):

APPLICATION NUMBER	DATE OF FILING (month, day, year)	STATUS: (PATENTED, PENDING OR ABANDONED)

POWER OF ATTORNEY: As the named inventors, we hereby appoint the attorney(s) and/or agents associated with Wilmer Cutler Pickering Hale and Dorr LLP, 60 State Street, Boston, Massachusetts 02109, Customer No. 23483, to prosecute the above-identified application and transact all business in the Patent and Trademark Office connected therewith.

Wherefore we petition that letters patent be granted to us for the invention or discovery described and claimed in the attached specification and claims, and hereby subscribe our names to said specification and claims and to the foregoing declaration, power of attorney, and this petition.

We hereby declare that all statements made herein of our 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.

Full name of first inventor: **Murali Aravamudan**

Inventor's signature _____ Date 12/1/05

Country of Citizenship: United States of America

Residence/Post Office Address: 3 Squire Armour Road, Windham New Hampshire 03087, USA

Full name of second inventor: **Rakesh D. Barve**

Inventor's signature _____ Date 25-11-2005

Country of Citizenship: India

Residence/Post Office Address: 204 LaHacienda, 2 Papanna St., Bangalore 560001, India

Full name of third inventor: **Sashikumar Venkataraman**

Inventor's signature _____ Date 28-11-2005

Country of Citizenship: India

Residence/Post Office Address: #2 Bel Air, Brookefields, Kundanahalli, Bangalore 560037 India

Full name of fourth inventor: **Ajit Rajasekharan**

Inventor's signature _____ Date 11/30/05

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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	11/246432-Conf. #5356
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First Named Inventor	Murali ARAVAMUDAN
Art Unit	2161
Examiner Name	Not Yet Assigned
Total Number of Pages in This Submission	
Attorney Docket Number	0290672.00128US2

ENCLOSURES (*Check all that apply*)

- [ ] Fee Transmittal Form
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- [ ] Amendment/Reply
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  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
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- [x] Information Disclosure Statement
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- [x] Other Enclosure(s) (please identify below):
  - 1 foreign patent publication
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OIPE IAP64 JAN 17 2006 PATENT & TRADEMARK OFFICE

Docket No.: 0290672.00128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Murali ARAVAMUDAN et al.

Application No.: 11/246432

Confirmation No.: 5356

Filed: October 7, 2005

Art Unit: 2161

For: METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

Commissioner for Patents
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Dear Sir:

This Information Disclosure Statement is being filed prior to the mailing date of a first Office Action on the merits. No fee is required.

Applicants request that the Examiner initial and return a copy of the enclosed Form PTO SB-08 with the next communication.

Dated: 1-13-06

Respectfully submitted,

By _____
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Filing Date	October 7, 2005
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Art Unit	2161
Examiner Name	Not Yet Assigned
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Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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	AT1*	US-2002/0042791-A1	04-11-2002	Smith et al.	

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Examiner Initials*	Cite No.[1]	Foreign Patent Document: Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
	BA	WO-2004/031931-A1	04-15-2004	Nokia Corporation		√

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	CA	PRESS RELEASE FROM TEGIC COMMUNICATIONS, TEGIC COMMUNICATIONS IS AWARDED PATENT FOR JAPANESE T9(R) TEXT INPUT SOFTWARE FROM THE JAPAN PATENT OFFICE, OCTOBER 12, 2004. RETRIEVED NOVEMBER 18, 2005 FROM HTTP://WWW.TEGIC.COM/PRESS_VIEW.HTML?RELEASE_NUM=55254242	
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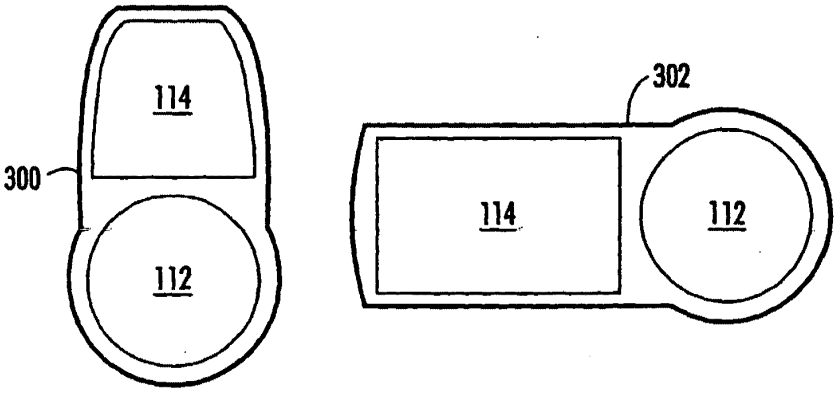
[Continued on next page]

(54) Title: METHOD AND USER INTERFACE FOR ENTERING TEXT



(57) Abstract: The invention relates to a method for entering text at a user interface for an electronic device, and to a text entry user interface for an electronic device. The text entry user interface comprises a display (114) for displaying characters and entered text, an input device (112) for issuing commands to browse and select characters, and a processing unit (104) for controlling the operation of the user interface. The processing unit is connected to the display and configured to display characters on the display. The processing unit is further connected to the input device and configured to receive, from the input device, commands to browse and select characters. The processing unit is further configured to generate, for browsing, a character subset made up of characters to be browsed, the character subset including the characters of a character set from among which, according to an inference logic configured into the processing unit, the next character for the text is most probably selected, and display the character subset on the display for browsing the characters and for selecting the next character by using the input device.

WO 2004/031931 A1

FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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METHOD AND USER INTERFACE FOR ENTERING TEXT

FIELD

The invention relates to a method for entering text at a user interface for an electronic device, and to a text entry user interface for an electronic device.

BACKGROUND

Electronic devices, for instance subscriber terminals in a radio system, such as mobile telephones, are becoming smaller and smaller. At some point the keyboard of a device, for instance a 12-button character keyboard used in mobile telephones, will become useless since it becomes too difficult for a user to press buttons that are extremely small. It is thus the keyboard that becomes the limiting factor which starts to restrict the design of mobile telephones. If the keyboard could be replaced by another input device, it would be possible to manufacture mobile telephones of a considerably smaller size, even of miniature sizes.

A character keyboard can be replaced by various input devices. Nokia® 7110 mobile telephone, for example, employs a roller wherein the mobile telephone can be given different commands by rotating and pressing the roller.

A special problem with the use of an electronic device is the process of entering text. For instance, in ordinary mobile telephones employing a character keyboard, each button in the keyboard relates to several letters. A single button may, for instance, relate to the letters *a*, *b* and *c*. Pressing the button once produces the letter *a*, pressing the button twice within a short period of time produces the letter *b*, and pressing the button three times within a short period of time produces the letter *c*. Pressing the button twice slightly more slowly produces two *a*'s. It is rather slow to use a keyboard in such a manner; therefore, various methods for entering text which employ a character keyboard have been developed; an example of such a method wherein an object is to identify a word entered by a user being disclosed in US Patent 5,818,437 (Tegic Communications), which is incorporated herein by reference.

An object of the invention disclosed by the present applicant is, however, to replace the character keyboard by another input device, which means that these prior art solutions cannot be used, at least not as such.

Some mobile telephones employ a solution wherein a user may browse a character string which includes the entire character set of the device, for instance in an alphabetical order, the characters then being selected one by one from this character string. The solution is rather slow, so different solutions have been provided thereto in publication Mobile Text Entry Using Three Keys by I. Scott MacKenzie, Proceedings of the Second Nordic Conference on Human Computer Interaction, NordiCHI 2002. In the solutions of the publication, a character string containing an entire character set is arranged in an order other than an alphabetical one in order to accelerate the process of entering text.

BRIEF DESCRIPTION

An object of the invention is to provide an improved method for entering text at a user interface for an electronic device, and an improved text entry user interface for an electronic device.

An aspect of the invention presents a method for entering text at a user interface for an electronic device, comprising: browsing characters on a display; and selecting one of the browsed characters for the text. The method further comprises: generating, for browsing, a character subset made up of characters to be browsed, the character subset including the characters of a character set from among which, according to a predetermined inference logic, the next character for the text is most probably selected; and displaying the character subset on the display for browsing the characters and for selecting the next character.

An aspect of the invention presents a text entry user interface for an electronic device, comprising: a display for displaying characters and entered text; an input device for issuing commands to browse and select characters; and a processing unit for controlling the operation of the user interface, the processing unit being connected to the display and configured to display characters on the display, the processing unit being further connected to the input device and configured to receive, from the input device, commands to browse and select characters. The processing unit is further configured to: generate, for browsing, a character subset made up of characters to be browsed, the character subset including the characters of a character set from among which, according to an inference logic configured into the processing unit, the next character for the text is most probably selected; and display the character sub-

set on the display for browsing the characters and for selecting the next character by using the input device.

Preferred embodiments of the invention are disclosed in the dependent claims.

The idea underlying the invention is that when an input device other than a character keyboard is used, text input must be enhanced one way or another. The procedure disclosed herein is based on using character subsets. After each entered character, a new character subset is generated applying a predetermined inference logic. Actually, the aim is thus not to predict an entire word but to try to guess the character the user most probably wishes to enter next.

The method and text entry user interface of the invention provide several advantages. The invention enables small electronic devices to be designed and manufactured, for instance when the keyboard is the limiting factor which prevents the sizes of the devices from being reduced. The use of a small input device enables an extremely good efficiency/size ratio to be achieved. The user interface is simple and intuitive and, in addition, designed for use with one hand.

LIST OF DRAWINGS

The preferred embodiments of the invention will be described below by way of example and with reference to the accompanying drawings, in which

Figure 1 is a simplified block diagram illustrating the structure of an electronic device;

Figures 2A to 2C show examples of different input devices;

Figure 3 illustrates the implementation of an input device in an electronic device;

Figures 4A to 4E provide a sequence to illustrate how text is entered;

Figures 5A to 5E provide a sequence to illustrate browsing from a character subset to a character set;

Figure 6 illustrates the layout of a display;

Figure 7 illustrates the implementation of a stored main vocabulary having the form of a tree;

Figure 8 is a flow diagram illustrating a method for entering text at a user interface for an electronic device;

Figures 9A to 9E provide a sequence to illustrate a process for inputting an entry; and

Figure 10 illustrates a character subset and a character set.

DESCRIPTION OF EMBODIMENTS

Referring to Figure 1, an example is described of the structure of an electronic device. The device may be e.g. a portable device relating to Ubiquitous Computing, e.g. a subscriber terminal in a radio system, such as a mobile telephone system, a PDA (Personal Digital Assistant) device or another electronic device equipped with a text entry user interface. In our example of Figure 1, the device is a subscriber terminal in a radio system. The example used being a subscriber terminal, the device comprises an antenna 100 and a radio transceiver 102. The radio transceiver 102 is e.g. a prior art transceiver for a mobile station, operating e.g. in a GSM (Global System for Mobile Communications) system, GPRS (General Packet Radio Service) system or in a UMTS (Universal Mobile Telecommunications System).

A rechargeable battery 106 usually serves as the power source for a subscriber terminal. The device further comprises a processing unit 104 to control and monitor the operation of the device and different parts thereof. The processing unit 104 further includes application software of the device, e.g. for radio signal processing, information processing and for controlling the operation of a user interface. The device thus comprises a memory in connection with the processing unit 104 for storing information. The memory can be implemented by known methods for implementing a non-volatile memory, e.g. as memory circuits and possibly as a small hard disk. Today, a processing unit 104 is usually implemented as a processor including its software, but different hardware configurations are also possible, e.g. a circuit built using separate logic components or one or more ASIC's (Application-Specific Integrated Circuit). If necessary, more than one processor may also be provided. A hybrid of these different implementation methods is also feasible. While selecting the mode of implementation, a person skilled in the art takes into account the requirements set for the size and power consumption of the device, the necessary processing capacity, manufacturing costs as well as manufacturing volumes.

The configuration of the processing unit 104 constitutes structural entities that can be implemented using a programming language, e.g. C pro-

gramming language, C++ programming language, a machine language, or as software modules, also known as routines, encoded by an assembler. Compiled routines constitute software to be stored as a runnable version in a memory provided in connection with the processor and to be run by the processor. Instead of compiled programming languages, interpretable programming languages may also naturally be used, provided that their use fulfils the required processing rate and capacity. When the processing unit 104 is implemented as ASIC, the routines are ASIC blocks.

The subscriber terminal further includes, connected to the processing unit 104, components implementing the user interface: a microphone 110 and a loudspeaker 108 for processing voice, a display 114 for displaying information, and an input device 112 for controlling the device, for entering information and for issuing commands to process information.

The text entry user interface of the device is thus made up of the display 114 to display the characters and the entered text, the input device 112 to issue commands to browse and select the characters, and the processing unit 104 to control the operation of the user interface. The input device 112 for issuing commands to browse and select the characters is a pointing device other than a character keyboard. Typical examples of such pointing devices 112 include:

- arrow buttons wherein browse commands are issued by pressing the arrow buttons;
- a selection button wherein select commands are issued by pressing the selection button;
- a joystick wherein browse and/or select commands are issued by moving the joystick;
- a trackball wherein browse commands and/or select commands are issued by rotating the trackball, and/or wherein select commands are issued by pressing the trackball;
- a touch pad wherein browse commands and/or select commands are issued by touching the touch pad.

Figure 2A shows a roller 112 wherein browse commands can be issued by rotating the roller around its axis. The roller can be rotated in both directions 200, 202. The roller 112 may also be provided with a function of issuing select commands such that select commands may be issued by pressing the roller 112 in a direction 204. Nokia® 7110 mobile telephone, for example,

employs such a three-way roller. The roller may also be implemented in a manner depicted in Figure 2B wherein the roller is a five-way roller, i.e. in addition to the functions of the three-way roller, the roller 112 can also be moved in lateral directions 206 and 208.

Figure 2C describes a disc 112 wherein browse commands may be issued by rotating the disc 112 coplanarly clockwise 212 and anti-clockwise 210. Furthermore, it is possible to issue select commands by pressing the disc 112. Figure 2C only shows one pressing direction 214 but the disc 112 may also be provided with such features that presses at different points of the disc 112 can be separated from each other, in which case many different commands may be issued by pressing the disc 112. Figure 3 describes an electronic device 300 to be used in a vertical direction, usually with one hand, in which case the display 114 and the disc are located one on top of the other. Furthermore, Figure 3 shows a second electronic device 302 to be used in a horizontal position, usually with both hands, in which case the display 114 and the disc 112 are located side by side. An electronic device may also be a device to be used both in a vertical position and in a horizontal position. In such a case, the electronic device is provided with a select command to select the direction in which the device is to be used. The direction of the text to be displayed on the display 114 is determined according to the select command; similarly, the rotating directions and pressing points of the disc 112 may vary, depending on the position in which the device is used.

The processing unit 104 is connected to the display 114 and configured to display characters on the display 114. The processing unit 104 is also connected to the input device 112 and configured to receive, from the input device 112, commands to browse and select the characters. Furthermore, the processing unit 104 is configured to generate, for browsing, a character subset ~~made up of characters to be browsed, the character subset including the characters~~ of a character set from among which, according to an inference logic configured into the processing unit 104, the next character for the text is most probably selected, and to display the character subset on the display 114 for browsing the characters and for selecting the next character by using the input device 112.

Next, let us examine different inference logics.

In an embodiment, the inference logic comprises a first routine for identifying a start of an entry of a new word, and a second routine for inserting,

into the character subset, the most frequent word-starting letters of the language used in the text. This embodiment is described in Figure 4A, according to which it has first been identified that a user wishes to start entering a new word. An entry of a new word is identified either by the user simply starting to enter text in the first place or by a previous character in the text being a space character, in which case it can be assumed that an entry of a new word will follow next. After the identification, a character subset 400 is displayed on the display 114, the character subset 400 in our example containing the five most frequent word-starting letters of the English language: T, A, O, I and W. The display 114 thus includes two areas: an area 400 for displaying a character subset and an area 404 for displaying entered text, a cursor 406 showing the place within the area 404 where the character to be entered next is to be placed.

Figure 4A further illustrates an embodiment wherein the processing unit 104 is configured to display a selection pointer 402 on the display 114, the character (i.e. T) at the selection pointer 402 being selected by a select command, and to display the character subset such that prior to receiving the select command, the character of the character subset which most probably becomes selected resides at the selection pointer 402.

Still referring to Figure 4A, it can be seen that the processing unit 104 is configured to display the character subset 400 as a character string. Tests conducted by the applicant suggest that preferably the character subset 400 includes three to six characters. As far as usability is concerned, it seems that a suitable compromise might be a character subset 400 which includes five characters since predicting becomes less successful using less than five characters but, on the other hand, more than five characters increase the visual search time for the user because not all characters can necessarily be seen at one time without moving the eyes and, furthermore, as the number of characters increases, the cognitive load increases as well. In our example, the letters of the character subset 400 have been arranged such that the most frequent letter T resides in the middle, and immediately at both sides of the most frequent letter are provided the next frequent letters A and O, I and W being the outermost letters. This enables the need to browse the characters to be minimized.

In an embodiment, the inference logic comprises a third routine for identifying, in the text being entered, letters relating to the word being entered,

a fourth routine for identifying candidate words appropriate for the word being entered by using a stored main vocabulary of the language used, and a fifth routine for selecting, for the character subset 400, a character from each candidate word to be possibly entered next. A main vocabulary herein refers to a dictionary containing the most frequent words of the language used. Such a main vocabulary can be generated on the basis of a frequency list based on the frequency of words.

In the embodiment illustrated in Figure 7, the words in the main vocabulary are arranged in the form of a tree such that a root 700 of the tree consists of a beginning of a word, the root being connected to nodes representing single characters on a next level 702, 704, 706, 708, 710 such that on each level, potential letters are, in order of frequency, connected to a node on a previous level whereby, as the process proceeds from the root of the tree through the nodes to a node on the last level, the characters in the nodes combine to form a word in the main vocabulary. Figure 7 only illustrates a small part of the tree, i.e. the part which, using letters encircled in boxes, forms the word TODAY. The axis on the right-hand side of Figure 7 describes frequency, i.e. on each level the letters are arranged in order of frequency such that the most frequent letter is the uppermost letter. The uppermost character on level 706 is a space character, i.e. the path leading thereto results in the word TO. In can also be seen in Figure 7 that in the tree containing 9025 words used as an example herein, no alternatives are provided after the characters TOD but it is already known then that the user is probably entering the word TODAY.

Examine the sequence provided by Figures 4A to 4E in connection with Figure 7, wherein the user is first in Figure 4A shown the most frequent word-starting letters, i.e. the letters of the first level 702, as a character subset 400 WOTAI, from among which the user selects the letter T.

Next, in Figure 4B, the user is shown the letters of the second level 704 as a character subset 400 AEHOR. The user moves a selection pointer 402 one character down and selects the letter O.

In Figure 4C, the letters of the third level 706 are then shown as a character subset 400 DW OG. The processing unit 104 then receives browse commands by means of which the selection pointer 402 is moved on the display 114 to be the uppermost one in the character subset 400, i.e. at the letter D. Next, the processing unit 104 receives a select command, whereby the let-

ter D at the selection pointer 402 is selected for the text being entered, i.e. it is added to the text 406 being entered, which is being displayed on the display 114, at the pointer.

In accordance with Figure 7, only one letter, the letter A, exists on the fourth level 708. According to Figure 4D, this is displayed at the selection pointer 402. Figure 4D also illustrates an embodiment according to which the inference logic comprises a sixth routine for generating a character combination by using at least one character already used and a character to be possibly entered next, a seventh routine for checking the probabilities of different character combinations from a databank containing the probabilities of the different character combinations for the language used, and an eighth routine for selecting, for the character subset, a character from each most probable character combination to be possibly entered next. At its simplest, as far as only the alphabet of the English language is concerned, ignoring other characters, such as numbers or special characters, letter-pair frequencies, i.e. digraph frequencies, may be generated. The letter-pair frequencies can be presented as a two-dimensional table wherein the letters (27 letters including the space character in the English language, 30 letters in the Finnish language, for instance) are arranged on the vertical and horizontal axes while the cells of the table are provided with the frequency of each particular letter-pair. Since the previously entered letter was the letter D, it is possible to check the most frequent letter-pairs having the letter D as the first letter from the table: these letter-pairs are DE, DI and DO. The second letters of these letter-pairs are, in accordance with Figure 4D, shown in the character subset 400, which thus consists of OEA I. The space character being a frequent character, in our example it has been positioned to be the most frequent alternative in the character subset 400 after the letter A before the second letters in the letter-pairs, i.e. before the letters E, I and O. In our example, from among the character subset 400 of Figure 4D, the user selects the letter A residing at the selection pointer 402.

In accordance with Figure 7, only one letter, the letter Y, remains on the fifth level 710 as well. In addition, according to Figure 4E, a space character is again provided in the character subset 400, as well as the second letters of the most frequent letter-pairs AN, AT and AR starting with the letter A that was entered previously, i.e. the character subset 400 to be shown is thus

RNY T. In our example, the user selects the letter Y from among the character subset of Figure 4E, which is then added to the entered character string 406 at the cursor. Since next, using the main vocabulary, the entered word can be identified as TODAY and, next, the user may be shown IE OS as the character subset wherein the character in the middle is thus a space character while the four other characters are obtained from the letter-pair frequencies. It is thus easy for the user to select the space character. Next, the display 114 of Figure 4A may be shown and an entry of a new word may begin.

Figure 6 illustrates some possibilities of enhancing the layout of the display already shown in connection with Figures 4A to 4E. The display 114 thus contains the area 400 displaying a character subset, the selection pointer 402 as well as the area 404 displaying the text being entered, including the cursor 406. In addition, the display 114 may, according to Figure 6, show a command bar 600 to display commands that are possible in a current state of the device. For example, if the display 114 according to Figure 6 were placed in the device 300 described in Figure 3, the operational logic could be slightly different, for instance such that the command bar 600 could show three commands 602, 604, 606 that are possible upon entering text. The first command 602 is for removing the character that was entered last, the second command 604 is for selecting the character located at the selection pointer 402, and the third command 606 is for implementing a word complete function. The word complete function can be implemented e.g. such that if, on the basis of characters already entered, only one word for which the characters are appropriate remains in the main vocabulary, the entire identified word will be shown on the display 114 by selecting the third command 606. For example, when in our example the word TODAY was being entered, according to Figure 7, it can be inferred on the fourth level 708 that after the user has entered the letters TOD, he or is she probably has the word TODAY in mind, the word being shown on the display 114 by the third command 606. When the disc 112 of Figure 3 is used, different commands can be implemented e.g. such that pressing the left-hand side of the disc 112 results in selecting the first command 602, pressing the middle of the disc 112 results in selecting the second command 604, and pressing the right-hand side of the disc 112 results in selecting the third command 606. The number of commands shown in the command bar 600 may vary, depending on whether the device is used in the vertical or in the horizontal position, as shown in Figure 3. In the examples, the character subset 400

has been described as a character string made up of characters located on top of each other. A character string may also be generated using horizontal characters adjacent to each other (in which case the character subset looks like the one in a window 1110 to be described below in Figure 10). The manner of representation of the character string may also vary depending on the position in which the device is used. The described method for entering text using a character subset may be an optional function of an electronic device which can be switched on/off e.g. by using an appropriate command in the command bar 600 or another selection mechanism enabled by a user interface for an electronic device.

In an embodiment, the processing unit 104 is configured such that in order to browse the characters on the display 114, the character subset is interlinked with the character set such that upon browsing past the character subset, the browsing of the character set begins. This embodiment will be described next with reference to the sequence provided by Figures 5A to 5E illustrating browsing from the character subset to the character set. As described above, Figure 5A first shows a character subset 400 consisting of WOTAI.

The relation between a character subset 1000 and a character set 1002 is described in Figure 10. All characters can be considered to form one long character string which is interlinked such that upon browsing past the end of the character subset, the process moves to the beginning of the character set; similarly, the interlinking may also operate such that upon browsing past the beginning of the character string, the process moves to the end of the character string. A character string made up of all characters thus constitutes a loop. In one long character string, the window 1110 is, in a manner of speaking, moved, and the contents of the window 1110 are displayed within the area 400 of the display 114. A character string thus includes a dynamic character subset 1000 and a static character set 1002 interlinked therewith. In our example, the character set 1002 is made up of letters 1004, numbers 1006 and the most frequent punctuation marks 1008. The composition of the character set 1002 may naturally vary depending on the application the process of entering text relates to. Commands can be associated with one long character string as well, in which case the user may select a command, e.g. removal of the previously entered character, by browsing onto the desired command in the long character string and by executing the selection.

In the example of Figure 5, the user does not, however, wish to enter a word starting with the characters of the character subset 400. Therefore, he or she starts browsing downwards, i.e. according to Figure 5B, the selection pointer has been moved at the letter I of the character subset. As the user browses further, the display starts scrolling up, in which case according to Figure 5C, only three last characters TAI of the character subset remain to be seen, followed by characters of the character set, the first being the space character followed by the letter A. According to Figure 5D, the scrolling continues until only the letter I from the character subset is shown on the display and, in addition to the space character, the letters A, B and C are shown from the character set; this situation is described in Figure 10 by the window 1110. The user gives a select command using the input device 112, whereby the letter C at the selection pointer 402 is, according to Figure 5E, conveyed into the area 404 displaying the entered text. In accordance with Figure 5E, the character subset 400 is then displayed, the character subset 400 consisting of the letters E, H, A, O and L and being generated on the basis of the previously entered character, i.e. the letter C.

In an embodiment, the processing unit 104 is configured to display the interlinked character subset and character set on the display 114 in visually different manners. Visuality can be implemented e.g. such that the character subset is displayed using a first colour while the character set is displayed using a second colour. Different background colours may also be used. If no colours are available, or it is not desirable to use them, visuality may also be implemented in other ways by using e.g. different fonts: character subset characters may be bold and character set characters may be normal.

In order to enhance usability, the control may by default be determined to reside within the area 400 displaying the character subset. Thus, even though the selection pointer 402 were moved into the area of the character set, it would automatically return to the area 400 displaying the character subset after a character has been selected or after the character entered last has been removed. The selection pointer 402 may then also be moved to its default location.

In addition to entering words of a language, the procedure disclosed above can also be used for processing databases such that an entry in a database is entered by using the described method. A database may be e.g. a telephone book stored in the memory of a subscriber terminal. For example,

the existing mobile telephones allow for over a thousand names and telephone numbers to be stored in their telephone books. A database may also be another database in need of a high-speed search mechanism. Examples of such databases include: databases used by navigation systems, wherein a destination has to be found out from among numerous places, street addresses, etc., as well as databases used in mobile e-commerce.

Next, referring to the sequence provided by Figures 9A to 9E, a process will be described for inputting an entry in order to process a database, i.e. in this case a telephone book. In our example, a name *Pirskanen Hannu* stored in the telephone book is searched for. Such a database may be stored e.g. in the form of a table in the memory located in connection with the processing unit 104. Different indexing techniques may also be needed to make the search fast enough. It is to be noted that the database to be processed does not, however, necessarily have to reside at the subscriber terminal but it may also reside e.g. in a network part of the mobile telephone system or at a server communicating with the network part.

In an embodiment, the inference logic comprises a ninth routine for identifying a start of an entry of a new word, and a tenth routine for inserting, into the character subset, the most frequent letters in a stored database starting an entry. This is described in Figure 9A wherein a character subset 400 containing the character string HKLPS is displayed on the display 114. As distinct from what has been disclosed above, the letters of the character subset 400 have been arranged in an alphabetical order and the selection pointer 402 resides at the first letter.

In an embodiment, the inference logic comprises an eleventh routine for identifying, in the text being entered, letters relating to the word being entered, a twelfth routine for identifying entries in the stored database that are appropriate for the word being entered, and a thirteenth routine for selecting, for the character subset, a character from each entry to be possibly entered next. According to Figure 9A, in an embodiment, the processing unit 104 is configured to display on the display 114, i.e. within an area 900, also the entries that most closely correspond with the word being entered. This embodiment is appropriate particularly when the database to be processed resides in an electronic device; if it resides somewhere else, in order to save data transfer capacity, it might be advisable not to display information within the area 900 until the amount of information to be transferred thereto has been filtered small

enough due to the advancing process of entering text. The area 900 also has a selection pointer 902 of its own. The starting situation herein is, however, that since the user has not made a single selection yet, all entries in the telephone book are displayed within the area 900, which is only capable of showing first five names in an alphabetical order (last name first, forename second): Aakko Kari, Aaltonen Kari, Aarinen Mika, Aho Kimmo and Ahola Jarno. The display 114 is also provided with an area 404 to display the entered text. The display 114 also includes the above-described command bar 600. The command bar now contains three commands: a first command 904 to remove the character entered last, a second command 906 to select the character located at the selection pointer 402, and a third command 908 to move the control from the area 400 containing the character subset to the area 900 containing entries. Both the character subset and the entry set may thus be browsed.

In Figure 9B, the user has moved the selection pointer 402 of the character subset 400 at the letter P.

In Figure 9C, the user, using the input device 112, has given a select command when the selection pointer 402 resides at the letter P, whereby all names starting with the letter P are displayed in an alphabetical order within the area 900, which is capable of displaying only five such names: Paakinaho Jussi, Paananen Anne, Paananen Jim, Paasila Marko and Paasonen Titta. A character string AIEOU is shown as the character subset 400; this is based on the fact that the database contains a largest number of names starting with Pa, a next largest number of names starting with Pi, etc.

In Figure 9D, the user has selected the letters PI, which are shown within the area 404 displaying the entered text, and the character subset 400 has been updated, now containing the letters EIKRT; this is based on the fact that the database contains a largest number of names starting with Pie, a next ~~largest number of names~~ starting with Pii, etc. All entries starting with Pi are now displayed within the area 900, which is only capable of showing five such names: Pieniniemi Janne, Pieskä Hannu, Pietarila Janne, Pietilä Heikki and Pietilä Heli.

In Figure 9E, the user has selected the letters PIR, which are shown within the area 404 displaying the entered text. In our example, an empty set is shown as the character subset 400 since only four names remain, i.e. the names shown within the area 900: Pirinen Jukka, Pirkola Jani, Pirskanen Hannu and Pirttiaho Lauri. The control has been moved using an optional func-

tion from the area 400 automatically displaying the character subset to the area 900 displaying the entries. This transfer of control can also be left to be executed by the user using a particular command. As can be seen, the selection pointer 902 resides at the name *Pirinen Jukka*. The commands in the command bar 900 have also been updated: a fourth command 910 is used for returning from the area 900 to the area 400, and a fifth command 912 is used for starting a call to the person whose name resides at the selection pointer 902. The user thus needs to move the selection pointer 902 at the correct name *Pirskanen Hannu* and select the fifth command 912 by using the input device 112.

The five commands 904, 906, 908, 910, 912 used in our example can be implemented e.g. by the five-way roller described above in Figure 2B. A movement sideways 206 implements the first command 904 when the control resides within the area 400, and the fourth command 910 when the control resides within the area 900. A movement sideways 208 implements the third command 908 when the control resides within the area 400. Rotation in the directions 200 and 202 implements movement of the selection pointer 402, 902 within whose area 400, 900 the control resides. Pressing the roller in the direction 204 implements the second command 906. It is obvious to a user interface designer that, depending on the conditions, the commands can be implemented as ergonomically as possible, using the different input devices described above.

Although not shown herein, the embodiment described above wherein upon browsing past the character subset the browsing of the character set begins can also be applied in connection with processing a database. In such a case, the character set contains the characters, i.e. an alphabet, with which the entries in the database may begin.

~~Next, referring to the flow~~ diagram of Figure 3, a method for entering text at a user interface for an electronic device will be described. The process starts in 800. Next, in 802, a character subset of the characters to be browsed is generated for browsing, the character subset including the characters of the character set from among which, according to a predetermined inference logic, the next character for the text is most probably selected. The character subset generated is displayed in accordance with 804 on the display for browsing the characters and for selecting the next character. In an embodiment, the charac-

ter subset is displayed as a character string, the character subset including three to six characters, or five characters.

In 806, it is tested whether or not to stop the process of entering characters. If the process of entering characters is continued, the process moves to 808, wherein characters are browsed on the display and, furthermore, to 810, wherein one of the browsed characters is selected 810 for the text. Next, from 810 the process returns to 802. If the process of entering characters is to be stopped, the process moves from 806 to 812, wherein the execution of the method ends.

In an embodiment, the predetermined inference logic comprises: identifying a start of an entry of a new word, and inserting, into the character subset, the most frequent word-starting letters of the language used in the text.

In an embodiment, the predetermined inference logic comprises: identifying, in the text being entered, letters relating to the word being entered, identifying candidate words appropriate for the word being entered by using a stored main vocabulary of the language used, and selecting, for the character subset, a character from each candidate word to be possibly entered next.

In an embodiment, the words in the main vocabulary are arranged in the form of a tree such that a root of the tree consists of a beginning of a word. The root is connected to nodes representing single characters on a next level such that on each level, potential letters are, in order of frequency, connected to a node on a previous level. Then, as the process proceeds from the root of the tree through the nodes to a node on the last level, the characters in the nodes combine to form a word in the main vocabulary.

In an embodiment, the predetermined inference logic comprises: generating a character combination by using at least one character already used and a character to be possibly entered next, checking the probabilities of ~~different character combinations from a databank~~ containing the probabilities of the different character combinations for the language used, and selecting, for the character subset, a character from each most probable character combination to be possibly entered next.

In an embodiment, in order to browse the characters on the display, the character subset is interlinked with the character set such that upon browsing past the character subset, the browsing of the character set begins. The interlinked character subset and character set may be displayed on the display in visually different manners.

The method can also be applied to entering text in an application wherein the entered text generates an entry by which the desired information is found in a stored database. In an embodiment, the predetermined inference logic then comprises: identifying a start of an entry of a new word, and inserting, into the character subset, the most frequent letters in the stored database starting an entry. In an embodiment, the predetermined inference logic comprises: identifying, in the text being entered, letters relating to the word being entered, identifying entries in the database that are appropriate for the word being entered, and selecting, for the character subset, a character from each entry to be possibly entered next. The display may also display the entries that most closely correspond with the word being entered.

Suitable devices for executing the method include an electronic device of the type described above; however, other kind of devices which include a display and an input device as a user interface and which benefit from entering text in the above-described manner may also be suitable for executing the method.

Although the invention has been described above with reference to the examples according to the accompanying drawings, it is obvious that the invention is not restricted thereto but can be varied in many ways within the scope of the attached claims. In the examples, the use of the invention has been described using the Roman alphabet but the basic ideas can also be applied to other character sets as well, e.g. to Cyrillic characters, Greek characters, Hebrew characters or the like. The inference logic described in the examples operates on a word level but it can also be applied to a grammatical level.

CLAIMS

1. A method for entering text at a user interface for an electronic device, comprising:

browsing (808) characters on a display; and

selecting (810) one of the browsed characters for the text;

characterized in that the method further comprises:

generating (802), for browsing, a character subset made up of characters to be browsed, the character subset including the characters of a character set from among which, according to a predetermined inference logic, the next character for the text is most probably selected; and

displaying (804) the character subset on the display for browsing the characters and for selecting the next character.

2. A method as claimed in claim 1, **characterized** in that the character subset is displayed as a character string.

3. A method as claimed in claim 1, **characterized** in that the character subset includes three to six characters.

4. A method as claimed in claim 1, **characterized** in that the character subset includes five characters.

5. A method as claimed in claim 1, **characterized** in that the predetermined inference logic comprises:

identifying a start of an entry of a new word;

inserting, into the character subset, the most frequent word-starting letters of the language used in the text.

6. A method as claimed in claim 1, **characterized** in that the predetermined inference logic comprises:

identifying, in the text being entered, letters relating to the word being entered;

identifying candidate words appropriate for the word being entered by using a stored main vocabulary of the language used;

selecting, for the character subset, a character from each candidate word to be possibly entered next.

7. A method as claimed in claim 6, **characterized** in that the words in the main vocabulary are arranged in the form of a tree such that a root of the tree consists of a beginning of a word, the root being connected to nodes representing single characters on a next level such that on each level,

potential letters are, in order of frequency, connected to a node on a previous level whereby, as the process proceeds from the root of the tree through the nodes to a node on the last level, the characters in the nodes combine to form a word in the main vocabulary.

8. A method as claimed in claim 1, **characterized** in that the predetermined inference logic comprises:

generating a character combination by using at least one character already used and a character to be possibly entered next;

checking the probabilities of different character combinations from a databank containing the probabilities of the different character combinations for the language used;

selecting, for the character subset, a character from each most probable character combination to be possibly entered next.

9. A method as claimed in claim 1, **characterized** in that in order to browse the characters on the display, the character subset is interlinked with the character set such that upon browsing past the character subset, the browsing of the character set begins.

10. A method as claimed in claim 9, **characterized** in that the interlinked character subset and character set are displayed on the display in visually different manners.

11. A method as claimed in claim 1, **characterized** in that the predetermined inference logic comprises:

identifying a start of an entry of a new word;

inserting, into the character subset, the most frequent letters in the stored database starting an entry.

12. A method as claimed in claim 1, **characterized** in that the predetermined inference logic comprises:

~~identifying, in the text being entered, letters relating to the word being entered;~~

identifying entries in the stored database that are appropriate for the word being entered;

selecting, for the character subset, a character from each entry to be possibly entered next.

13. A method as claimed in claim 1, **characterized** in that the method further comprises:

displaying on the display also the entries that most closely correspond with the word being entered.

14. A text entry user interface for an electronic device, comprising:

a display (114) for displaying characters and entered text;

an input device (112) for issuing commands to browse and select characters; and

a processing unit (104) for controlling the operation of the user interface, the processing unit being connected to the display and configured to display characters on the display, the processing unit being further connected to the input device and configured to receive, from the input device, commands to browse and select characters;

characterized in that the processing unit (104) is further configured to:

generate, for browsing, a character subset made up of characters to be browsed, the character subset including the characters of a character set from among which, according to an inference logic configured into the processing unit, the next character for the text is most probably selected; and

display the character subset on the display for browsing the characters and for selecting the next character by using the input device.

15. A device as claimed in claim 14, **characterized** in that the processing unit (104) is configured to display the character subset as a character string.

16. A device as claimed in claim 14, **characterized** in that the character subset includes three to six characters.

17. A device as claimed in claim 14, **characterized** in that the character subset includes five characters.

18. A device as claimed in claim 14, **characterized** in that ~~the inference logic comprises:~~

a first routine for identifying a start of an entry of a new word;

a second routine for inserting, into the character subset, the most frequent word-starting letters of the language used in the text.

19. A device as claimed in claim 14, **characterized** in that the inference logic comprises:

a third routine for identifying, in the text being entered, letters relating to the word being entered;

a fourth routine for identifying candidate words appropriate for the

word being entered by using the stored main vocabulary of the language used;

a fifth routine for selecting, for the character subset, a character from each candidate word to be possibly entered next.

20. A device as claimed in claim 19, **characterized** in that the words in the main vocabulary are arranged in the form of a tree such that a root of the tree consists of a beginning of a word, the root being connected to nodes representing single characters on a next level such that on each level, potential letters are, in order of frequency, connected to a node on a previous level whereby, as the process proceeds from the root of the tree through the nodes to a node on the last level, the characters in the nodes combine to form a word in the main vocabulary.

21. A device as claimed in claim 14, **characterized** in that the inference logic comprises:

a sixth routine for generating a character combination by using at least one character already used and a character to be possibly entered next;

a seventh routine for checking the probabilities of different character combinations from a databank containing the probabilities of the different character combinations for the language used;

an eighth routine for selecting, for the character subset, a character from each most probable character combination to be possibly entered next.

22. A device as claimed in claim 14, **characterized** in that the processing unit (104) is configured such that for browsing the characters on the display, the character subset is interlinked with the character set such that upon browsing past the character subset, the browsing of the character set begins.

23. A device as claimed in claim 22, **characterized** in that the processing unit (104) is configured to display the interlinked character subset and character set on the display in visually different manners.

24. A device as claimed in claim 14, **characterized** in that the inference logic comprises:

a ninth routine for identifying a start of an entry of a new word;

a tenth routine for inserting, into the character subset, the most frequent letters in a stored database starting an entry.

25. A device as claimed in claim 14, **characterized** in that the inference logic comprises:

an eleventh routine for identifying, in the text being entered, letters relating to the word being entered;

a twelfth routine for identifying entries in the stored database that are appropriate for the word being entered; and

a thirteenth routine for selecting, for the character subset, a character from each entry to be possibly entered next.

26. A device as claimed in claim 14, **characterized** in that the processing unit (104) is configured to display on the display also the entries that most closely correspond with the word being entered.

27. A device as claimed in claim 14, **characterized** in that the processing unit (104) is configured to display a selection pointer on the display, the character residing at the selection pointer being selected by a select command, and to display the character subset such that prior to receiving a browse command, the character of the character subset which most probably becomes selected resides at the selection pointer.

28. A device as claimed in claim 14, **characterized** in that the input device (112) for issuing commands to browse and select characters is a pointing device other than a character keyboard.

29. A device as claimed in claim 14, **characterized** in that the input device (112) for issuing commands to browse and select characters comprises at least one of the following:

a roller wherein browse commands are issued by rotating the roller around its axis, and/or wherein select commands are issued by pressing the roller;

a disc wherein browse commands are issued by rotating the disc coplanarly clockwise and anti-clockwise, and/or wherein select commands are issued by pressing the disc;

arrow buttons wherein browse commands are issued by pressing the arrow buttons;

a selection button wherein select commands are issued by pressing the selection button;

a joystick wherein browse and/or select commands are issued by moving the joystick;

a trackball wherein browse commands and/or select commands are issued by rotating the trackball, and/or wherein select commands are issued by pressing the trackball;

a touch pad wherein browse commands and/or select commands are issued by touching the touch pad.

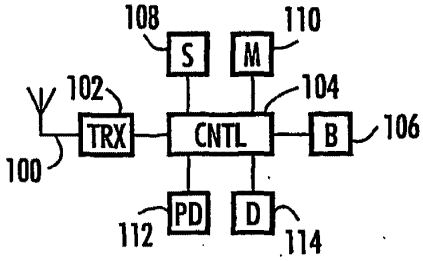

FIG. 1

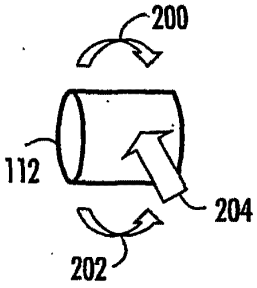

FIG. 2A

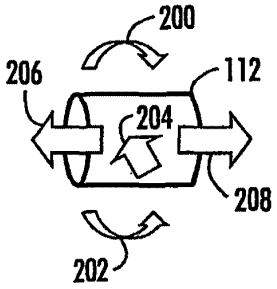

FIG. 2B

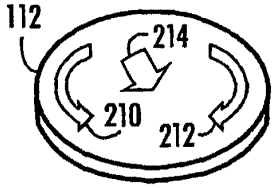

FIG. 2C

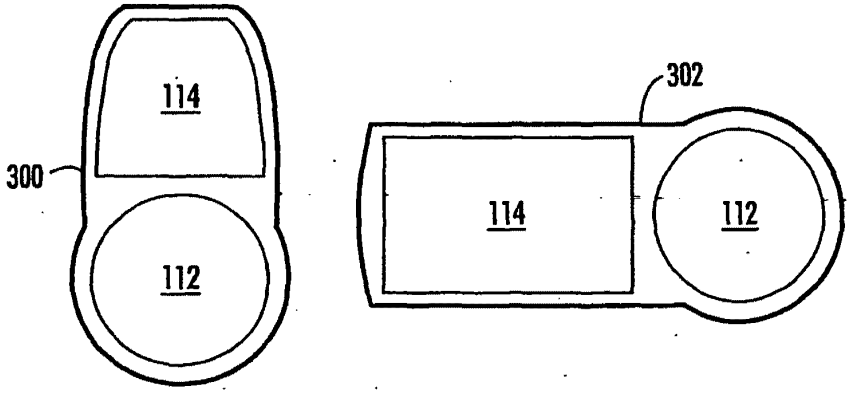

FIG. 3

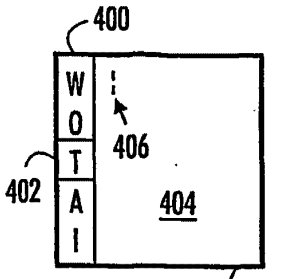

FIG. 4A

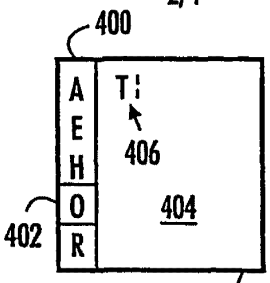

FIG. 4B

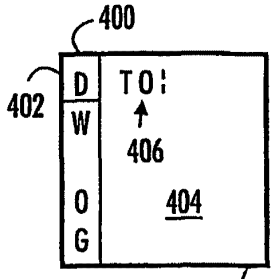

FIG. 4C

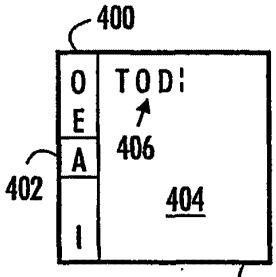

FIG. 4D

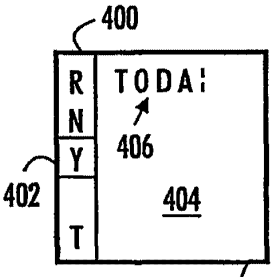

FIG. 4E

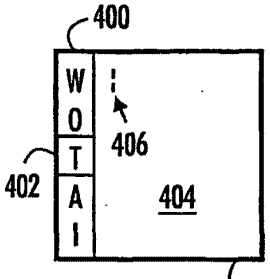

FIG. 5A

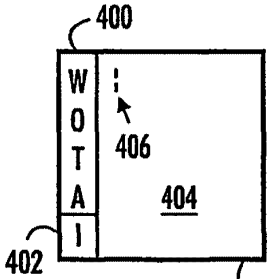

FIG. 5B

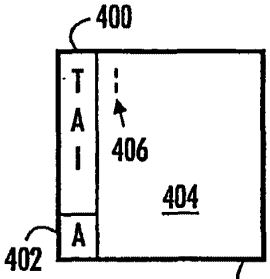

FIG. 5C

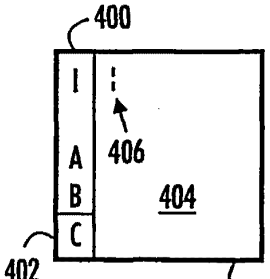

FIG. 5D

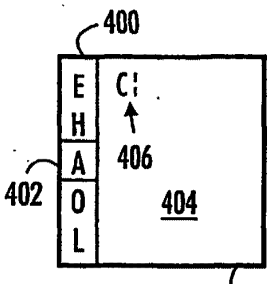

FIG. 5E

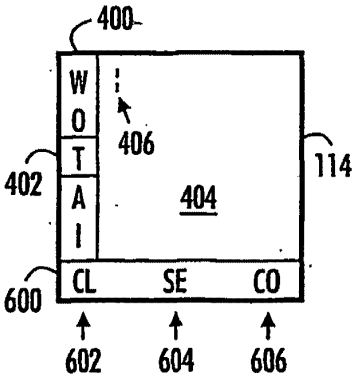

FIG. 6

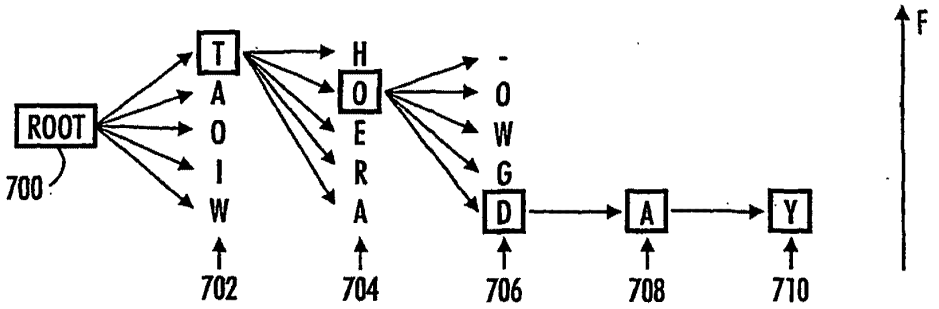

FIG. 7

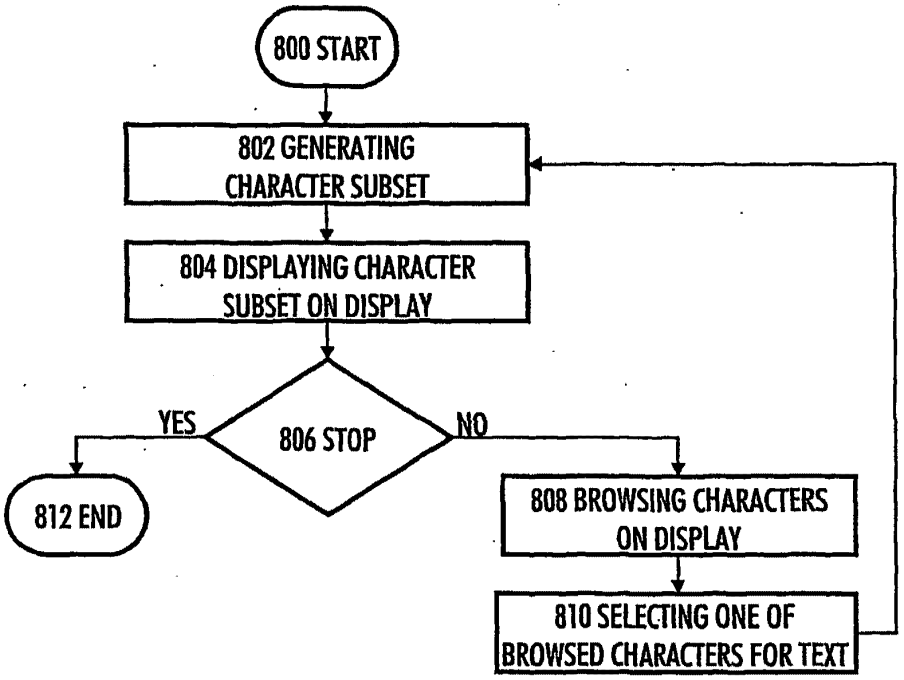

FIG. 8

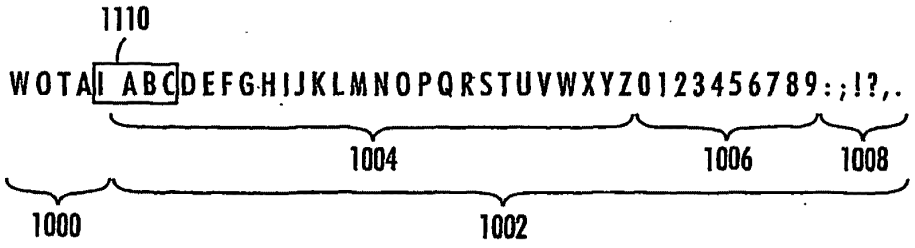

FIG. 10

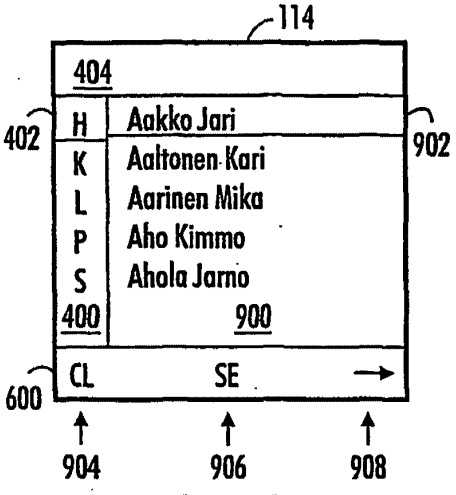

FIG. 9A

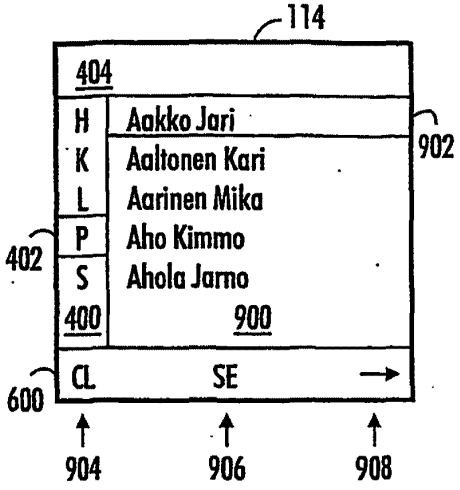

FIG. 9B

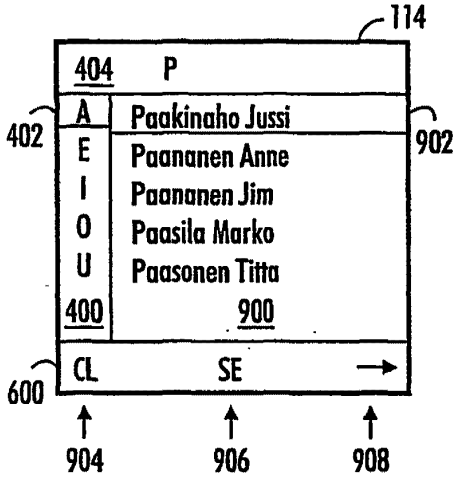

FIG. 9C

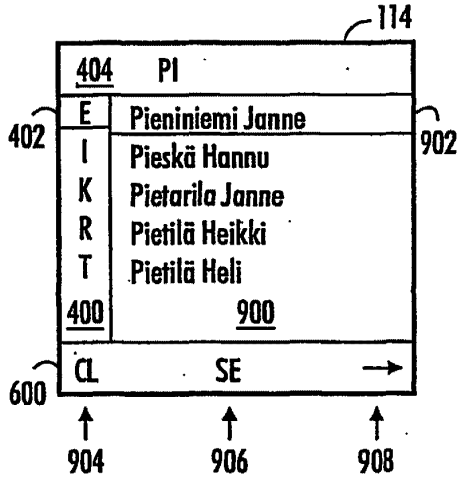

FIG. 9D

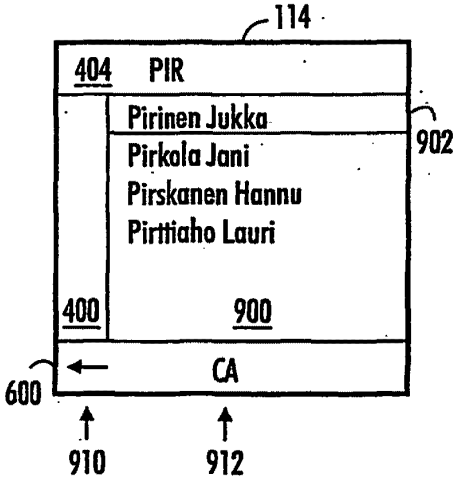

FIG. 9E

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 03/00719

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06F 3/023, H04M 1/272
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)

IPC7: G06F, H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0930760 A2 (NOKIA MOBILE PHONES LTD), 21 July 1999 (21.07.99), whole document --	1-29
X	WO 02067105 A1 (NPTV), 29 August 2002 (29.08.02), whole document --	1-29
A	US 2002138292 A1 (TANG, W.C.), 26 Sept 2002 (26.09.02) --	1-29

☐ Further documents are listed in the continuation of Box C. ☒ See patent family 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 application or patent 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	Date of mailing of the international search report
15 December 2003	17 -12- 2003
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Jan Silfverling /LR Telephone No. +46 8 782 25 00

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

Information on patent family members

31/10/03

International application No.
PCT/FI 03/00719

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0930760 A2	21/07/99	AU 6410098 A	29/09/98
		CN 1229316 A	22/09/99
		GB 2333386 A,B	21/07/99
		GB 9800746 D	00/00/00
		JP 2000003250 A	07/01/00
		US 6487424 B	26/11/02
		US 2003017858 A	23/01/03
WO 02067105 A1	29/08/02	FR 2821180 A	23/08/02
US 2002138292 A1	26/09/02	HK 1034417 A	00/00/00

Form PCT/ISA/210 (patent family annex) (July 1998)

OIPE IAP28
FEB 2 1 2006
PATENT & TRADEMARK OFFICE

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PTO/SB/21 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	

Application Number	11/246432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	2161
Examiner Name	Not Yet Assigned
Attorney Docket Number	0290672.00128US2

ENCLOSURES (*Check all that apply*)

- [ ] Fee Transmittal Form
- [ ] Fee Attached
- [ ] Amendment/Reply
- [ ] After Final
- [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Reply to Missing Parts/ Incomplete Application
- [ ] Reply to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] Landscape Table on CD
- [ ] After Allowance Communication to TC
- [ ] Appeal Communication to Board of Appeals and Interferences
- [ ] Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Other Enclosure(s) (please Identify below):

- Declaration
- Return Receipt Postcard
- Statement of Filing of Supplemental Declaration

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	WILMER CUTLER PICKERING HALE AND DORR LLP		
Signature			
Printed name	Rajesh Vallabh		
Date	2-16-06	Reg. No.	35,761

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as First Class Mail, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: 2/16/06 Signature: Marijke W. Abbes (Marijke W. Abbes)

OIPE IAP28
FEB 2 1 2006
PATENT & TRADEMARK OFFICE

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the U.S. Postal Service on the date shown below with sufficient postage as First Class Mail, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Dated: 2/16/06 Signature: Marijke W. Abbes
(Marijke W. Abbes)

Docket No.: 0290672.00128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Murali ARAVAMUDAN et al.

Application No.: 11/246432

Filed: October 7, 2005

Confirmation No.: 5356

Art Unit: 2161

Examiner: Not Yet Assigned

For: METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

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

FILING OF SUPPLEMENTAL DECLARATION

Dear Sir:

Applicant respectfully submits a Declaration to supplement the Declaration as submitted on December 8, 2005 with the Response to Notice to File Missing Parts.

No fees are believed to be due in connection with this submission. However, if any fees are due in connection with this application, the Director is hereby authorized to charge them (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 08-0219, under Order No. 0290672.00128US2.

Dated: 2-16-06

Respectfully submitted,

By _____

Rajesh Vallabh
Registration No.: 35,761
WILMER CUTLER PICKERING HALE AND DORR LLP
60 State Street
Boston, Massachusetts 02109
(617) 526-6000
Attorney for Applicant

OIPE IAP28
FEB 2 1 2006
PATENT & TRADEMARK OFFICE

PTO/SB/01A (09-04)
Approved for use through 07/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

As the below named inventor(s), I/we declare that:

This declaration is directed to:

☐ The attached application, or

☒ Application No. 11/246432, filed on 10/07/2005,

☐ as amended on _____ (if applicable);

I/we believe that I/we am/are the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought;

I/we have reviewed and understand the contents of the above-identified application, including the claims, as amended by any amendment specifically referred to above;

I/we acknowledge the duty to disclose to the United States Patent and Trademark Office all information known to me/us to be material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

All statements made herein of my/our own knowledge are true, all statements made herein 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 are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

FULL NAME OF INVENTOR(S)

Inventor one: MuralhARAVAMUDAN
Signature: _____ Citizen of: US

Inventor two: Rakesh BARVE
Signature: _____ Citizen of: India

Inventor three: Sashikumar VENKATARAMAN
Signature: _____ Citizen of: India

Inventor four: Ajit RAJASEKHARAN
Signature: _____ Citizen of: US

☐ Additional inventors or a legal representative are being named on _____ additional form(s) attached hereto.

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as First Class Mail, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.

Dated: 2/16/06 Signature: Marijke W. Abbes (Marijke W. Abbes)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NUMBER	FILING OR 371(c) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2

CONFIRMATION NO. 5356

23483
WILMER CUTLER PICKERING HALE AND DORR LLP
60 STATE STREET
BOSTON, MA02109

Title: Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count

Publication No. US-2007-0005563-A1
Publication Date: 01/04/2007

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 703-305-3028.

Pre-Grant Publication Division, 703-605-4283

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 01/23/2008

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
WONG, HUEN	
ART UNIT	**PAPER NUMBER**
4171	

NOTIFICATION DATE	DELIVERY MODE
01/23/2008	ELECTRONIC

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

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

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

michael.mathewson@wilmerhale.com
teresa.carvalho@wilmerhale.com
sharon.matthews@wilmerhale.com

Office Action Summary	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	Huen Wong	4171	

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *07 October 2005*.

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

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

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-33* is/are rejected.

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

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

Application Papers

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

10)☒ The drawing(s) filed on *07 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *17 January 2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-33 are presented for examination.

2. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. The Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 01/17/2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

4. Claim 12 is objected to because of the following informalities: change "the **method** comprising" to "the **system** comprising". Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 3, 6, 7, 14, 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 3 recites the limitation "the device" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

8. Claim 6 recites the limitation "said device" in lines 2-3 of the claim. There is insufficient antecedent basis for this limitation in the claim.

9. Claim 7 is rejected as being dependent from claim 6.

10. The term “proximate” in claims 3, 14, 25 is a relative term, which renders the claims indefinite. The term is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

11. Applicant is required to review the claim and correct all language which does not comply with 35 U.S.C. § 112, second paragraph.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1- 9, 12-20, 23-31 are rejected under 35 U.S.C. 102(e) as being anticipated by US PGPUB 20050283468 by Kamvar et al. (hereinafter "Kamvar").

14. As to **claim 1**, Kamvar teaches a method of processing a search request received from a user operating a text input device (Kamvar: Fig. 3; Fig. 10; Fig. 11; device with "keyboard"), the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms (Kamvar: Pg. 1, ¶ 0005, ¶ 0019; Pgs. 3-4, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses receiving query from user for what the user desire and that the "term portion" stores "single or multiple word terms"), the method comprising:

(a) receiving a query input from a user directed at identifying the desired item (Kamvar: Pg. 1, ¶ 0005, ¶ 0019; Pgs. 3-4, ¶ 0042 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses receiving query from user for what the user desire), the query input comprising one or more characters input by the user on the text input device (Kamvar:

Pg. 1, ¶ 0020; Fig. 7; Fig. 11; wherein Kamvar discloses that query may be “few characters");

(b) as each character of the query input is received from the user, dynamically identifying a group of items having one or more terms matching the characters received thus far of the query input (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney");

(c) ordering the items in the group of items identified in step (b) based on relevance values of the one or more terms matching the characters and on the number of characters of the query input used in identifying the group of items (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string); and

(d) transmitting identification of the group of items as ordered in step (c) to be displayed on a device operated by the user (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses return of ordered desired items to be presented to user).

15. As to **claim 2**, Kamvar teaches a method as in claim 1 wherein the method steps are performed by a server computer remote from the user (Kamvar: ¶ 0005; ¶ 0019 - ¶ 0020; ¶ 0023 - ¶ 0024; ¶ 0028 - ¶ 0029; ¶ 0034 - ¶ 0035; ¶ 0043 - ¶ 0049; Fig. 1; Fig. 3; Fig. 4; Fig. 6, Fig. 7; wherein Kamvar discloses receiving and processing of search request by search engine remote from the user).

16. As to **claim 3**, Kamvar teaches a method as in claim 1 wherein the method steps are performed by the device operated by and proximate the user (Kamvar: ¶ 0005; ¶ 0019 - ¶ 0020; ¶ 0023 - ¶ 0024; ¶ 0028 - ¶ 0029; ¶ 0034 - ¶ 0035; ¶ 0043 - ¶ 0049; Fig. 1; Fig. 3; Fig. 4; Fig. 6, Fig. 7; wherein Kamvar discloses receiving and processing of search request by search engine within proximity of user).

17. As to **claim 4**, Kamvar teaches a method as in claim 1 further comprising organizing said terms into a plurality of subspaces (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7), and wherein step (c) comprises selectively applying a relevance bias to said subspaces in accordance with the number of characters of the query input (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

18. As to **claim 5**, Kamvar teaches a method as in claim 4 wherein said plurality of subspaces include a personalized history subspace containing terms from previous searches conducted by said user (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses previous search requests).

19. As to **claim 6**, Kamvar teaches a method as in claim 1 further comprising organizing said terms into a plurality of subspaces (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig.

6; Fig. 7), and wherein said device operated by the user includes a display area for displaying search results (Kamvar: Fig. 7; Fig. 10; Fig. 11), and wherein step (c) comprises ordering said items in the group of items such that items associated with given subspaces appear in said display area (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, and measure of how recent an item is).

20. As to **claim 7**, Kamvar teaches a method as in claim 6 wherein said given subspaces are allocated space in said display area (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; Fig. 10; Fig. 11).

21. As to **claim 8**, Kamvar teaches a method as in claim 1 wherein step (c) comprises ordering said items also in accordance with the popularity of each item in the group of items (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string).

22. As to **claim 9**, Kamvar teaches a method as in claim 1 wherein said relevance values are based on popularity, temporal relevance or location relevance (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string).

23. As to **claim 12**, Kamvar teaches a system for processing a search request received from a user operating a text input device (Kamvar: Fig. 3; Fig. 10; Fig. 11; device with “keyboard”), the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms (Kamvar: Pg. 1, ¶ 0005, ¶ 0019; Pgs. 3-4, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses receiving query from user for what the user desire and that the "term portion" stores "single or multiple word terms"), the method comprising:

a memory for storing identification of said set of items and associated terms (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7);

a device input for receiving a query input from a user directed at identifying the desired item (Kamvar: Pg. 1, ¶ 0005, ¶ 0019; Pgs. 3-4, ¶ 0042 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses receiving query from user for what the user desire), the query input comprising one or more characters input by the user on the text input device (Kamvar: Pg. 1, ¶ 0020; Fig. 7; Fig. 11; wherein Kamvar discloses that query may be “few characters");

a processor for dynamically identifying a group of items having one or more terms matching the characters received of the query input as each character of the query input is received from the user (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"); and

ordering the items in the group of items based on relevance values of the one or

more terms matching the characters and on the number of characters of the query input used in identifying the group of items (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string); and

a device output for transmitting identification of the group of items as ordered to be displayed on a device operated by the user (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses return of ordered desired items to be presented to user).

24. As to **claim 13**, Kamvar teaches a system as in claim 12 wherein the system comprises a server computer remote from the user (Kamvar: ¶ 0005; ¶ 0019 - ¶ 0020; ¶ 0023 - ¶ 0024; ¶ 0028 - ¶ 0029; ¶ 0034 - ¶ 0035; ¶ 0043 - ¶ 0049; Fig. 1; Fig. 3; Fig. 4; Fig. 6, Fig. 7; wherein Kamvar discloses receiving and processing of search request by search engine remote from the user).

25. As to **claim 14**, Kamvar teaches a system as in claim 12 wherein the system comprises a device operated by and proximate the user (Kamvar: ¶ 0005; ¶ 0019 - ¶ 0020; ¶ 0023 - ¶ 0024; ¶ 0028 - ¶ 0029; ¶ 0034 - ¶ 0035; ¶ 0043 - ¶ 0049; Fig. 1; Fig. 3; Fig. 4; Fig. 6, Fig. 7; wherein Kamvar discloses receiving and processing of search request by search engine within proximity of user).

26. As to **claim 15**, Kamvar teaches a system as in claim 12 wherein the processor further organizes said terms into a plurality of subspaces (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7), and orders the items by selectively applying a relevance bias to said subspaces in accordance with the number of characters of the query input (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

27. As to **claim 16**, Kamvar teaches a system as in claim 15 wherein said plurality of subspaces include a personalized history subspace containing terms from previous searches conducted by said user (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses previous search requests).

28. As to **claim 17**, Kamvar teaches a system as in claim 12 said terms are organized into a plurality of subspaces (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7), and wherein said device operated by the user includes a display area for displaying search results (Kamvar: Fig. 7; Fig. 10; Fig. 11), and wherein the processor orders said items in the group of items such that items associated with given subspaces appear in said display area (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, and measure of how recent an item is).

29. As to **claim 18**, Kamvar teaches a system as in claim 17 wherein said given subspaces are allocated space in said display area (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; Fig. 10; Fig. 11).

30. As to **claim 19**, Kamvar teaches a system as in claim 12 wherein the items are also ordered in accordance with the popularity of each item in the group of items (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string).

31. As to **claim 20**, Kamvar teaches a system as in claim 12 wherein said relevance values are based on popularity, temporal relevance or location relevance (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string).

32. As to **claim 23**, Kamvar teaches a computer program product for processing a search request received from a user operating a text input device ((Kamvar: Fig. 3; Fig. 10; Fig. 11; device with “keyboard”), the search request being directed at identifying a desired item from a set of items, each of the items having one or more associated terms (Kamvar: Pg. 1, ¶ 0005, ¶ 0019; Pgs. 3-4, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses receiving query from user for what the user desire and that the "term portion" stores "single or multiple word terms"), said computer program product residing on a computer readable medium and having a plurality of instructions stored thereon

which, when executed by a processor, cause that processor to:

receive a query input from a user directed at identifying the desired item, the query input comprising one or more characters input by the user on the text input device (Kamvar: Pg. 1, ¶ 0005, ¶ 0019; Pgs. 3-4, ¶ 0042 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses receiving query from user for what the user desire);

as each character of the query input is received from the user, dynamically identify a group of items having one or more terms matching the characters received thus far of the query input (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney");

order the items in the group of items based on relevance values of the one or more terms matching the characters and on the number of characters of the query input used in identifying the group of items (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string); and

transmit identification of the group of items as ordered to be displayed on a device operated by the user (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses return of ordered desired items to be presented to user).

33. As to **claim 24**, Kamvar teaches a computer program product as in claim 23 wherein the processor is in a server computer remote from the user (Kamvar: ¶ 0005; ¶ 0019 - ¶ 0020; ¶ 0023 - ¶ 0024; ¶ 0028 - ¶ 0029; ¶ 0034 - ¶ 0035; ¶ 0043 - ¶ 0049; Fig.

1; Fig. 3; Fig. 4; Fig. 6, Fig. 7; wherein Kamvar discloses receiving and processing of search request by search engine remote from the user).

34. As to **claim 25**, Kamvar teaches a computer program product as in claim 23 wherein the processor is in a device operated by and proximate the user (Kamvar: ¶ 0005; ¶ 0019 - ¶ 0020; ¶ 0023 - ¶ 0024; ¶ 0028 - ¶ 0029; ¶ 0034 - ¶ 0035; ¶ 0043 - ¶ 0049; Fig. 1; Fig. 3; Fig. 4; Fig. 6, Fig. 7; wherein Kamvar discloses receiving and processing of search request by search engine within proximity of user).

35. As to **claim 26**, Kamvar teaches a computer program product as in claim 23 wherein the computer program product further causes the processor to organize said terms into a plurality of subspaces (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7), and selectively apply a relevance bias to said subspaces in accordance with the number of characters of the query input (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

36. As to **claim 27**, Kamvar teaches a computer program product as in claim 26 wherein said plurality of subspaces include a personalized history subspace containing terms from previous searches conducted by said user (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses previous search requests).

37. As to **claim 28**, Kamvar teaches a computer program product as in claim 23 wherein said terms are organized into a plurality of subspaces (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7), and wherein said device operated by the user includes a display area for displaying search results (Kamvar: Fig. 7; Fig. 10; Fig. 11), and wherein said items in the group of items are ordered such that items associated with given subspaces appear in said display area (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, and measure of how recent an item is).

38. As to **claim 29**, Kamvar teaches a computer program product as in claim 28 wherein said given subspaces are allocated space in said display area (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; Fig. 10; Fig. 11).

39. As to **claim 30**, Kamvar teaches a computer program product as in claim 23 wherein said items are ordered also in accordance with the popularity of each item in the group of items (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string).

40. As to **claim 31**, Kamvar teaches a computer program product as in claim 23 wherein said relevance values are based on popularity, temporal relevance or location relevance (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string).

Claim Rejections - 35 USC § 103

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

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

42. **Claims 10, 11, 21, 22, 32, 33 are rejected under U.S.C 103(a) as being unpatentable over US PGPUB 20050283468 by Kamvar et al. (hereinafter "Kamvar"), in view of US PGPUB 20040021691 by Dostie et al. (hereinafter "Dostie").**

43. As to **claim 10**, Kamvar teaches a method as in claim 1. Kamvar is silent on said text input device being a phone, a mobile computing device, or a remote control device for a television.

However, Dostie discloses "personal computing devices" and "hand-held devices" with overloaded keys (Dostie: Pg. 5, ¶ 0067- ¶ 0068; Fig. 1; wherein Dostie discloses "personal computing devices" and "hand-held devices") for the purpose of rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the

Applicant's invention that it is quite advantageous to incorporate Kamvar's method with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

44. As to **claim 11**, Kamvar teaches a method as in claim 1. Kamvar is silent on said text input device being one that includes a set of overloaded keys generating an ambiguous text input.

However, Dostie discloses QWERTY input with overloaded keys used for generating ambiguous character input system (Dostie: Pgs. 6-7, ¶ 0079 - ¶ 0082; Fig. 3; wherein Dostie discloses that "each key [ ] can contain one of more letters") for the purpose of rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate Kamvar's method with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

45. As to **claim 21**, Kamvar teaches a system as in claim 12. Kamvar is silent on said text input device being a phone, a mobile computing device, or a remote control device for a television.

However, Dostie discloses "personal computing devices" and "hand-held devices" with overloaded keys (Dostie: Pg. 5, ¶ 0067- ¶ 0068; Fig. 1; wherein Dostie discloses "personal computing devices" and "hand-held devices") for the purpose of

rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate Kamvar's system with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

46. As to **claim 22**, Kamvar teaches a system as in claim 12. Kamvar is silent on said text input device being one that includes a set of overloaded keys generating an ambiguous text input.

However, Dostie discloses QWERTY input with overloaded keys used for generating ambiguous character input system (Dostie: Pgs. 6-7, ¶ 0079 - ¶ 0082; Fig. 3; wherein Dostie discloses that "each key [ ] can contain one of more letters") for the purpose of rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate Kamvar's system with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

47. As to **claim 32**, Kamvar teaches a computer program product as in claim 23. Kamvar is silent on said text input device being a phone, a mobile computing device, or a remote control device for a television.

However, Dostie discloses "personal computing devices" and "hand-held

devices" with overloaded keys (Dostie: Pg. 5, ¶ 0067- ¶ 0068; Fig. 1; wherein Dostie discloses "personal computing devices" and "hand-held devices") for the purpose of rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate Kamvar's computer program product with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

48. As to **claim 33**, Kamvar teaches a computer program product as in claim 23. Kamvar is silent on said text input device being one that includes a set of overloaded keys generating an ambiguous text input.

However, Dostie discloses QWERTY input with overloaded keys used for generating ambiguous character input system (Dostie: Pgs. 6-7, ¶ 0079 - ¶ 0082; Fig. 3; wherein Dostie discloses that "each key [ ] can contain one of more letters") for the purpose of rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate Kamvar's computer program product with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

Prior Art

49. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. **US Patent 6,654,213** is pertinent because it discloses a search method wherein searches and the return of results of searches are performed on-the-fly, as user adds more character(s) or term(s) to the search string. **US Patent 6,006,225** is pertinent because it discloses a search engine which returns suggestions to user to help refine the user's incremental search to increase the ease of searching; the search engine may use historical information and frequency information to help in determining what suggestions are returned.

Conclusion

50. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huen Wong whose telephone number is (571) 270-3426. The examiner can normally be reached on Monday - Friday (8:30 EST - 5:00 EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ramesh Patel can be reached on (571) 270-3688. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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

/Huen Wong/
Examiner, Art Unit 4171

/H. W./

January 15, 2008

/Ramesh B. Patel/
Supervisory Patent Examiner, Art Unit 4171

Notice of References Cited	Application/Control No. 11/246,432	Applicant(s)/Patent Under Reexamination ARAVAMUDAN ET AL.	
	Examiner Huen Wong	Art Unit 4171	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2005/0283468	12-2005	Kamvar et al.	707/003
*	B	US-2004/0021691	02-2004	Dostie et al.	345/773
*	C	US-6,564,213	05-2003	Ortega et al.	707/5
*	D	US-6,006,225	12-1999	Bowman et al.	707/5
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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CONFIRMATION NO. 5356

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
11/246,432	10/07/2005	707	4171	0290672.00128US2

APPLICANTS

Murali Aravamudan, Windham, NH;
Rakesh D. Barve, Bangalore, INDIA;
Sashikumar Venkataraman, Bangalore, INDIA;
Ajit Rajasekharan, West Windsor, NJ;

**** CONTINUING DATA **************************

This appln claims benefit of 60/695,463 06/30/2005

**** FOREIGN APPLICATIONS **************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **** ** SMALL ENTITY **
11/03/2005

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /HUEN WONG/ Examiner's Signature	☐ Met after Allowance /HW/ Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		NH	10	33	3

ADDRESS

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109
UNITED STATES

TITLE

Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count

FILING FEE RECEIVED		
890	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	1	"predictive text search"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 17:19
S2	2	"20060253427"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 17:20
S3	210	"as user enters" same character$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 17:22
S4	67	S3 and quer$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 17:23
S5	13	"6564213"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 17:33
S6	106	"6006225"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 17:38
S7	2	S4 and "hot" and "dog"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:00

EAST Search History

S8	6	S4 and phonet$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:02
S9	2	S4 and springfield	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:10
S10	2	"20040021691"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:22
S11	2	"20050251497"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:24
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S13	2	"20060253427"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:25
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EAST Search History

S15	2	"20070050351"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:28
S16	2	"20070061753"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:28
S17	16	"richard" and "kasperski"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:30
S18	2	"20070118533"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:32
S19	12	"6704727"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:33
S20	28	"5805911"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:38
S21	1	S4 and gibbs	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:40

EAST Search History

S22	0	S3 and (order same "number of characters")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:48
S23	0	(order same "number of characters")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:49
S24	5925	(order same alphabet)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:49
S26	2654	query and (order same "number" same character$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:50
S27	339	(order same "number" same character$1 same query)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 19:57
S28	2	S4 and "wu"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 20:06
S29	2	"20040148272"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2008/01/10 20:11
S33	1	"4972328".PN.	USPAT; USOCR	OR	OFF	2008/01/14 12:17

EAST Search History

S37	2	"20070005563"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2008/01/16 10:57

IPR2017-00933 Page 0118

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	4171

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

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

CLAIM		DATE								
Final	Original	01/15/2008								
	1	✓								
	2	✓								
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	30	✓								
	31	✓								
	32	✓								
	33	✓								

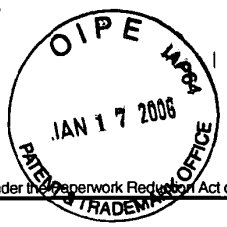
Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	4171

SEARCHED			
Class	Subclass	Date	Examiner
707	1	1/10/2008	HW
707	3	1/10/2008	HW
707	5	1/10/2008	HW
707	6	1/10/2008	HW
707	7	1/10/2008	HW
709	230	1/10/2008	HW
709	231	1/10/2008	HW

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	1/10/2008	HW
Inventor Search	1/10/2008	HW
Google Search	1/10/2008	HW

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

IFW



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TRANSMITTAL FORM

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Application Number	11/246432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	2161
Examiner Name	Not Yet Assigned
Total Number of Pages in This Submission	
Attorney Docket Number	0290672.00128US2

ENCLOSURES (*Check all that apply*)

- [ ] Fee Transmittal Form
  - [ ] Fee Attached
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  - 5 non-patent publications
  - Form PTO/SB/08
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Signature			
Printed name	Rajesh Vallabh		
Date	1-17-06	Reg. No.	35,761

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OIPE IAP64 JAN 17 2006 PATENT & TRADEMARK OFFICE

Docket No.: 0290672.00128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Murali ARAVAMUDAN et al.

Application No.: 11/246432

Confirmation No.: 5356

Filed: October 7, 2005

Art Unit: 2161

For: METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

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Dated: 1-13-06

Respectfully submitted,

By _____
Rajesh Vallabh
Registration No.: 35,761
WILMER CUTLER PICKERING HALE AND DORR LLP
60 State Street
Boston, Massachusetts 02109
(617) 526-6000
Attorney for Applicant

5463126

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Complete if Known	
Application Number	11/246432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	2161
Examiner Name	Not Yet Assigned
Attorney Docket Number	0290672.00128US2

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
/H.W./	AA*	US-2002/0133481-A1	09-16-2002	Smith et al.	
	AB*	US-2003/0023976-A1	01-30-2003	Kamen et al.	
	AC*	US-2003/0066079-A1	04-03-2003	Suga	
	AD*	US-2004/0049783-A1	03-11-2004	Lemmons et al.	
	AE*	US-2004/0078815-A1	04-22-2004	Lemmons et al.	
	AF*	US-2004/0078820-A1	04-22-2004	Nickum	
	AG*	US-2004/0111745-A1	06-10-2004	Schein et al.	
	AH*	US-2004/0194141-A1	09-30-2004	Sanders	
	AI*	US-2005/0015366-A1	01-20-2005	Carrasco et al.	
	AJ*	US-2005/0086691-A1	04-21-2005	Dudkiewicz et al.	
	AK*	US-1,261,167	04-02-1918	Russell	
	AL*	US-4,893,238	01-09-1990	Venema	
	AM*	US-5,623,406	04-22-1997	Ichbiah	
	AN*	US-5,859,662	01-12-1999	Cragun et al.	
	AO*	US-6,005,565	12-21-1999	Legall et al.	
	AP*	US-6,133,909	10-17-2000	Schein et al.	
	AQ*	US-6,266,814-B1	07-24-2001	Lemmons et al.	
	AR*	US-6,600,496-B1	07-29-2003	Wagner et al.	
	AS*	US-6,615,248-B1	09-02-2003	Smith	
	AT*	US-6,732,369-B1	05-04-2004	Schein et al.	
	AU*	US-6,772,147-B2	08-03-2004	Wang	
	AV*	US-6,850,693-B2	02-01-2005	Young et al.	
	AW*	US-6,865,575-B1	03-08-2005	Smith et al.	
	AX*	US-6,839,705-B1	01-04-2005	Grooters	
	AY*	US-6,757,906-B1	06-29-2004	Look et al.	
	AZ*	US-6,721,954-B1	04-13-2004	Nickum	
	AA1*	US-6,614,455-B1	09-02-2003	Cuijpers et al.	
	AB1*	US-6,307,549-B1	10-23-2001	King et al.	
	AC1*	US-6,184,877-B1	02-06-2001	Dodson et al.	
	AD1*	US-6,075,526	06-13-2000	Rothmuller	
	AE1*	US-5,880,768	03-09-1999	Lemmons et al.	
	AF1*	US-5,635,989	06-03-1997	Rothmuller	
	AG1*	US-5,487,616	01-30-1996	Ichbiah	
	AH1*	US-4,760,528	07-26-1988	Levin	
	AI1*	US-2005/0086692-A1	04-21-2005	Dudkiewicz et al.	
	AJ1*	US-2005/0071874-A1	03-31-2005	Elcock et al.	
	AK1*	US-2004/0216160-A1	10-28-2004	Lemmons et al.	
	AL1*	US-2004/0128686-A1	07-01-2004	Boyer et al.	
	AM1*	US-2004/0093616-A1	05-13-2004	Johnson	
	AN1*	US-2004/0078816-A1	04-22-2004	Johnson	
	AO1*	US-2004/0073926-A1	04-15-2004	Nakamura et al.	
	AP1*	US-2003/0237096-A1	12-25-2003	Barrett et al.	
	AQ1*	US-2003/0046698-A1	03-06-2003	Kamen et al.	
	AR1*	US-2003/0014753-A1	01-16-2003	Beach et al.	
/H.W./	AS1*	US-2002/0083448-A1	06-27-2002	Johnson	

Examiner Signature	/Huen Wong/	Date Considered	01/16/2008

5463125

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Sheet 2 of 2

Complete if Known	
Application Number	11/246432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	2161
Examiner Name	Not Yet Assigned
Attorney Docket Number	0290672.00128US2

/H.W./	AT1*	US-2002/0042791-A1	04-11-2002	Smith et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document: Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]
/H.W./	BA	WO-2004/031931-A1	04-15-2004	Nokia Corporation		√

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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
/H.W./	CA	PRESS RELEASE FROM TEGIC COMMUNICATIONS, TEGIC COMMUNICATIONS IS AWARDED PATENT FOR JAPANESE T9(R) TEXT INPUT SOFTWARE FROM THE JAPAN PATENT OFFICE, OCTOBER 12, 2004. RETRIEVED NOVEMBER 18, 2005 FROM HTTP://WWW.TEGIC.COM/PRESS_VIEW.HTML?RELEASE_NUM=55254242	
	CB	GADD T.N., PHONIX: THE ALGORITHM, PROGRAM 24(4), OCTOBER 1990, PP. 363-369	
	CC	DALIANIS, IMPROVING SEARCH ENGINE RETRIEVAL USING A COMPOUND SPLITTER FOR SWEDISH, ABSTRACT OF PRESENTATION AT NODALIDA 2005 - 15TH NORDIC CONFERENCE ON COMPUTATIONAL LINGUISTICS, JOENSUU FINLAND, MAY 21-22 2005. RETRIEVED JANUARY 5, 2006 FROM HTTP://PHON.JOENSUU.FI/NODALIDA/ABSTRACTS/03.SHTML	
	CD	SILFVERBERG ET AL., PREDICTING TEXT ENTRY SPEED ON MOBILE PHONES, PROCEEDINGS OF THE ACM CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS - CHI 2000. PP. 9-16	
/H.W./	CE	MACKENZIE ET AL., LETTERWISE: PREFIX-BASED DISAMBIGUATION FOR MOBILE TEXT INPUT, PROCEEDINGS OF THE ACM SYMPOSIUM ON USER INTERFACE SOFTWARE AND TECHNOLOGY - UIST 2001, PP. 111-120	

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[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature	/Huen Wong/	Date Considered	01/16/2008

5463125

Docket No.: 0290672.00128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Murali ARAVAMUDAN et al.	Confirmation No.:	5356
Application No.:	11/246,432	Art Unit:	4171
Filed:	October 7, 2005	Examiner:	H. Wong
Title:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT		

Commissioner for Patents
P.O. Box 1450
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INFORMATION DISCLOSURE STATEMENT (IDS)

Dear Sir:

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Please charge the $180.00 fee to our Deposit Account No. 08-0219.

Applicants request that the Examiner initial and return a copy of the enclosed Form PTO SB-08 with the next communication.

Respectfully submitted,

Dated: March 25, 2008

/John V. Hobgood/
John V. Hobgood
Registration No.: 61,540
Attorney for Applicant(s)

Wilmer Cutler Pickering Hale and Dorr LLP
60 State Street
Boston, Massachusetts 02109
(617) 526-6000 (telephone)
(617) 526-5000 (facsimile)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 4

Complete if Known	
Application Number	11/246,432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	4171
Examiner Name	H. Wong
Attorney Docket Number	0290672.00128US2

U.S. PATENT DOCUMENTS

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	AA*	US-60/548,589	09-01-2005	Flinchem	
	AB*	US-11/855661		Venkataraman et al.	
	AC*	US-11/862917		Aravamudan	
	AD*	US-11/939086		Ramakrishnan et al.	
	AE*	US-12/018566		Venkataraman et al.	
	AF*	US-2003/0011573	01-16-2003	Villet et al.	
	AG*	US-2004/0021691-A1	02-05-2004	Dostie et al.	
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Examiner Signature		Date Considered	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	11/246,432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	4171
Examiner Name	H. Wong
Attorney Docket Number	0290672.00128US2

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Examiner Signature		Date Considered	

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(Based on PTO 10-07 version)

Substitute for form 1449/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** *(Use as many sheets as necessary)*				***Complete if Known***	
				Application Number	11/246,432-Conf. #5356
				Filing Date	October 7, 2005
				First Named Inventor	Murali ARAVAMUDAN
				Art Unit	4171
				Examiner Name	H. Wong
Sheet	3	of	4	Attorney Docket Number	0290672.00128US2

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. * CITE NO.: Those application(s) which are marked with an single asterisk (*) next to the Cite No. are not supplied (under 37 CFR 1.98(a)(2)(iii)) because that application was filed after June 30, 2003 or is available in the IFW. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
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Examiner Signature		Date Considered	

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				Art Unit	4171
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	

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European Patent Office
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(54) Système visant à simplifier l'accès et l'utilisation de services internet depuis un terminal mobile

(57) Dispositif destiné à faciliter l'accès à un Service Internet ainsi que son utilisation depuis un terminal dépourvu d'un clavier complet. L'invention concerne un dispositif permettant à un utilisateur de n'avoir à saisir qu'un abrégé ou une forme adaptée au mode de saisie de son terminal du nom du Service auquel il souhaite accéder, ainsi que d'éventuels paramètres. L'invention permet de rediriger automatiquement l'utilisateur vers le Site Internet voulu, en déterminant au moyen d'une base de données distante la correspondance entre la saisie effectuée et le Service voulu, puis l'adresse Internet complète.

EP 1 143 691 A1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] La présente invention concerne un dispositif destiné à faciliter l'accès à un Service Internet ainsi que son utilisation depuis un terminal dépourvu d'un clavier complet. L'accès direct à un Service Internet s'obtient généralement par la saisie de l'adresse Internet du site correspondant, dénommée URL (Universal Resource Locator). Cette adresse est fastidieuse à saisir sur des terminaux ne possédant pas un clavier alphanumérique complet, tels que les terminaux Internet mobiles.

[0002] La présente invention consiste à simplifier cet accès à un Service de type Internet, en faisant correspondre un nom ou une séquence de saisie simplifiée de ce nom avec l'adresse Internet réelle d'un Service puis à rediriger l'utilisateur vers celle-ci. La présente invention donne également l'occasion de saisir par le même moyen, et préalablement à l'accès au Service, des paramètres complémentaires qui seront transmis à celui-ci, de manière à préciser l'information recherchée sur ce Service.

[0003] Depuis son terminal, l'utilisateur ne saisit que le nom du Service auquel il souhaite accéder, et non l'adresse Internet complète. Il est également possible de n'appuyer qu'une fois sur les touches correspondant à la suite de lettres formant le nom du Service. La saisie peut être effectuée grâce au clavier physique du terminal, ou bien grâce à un clavier affiché sur un écran tactile, dont la disposition des touches peut varier d'un terminal à l'autre. Le ou les Service(s) correspondant(s) au nom ou à la séquence entrée par l'utilisateur sont déterminés par la comparaison, sur un serveur distant et au sein de une ou plusieurs bases de données, du nom ou de la séquence saisie par l'utilisateur avec le nom ou la séquence correspondant aux Services référencés dans un groupe ci-après dénommé dictionnaire. La résolution de la requête peut s'effectuer sur un ou plusieurs dictionnaires, soit de manière simultanée, soit de manière séquentielle, le choix et l'ordre de ces dictionnaires étant déterminés selon les conditions d'utilisation suivantes : localisation géographique de l'utilisateur, langue utilisée, modèle et constructeur du terminal utilisé, langages informatiques et standards compatibles avec le terminal, fournisseur par lequel s'effectue l'accès à Internet, Portail Internet sur lequel se situe l'utilisateur au moment de la requête.

[0004] La saisie de paramètres s'effectue par le même mode, étant séparée du nom du Service ou de sa séquence correspondante par une touche ou une action prédéfinie, ci-après nommée Séparateur. L'invention permet de combiner un nombre indéfini de noms et de paramètres, distingués à chaque fois par un Séparateur. L'ensemble de la requête est envoyé au serveur. Une fois le nom du Service résolu, les paramètres peuvent être soit résolus à leur tour au sein de dictionnaires secondaires au Service, soit transmis au site Internet du Service lors de la re-direction de l'utilisateur, afin que l'utilisateur accède à l'information désirée, notamment à une sous-partie du site en question.

[0005] En cas d'ambiguïté, du fait que plusieurs lettres peuvent être attribuées à une même touche ou bien si plusieurs réponses existent, une liste de noms peut être présentée en réponse à l'utilisateur. Cette liste des noms peut être organisée et triée en fonction des conditions d'utilisation précédemment décrites. L'ambiguïté est levée lorsque la sélection de l'un des noms de cette liste est renvoyé au serveur. Cette sélection dans une liste peut s'effectuer par tout moyen propre à chaque terminal.

[0006] L'utilisateur peut se voir proposer, par un mécanisme dit de saisie prédictive, un certain nombre de noms de Services ou de paramètres, alors que la saisie n'en est que partielle, par comparaison des signes entrés au fur et à mesure avec les noms des Services ou les paramètres contenus soit dans un dictionnaire constitué de l'historique des Services précédemment accédé ou des paramètres précédemment entrés, soit dans un ou plusieurs dictionnaire(s) contenant une liste prédéfinie de Service ou de paramètres. Ces dictionnaires peuvent être téléchargés dans le terminal pour améliorer la réactivité du système, totalement ou seulement partiellement, préalablement à l'utilisation de l'invention ou bien chaque fois qu'une mise à jour s'impose.

[0007] Quel que soit le mode de saisie, une fois le nom du Service et les éventuels paramètres qui y sont attachés déterminés, l'utilisateur est automatiquement redirigé vers le site Internet correspondant, grâce à l'enregistrement, au sein des dictionnaires, des adresses Internet complètes de chaque Service. Il est possible, pour un même Service, de rediriger les utilisateurs vers différentes adresses Internet, en fonction des conditions d'utilisation précédemment décrites.

[0008] L'interrogation de la ou des base(s) de données distante(s) peut s'effectuer sur un ou plusieurs serveur(s) distinct(s), contenant un extrait de cette base, situé éventuellement sur le même réseau local que le site hébergeant la zone de saisie, dans le but d'améliorer la performance et la fiabilité du système.

Revendications

1. Dispositif destiné à simplifier l'accès à un Service Internet, ainsi que son utilisation, depuis un terminal ne disposant pas d'un clavier alphanumérique complet **caractérisé en ce qu'**il permet d'identifier un Service Internet à partir de la saisie d'un nom ou bien de la séquence formée par la série d'un appui par touche pour chaque lettre du nom utilisé, puis de rediriger l'utilisateur vers l'adresse Internet correspondante.

2. Dispositif selon la revendication 1 tel que la saisie peut être effectuée soit sur un clavier physique, soit sur un clavier affiché sur un écran tactile, dont la disposition des touches ainsi que la répartition des

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lettres par touche peut varier en fonction des terminaux, et notamment être effectuée en fonction d'une estimation de la fréquence d'utilisation des lettres dans les noms de Services.

3. Dispositif selon la revendication 1 **caractérisé en ce que** la détermination du Service Internet à accéder est effectuée par comparaison sur un serveur distant et au sein d'une ou plusieurs bases de données, du nom ou de la séquence saisie par l'utilisateur avec le nom ou la séquence des Services référencés, au sein d'un ou plusieurs groupes, dénommés Dictionnaires.

4. Dispositif d'aide à l'utilisation d'un site Internet **caractérisé en ce qu'**il permet de saisir un certain nombre de paramètres consécutivement à la saisie du nom du Service à accéder et préalablement à l'accès au site Internet correspondant, les paramètres saisis étant transmis à celui-ci ou bien permettant d'accéder à une sous-partie spécifique du site en question.

5. Dispositif selon les revendications 1 et 4 selon lequel une liste de noms peut être présentée en réponse à l'utilisateur, si plusieurs réponses correspondent au nom ou à la séquence saisis par l'utilisateur, la sélection de l'un des items de la liste permettant de lever l'ambiguïté.

6. Dispositif selon les revendications 1, 3 et 5 tel que les conditions d'utilisation suivantes peuvent être prises en compte pour déterminer le choix et l'ordre des dictionnaires de services référencés, l'ordre ou l'organisation de la liste de noms retournée à l'utilisateur, l'adresse Internet correspondant au service identifié et d'éventuels paramètres transmis à celui-ci : localisation géographique de l'utilisateur, langue utilisée, modèle et constructeur du terminal utilisé, langages informatiques et standards compatibles avec le terminal, fournisseur par lequel s'effectue l'accès à Internet, Portail Internet sur lequel se situe l'utilisateur au moment de la requête.

7. Dispositif selon les revendications 1 et 4 selon lequel l'utilisateur peut se voir proposer, par un mécanisme dit de saisie prédictive, un certain nombre de noms de Services ou de paramètres, alors que la saisie n'en est que partielle, par comparaison des signes entrés au fur et à mesure avec les noms des Services ou les paramètres contenus dans un ou plusieurs dictionnaires.

8. Dispositif selon la revendication 7 selon lequel ces dictionnaires peuvent être constitués de l'historique des Services précédemment accédés ou des paramètres précédemment entrés, dans un ou plusieurs dictionnaire(s) contenant une liste prédéfinie de Services ou de paramètres, et peuvent être téléchargés dans le terminal pour améliorer la réactivité du système, totalement ou seulement partiellement, préalablement à l'utilisation de l'invention ou bien chaque fois qu'une mise à jour s'impose.

9. Dispositif selon la revendication 1 et 3 tel que l'interrogation de la ou des base(s) de données distante(s) peut s'effectuer sur un ou plusieurs serveur(s) distinct(s), contenant un extrait de cette base, situés éventuellement sur le même réseau local que le site hébergeant la zone de saisie, dans le but d'améliorer la performance et la fiabilité du système.

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Office européen des brevets

RAPPORT DE RECHERCHE EUROPEENNE

Numéro de la demande
EP 01 40 0839

DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie	Citation du document avec indication, en cas de besoin, des parties pertinentes	Revendication concernée	CLASSEMENT DE LA DEMANDE (Int.Cl.7)
X	WO 99 22488 A (D & I SYSTEMS INC) 6 mai 1999 (1999-05-06)	1-5,9	H04M11/06 H04M1/2745
A	* abrégé; revendications 1-3,7-9,21-14 *	8,12,13	G06F17/30
A	* page 16, ligne 5 - ligne 26 * * page 28, ligne 20 - page 29, ligne 12 * * page 30, ligne 4 - page 31, ligne 20; figures 22,24 *	8	
A	EP 0 732 646 A (TOKYO SHIBAURA ELECTRIC CO) 18 septembre 1996 (1996-09-18) * colonne 15, ligne 37 - colonne 19, ligne 18 * * colonne 21, ligne 17 - colonne 22, ligne 28 *	1-9	
A	US 5 797 098 A (SHARMAN DUANE ET AL) 18 août 1998 (1998-08-18) * colonne 4, ligne 20 - colonne 7, ligne 54; figure 4 *	1-8	

DOMAINES TECHNIQUES RECHERCHES (Int.Cl.7)
H04M
G06F

Le présent rapport a été établi pour toutes les revendications

Lieu de la recherche	Date d'achèvement de la recherche	Examinateur
LA HAYE	7 août 2001	Fournier, C

CATEGORIE DES DOCUMENTS CITES

X : particulièrement pertinent à lui seul
Y : particulièrement pertinent en combinaison avec un autre document de la même catégorie
A : arrière-plan technologique
O : divulgation non-écrite
P : document intercalaire

T : théorie ou principe à la base de l'invention
E : document de brevet antérieur, mais publié à la date de dépôt ou après cette date
D : cité dans la demande
L : cité pour d'autres raisons

& : membre de la même famille, document correspondant

EPO FORM 1503 03.82 (P04C02)

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ANNEXE AU RAPPORT DE RECHERCHE EUROPEENNE RELATIF A LA DEMANDE DE BREVET EUROPEEN NO. EP 01 40 0839

La présente annexe indique les membres de la famille de brevets relatifs aux documents brevets cités dans le rapport de recherche européenne visé ci-dessus.
Lesdits members sont contenus au fichier informatique de l'Office européen des brevets à la date du
Les renseignements fournis sont donnés à titre indicatif et n'engagent pas la responsabilité de l'Office européen des brevets.

07-08-2001

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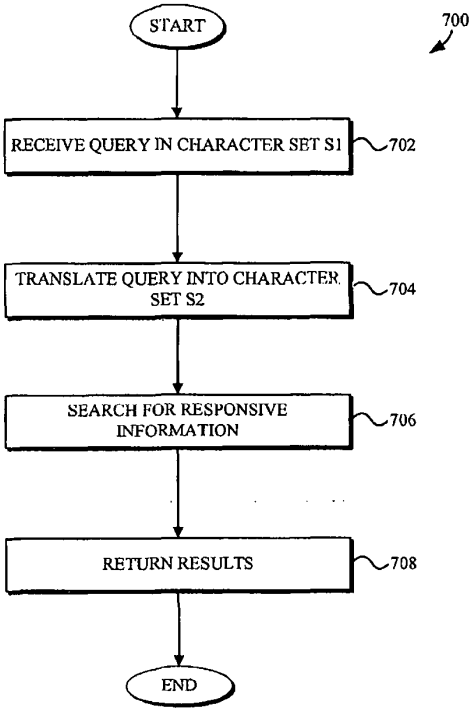

(57) Abstract: Methods and apparatus consistent with the invention allow a user to submit an ambiguous search query and to receive relevant search results. Queries can be expressed using character sets and/or languages that are different from the character set and/or language of at least some of the data that is to be searched. A translation between these character sets and/or languages can be performed by examining the use of terms in aligned text. Probabilities can be associated with each possible translation. Refinements can be made to these probabilities by examining user interactions with the search results.

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SYSTEMS AND METHODS FOR SEARCHING USING QUERIES WRITTEN IN A DIFFERENT CHARACTER-SET AND/OR LANGUAGE FROM THE TARGET PAGES

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of U.S. Patent Application Serial No. 09/748,431, entitled "METHODS AND APPARATUS FOR PROVIDING SEARCH RESULTS IN RESPONSE TO AN AMBIGUOUS SEARCH QUERY," filed December 26, 2000, which claims priority under 35 U.S.C. §119(e) to U.S. Provisional Application Serial No. 60/216,530, entitled "DATA ENTRY AND SEARCH FOR HANDHELD DEVICES," filed July 6, 2000, both of which are hereby incorporated by reference in their entirety.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to information search and retrieval. More specifically, systems and methods are disclosed for performing searches using queries that are written in a character set or language that is different from the character set or language of at least some of the documents that are to be searched.

2. Description of Related Art

Most search engines operate under the assumption that the end user is entering search queries using something like a conventional keyboard, where the input of alphanumeric strings is not difficult. As small devices become more common, however, this assumption is not always valid. For example, users may query search engines using a wireless telephone that supports the WAP (Wireless Application Protocol) standard. Devices such as wireless telephones typically have a data input interface wherein a particular action by the user (e.g., pressing a key) may correspond to more than one alphanumeric character. A detailed description of WAP architecture is available at http://www1.wapforum.org/tech/documents/SPEC-WAPArch-19980439.pdf ("WAP 100 Wireless Application Protocol Architecture Specification").

In the usual case, the WAP user navigates to the search query page, and is presented with a form into which they input their search query. With conventional methods, the user

may be required to press multiple keys to select a particular letter. On a standard telephone keypad, for example, the user would select the letter "b" by pressing the "2" key twice, or would select the letter "s" by pressing the "7" key four times. Accordingly, to enter a query for "ben smith", the user would ordinarily need to enter the following string of key presses: 223366077776444844, which map to letters as follows:

22 → b

33 → e

66 → n

0 → space

7777 → s

6 → m

444 → i

8 → t

44 → h

After the user has entered their search request, the search engine receives the word or words from the user, and proceeds in much the same manner as if it had received the request from a desktop browser wherein the user employed a conventional keyboard.

As can be seen from the foregoing example, this form of data entry is inefficient in that it requires eighteen keystrokes to enter the nine alphanumeric characters (including the space) corresponding to "ben smith".

Similar difficulties may arise when typing queries using non-target-language keyboards. For example, Japanese text can be expressed using a variety of different character sets, including hiragana, katakana, and kanji, none of which are easily entered using a typical ASCII keyboard based on the Roman alphabet. In such a situation, the user will often make use of a word-processor such as Ichitaro, produced by JustSystem Corp. of Tokushima City, Japan, that is able to convert text written in romaji (a phonetic, Roman-alphabet representation of Japanese) to katakana, hiragana, and kanji. Using the word processor, the user can type a query in romaji, and then cut-and-paste the translated text from the word processor's screen into a search box on the browser. A drawback of this approach is that it can be relatively slow and tedious, and requires the user to have access to a copy of the word processor, which may not be feasible due to cost and/or memory constraints.

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There remains, therefore, a need for methods and apparatus for providing relevant search results in response to an ambiguous search query.

SUMMARY OF THE INVENTION

Methods and apparatus consistent with the present invention, as embodied and broadly described herein, provide relevant search results in response to an ambiguous search query. Consistent with the invention, such a method includes receiving a sequence of ambiguous information components from a user. The method obtains mapping information that maps the ambiguous information components to less ambiguous information components. This mapping information is used to translate the sequence of ambiguous information components into one or more corresponding sequences of less ambiguous information components. One or more of these sequences of less ambiguous information are provided as an input to a search engine. The search results are obtained from the search engine and are presented to the user.

In addition, systems and methods are disclosed for performing searches using queries that are expressed in character sets or languages that are different from the character set or language of at least some of the documents that are to be searched. Embodiments of the present invention allow users to type queries using standard input devices (e.g., ASCII keyboards), have the queries translated into the relevant forms at a server (e.g., translate a query written in romaji into katakana, hiragana, and/or kanji), and receive search results based on the converted forms.

It should be appreciated that the present invention can be implemented in numerous ways, including as a process, an apparatus, a system, a device, a method, or a computer readable medium such as a computer readable storage medium, carrier wave, or a computer network wherein program instructions are sent over optical or electronic communication lines. Several inventive embodiments are described below.

In one embodiment, a method is described for automatically translating query terms from one language and/or character set to another. A first set of anchor text containing a given query term is identified, as are a set of documents (e.g., web pages) to which the anchor text point. A second set of anchor text, written in a second format and pointing to the same set of documents, is then identified. The second set of anchor text is then analyzed to obtain a probability that a representation of the given query term in the first format corresponds to a representation of the given query term in the second format.

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In another embodiment, a probabilistic dictionary is created that maps terms written in a first format (e.g., a language and/or character set) to a second format (e.g., another language and/or character set). The probabilistic dictionary is used to translate a query written in the first format into the second format. The translated query is then used to perform a search, the results of which are returned to the user. In some embodiments, the user's interaction with the search results can be monitored, and used to update the probabilities in the probabilistic dictionary. Also, in some embodiments the query itself could, prior to the search, be expanded to include alternative language and/or character set mappings.

In yet another embodiment, a method for creating a probabilistic dictionary is described. The probabilistic dictionary can be used to translate terms in a first format into a second format. The dictionary is preferably created term-by-term, by identifying anchor text or other data containing the term. Next, data that is aligned with the anchor text or other data is analyzed to determine a probability with which a given term in the first format maps onto one or more terms in the second format.

In yet another embodiment, a query provided in a first language or character set is translated into a second language or character set by comparing anchor text that contains one or more of the query terms and is written in the first language or character set with anchor text that corresponds to the first anchor text and is written in the second language or character set.

In another embodiment, a computer program product is provided for translating a term written in a first format into a second format. The computer program product is operable to cause a computer system to identify aligned anchor text and to determine a probability that a representation of a given term in the first format corresponds to one or more terms in the second format.

In another embodiment, a method is provided for performing searches using potentially ambiguous queries. When a user enters a query in a first format, it is translated into a group of one or more variants written in a second format. A search is then performed using the translated variants, and responsive information is returned to the user. For example, the first format might comprise a sequence of numbers entered using a telephone keypad, and the second format might comprise alphanumeric text (e.g., English, romaji, romaja, pinyin, or the like). In some embodiments, the group of one or more variants is selected by discarding translated variants that do not appear in a predefined lexicon, and/or that contain predefined low-probability character combinations. In some embodiments, a probabilistic dictionary is used to further translate the group of one or more variants into a

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third format before the search is performed. For example, the probabilistic dictionary can be used to translate the group of one or more variants from romaji, romaja, or pinyin into kanji, katakana, hiragana, hangul, hanja, or traditional Chinese characters, and a search can then be performed using the translated variants.

These and other features and advantages of the present invention will be presented in more detail in the following detailed description and the accompanying figures which illustrate by way of example the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in, and constitute a part of, this specification illustrate embodiments of the invention and, together with the description, serve to explain the advantages and principles of the invention. In the drawings:

FIG. 1 illustrates a block diagram of a system in which methods and apparatus consistent with the present invention map be implemented;

FIG. 2 illustrates a block diagram of a client device, consistent with the invention;

FIG. 3 illustrates a diagram depicting three documents;

FIG. 4a illustrates a conventional alphanumeric index;

FIG. 4b illustrates a flow diagram for providing search results in response to a conventional alphanumeric search query;

FIG. 5a illustrates a flow diagram, consistent with the invention, for providing search results in response to an ambiguous search query;

FIG. 5b illustrates a diagram for mapping alphanumeric information to numeric information; and

FIG. 6 illustrates another flow diagram, consistent with the invention, for providing search results in response to an ambiguous search query.

FIG. 7 illustrates a method for performing a search in accordance with embodiments of the present invention.

FIG. 8 illustrates a probabilistic dictionary of character-set translations.

FIG. 9 illustrates the use of parallel anchor text to build a probabilistic dictionary.

FIG. 10 illustrates a collection of documents linked using anchor text.

FIGS. 11A and **11B** illustrate the calculation of likely translations based on the anchor text shown in **FIG. 10.**

FIG. 12 shows a probability distribution associated with an illustrative word translation.

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DESCRIPTION OF SPECIFIC EMBODIMENTS

Reference will now be made in detail to embodiments of the present invention as illustrated in the accompanying drawings. The same reference numbers may be used throughout the drawings and the following description to refer to the same or like parts. The following description is presented to enable any person skilled in the art to make and use the inventive body of work. Descriptions of specific embodiments and applications are provided only as examples, and various modifications will be readily apparent to those skilled in the art. For example, although many of the examples are described in the context of Internet web pages, it should be understood that embodiments of the present invention could be used to search other types of documents and/or information, such as books, newspapers, magazines, or the like. Similarly, although for the sake of illustration many of the examples describe the translation of Japanese text from romaji to katakana, hiragana, and/or kanji, those of ordinary skill in the art will appreciate that the systems and methods of the present invention can be applied to any suitable translation. For example, without limitation, embodiments of the present invention could be used to search text written in, e.g., traditional Chinese characters or Korean hangul or hanja characters, based on queries received in some other format (e.g., pinyin or romaja). The general principles described herein may be applied to other embodiments and applications without departing from the spirit and scope of the invention. Thus, the present invention is to be accorded the widest scope, encompassing numerous alternatives, modifications, and equivalents consistent with the principles and features disclosed herein. For purpose of clarity, details relating to technical material that is known in the fields related to the invention have not been described in detail so as not to unnecessarily obscure the present invention.

A. Overview

Methods and apparatus consistent with the invention allow a user to submit an ambiguous search query and to receive potentially disambiguated search results. In one embodiment, a sequence of numbers received from a user of a standard telephone keypad is translated into a set of potentially corresponding alphanumeric sequences. These potentially corresponding alphanumeric sequences are provided as an input to a conventional search engine, using a boolean "OR" expression. In this manner, the search engine is used to help limit search results to those in which the user was likely interested.

B. Architecture

FIG. 1 illustrates a system 100 in which methods and apparatus, consistent with the present invention, may be implemented. The system 100 may include multiple client devices 110 connected to multiple servers 120 and 130 via a network 140. The network 140 may include a local area network (LAN), a wide area network (WAN), a telephone network, such as the Public Switched Telephone Network (PSTN), an intranet, the Internet, or a combination of networks. Two client devices 110 and three servers 120 and 130 have been illustrated as connected to network 140 for simplicity. In practice, there may be more or less client devices and servers. Also, in some instances, a client device may perform the functions of a server and a server may perform the functions of a client device.

The client devices 110 may include devices, such mainframes, minicomputers, personal computers, laptops, personal digital assistants, or the like, capable of connecting to the network 140. The client devices 110 may transmit data over the network 140 or receive data from the network 140 via a wired, wireless, or optical connection.

FIG. 2 illustrates an exemplary client device 110 consistent with the present invention. The client device 110 may include a bus 210, a processor 220, a main memory 230, a read only memory (ROM) 240, a storage device 250, an input device 260, an output device 270, and a communication interface 280.

The bus 210 may include one or more conventional buses that permit communication among the components of the client device 110. The processor 220 may include any type of conventional processor or microprocessor that interprets and executes instructions. The main memory 230 may include a random access memory (RAM) or another type of dynamic storage device that stores information and instructions for execution by the processor 220. The ROM 240 may include a conventional ROM device or another type of static storage device that stores static information and instructions for use by the processor 220. The storage device 250 may include a magnetic and/or optical recording medium and its corresponding drive.

The input device 260 may include one or more conventional mechanisms that permit a user to input information to the client device 110, such as a keyboard, a mouse, a pen, voice recognition and/or biometric mechanisms, etc. The output device 270 may include one or more conventional mechanisms that output information to the user, including a display, a printer, a speaker, etc. The communication interface 280 may include any transceiver-like mechanism that enables the client device 110 to communicate with other devices and/or systems. For example, the communication interface 280 may include mechanisms for communicating with another device or system via a network, such as network 140.

As will be described in detail below, the client devices 110, consistent with the present invention, perform certain searching-related operations. The client devices 110 may perform these operations in response to processor 220 executing software instructions contained in a computer-readable medium, such as memory 230. A computer-readable medium may be defined as one or more memory devices and/or carrier waves. The software instructions may be read into memory 230 from another computer-readable medium, such as the data storage device 250, or from another device via the communication interface 280. The software instructions contained in memory 230 causes processor 220 to perform search-related activities described below. Alternatively, hardwired circuitry may be used in place of or in combination with software instructions to implement processes consistent with the present invention. Thus, the present invention is not limited to any specific combination of hardware circuitry and software.

The servers 120 and 130 may include one or more types of computer systems, such as a mainframe, minicomputer, or personal computer, capable of connecting to the network 140 to enable servers 120 and 130 to communicate with the client devices 110. In alternative implementations, the servers 120 and 130 may include mechanisms for directly connecting to one or more client devices 110. The servers 120 and 130 may transmit data over network 140 or receive data from the network 140 via a wired, wireless, or optical connection.

The servers may be configured in a manner similar to that described above in reference to FIG. 2 for client device 110. In an implementation consistent with the present invention, the server 120 may include a search engine 125 usable by the client devices 110. The servers 130 may store documents (or web pages) accessible by the client devices 110.

C. Architectural Operation

FIG. 3 illustrates a diagram depicting three documents, which may be stored for example on one of the servers 130.

A first document (Document 1) contains two entries--"car repair" and "car rental"--and is numbered "3" at its bottom. A second document (Document 2) contains the entry "video rental". A third document (Document 3) contains three entries--"wine", "champagne", and "bar items"--and includes a link (or reference) to Document 2.

For the sake of illustrative simplicity, the documents shown in FIG. 3 only contain alphanumeric strings of information (e.g., "car", "repair", "wine", etc.). Those skilled in the art will recognize, however, that in other situations the documents could contain other types of information, such as phonetic, or audiovisual information.

FIG. 4a illustrates a conventional alphanumeric index, based on the documents shown in FIG. 3. The first column of the index contains a list of alphanumeric terms, and the second column contains a list of the documents corresponding to those terms. Some terms, such as the alphanumeric term "3", only correspond to (e.g., appear in) one document--in this case Document 1. Other terms, such as "rental", correspond to multiple documents--in this case Documents 1 and 2.

FIG. 4b illustrates how a conventional search engine, such as search engine 125, would use the index illustrated in FIG. 4a to provide search results in response to an alphanumeric search query. The alphanumeric query may be generated using any conventional technique. For purposes of illustration, FIG. 4b depicts two alphanumeric queries: "car" and "wine". Under a conventional approach, search engine 125 receives an alphanumeric query, such as "car" (stage 410), and uses the alphanumeric index to determine which documents correspond to that query (stage 420). In this example, a conventional search engine 125 would use the index illustrated in FIG. 4a to determine that "car" corresponds to Document 1 and would return Document 1 (or a reference to it) to the user as a search result. Similarly, a conventional search engine would determine that "wine" corresponds to Document 3 and would return Document 3 (or a reference to it) to the user (stage 430).

FIG. 5a illustrates a flow diagram, consistent with the invention, of a preferred technique for providing search results in response to a numeric search query, based on the documents and index shown in FIGS. 3 and 4a, respectively. For the sake of illustrative ease, FIG. 5a describes a particular technique for processing a numeric query based on the mapping of a standard telephone handset; but those skilled in the art will recognize that other techniques consistent with the invention may be used.

At stage 510, a sequence "227" (consisting of numeric components "2", "2", and "7") is received from a user. At stage 520, information is obtained about how the numeric components map to letters. Assuming that the user entered the information from a standard telephone keypad, this mapping information is shown in FIG. 5b. As shown in FIG. 5b, the letters "a", "b", and "c" each map to the number "1", the letters "p", "q", "r", and "s" each map to the number "7", and so forth.

At stage 530, using this mapping information, the sequence "227" is translated into its potential alphanumeric equivalents. Based on the information shown in FIG. 5b, there exist 36 possible combinations of letters that correspond to the sequence "227", including the following: aap, bap, cap, abp, bbp, . . . bar . . . car . . . ccs. If numbers are included in the possible combinations (e.g., "aa7"), there would exist 80 possible combinations. Rather than

generating all possible alphanumeric equivalents, it may be desirable to limit the generated equivalents based on some lexicon. For example, it may be desirable to generate only those alphanumeric equivalents that appear in a dictionary, search engine log of previous search queries, etc.; or to otherwise limit the alphanumeric equivalents by using known statistical techniques (e.g., the probability of certain words appearing together).

At stage 540, these alphanumeric equivalents are provided as an input to a conventional search engine, such as that described in reference to FIGS. 4a and 4b, using a logical "OR" operation. For example, the search query provided to the search engine could be "aap OR bap OR cap OR abp . . . OR bar . . . OR car". Although all possible alphanumeric equivalents may be provided to the search engine, a subset may instead be used by using conventional techniques to eliminate equivalents that are unlikely to be intended. For example, one could generate a narrower list of possible combinations by using techniques that draw upon probabilistic information about the usage of letters or words: one could ignore combinations that begin with "qt" but include (and favor) combinations that begin with "qu."

At stage 550, search results are obtained from the search engine. Because terms such as "aap" and "abp" do not appear in the search engine's index, they are effectively ignored. Indeed, the only terms contained within the index shown in FIG. 4b are "car" and "bar", and so the only search results returned are those that reference Documents 1 and 3. At stage 560, these search results are presented to the user. The search results may be presented in the same order provided by the search engine, or may be reordered based on considerations such as the language of the user. Assuming that the user was only interested in documents containing the term "bar", the user would receive an undesired result (Document 3) in addition to the desired result (Document 1). This may be an acceptable price to pay, however, for the benefit of the user only having to press three keys to formulate the search query.

FIG. 6 illustrates another flow diagram, consistent with the invention, of a preferred technique for providing search results in response to a numeric search query, based on the documents and index shown in FIGS. 3 and 4a, respectively. This flow diagram demonstrates how increasing the size of the received sequence can help limit search results to those desired by the user. For the sake of illustrative ease, FIG. 6 again describes a particular technique for processing a numeric query based on the mapping of a standard telephone handset; but those skilled in the art will recognize that other techniques consistent with the invention may be used.

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At stage 610, a sequence "227 48367" (consisting of numeric components "2", "2", "7", "4", "8", "3", "6", "7") is received from a user. For the sake of explanation, the sequence "227" will be called a "number word" and the entire sequence "227 48367" will be called a "number phrase." The possible alphanumeric equivalents of a number word will be called "letter words" and the possible alphanumeric equivalents of a number phrase will be called "letter phrases."

At stage 620, information is obtained about how the numeric components map to letters. Assuming the same mapping information is used as shown in FIG. 5b, at stage 630, the number phrase "227 48367" is translated into potentially corresponding letter phrases. Based on the information shown in FIG. 5b, there exist 11664 possible letter phrases that correspond to the sequence "227 48367".

At stage 640, these letter phrases are provided as an input to a conventional search engine, such as that described in reference to FIGS. 4a and 4b, using a logical "OR" operation. For example, the search query provided to the search engine could be "`aap gtdmp` OR `aap htdmp` . . . OR `bar items` . . . OR `car items`". Although all possible letter phrases may be provided to the search engine, a subset may instead be used by employing conventional techniques to eliminate letter phrases that are unlikely to be intended.

At stage 650, search results are obtained from the search engine. Because many search engines are designed to rank highly those documents that contain the exact phrase sought, Document 3 would likely be the highest ranked search result (i.e., because it contains the exact phrase "bar items"). No other document in the example contains one of the other letter phrases generated at stage 620. Furthermore, many search engines downweight (or eliminate) search results that contain individual parts of a phrase but not the entire phrase. For example, Document 1 would be downweighted or eliminated because it contains the letter word "car", which corresponds to the first part of the letter phrase, but it does not contain any letter word that corresponds to the second part of the letter phrase. Finally, letter phrases such as "aap htdmp" are effectively ignored because they contain no letter words that appear in the search engine's index.

At stage 660, the search results are presented to the user. In the example shown, the first result shown to the user would be Document 3, which is likely most relevant to the user's query. Document 1 may be eliminated altogether, because it does not contain one of the possible letter phrases. In this manner, the user is provided with the most relevant search results.

Although the descriptions above in reference to FIGS. 5 and 6 are made in reference to receiving numeric information and mapping it to alphanumeric information, those skilled

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in the art will recognize that other implementations are possible consistent with the invention. For example, instead of receiving a sequence of numbers corresponding to the keys pressed by a user, the received sequence may consist of the first letters corresponding to the keys pressed by the user. In other words, instead of receiving "227", the received sequence may be "aap". Consistent with the invention, the equivalent letter sequences generated in stages 530 or 630 could then be other letter sequences (e.g., "bar") that correspond to "aap." Indeed, the received sequence may contain phonetic, audiovisual, or any other type of information components.

Regardless of the form in which the sequence is received, it is generally preferred that the received sequence be translated into a sequence that corresponds to the format in which information is stored in the search engine's index. For example, if the search engine's index is stored in alphanumeric format, the received sequence should be translated into alphanumeric sequences.

Furthermore, it is generally preferred that the mapping technique that is used to translate the received sequence of information components be the same technique that is employed at the user's device to map the user's input to the information generated by the device. There may, however, be instances where it is preferable to use a different mapping technique than is used for user input.

Embodiments of the present invention can also enable users to perform searches entered using non-target-language keyboards. For example, a web page containing Japanese text may be written in kanji, while a user attempting to search that page may only have access to a standard ASCII keyboard (or handset) based on the Roman alphabet.

FIG. 7 illustrates a method for performing such a search. As shown in **FIG. 7**, a user types a query using a standard input device (e.g., an ASCII keyboard, a telephone handset, etc.), and sends the query to the search engine. The query may be written in a character set (e.g., romaji) that is different from the character set in which some of the responsive documents are written (e.g., kanji). The search engine receives the query (block 702), translates it into the relevant form(s) (block 704), and performs a search for documents responsive to the translated query using, e.g., conventional search techniques (block 706). The search engine then returns a list of responsive documents (and/or copies of the documents themselves) to the user (block 708). For example, results could be returned to the user in a manner similar to that described above in connection with **FIG. 6**.

As shown in **FIG. 7**, the user's query is preferably translated at the search engine's server, as opposed to the client, thus relieving the user of the need to obtain special-purpose software to perform the translation. However, it will be appreciated that in other

embodiments, some or all of the translation could be performed at the client. In addition, in some embodiments the query may be entered using a device such as a telephone keypad. In such embodiments, the initial, numeric query may first be converted to alphanumeric form (e.g., romaji) using the mapping techniques described above in connection with **FIGS. 5** and **6**, including, for example, the application of a lexicon and/or probabilistic techniques to discard low probability mappings (e.g., mappings that include letter combinations that do not occur in romaji). Once an alphanumeric translation of the query has been obtained, the remainder of the steps shown in **FIG. 7** could be performed (i.e., 704, 706, and 708).

The translation of the query from one character set or language into another (i.e., block 704 in **FIG. 7**) can be performed in a variety of ways. One technique is to use a conventional, static dictionary of word meanings or translations to map each term in the query to a corresponding term in the target language or character set. A problem with this approach, however, is that it will often yield inaccurate results, since words are often ambiguous, and queries will often be too short to provide adequate contextual clues to resolve this ambiguity. For instance, the word "bank" can refer to a river bank, a financial institution, or a maneuver by an airplane, thus making it difficult to translate accurately in the abstract. In addition, if the dictionary is not relatively large and/or frequently updated, it may not contain entries for all the terms that the search engine may encounter, such as seldom-used words, slang, idioms, proper names, and the like.

Embodiments of the present invention can be used to overcome or ameliorate some or all of these problems by using a probabilistic dictionary to translate query terms from one language or character set (e.g., ASCII) to another (e.g., kanji). In a preferred embodiment, the probabilistic dictionary maps one set of terms to another set of terms, and associates a probability with each of the mappings. For convenience, a "term" or "token" will refer to words, phrases, and/or (more generally) sequences of one or more characters that may include spaces.

FIG. 8 shows an example of a probabilistic dictionary 800 such as that described above. The example probabilistic dictionary 800 shown in **FIG. 8** maps words written in romaji (a Roman alphabet representation of Japanese) to words written in kanji (a non-Roman, ideogram-based Japanese character set). To facilitate explanation, **FIG. 8** depicts romaji terms as "$<term>_{romaji}$", and kanji terms as "$<term>_{kanji}$". It will be appreciated that in an actual romaji to kanji dictionary, actual romaji and kanji terms would be used, rather than the English translations shown in **FIG. 8**. Thus it will be appreciated that **FIG. 8** is provided to facilitate an explanation of embodiments of the present invention, and not to illustrate the actual characteristics and meaning of Japanese text.

Dictionary 800 contains entries 808, 810, 812, 814 for various romaji terms 802. The dictionary also contains potential representations of each of these terms in kanji 804, along with a corresponding probability 806 that each such representation is correct. For example, the romaji term "bank" might map to a kanji term meaning "steep slope" with probability 0.3, to a term meaning "financial institution" with probability 0.4, and to a term meaning "airplane maneuver" with probability 0.2. With probability 0.1, the term might map to "other," which is simply a generic way of allowing each term to map to terms that may not be in the dictionary.

Again, it will be appreciated that the example shown in **FIG. 8** has been constructed to illustrate that a given term (e.g., the word "bank") in a first character set or language, may map to more than one term in another character set or language. One of skill in the art will appreciate, however, that while for the sake of clarity the particular example in **FIG. 8** illustrates this principle using English words and meanings, the actual romaji representation of the word "bank," for example, may not be ambiguous in the same fashion as its English equivalent (e.g., there may be no ambiguity in romaji between the word for a financial institution and the word for an airplane maneuver). It should also be appreciated that, to facilitate explanation, the dictionary shown in **FIG. 8** has been simplified in other respects as well. For example, an actual probabilistic dictionary might contain many more potential mappings for each term, or might only contain mappings that exceed a predefined probability threshold.

Preferred embodiments of the present invention use such a probabilistic dictionary to translate queries expressed in one language and/or character set into another language and/or character set, thereby enabling users to find documents written in a different character set and/or language than their original query. For example, if the user enters a query for "cars" in romaji, the probabilistic dictionary can be used to map the romaji term for "cars" to, e.g., the kanji term for "cars." In this way, users can find documents related to their queries, even if the character set of the queries (e.g., romaji) and the character set of the matching documents (e.g., kanji) are not be the same. Note that in this particular example, the actual language of the query is not changed (both romaji and kanji are used to express Japanese), only the character encoding.

As yet another example, the term "tired" in ASCII English could map to the term "müde" in German using a Latin 1 character encoding, since the character umlaut-u does not exist in ASCII. Note that in this example the dictionary provides both a translation into another language (English to German) and a translation into another character encoding (ASCII to Latin 1).

In preferred embodiments, the mapping dictionary described above is built in an automatic manner, using information available on the web in conjunction with statistical techniques. Preferred embodiments use parallel, aligned bilingual corpora, such as anchor text written in different languages and/or character sets, to arrive at accurate translations. Using this data, preferred embodiments can construct a dictionary of potential word mappings. This can be done, for example, by simply counting the number of times a token in language S_i (source language) occurs at the same time as a token T_j (target language) in aligned text pairs (e.g., anchors, sentences, etc.). It will be appreciated, however, that any suitable technique could be used.

In the absence of sufficiently large and correctly aligned data sets, this method may generate relatively ambiguous many-to-many mappings. Thus, for instance, it may be determined only that S_1 could map to T_2, T_3, T_7, and T_8 with some probability. However, this is acceptable, and, as described in more detail below, in some embodiments additional refinements can be made to increase the respective likelihood of each of the mappings, e.g., by examining previous user queries, the user's selection of items on the results page, and/or the like.

FIG. 9 illustrates the use of parallel anchor text to build a probabilistic dictionary. Anchor text comprises the text associated with a hyperlink between web pages (or locations within a given web page). For example, in the hypertext markup language (HTML), the command: "<A href = "http://www. abc.com">Banks and Savings and Loans</A>" causes the text "Banks and Savings and Loans" to be displayed as a hyperlink pointing to the web page found at http://www.abc.com. The text "Banks and Savings and Loans" is called anchor text, and typically provides a short description of the web page to which it points (e.g., www.abc.com). Indeed, anchor text will often provide a more accurate description of a web page than the page itself, and thus can be particularly useful in determining the nature of the web page to which it points. In addition, the word usage and distribution in anchor text is often closer in spirit and length to that found in user queries. It is also the case that many of the anchors pointing to a given page will contain the same, or highly similar text. For example, anchors pointing to www.google.com will often simply say "Google," or will at least use this term along with other text. Thus, by examining all, e.g., katakana, anchors that point to www.google.com, a katakana translation for "Google" can be inferred with a relatively high degree of confidence by simply looking for the term that appears with the highest frequency (possibly after discarding certain predefined, low information-content anchors, such as ones that simply say "click here"). Preferred embodiments of the present

invention take advantage of these characteristics of anchor text to provide accurate translations.

Referring to **FIG. 9**, upon receiving a query containing a term written in a first character set (e.g., ASCII) (block 902), the server identifies a set of anchor text in which the term appears (block 904). For example, the server may examine an index of all known anchors to identify those anchors that contain the term. Next, the web pages to which those anchors point are identified (block 906), as are any anchors written in the target language or target character set (e.g., hiragana, katakana, and/or kanji) that point to these pages (block 908). The system will now have two sets of documents (where anchor text is considered to be a form of document). The distribution of the query term in one document set (e.g., the anchors that contain the original ASCII query) is then used to identify the most likely candidates for the translated phrase in the other document set (e.g., the parallel anchors). Statistics can be computed regarding the frequency with which the anchor text terms appear, and these statistics can be used to determine the relative frequencies or probabilities of the terms found in the anchor text being the correct translation of the original query (block 910). For queries with multiple words, the process described above can be repeated for each word, or the entire query can simply be treated as a single term, or some other suitable grouping of words could be used. For example, if the query is "big houses," a dictionary of possible translations could be constructed by finding aligned anchor text that contains that phrase (or at least one of the words in the phrase). Similarly, if the query contained more than two terms, experiments to determine an appropriate mapping could be constructed by picking appropriate subsets of the query terms and generating results for those terms.

An advantage of performing a translation in the manner shown in **FIG. 9** is that the translation system need not have prior knowledge of the mappings between terms in one language or character set and those in the target set. Instead, the mappings can be determined dynamically based on the body of data that is available to perform the statistical analysis. Thus, for example, it is possible to discover accurate translations for slang terms, idioms, proper names, and the like without incurring the effort or expense (e.g., linguistic analysis and research) of maintaining a conventional static dictionary.

An illustrative embodiment of the foregoing translation techniques will now be described in connection with **FIGS. 10-12**. In this example, it will be assumed that the user has entered the query term "house," and wishes to obtain search results written in Spanish (or simply a translation of the query term). The server will thus attempt to translate the English term "house" into its Spanish equivalent.

Referring to **FIG. 10**, a variety of web pages 959, 961, 963, 965 are linked via anchor text 960, 962, 964, 966 to pages 972 and 974. Some of the pages, and their associated anchor text, are written in English (i.e., pages 959a-e and 963a-t) and some are written in Spanish (i.e., pages 961a-e and 965a-j). The server first locates all anchors that use the term "house." These anchors can be located, for example, by searching an index of anchor text stored at the server. Using such an index, the server might first find the five anchors 960 that each use the phrase "big house" and point to web page 972. The server next determines that there are also five target-language (i.e., Spanish) anchors 962 that point to page 972, too. In the example shown in **FIG. 10**, these anchors contain the text "casa grande." Anchors that point to the same page (such as anchors 960 and anchors 962), or to pages bearing a predefined relationship thereto, are said to be "aligned," where, in a more general sense, alignment typically refers to the equivalence (or likely equivalence) of the aligned items.

FIG. 11A shows the frequency with which each target-language term appears in the target-language anchors 962. As shown in **FIG. 11A**, the terms "casa" and "grande" each appear five times (i.e., once in each anchor 962). Thus, out of the ten total terms that appear in the target anchors 962 (i.e., two terms per anchor in each of the five anchors), "casa" accounts for half, and "grande" accounts for the other half. Thus, as shown in **FIG. 11A**, at this point the term "house" could map to either "casa" or "grande" with equal probability, since both terms appear with equal frequency.

However, as shown in **FIG. 10**, the system also finds twenty English anchors 964 that contain the term "house" and point to page 974, and ten Spanish anchors 966 containing the term "casa" and also pointing to page 974. As shown in **FIG. 11B**, the term "house" will now map to "casa" with probability 0.75 (i.e., 15/20), and to "grande" with probability 0.25 (i.e., 5/20). These probabilities are calculated by simply dividing the total number of occurrences of each term in the target language anchors (i.e., fifteen, in the case of "casa") by the total number of terms—including duplicates—in the target language anchors (i.e., twenty terms: ten contained in anchors 962, and ten contained in anchors 964). Alternatively, or in addition, other techniques could be used to calculate and/or refine the probabilities of a given translation or mapping. For example, those skilled in the art will appreciate that any of a variety of well-known techniques could be used for reducing the variance error of the probability estimates, such as Bayesian methods, histogram smoothing, kernel smoothing, shrinkage estimators, and/or other estimation techniques.

If more anchor text is available, the probabilities could be refined even further. For example, a final probability distribution might be similar to that shown in **FIG. 12**, in which

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"house" maps with a relatively high probability to "casa" and its diminutive form "casita," and with somewhat lesser probability to terms like "casino" and "mansión" (the Spanish word for mansion), and with negligible probability to terms like "grande." Thus, a correct translation—as well as an identification of likely synonyms—can be obtained without knowledge of the languages and/or character sets that are being translated.

Having translated the query terms, the server can now run a search using the translation. For example, if a user were to enter a romaji query for "hotels in Kyoto," the techniques described above could be used to enable the server to infer katakana, hiragana and kanji forms of the query, perform searches using those queries, and then present the combined results for each of those query forms to the user within an appropriate user interface.

It should be appreciated that the example described in connection with **FIGS. 10-12** is provided for purposes of illustration, and not limitation, and that many changes could be made to the methodology depicted therein. For example, different statistical techniques could be used to arrive at the probabilities, and/or modifications could be made to the basic techniques described above. Similarly, it should be appreciated that the translation technique described above can simply be used to perform translations of words or phrases entered by users, and need not also be used to perform an associated Internet search or to create a probabilistic dictionary. In addition, although the preceding example describes the translation process as occurring after the receipt of a user's query, it should be appreciated that in other embodiments the mapping process could be performed before the user's query is received. Such pre-computed mappings could be stored in a dictionary such as that described in **FIG. 8**, which would then be applied to translate user queries as they were received. Finally, it should be understood that text other than aligned anchor text could be used to perform the translation. For example, aligned sentences or other data could be used in a similar manner. In many countries there is more than one official or recognized language, and newspapers and periodicals will often contain the same article written in each of these languages. These parallel translations can be used in the same manner as the previously described anchor text to prepare probabilistic dictionaries of word translations.

Thus, preferred embodiments advantageously enable users to enter search queries and/or translation requests in a convenient manner (e.g., using an ASCII keyboard), and provide an accurate and automatic translation and search. In some embodiments, additional refinements can be made to the basic model described above. For example, in some embodiments a preference (weighting) can be given to anchors that contain a number of terms that is similar to the number of terms in the original query and/or in other aligned

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anchors. For example, in the system shown in **FIG. 10** a preference might be given to the anchors that point to page 974, since, like the original query, they each contain a single term. Similarly, if an anchor containing the text "la casa grande" also pointed to page 972, its weighting could be discounted by an appropriate factor, since it contains more terms (i.e., 3) than the other anchors with which it is aligned. Such a weighting scheme could be reflected in the probability calculation shown in **FIG. 11B** by multiplying the frequencies associated with these anchors' terms by a suitable factor.

The translation process described above can also be used to improve the effectiveness of the search itself. For example, the probabilistic dictionary can be used to expand queries on the fly to include, e.g., various translations and synonyms of the original query terms. By expanding user queries prior to document retrieval, simultaneous searches for the same "concepts" can be performed, thereby increasing the likelihood that the search results will contain what the user is looking for. Alternatively, or in addition, the probabilistic dictionary can be used to supplement the normal document indexing process, by providing expansions of document terms. For example, the terms found in a document could be supplemented in the document index with translations from the probabilistic dictionary, thus increasing the probability that the document will be located even by searches that do not use precisely the same terms found in the original document.

A problem that may arise when using the translation techniques described above, is that, due to data sparsity (e.g., not enough anchors to conclusively determine that "casa" maps to "house"), or lack of diversity (e.g., all the anchors say the same thing), the system may be unable to arrive at sufficiently accurate probabilistic mappings. Thus, in some embodiments the probabilistic mappings can be further improved by examining user behavior. Several illustrative techniques are described below.

For example, assume once again that the server wishes to obtain a translation for "house." Assume, however, that the only anchor text that can be found either contains the phrase "big house" or the phrase "casa grande." Due to this lack of diversity in the anchor text, the probabilistic dictionary might arrive at the following mappings:

house → casa, with 0.5 probability
house → grande, with 0.5 probability

big → casa, with 0.5 probability
big → grande, with 0.5 probability

grande → house, with 0.5 probability

grande → big, with 0.5 probability

casa → house, with 0.5 probability
casa → big, with 0.5 probability

Imagine that a user now queries the search engine with the term "casa." At this point, the search engine could return pages that contain the term "casa," and also mix in N results that contain just the term "house" and M results that contain just the term "big." In practice, N and M could be adjusted to take into account the underlying probabilities of the mappings, so that relatively unlikely mappings would result in fewer results being displayed. If users were found to click on results containing just the term "house" ten times more than they clicked on results containing just the term "big," the probabilities of the mappings could, for example, be adjusted as follows:

house → casa, with 0.9 probability
house → grande, with 0.1 probability

big → casa, with 0.1 probability
big → grande, with 0.9 probability

grande → house, with 0.1 probability
grande → big, with 0.9 probability

casa → house, with 0.9 probability
casa → big, with 0.1 probability

Note that the actual numbers could depend on a variety of other factors, such as the number of users whose clicks were taken into account, the number of clicks on pages containing both the terms, the placement of the results containing the terms in question amongst the result set, and/or the like. It should also be appreciated that the adjusted probabilities given in this example (i.e., 0.1 and 0.9) are for illustrative purposes. One of skill in the art will appreciate that the actual weighting given to user feedback such as that described above could be implemented in any suitable manner.

Also note that the foregoing example has been simplified to facilitate explanation of the use of user feedback. For example, in some systems it will be possible to make use of

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information obtained from other translations to assist in performing a given translation. For instance, in the example that has just been presented, even if the term "house" only appeared in anchor text that said "big house," it might still be possible to determine that "house" more appropriately maps to "casa" than it does to "grande." For example, if it had already been determined that "big" mapped to "grande" with a very high probability and over a sufficiently large data set (and if it were assumed that anchor text seldom consists of a list of synonyms), then the house-to-casa mapping could still be given preference over the house-to-grande mapping, even though the anchors containing "house" or "casa" were inconclusive.

The accuracy of the translation and/or the usefulness of the search results can also be improved by examining the user's query session history. For example, in many cases the system will know (e.g., through cookies or information stored in a user's account at the server) the previous queries that the user has entered. This historical data can be used to rank possible senses of the queries from that user, thus potentially disambiguating "bank" for fishing-related queries from those related to flying. Thus, this process can be used to narrow the set of possible translations. In some embodiments the system may suggest these by displaying them in connection with a message such as "Did you mean to search for X" in the user interface (where "X" refers to the predicted translation preference), while also potentially displaying in the first page of results a small number of results from each of the possible reformulations. When a user either selects one of the alternatives suggested by the "did you mean ..." display, or one of the results presented on the results page, the system will obtain additional evidence regarding the likely translations of the query word(s), as well as the likely search bias of the user. Both of these signals can then be used by the system to update the likelihood scores for term mappings (e.g., in the probabilistic dictionary), both in the general case as well as in the user-specific case.

D. Conclusion

As described in detail above, methods and systems consistent with the invention can be used to provide search results in response to ambiguous search queries and/or to translate terms into other character set and/or languages. A variety of translation and search techniques and systems have been described. However, it will be appreciated that the foregoing description has been presented for purposes of illustration, and that many modifications and variations are possible in light of the above teachings, or through practicing the invention. For example, although the foregoing description is based on a client-server architecture, those skilled in the art will recognize that a peer-to-peer

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architecture may be used consistent with the invention. Moreover, although the described implementation includes software, the invention may be implemented as a combination of hardware and software or in hardware alone. Additionally, although aspects of the present invention are described as being stored in memory, one skilled in the art will appreciate that these aspects can also be stored on other types of computer-readable media, such as secondary storage devices, like hard disks, floppy disks, or CD-ROM; a carrier wave from the Internet; or other forms of RAM or ROM. The scope of the invention is therefore defined by the claims and their equivalents.

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CLAIMS

What is claimed is:

1. A method comprising:

identifying a first set of anchor text written in a first format and containing a given term;

identifying a set of documents to which the first set of anchor text points;

identifying a second set of anchor text written in a second format and pointing to the identified set of documents;

analyzing the second set of anchor text to determine that a representation of the given term in the first format corresponds to a representation of the given term in the second format.

2. The method of claim 1, in which the first format comprises a first character set, and the second format comprises a second character set.

3. The method of claim 1, in which the first format comprises a first language and the second format comprises a second language.

4. The method of claim 1, in which analyzing the second set of anchor text includes identifying a term that appears most frequently in the second set of anchor text and designating the most frequently appearing term as the representation of the given term in the second format.

5. The method of claim 1, in which analyzing the second set of anchor text comprises:

calculating a probability that the given term corresponds to a term in the second set of anchor text.

6. The method of claim 5, in which the probability is obtained using at least one of Bayesian methods, histogram smoothing, kernel smoothing, and shrinkage estimators.

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7. The method of claim 5, in which the probability that the given term corresponds to a term in the second set of anchor text is obtained by dividing the number of occurrences of the term in the second set of anchor text by the total number of occurrences of all terms in the second set of anchor text.

8. The method of claim 1, in which analyzing the second set of anchor text comprises:

calculating a probability that the given term corresponds to each term in the second set of anchor text.

9. The method of claim 1, in which analyzing the second set of anchor text comprises:

identifying a term that appears most frequently in the second set of anchor text.

10. The method of claim 2, in which the first format is selected from the group consisting of: romaji, romaja, and pinyin; and in which the second character set is selected from the group consisting of: katakana, hiragana, kanji, hangul, hanja, and traditional Chinese characters.

11. The method of claim 1, in which the documents comprise web pages.

12. The method of claim 1, further comprising:

obtaining a query written in the first format and containing the given term;

translating the query into the second format based at least in part on said analyzing step;

searching a database for information written in the second format that is responsive to the translated query.

13. The method of claim 12, in which the steps are performed in the order recited.

14. A search method comprising:

obtaining a query written in a first format from a user;

translating the query into a second format using a probabilistic dictionary, the probabilistic dictionary mapping terms from the first format to the second format;

searching a database for information responsive to the translated query; and

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returning search results written in the second format to the user.

15. The search method of claim 14, further comprising:

obtaining search result selections from the user;

using said search result selections to modify the probabilistic dictionary of term mappings.

16. The search method of claim 15, wherein the modification comprises adjusting at least one probability associated with at least one mapping in the probabilistic dictionary.

17. The search method of claim 14, in which the step of translating the query into the second format includes expanding the query.

18. The search method of claim 17, in which the expanded query includes alternative encodings of the query terms.

19. The search method of claim 17, in which the expanded query includes alternative language translations of the query terms.

20. The search method of claim 17, in which the expanded query includes alternative encodings and alternative language translations of the query terms.

21. The search method of claim 18, in which the expanded query includes synonyms of the alternative encodings of the query terms.

22. A method for creating a probabilistic dictionary, the probabilistic dictionary mapping terms in a first format to terms in a second format, the method comprising:

for a given term, identifying a first set of data in the first format that contains the term;

identifying a second set of data in the second format that is aligned with the first set of data; and

analyzing the second set of data to determine one or more probabilities with which the given term maps onto one or more terms in the second set of data.

23. The method of claim 22, further comprising:

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adding the given term to the dictionary along with one or more probabilities with which the given term maps onto one or more terms in the second set of data.

24. The method of claim 23, further comprising:

repeating, for each term to be added to the dictionary, said steps of identifying a first set of data, identifying a second set of data, and analyzing the second set of data.

25. The method of claim 22, in which the first set of data comprises a first set of anchor text pointing to a set of one or more web pages, and in which the second set of data comprises a second set of anchor text pointing to the same set of one or more web pages.

26. The method of claim 22, in which the first set of data comprises a set of text written in a first language, and in which the second set of data comprises the same set of text written in a second language.

27. The method of claim 22, in which the probability with which the given term maps onto a term in the second set of data is calculated by dividing the number of occurrences of the term in the second set of data by the total number of terms in the second set of data.

28. The method of claim 22, further comprising:

modifying the probability with which the given term maps onto a term in the second set of data based, at least in part, on an analysis of a user's selection of search results.

29. The method of claim 22, further comprising:

modifying the probability with which the given term maps onto a term in the second set of data based, at least in part, on an analysis of a user's previous queries.

30. A computer program product embodied on a computer-readable medium, the computer program product including instructions, which when executed by a computer system, are operable to cause the computer system to perform acts comprising:

identifying a first set of anchor text written in a first format and containing a given term;

identifying a set of web pages to which the first set of anchor text points;

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identifying a second set of anchor text written in a second format and pointing to the identified set of web pages;

determining a probability that a representation of the given term in the first format corresponds to a representation of the given term in the second format.

31. The computer program product of claim 30, further including instructions, which when executed by the computer system, are operable to cause the computer system to perform acts comprising:

modifying the probability that a representation of the given term in the first format corresponds to a representation of the given term in the second format based, at least in part, on an analysis of a user's selection of search results.

32. The computer program product of claim 30, further including instructions, which when executed by the computer system, are operable to cause the computer system to perform acts comprising:

modifying the probability that a representation of the given term in the first format corresponds to a representation of the given term in the second format based, at least in part, on an analysis of a user's previous queries.

33. The computer program product of claim 30, in which the probability is determined, at least in part, using at least one of Bayesian methods, histogram smoothing, kernel smoothing, and shrinkage estimators.

34. A translation method comprising:

identifying a first body of text written in a first format;

identifying a second body of text written in a second format, the second body of text being aligned with the first body of text;

creating a dictionary of translations between terms in the first body of text and terms in the second body of text by comparing the occurrence of terms in the first body of text with the occurrence of terms in the second body of text.

35. A translation method as in claim 34, in which the dictionary of translations includes one or more probabilities associated with the translations.

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36. A translation method as in claim 34, in which the first format comprises a first character set and the second format comprises a second character set.

37. A translation method as in claim 34, in which the first format comprises a first language and the second format comprises a second language.

38. A translation method as in claim 34, in which the first body of text comprises anchor text and the second body of text comprises anchor text.

39. A method comprising:

receiving a query containing at least one query term written in a first format;

translating the query term into a plurality of variants written in a second format; and

using one or more of the variants to search for information written in the second format that is responsive to the query.

40. The method of claim 39, in which the first format comprises a sequence of numbers entered from a telephone keypad; and in which the second format comprises alphanumeric text.

41. The method of claim 39, further comprising:

obtaining the one or more variants by discarding variants in the plurality of variants that are not part of a predefined lexicon.

42. The method of claim 39, further comprising:

obtaining the one or more variants by discarding variants in the plurality of variants that contain predefined low-probability character combinations.

43. The method of claim 39, in which the first format comprises alphanumeric text written in a character set selected from the group consisting of romaji, romaja, and pinyin; and in which the second format comprises alphanumeric text written in a character set selected from the group consisting of kanji, katakana, hiragana, hangul, hanja, and traditional Chinese characters.

44. A method comprising:

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receiving a numeric query entered from a telephone keypad;

translating the numeric query into a group of potential alphanumeric translations in a first format;

discarding potential translations that are determined to include predefined low-probability character combinations;

translating the remaining alphanumeric translations from the first format to a second format using a probabilistic dictionary; and

performing a search using the alphanumeric translations in the second format.

45. The method of claim 44, in which the first format comprises text written in a character set selected from the group consisting of romaji, romaja, and pinyin; and in which the second format comprises text written in a character set selected from the group consisting of kanji, katakana, hiragana, hangul, hanja, and traditional Chinese characters.

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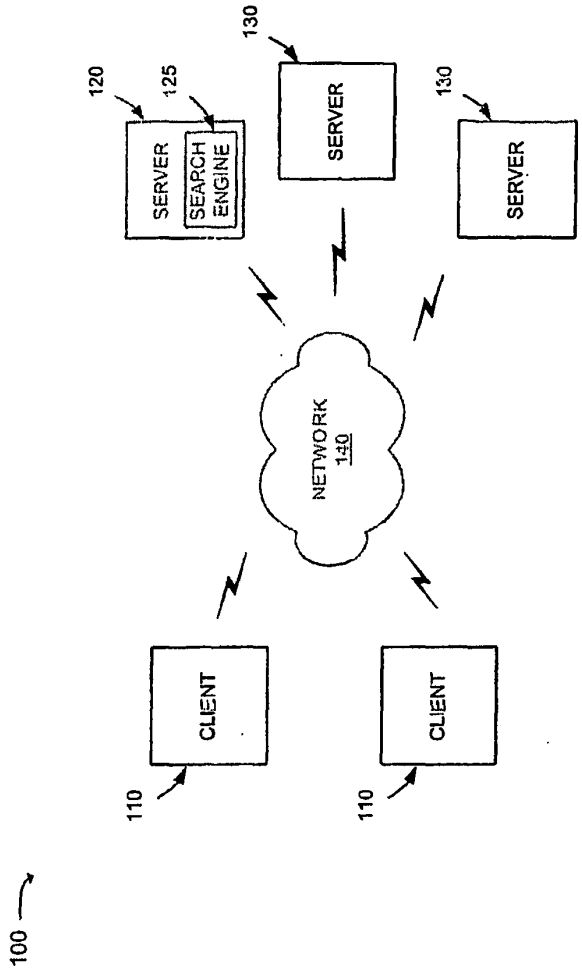

100
110
CLIENT
110
CLIENT
NETWORK
140
120
SERVER
125
SEARCH ENGINE
130
SERVER
130
SERVER

FIG. 1

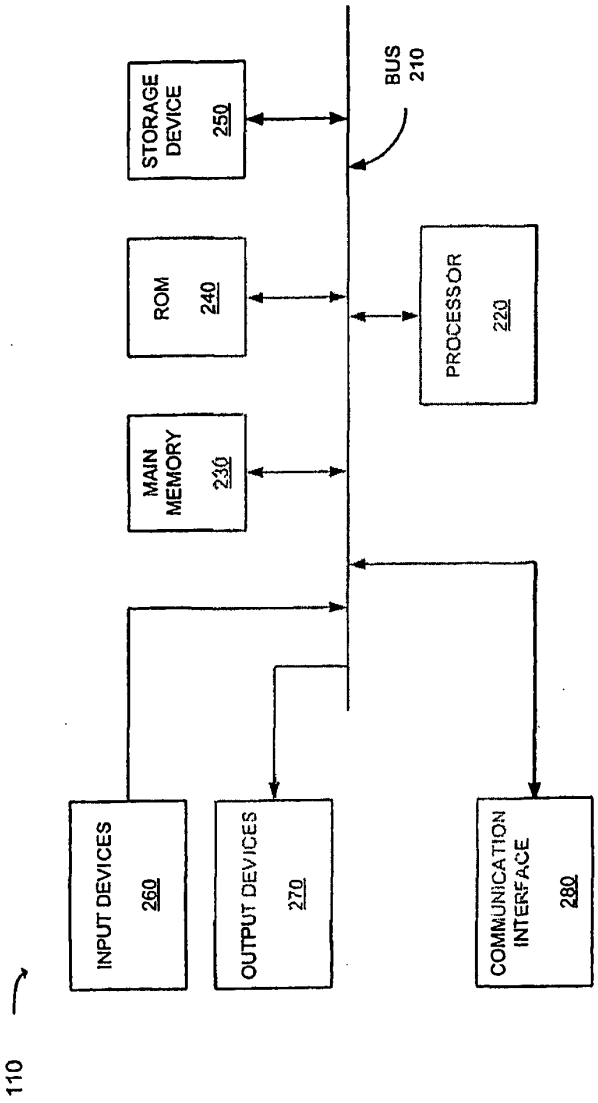

110
INPUT DEVICES
260
OUTPUT DEVICES
270
COMMUNICATION INTERFACE
280
MAIN MEMORY
230
ROM
240
STORAGE DEVICE
250
BUS
210
PROCESSOR
220

FIG. 2

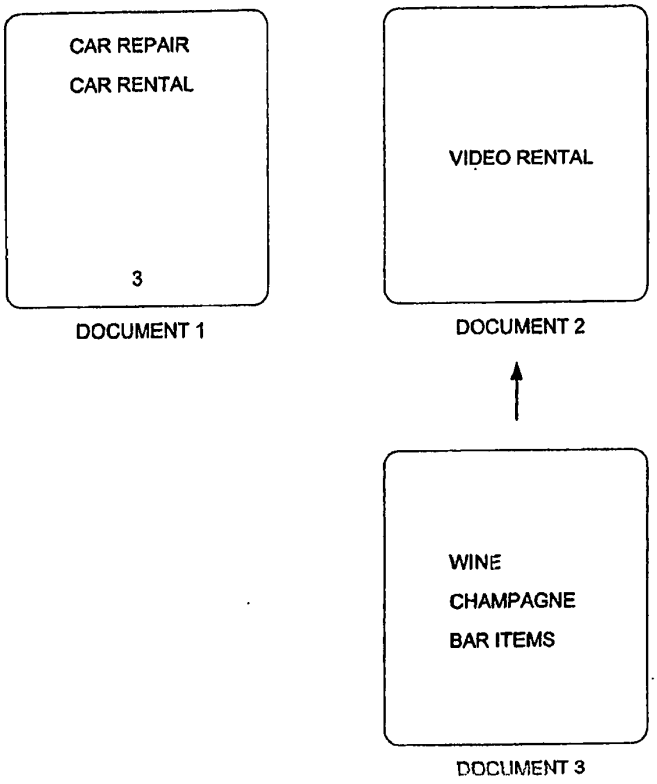

CAR REPAIR
CAR RENTAL
3
DOCUMENT 1
VIDEO RENTAL
DOCUMENT 2
WINE
CHAMPAGNE
BAR ITEMS
DOCUMENT 3

FIG. 3

TERM	LOCATION (DOCUMENT)
3	DOCUMENT 1
BAR	DOCUMENT 3
CAR	DOCUMENT 1
CHAMPAGNE	DOCUMENT 3
ITEMS	DOCUMENT 3
RENTAL	DOCUMENTS 1 AND 2
REPAIR	DOCUMENT 1
VIDEO	DOCUMENT 2
WINE	DOCUMENT 3

FIG. 4A

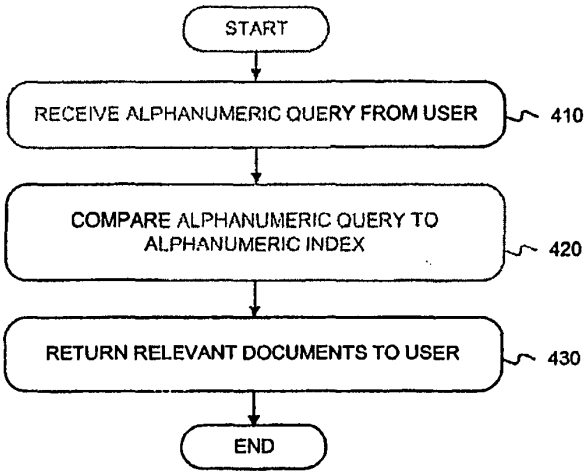

START
RECEIVE ALPHANUMERIC QUERY FROM USER
410
COMPARE ALPHANUMERIC QUERY TO ALPHANUMERIC INDEX
420
RETURN RELEVANT DOCUMENTS TO USER
430
END

FIG. 4B

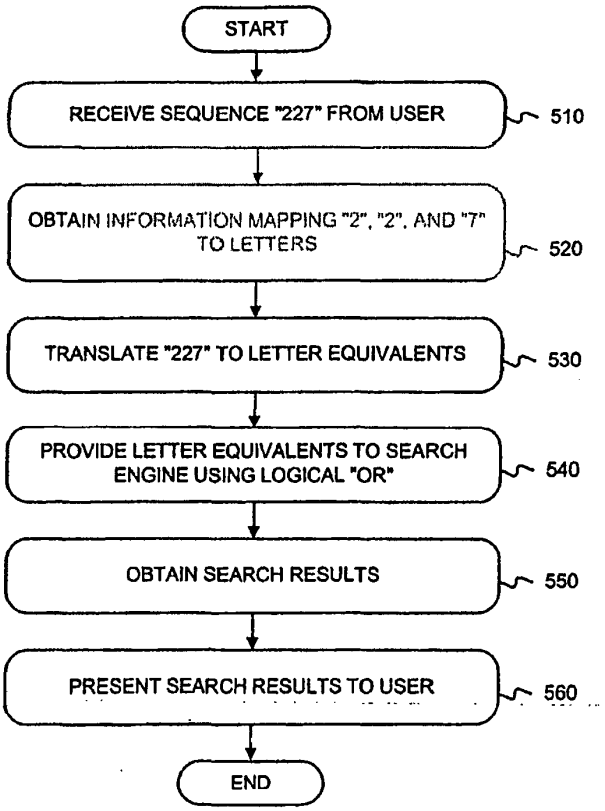

START
RECEIVE SEQUENCE "227" FROM USER
510
OBTAIN INFORMATION MAPPING "2", "2", AND "7" TO LETTERS
520
TRANSLATE "227" TO LETTER EQUIVALENTS
530
PROVIDE LETTER EQUIVALENTS TO SEARCH ENGINE USING LOGICAL "OR"
540
OBTAIN SEARCH RESULTS
550
PRESENT SEARCH RESULTS TO USER
560
END

FIG. 5A

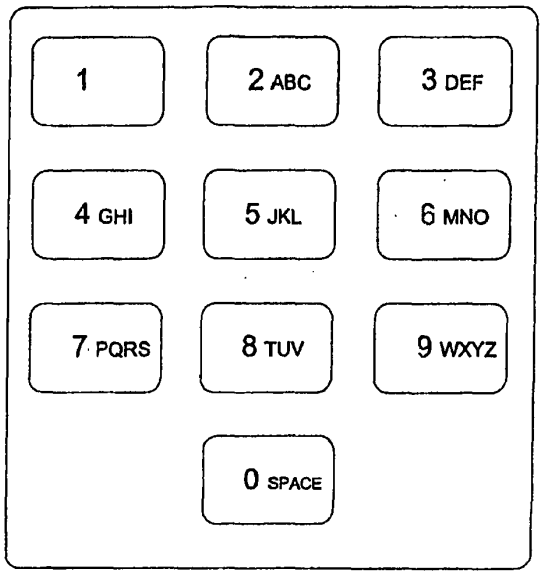


FIG. 5B

TERM	LOCATION (DOCUMENT)
3	DOCUMENT 1
227	DOCUMENTS 1 AND 3
242672463	DOCUMENT 3
48367	DOCUMENT 3
736825	DOCUMENTS 1 AND 2
737247	DOCUMENTS 1
84336	DOCUMENT 2
8463	DOCUMENT 3

FIG. 5C

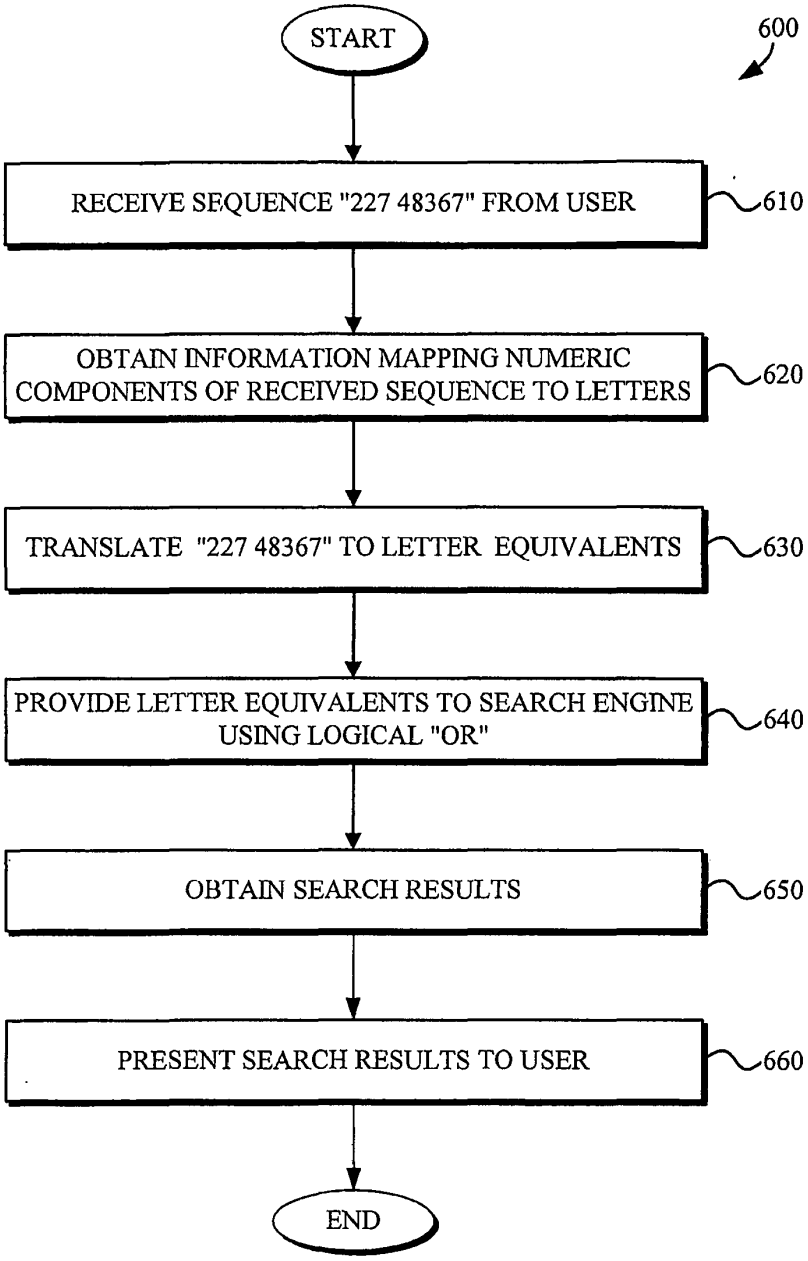

START
600
RECEIVE SEQUENCE "227 48367" FROM USER
610
OBTAIN INFORMATION MAPPING NUMERIC COMPONENTS OF RECEIVED SEQUENCE TO LETTERS
620
TRANSLATE "227 48367" TO LETTER EQUIVALENTS
630
PROVIDE LETTER EQUIVALENTS TO SEARCH ENGINE USING LOGICAL "OR"
640
OBTAIN SEARCH RESULTS
650
PRESENT SEARCH RESULTS TO USER
660
END

FIG. 6

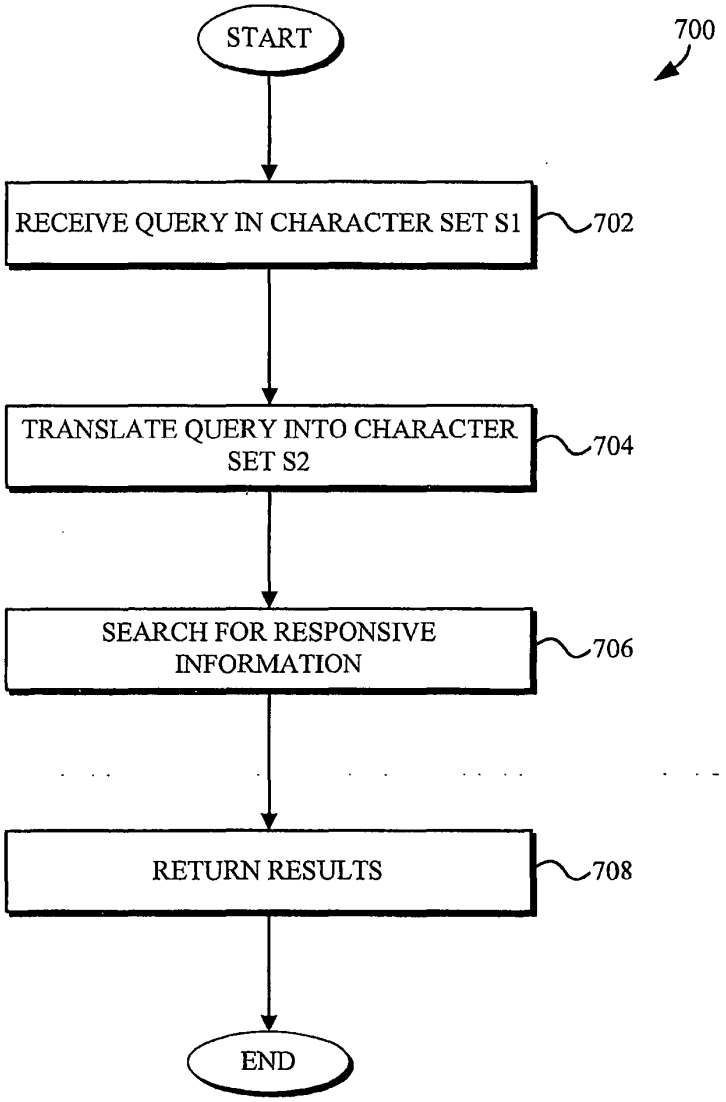
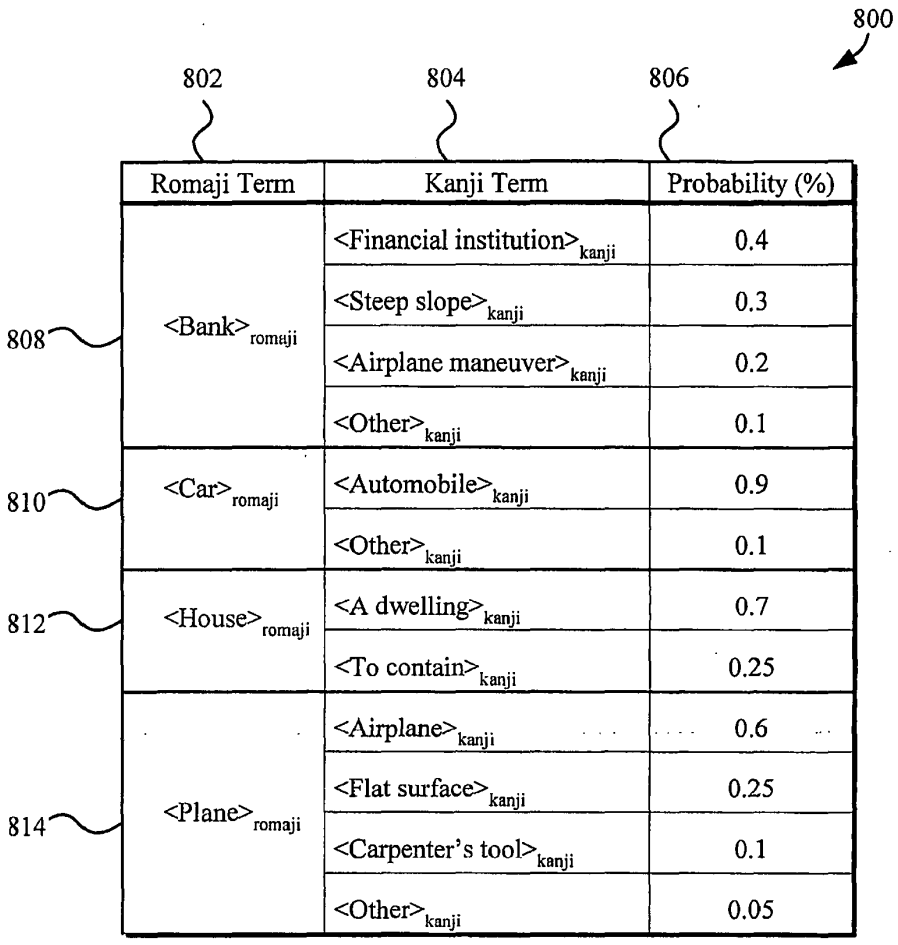

START
700
RECEIVE QUERY IN CHARACTER SET S1
702
TRANSLATE QUERY INTO CHARACTER SET S2
704
SEARCH FOR RESPONSIVE INFORMATION
706
RETURN RESULTS
708
END

FIG. 7



Romaji Term	Kanji Term	Probability (%)
<Bank>$_{romaji}$	<Financial institution>$_{kanji}$	0.4
	<Steep slope>$_{kanji}$	0.3
	<Airplane maneuver>$_{kanji}$	0.2
	<Other>$_{kanji}$	0.1
<Car>$_{romaji}$	<Automobile>$_{kanji}$	0.9
	<Other>$_{kanji}$	0.1
<House>$_{romaji}$	<A dwelling>$_{kanji}$	0.7
	<To contain>$_{kanji}$	0.25
<Plane>$_{romaji}$	<Airplane>$_{kanji}$	0.6
	<Flat surface>$_{kanji}$	0.25
	<Carpenter's tool>$_{kanji}$	0.1
	<Other>$_{kanji}$	0.05

FIG. 8

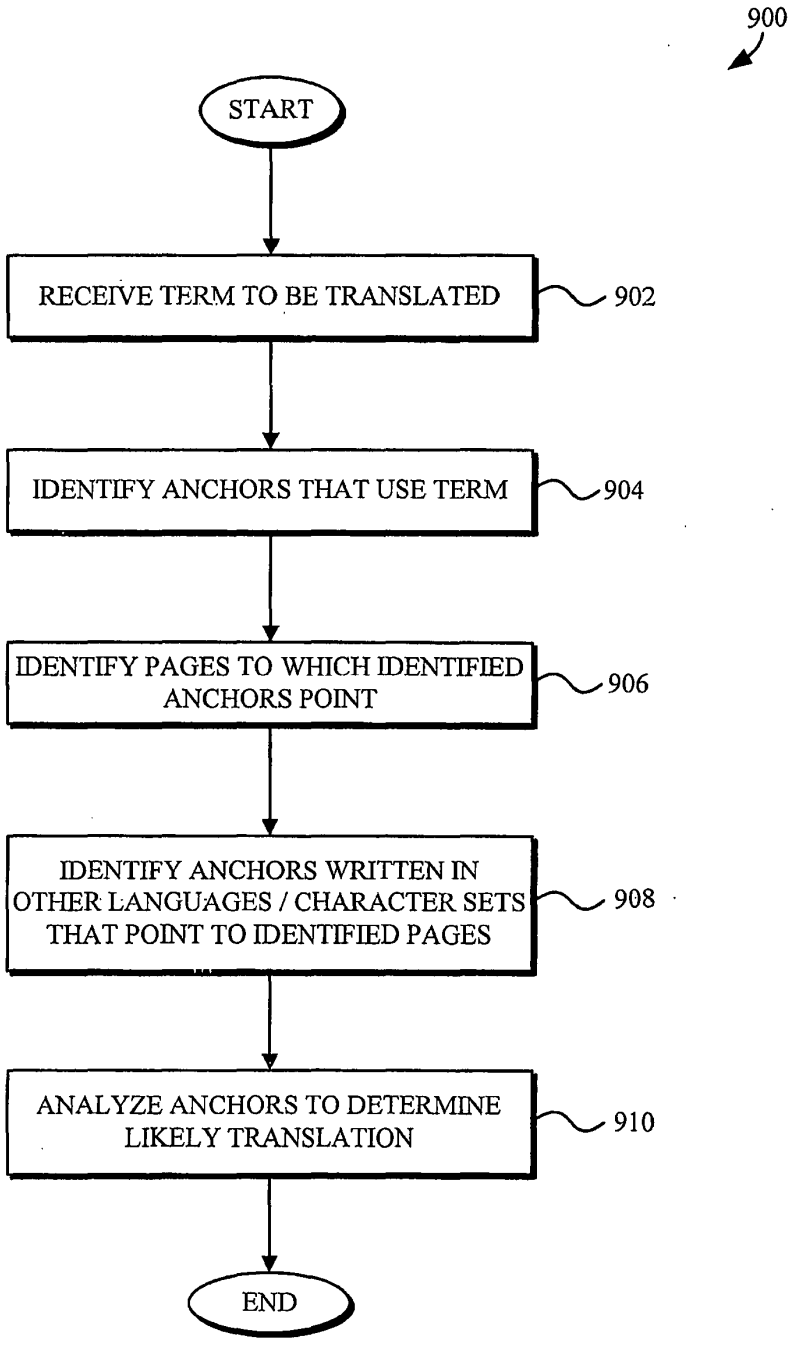

900
START
RECEIVE TERM TO BE TRANSLATED
902
IDENTIFY ANCHORS THAT USE TERM
904
IDENTIFY PAGES TO WHICH IDENTIFIED ANCHORS POINT
906
IDENTIFY ANCHORS WRITTEN IN OTHER LANGUAGES / CHARACTER SETS THAT POINT TO IDENTIFIED PAGES
908
ANALYZE ANCHORS TO DETERMINE LIKELY TRANSLATION
910
END

FIG. 9

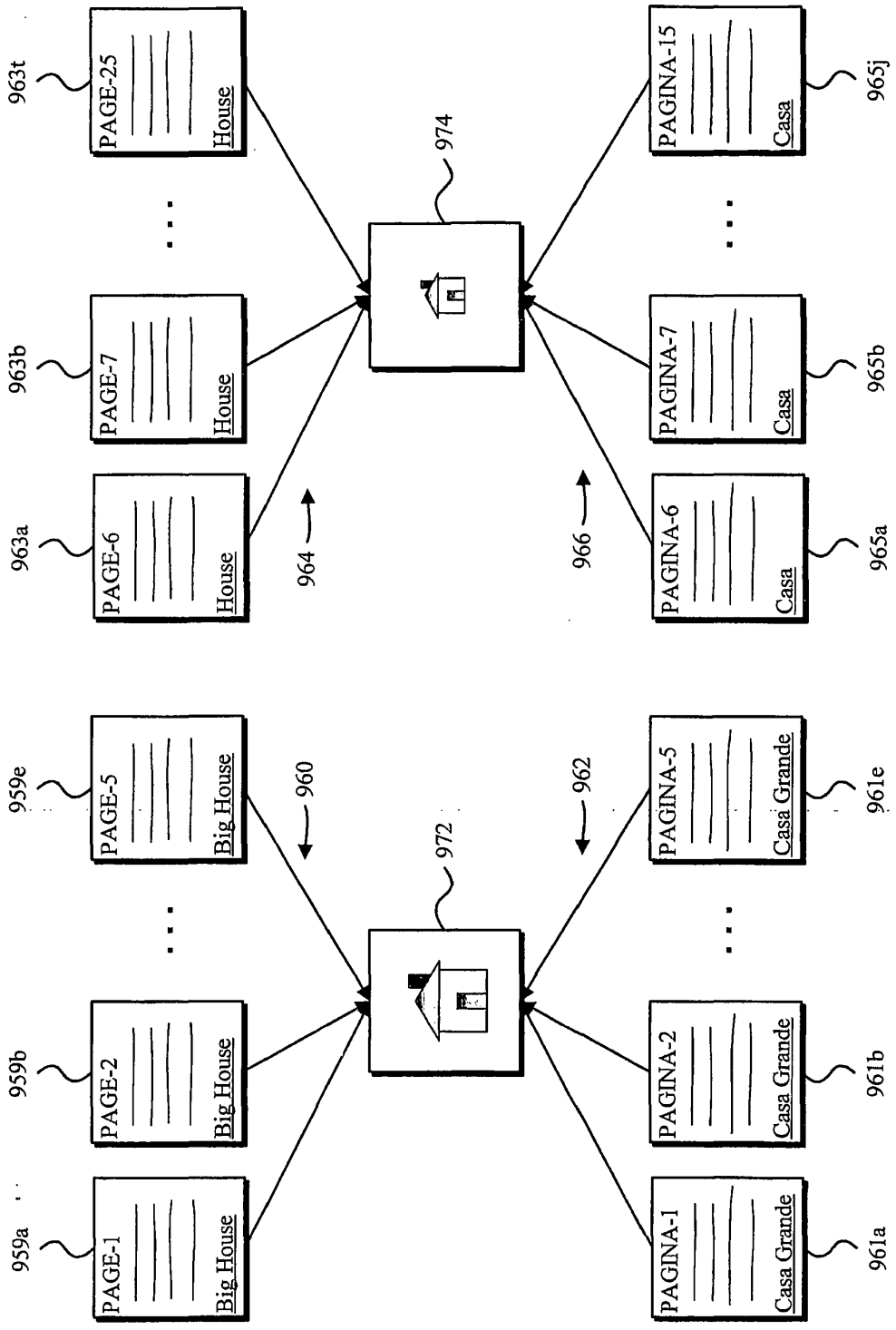

PAGE-1
Big House
959a
PAGE-2
Big House
959b
PAGE-5
Big House
959e
960
962
972
PAGINA-1
Casa Grande
961a
PAGINA-2
Casa Grande
961b
PAGINA-5
Casa Grande
961e
964
966
974
PAGE-6
House
963a
PAGE-7
House
963b
PAGE-25
House
963t
PAGINA-6
Casa
965a
PAGINA-7
Casa
965b
PAGINA-15
Casa
965j

FIG. 10

House

1	Casa
2	Casa
3	Casa
4	Casa
5	Casa
6	Grande
7	Grande
8	Grande
9	Grande
10	Grande

Probability(house=casa): 5/10 = 0.5

Probability(house=grande): 5/10 = 0.5

FIG. 11A

House

1	Casa
2	Casa
3	Casa
. . .	Casa
13	Casa
14	Casa
15	Casa
16	Grande
17	Grande
18	Grande
19	Grande
20	Grande

Probability(house=casa): 15/20 = 0.75

Probability(house=grande): 5/20 = 0.25

FIG. 11B

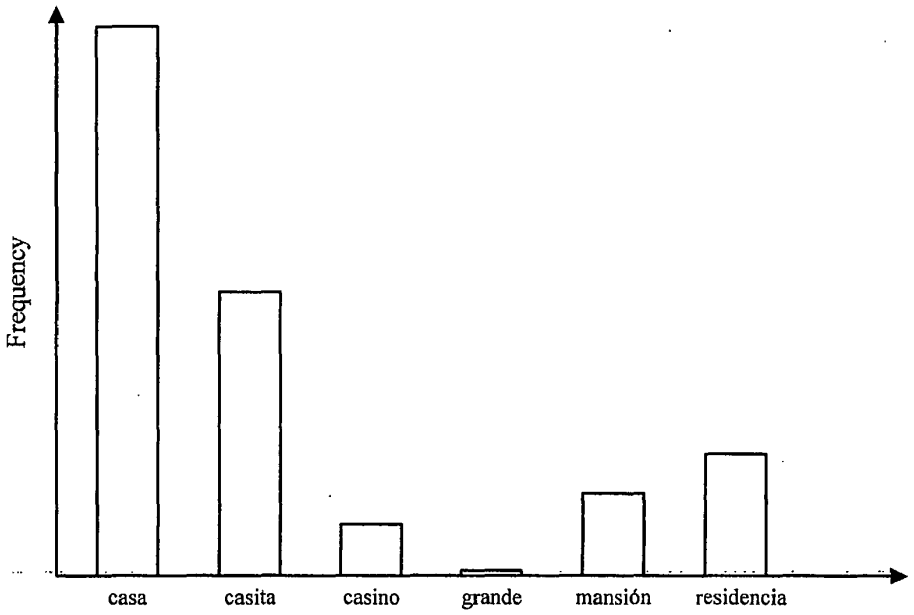


FIG. 12

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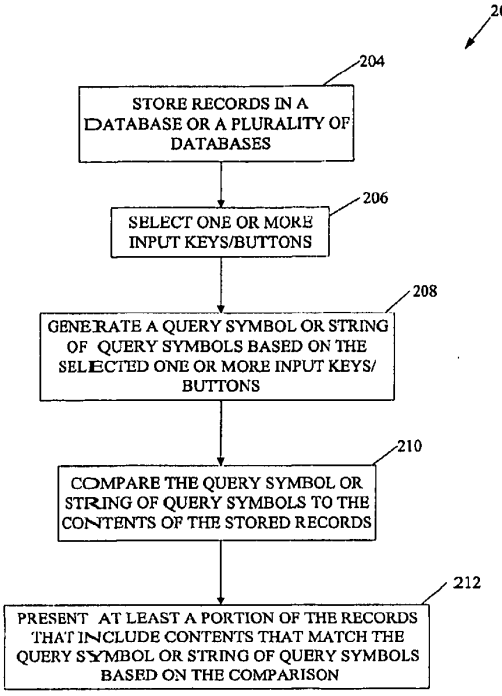
[Continued on next page]

(54) Title: A METHOD AND APPARATUS FOR SEARCHING LARGE DATABASES VIA LIMITED QUERY SYMBOL SETS



(57) Abstract: Methods and systems for searching a database that include a plurality of records. Each record includes one or more tokens. The one or more tokens include one or more letters, numbers, or symbols. The system includes a user interface that when activated by a user generates at least one of a query symbol or a string of query symbols. A processing device compares the generated query symbol or string of query symbols to the stored records. An output device presents the record or records having tokens that match the generated query symbol or a string of query symbols based on the comparison. The user interface includes two or more input keys. Each input key is associated with a query symbol and the number of input keys is less than the number of distinct letters, characters, and symbols.

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SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A METHOD AND APPARATUS FOR SEARCHING LARGE DATABASES VIA LIMITED QUERY SYMBOL SETS

BACKGROUND

Currently there is not a way to simply, quickly, and easily compose a query for a database where the query is expressed using a set of symbols different from the set used to represent the data being queried and having a smaller number of distinct symbols than distinct searchable entities in the database. For example, a phone having 9 or so input keys cannot presently be employed to search a database that includes records that may include a combination of numbers, letters or symbols.

SUMMARY OF THE INVENTION

The present invention provides methods and systems for searching a database that includes a plurality of records. Each record includes one or more tokens. The one or more tokens include one or more letters, numbers, or symbols. The system includes a user interface that when activated by a user generates at least one of a query symbol or a string of query symbols. A processing device compares the generated query symbol or string of query symbols to the stored records. An output device presents the record or records having tokens that match the generated query symbol or a string of query symbols based on the comparison. The user interface includes two or more input keys. Each input key is associated with a query symbol and the number of input keys is less than the number of distinct letters, characters, and symbols.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIGURES 1 and 2 are diagrams showing system formed in accordance with an embodiment of the present invention; and

FIGURE 3 is a flow diagram illustrating a process formed in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Given a database of tens, hundreds, thousands, or even more records, each record being allowed to be of variable length but not required, and all records being represented in a character set of a given number of distinct symbols (typically in the range of 32 to 128 symbols, such as ASCII, but not restricted to that range). The present invention includes methods and apparatus whereby a user may simply, quickly, and easily compose a query for the database. The query is expressed using a set of symbols different from the set used to represent the data being queried (even using a symbol set completely disjoint from that being

searched but related to it systematically). The set of query symbols has a smaller number of distinct members than distinct members used in the database (typically in the range of one half to one tenth the number of distinct symbols but not restricted to that range).

As shown in FIGURE 1, a system 10 includes a device 12, a memory device 14 linked with the device 12, and one or more database storage systems 20. In one embodiment, the database storage systems 20 are accessible by the device 12 over a network 22. The network 22 may be a wired or wireless network or any combination of wired and wireless networks. The database being searched may be located in the memory device 14 or any of the database storage systems 20 or may be distributed across any or all of the memory device 14 and the database storage systems 20. The memory device 14 may be a storage device located within the device 12. The device 12 may be any of a number of devices, such as a cell phone, personal data assistant, or any device that has more that two searchable entities associated with at least one input key/switch.

As shown in FIGURE 2, a cell phone 100 is an example of the device 12 of FIGURE 1. The cell phone includes input keys 110, a display 114, and other interface keys, such as display interface keys 112 and a multi-directional toggle 116. One or more of the keys 110 are associated with two or more letters, numbers, or symbols. Activation of the keys 110 during a search mode of the phone 100 generates query symbols that are associated with the activated keys. Then, the database is searched using the query symbols. The display 114 presents results of the search.

The keys 110 may be in the form of a graphical user interface, switches, or other form or forms of electrical, mechanical, magnetic, optical, or capacitive sensing devices, which a user might manipulate to produce electrical inputs

comparable to opening and closing mechanical switches in order to compose a query one symbol at a time.

In one embodiment, the records in the database are stored associated with a particular order of priority, which may be based on any of several factors or combinations thereof. For example, factors include the number of retrievals of each record in the past by a population of users, the timeliness of the records by a date inherent in each, the timeliness of the records by the date each was created in the database, the timeliness of the records by the date and time of the last instance each was retrieved, the rate of retrievals of each record over a certain time window by a set population, a count of references to each record in other searchable data storage repositories (such as the internet), the relevancy of each record relative to information concerning the user (such as but not limited to his or her objectively measured tastes, age, gender, income, geographical position, previously expressed preferences), alphabetical order (or other externally defined sorting order), or at random. The display 114 presents as many of the found highest priority records from the database (in priority sorted order) as will fit in available display space.

In one embodiment, the result of a search is defined as all the records in the database in order from highest priority down. The interface of the device allows for all the results of a search to be scrolled through the display in order from highest priority to lowest priority, a line at a time, and a screen full at a time. The occurrence and direction of scrolling is controlled by the user's manipulation of the interface, such as the keys 116. In one embodiment, one record in the display 114 is always visually indicated as the candidate result of a search, which by default is the highest priority result each time search results are computed, unless and until the user scrolls the selection highlight after the update. If multiple

records are visible simultaneously, the interface enables the selection indication to be moved to any visible record according to manipulation by the user. In one implementation, in the display 114, when the query has non-zero length, one or more contiguous ranges of characters of each record which are the characters matching the query are graphically distinguished, such as bold, underlined, italicized, differently colored, or otherwise distinguished. For example, a region of the display 114 that is distinct from the list of results displays the one or more contiguous ranges of characters of the highlighted record which are the characters matching the query.

The interface enables the search to be finalized at any time by a user activating a selection function. In one implementation, the search may auto-finalize upon the expiration of a timer if the user neither scrolls the results nor modifies the query for more than a set length of time.

Upon each additional symbol of a query being input or deleted, the database is searched for the highest priority matching results and the display 114 is updated with the most recently found results. In one implementation, the number of matching records is displayed and updated dynamically after each change in the query.

Mathematical Preliminaries

For illustration, suppose a database consists of one million, 40 digit, random, decimal numbers. The symbol set of the data is the set of the ten digits: "0", "1", ... "9". Suppose the symbol set of the queries is limited to only two symbols. How could the database be usefully searched? Let one symbol, "E," match any even digit (0,2,4,6,8) and one symbol, "O," match any odd digit (1,3,5,7,9). In a 20 symbol sequence of E's and O's, there are over one million possible combinations. Thus, on average, it should be possible to search for and

retrieve any 40 digit number in the database with a search string of only approximately 20 symbols, on a device with only two input keys, given an assumption that the numbers in the database are random.

Range of Applicability

As a general principal, the following conditions are necessary, to a rough approximation, for the present invention to be effective as a search technique, given any database to be searched. Suppose Nr is the number of records of length R characters in the given database (where R may have multiple values). Further suppose, the number of distinct symbols in the query composition set is S and the query symbols map in a one to many manner to the set of distinct symbols of the records to be searched, such that every symbol to be searched maps to at least one query symbol. Lastly, suppose that the number of lines displayable at once in the visual read out of the device is L. Then, the invention is effective if Nr divided by S to the power R is less than or equal to L for all values of R in the given database.

$$\frac{N_r}{S^R} \leq L \quad \text{for all values of R}$$

Even on a one line display L may be greater than 1.

It does not preclude an effective result if there is partial over lapping in the mapping of the record symbols to the search symbols, i.e., if a record symbol maps to more than one search symbol. Although the performance of the invention may be less than if that were not the case.

In the case where the device 12 is a mobile phone, the keys of the dialing pad may be visually marked with an arrangement of letters and numbers. There are also symbols commonly mapped to the keys for which the keys are not graphically marked, but which are nonetheless used by software on the phone.

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One such mapping arrangement is shown in Table 1. Other arrangements are possible.

Key Name	Symbols Mapped to Each Key								
(Query Symbols)	(Symbol Set of Records to be Searched)								
1	1	.	,	-	?	!	'	@	:
2	2	a	b	c	á	à	â	ä	ç
3	3	d	e	f	é	è	ê	ë	
4	4	g	h	i	í	ì	î	ï	
5	5	j	k	l					
6	6	m	n	o	ñ	ó	ò	ô	ö
7	7	p	q	r	s	ß			
8	8	t	u	v	ú	ù	û	ü	
9	9	w	x	y	z				
0	space	0							

Definition

Since each key in this example (Table 1) includes a single digit number, it is convenient hereafter to identify the symbols that are mapped to the keys by the digit of the respective key, although this is not required. It is important to distinguish between the names of the keys, which are the symbols used to express queries, and the characters mapped onto the keys, especially since the digit "1" is mapped onto the first key, and the digit "2" is mapped into the second key in this example, and so on. The digits 0-9 as digits (symbols standing for integers) are logically quite distinct from the names, or indices, of the keys onto which a variety of symbols including digits happen to be mapped. To mark this distinction, the names of the query symbols are designated by the digits 0 to 9 with underscores. The query input keys, which in a device are commonly switches or electronic sensors functioning in a manner comparable to switches, may also be referred to by the word "key" followed or preceded by either a digit or a short

name sufficient to distinguish exactly one key from a range of keys. When the present invention is applied to a mobile phone, depressing a dialing key, such as key 2 (which might also be written as "key 2abc" or "the abc key") would cause query symbol 2 to be input to the invention. Depressing key 3 would cause query symbol 3 to be input into the invention, and so one for the other dialing keys.

The set of symbols, or character set, of the data in the database to be search is also called the target character set, individual characters being target characters, and so on.

In any application of the invention, there is a logical mapping of user interface elements (e.g., switches, keys, on screen buttons) to a list of query symbols and a logical mapping of each query symbol to a list of symbols used to represent data in the database to be searched (e.g., Table 1). Wide variations are possible in the number and arrangement of keys and symbols.

Definition of "match"

Matching is an element of the invention that operates at two levels of complexity: single symbols and multiple symbols.

A single symbol match is a relationship between a given query symbol and a target character where the relationship is defined by a mapping table (e.g., Table 1). A query symbol and a target/component/token match if they both occupy a common row in a table comparable to Table 1. Representing the relationship in a table with all query symbols listed once in a single column is merely a convenience to represent the relationship in a compact manner in a document. In a preferred implementation, all target characters are in a one row (or column) of a table and their matching query symbols are identified by an adjoining row (or column), in which case each query symbol will appear several times.

A query of multiple symbols matches a particular target record only if all of its symbols individually match targets in the particular record.

Shift state

In one implementation, shift state, the distinction between upper case and lower case, is incorporated into the invention. In the preferred implementation, upper case and lower case versions of the targets are treated as being identical, e.g., "A" is the same as "a" and either matches 2 in the case of Table 1.

Definition of database

A database is an aggregation of information into one or more distinct records, each record being a mixed or uniform collection of characters, numbers, or other data types, each record being finite in size, though not necessarily all of one size. The simplest example of a database is a file of text where each record is separated from the next by one or more record separator characters.

Division of records into tokens or words

In many applications of the present invention, such as searching a database of directory information (e.g., persons, businesses, government offices, and comparable lists) or catalogs of items such as might be found in a store or library or warehouse, the database records may be usefully further divided into words or tokens (i.e., sequences of characters with a common characteristic confined between logical boundaries). In the English language, the boundaries between word tokens may be white space or any of a number of different punctuation marks, while the substance of word tokens is confined to the letters of the alphabet, plus hyphen and apostrophe.

In one embodiment, continuous mixed sequences of letters and digits are defined as tokens, i.e., "3COM," is a valid token.

In one embodiment, continuous sequences of digits bounded by any non-

digits are tokens.

In one embodiment, token boundaries may overlap. For example, the sequence "poly1234" is three tokens: "poly," "1234," and "poly1234."

Different embodiments of the invention may use various combinations of the above rules.

Search

FIGURE 3 illustrates an example process 200 performed by the device 12 of FIGURE 1. At a block 204, records are stored in a database. At a block 206, one or more input keys/buttons are selected by a user. At a block 208, a query symbol or string of query symbols is generated based on the selected one or more input keys/buttons. At a block 210, the generated query symbol or string of query symbols is compared to the contents of the stored records. At a block 212, at least a portion of the records that include contents that match the query symbol or string of query symbols is presented based on the comparison.

In one embodiment, the present invention (a processor coupled to memory and user interface devices, all of which are included in the device 12) searches a database in a manner organized into tokens. When the first symbol of a query is input, matching records are those containing any token(s) where the initial character matches the first symbol of a query. When the second symbol of a query is input, the matching records are those containing any token where the initial two characters match the two query symbols in the same order as the entered query symbols. Matching continues in the same manner for additional symbols input into the query.

In another embodiment, the present invention (a processor coupled to memory and user interface devices, all of which are included in the device 12) searches a database in a manner organized into tokens. When the first symbol of a

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query is input, matching records are those containing any token(s) where any character matches the first symbol of a query. When the second symbol of a query is input, the matching records are those containing any token where any two successive characters match the two query symbols in the same order as the entered query symbols. Matching continues in the same manner for additional symbols input into the query. Thus, the query string 383 could match both of the following targets "steve" and "eve."

Typographical, spelling, or other errors are examples of exceptions to searching the exact order of the entered query symbols. For example, in one embodiment, records including the "ie" and "ei" match the query symbols 43.

Queries are not limited to searching for single tokens. In one embodiment, an additional key is provided in the device 12 for dividing the query into sections, e.g., before and after. The query symbols inputted prior to activation of the additional key will match any target tokens as a before match, while query symbols input after activation of the additional key will only match target tokens as if they were the initial symbols of a query. The query dividing key may be used to compose a query of as many parts (or terms) as desired. Matching records are only those containing tokens matching all components of a multi-term query. In one embodiment, matching records are only those containing tokens matching all components of a multi-term query in the same order as the queries were input. In another embodiment, the matching target tokens are not required to be in the same order as the query terms, but matching records where the tokens are in the same order as the query tokens may be assigned a higher priority and may be displayed earlier on a display, such as the display 114, FIGURE 2.

Implicit boundaries between query terms are enabled and query terms may overlap. For example, in Table 1, query symbol 0 matches both *space* and the

digit zero. Thus, in one embodiment, the query symbols 36905 match both "fox jumps" and "dm905 please".

In one embodiment, single query terms are enabled to cross boundaries between adjacent target tokens even when the query symbols contains no symbol to match an inter-token boundary in the target. For example, the query symbols 843 matches the following record where the matching target characters are indicated by an underscore: "the long theorem." If the query symbols were extended to 8436 the result would be: "the long theorem." But, if the query symbols were extended to 8435 the result would be: "the long theorem."

In one embodiment, the function of dividing a query symbol string is combined with the query symbol matching *space*. Thus, the input of multiple, short query terms to match multiple, longer target tokens is enabled, even for very limited key pads. For example, the query symbols 74092 would match the following target: "Pink Floyd: the Wall."

In another embodiment, the device 12 includes an any or all key, such as an asterik or star key, that when selected generates a query symbol that is comparable to simultaneously selecting all the keys associated with a query symbol and/or generates a query symbol that matches all the distinct letters, numbers, and symbols.

While the preferred embodiment of the invention has been illustrated and described, as noted above, many changes can be made without departing from the spirit and scope of the invention. Accordingly, the scope of the invention is not limited by the disclosure of the preferred embodiment. Instead, the invention should be determined entirely by reference to the claims that follow.

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The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A method of searching a database having a plurality of records, each record including one or more tokens, wherein the one or more tokens include one or more letters, numbers, or symbols, the method comprising:

generating at least one of a query symbol or a string of query symbols using two or more input keys, wherein each input key is associated with a query symbol and the number of input keys is less than the number of distinct letters, characters, and symbols;

comparing the generated query symbol or string of query symbols to the stored records; and

if based on the comparison the query symbol or string of query symbols match match token or tokens of a record, outputting the record or records having the matching tokens on a display associated with the input keys.

2. The method of Claim 1, wherein generating is performed using at most 10 input keys.

3. The method of Claim 1, wherein a blank space is mapped to one of the input keys.

4. The method of Claim 1, further comprising:

generating a delimiter function; and

separating query symbols that are entered after generation of the delimiter function from one or more query symbols that were entered before generation of the delimiter function.

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5. The method of Claim 4, wherein the key associated with a delimiter function includes an input key that is mapped with a space entering function.

6. The method of Claim 4, wherein a record is determined to match the separated query symbols if the record includes at least portions of tokens that match the separated query symbols.

7. The method of Claim 6, wherein the matching portions of tokens are in the same order as the separated query symbols.

8. The method of Claim 6, wherein the matching portions of tokens are not in the same order as the separated query symbols.

9. The method of Claim 1, wherein comparing includes:

determining if at least a portion of a string of query symbols is associated with a predefined spelling rule;

searching the database according to the associated spelling rule; and

outputting results based on the search.

10. The method of Claim 1, generating an all query symbol that matches all the distinct letters, numbers, and symbols.

11. A system for searching a database that includes a plurality of records, each record includes one or more tokens, the one or more tokens include one or more letters, numbers, or symbols, the system comprising:

a user interface for generating at least one of a query symbol or a string of query symbols;

a processing device for comparing the generated query symbol or string of query symbols to the stored records; and

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an output device for presenting the record or records having tokens that match the generated query symbol or a string of query symbols based on the comparison,

wherein the user interface includes two or more input keys, wherein each input key is associated with a query symbol and the number of input keys is less than the number of distinct letters, characters, and symbols.

12. The system of Claim 11, wherein the means for generating includes at most 10 input keys.

13. The system of Claim 11, wherein a blank space is mapped to one of the input keys.

14. The system of Claim 11, further comprising:

a user interface component for generating a delimiter function; and

a means for separating query symbols that are entered after generation of the delimiter function from one or more query symbols that were entered before generation of the delimiter function.

15. The system of Claim 14, wherein the user interface component that generates the delimiter function is mapped with a space entering function.

16. The system of Claim 14, wherein a record is determined to match the separated query symbols if the record include at least portions of tokens that match the separated query symbols.

17. The system of Claim 16, wherein the matching portions of tokens are in the same order as the separated query symbols.

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18. The system of Claim 16, wherein the matching portions of tokens are not in the same order as the separated query symbols.

19. The system of Claim 11, wherein the means for comparing includes:

a means for determining if at least a portion of a string of query symbols is associated with a predefined spelling rule;

a means for searching the database according to the associated spelling rule; and

a means for outputting results based on the search.

20. The system of Claim 1, further comprising:

a user interface component for generating an all query symbol that matches all the distinct letters, numbers, and symbols.

21. A method of searching a database, the method comprising:

storing a plurality of records, each record includes one or more tokens, wherein the one or more tokens include one or more letters, numbers, or symbols;

generating at least one of a query symbol or a string of query symbols using two or more input keys, wherein each input key is associated with a query symbol and the number of input keys is less than the number of distinct letters, characters, and symbols;

comparing the generated query symbol or string of query symbols to the stored records; and

if based on the comparison the query symbol or string of query symbols match the token or tokens of a record, outputting the

record or records having the matching tokens on a display associated with the input keys.

22. A system for searching a database, the system comprising:

a means for storing a plurality of records, each record includes one or more tokens, wherein the one or more tokens include one or more letters, numbers, or symbols;

a means for generating at least one of a query symbol or a string of query symbols, the means for generating includes two or more input keys, wherein each input key is associated with a query symbol and the number of input keys is less than the number of distinct letters, characters, and symbols;

a means for comparing the generated query symbol or string of query symbols to the stored records; and

a means for outputting on a display the record or records having tokens that match the generated query symbol or string of query symbols based on the comparison.

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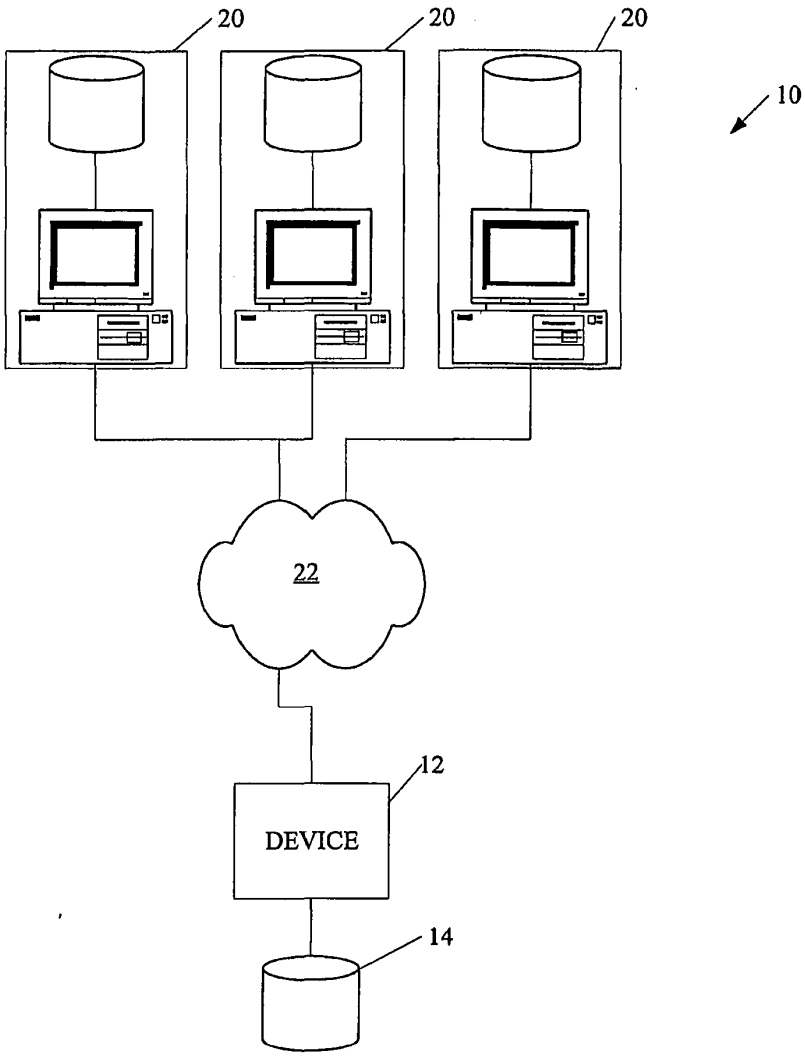

FIG. 1.

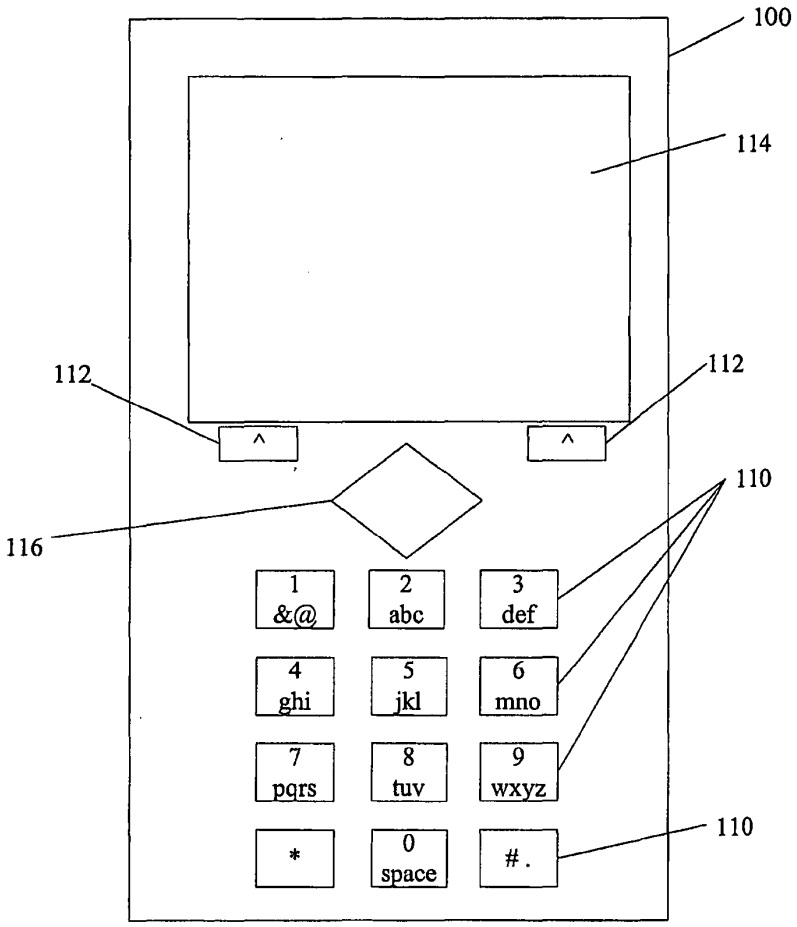
100
114
112
112
110
116
1 &@
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
*
0 space
#.
110

FIG. 2.

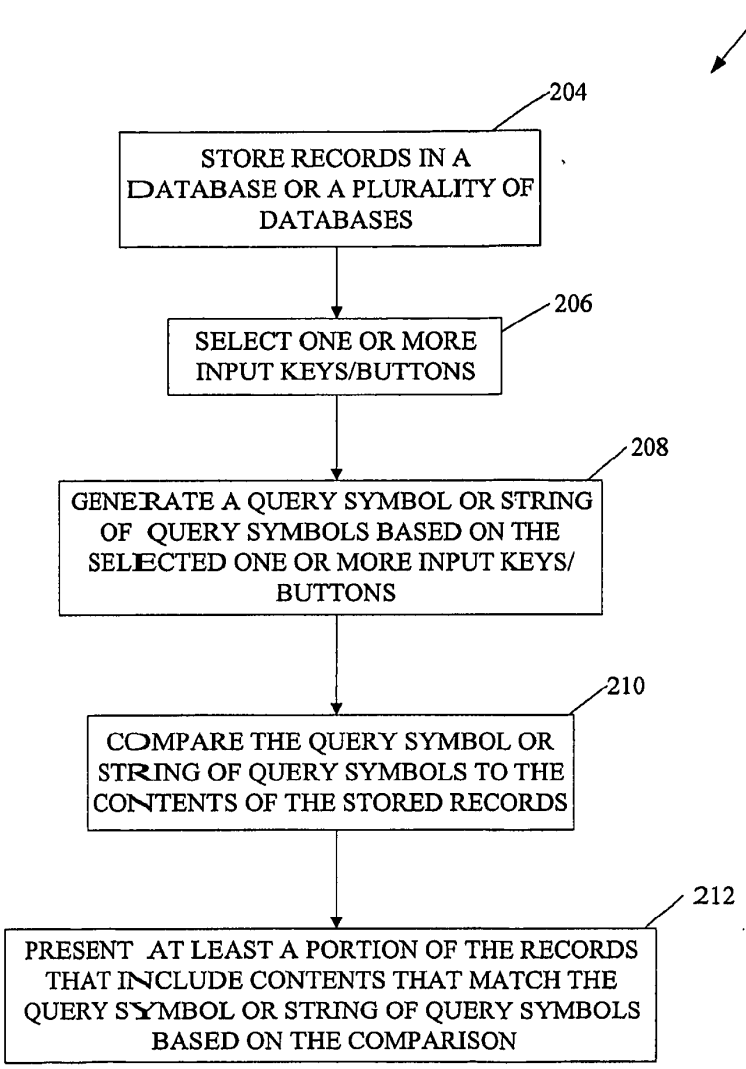
200
204
STORE RECORDS IN A DATABASE OR A PLURALITY OF DATABASES
206
SELECT ONE OR MORE INPUT KEYS/BUTTONS
208
GENERATE A QUERY SYMBOL OR STRING OF QUERY SYMBOLS BASED ON THE SELECTED ONE OR MORE INPUT KEYS/ BUTTONS
210
COMPARE THE QUERY SYMBOL OR STRING OF QUERY SYMBOLS TO THE CONTENTS OF THE STORED RECORDS
212
PRESENT AT LEAST A PORTION OF THE RECORDS THAT INCLUDE CONTENTS THAT MATCH THE QUERY SYMBOL OR STRING OF QUERY SYMBOLS BASED ON THE COMPARISON

FIG. 3.

Electronic Patent Application Fee Transmittal

Application Number:	11246432
Filing Date:	07-Oct-2005
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Filer:	John Verble Hobgood/Jeanne DeLuca
Attorney Docket Number:	0290672.00128US2
Filed as Small Entity	

Utility Filing Fees

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	3045877
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Jeanne DeLuca
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	25-MAR-2008
Filing Date:	07-OCT-2005
Time Stamp:	15:19:07
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	536
Deposit Account	080219
Authorized User	

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

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

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

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement Letter	290672_128US2_IDS_Letter_25-March-2008.pdf	89095 18b7f71555845bd715dd04049d827a95f251fae3	no	2
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Filed	290672_128US2_IDS_SB08_25-March-2008.pdf	142084 3597c7b65bef6f95cf2ce2cb82b3eac616c043cb	no	4
Warnings:					
Information:					
This is not an USPTO supplied IDS fillable form					
3	Foreign Reference	FOR_EP1143691.pdf	232061 d6d003913fb5b13bf5e7b3244624b727ab259003	no	5
Warnings:					
Information:					
4	Foreign Reference	FOR_WO_05_033967.pdf	1770982 a29511f2ca789ea17e57f53db16ee8eef3d6d534	no	46
Warnings:					
Information:					
5	Foreign Reference	FOR_WO_05_084235.pdf	716288 4e7fdb2f33004efa8ee44f7e1834d0f6a68e0faa	no	22
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Information:					
6	NPL Documents	NPL_Digital_Video_Broadcasting.pdf	105229 c867022255a9dc5e785b5319b403cb308e2e4819	no	2
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Information:					
7	NPL Documents	NPL_Good.pdf	732443 f2259e21709196c4b4e3091422ff765c095fc7cd	no	8
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Information:					
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Warnings:					

Information:					
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Warnings:					
Information:					
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Warnings:					
Information:					
11	NPL Documents	NPL_ISR_PCT_US07_65703.pdf	144946 1af60b70318be54bcc45eb0ac5da4cfb1008cd9c	no	2
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Information:					
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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

Docket No.: 290672.128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Murali Aravamudan et al.	Confirmation No.:	5356
Application No.:	11/246,432	Art Unit:	4171
Filed:	October 7, 2005	Examiner:	Wong, Huen
Title:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT		

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

AMENDMENT

Dear Sir:

INTRODUCTORY COMMENTS

In response to the Office Action dated January 23, 2008, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

Amendments to the Claims:

The following listing of the claims will replace all prior versions and listings of claims in the application.

Listing of the Claims;

Claims 1-33 (Cancelled)

34. (New) A user-interface method for identifying and presenting a set of documents and associated actions in an order so that relatively more relevant documents and associated actions appear earlier in the order based on a popularity of the documents and on an informational relevance of descriptive terms identified by a user via minimal prefix text entry and for reordering the documents and associated actions based on a number of text characters received from the user, the method comprising:

providing the set of documents and associated actions, the documents having assigned popularities to indicate a relative measure of a likelihood that the document is desired by the user;

for each document, associating a set of descriptive terms to describe the document and assigning a relevance weight for each term based on a relevance of an informational content of the term in identifying the document;

receiving text entered by the user, the text having one or more text characters of one or more prefixes for descriptive terms the user is using to identify a desired document;

in response to receiving a text character, performing an incremental find to compare the user-entered prefixes with the descriptive terms and to retrieve the relevance weights for user-entered prefixes matching descriptive terms;

ordering and presenting one or more documents and associated actions to the user based on the assigned popularities of the documents and based on a weighing of the relevance weights for user-entered prefixes matching descriptive terms associated with the documents, so that relatively more popular and more relevant documents and associated actions appear earlier in the order for user selection or activation;

adjusting the relevance weights of the descriptive terms in response to the number of text characters received from the user; and

reordering at least a portion of the one or more documents and associated actions presented to the user based on the adjusted relevance weights of the descriptive terms.

35. (New) The method of claim 34, further comprising the descriptive terms being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein ordering and presenting the one or more documents and associated actions is further based on the relevance bias values of the subspace categories.

36. (New) The method of claim 35, wherein the relevance bias values are based on the number of text characters received from the user.

37. (New) The method of claim 35, wherein the subspace categories include a personalized history category containing descriptive terms associated with documents and associated actions identified from previous incremental finds conducted by the user.

38. (New) The method of claim 35, wherein the ordering and presenting of one or more documents and associated actions is limited to documents, and associated actions, having associated descriptive terms of one or more selected subspace categories.

39. (New) The method of claim 38, wherein the one or more selected subspace categories are selected based on the number of text characters received from the user.

40. (New) The method of claim 35, wherein the ordered and presented one or more documents

and associated actions are presented on a display device, the display device having display space allocated according to the subspace categories.

41. (New) The method of claim 34, wherein the text entered by the user is entered on an input device including a set of overloaded keys generating an ambiguous text input.

42. (New) The method of claim 41, wherein the input device is a phone, a mobile computing device, or a remote control device for a television.

43. (New) The method of claim 34, wherein the ordered and presented one or more documents and associated actions are presented on a display device having a minimal display area.

44. (New) The method of claim 43, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

45. (New) The method of claim 34, wherein the assigned popularity of one or more documents of the set of documents is based on a relative measure of popular opinion of the document.

46. (New) The method of claim 34, wherein the assigned popularity of one or more documents of the set of documents is based on a temporal relevance of the document or a location relevance of the document.

47. (New) The method of claim 34, wherein ordering and presenting the one or more documents and associated actions is further based on the number of prefixes of the received text.

48. (New) The method of claim 34, wherein a portion of the set of documents and associated actions resides on a computer remote from the user.

49. (New) The method of claim 34, wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing an incremental find, ordering and presenting one or more documents and associated actions to the user, and adjusting the relevance weights of the descriptive terms.

50. (New) A system for identifying and presenting a set of documents and associated actions in an order so that relatively more relevant documents and associated actions appear earlier in the order based on a popularity of the documents and on an informational relevance of descriptive terms identified by a user via minimal prefix text entry and for reordering the documents and associated actions based on a number of text characters received from the user, the system comprising:

a first memory for storing at least a first portion of the set of documents and associated actions, the documents having assigned popularities to indicate a relative measure of a likelihood that the document is desired by the user, and each document being associated with a set of descriptive terms to describe the document, each term being assigned a relevance weight based on a relevance of an informational content of the term in identifying the document;

a device input for receiving text entered by the user, the text having one or more text characters of one or more prefixes for descriptive terms the user is using to identify a desired document;

a processor for performing an incremental find in response to receiving a text character and for ordering one or more documents and associated actions, the incremental find comparing the user-entered prefixes with the descriptive terms and retrieving the relevance weights for user-entered prefixes matching descriptive terms, the order of the one or more documents and associated actions being based on the assigned popularities of the documents and being based on a weighing of the relevance weights for user-entered prefixes matching descriptive terms associated with the documents, so that relatively more popular and more relevant documents and associated actions appear earlier in the order for user selection or activation, the relevance weights of the descriptive terms being adjusted in response to the number of text characters received from the user, and the order of at least a portion of the one or more documents and associated actions being changed based on the adjusted relevance weights of the

descriptive terms; and

a device output for presenting the ordered one or more documents and associated actions to the user.

51. (New) The system of claim 50, further comprising the descriptive terms being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein ordering and presenting the one or more documents and associated actions is further based on the relevance bias values of the subspace categories.

52. (New) The system of claim 51, wherein the relevance bias values are based on the number of text characters received from the user.

53. (New) The system of claim 51, wherein the subspace categories include a personalized history category containing descriptive terms associated with documents and associated actions identified from previous incremental finds conducted by the user.

54. (New) The system of claim 51, wherein the incremental find is limited to documents, and associated actions, having associated descriptive terms of one or more selected subspace categories.

55. (New) The system of claim 54, wherein the one or more selected subspace categories are selected based on the number of text characters received from the user.

56. (New) The system of claim 51, further comprising a display device for presenting the ordered one or more documents and associated actions, the display device having display space allocated according to the subspace categories.

57. (New) The system of claim 50, wherein the text entered by the user is entered on an input device including a set of overloaded keys generating an ambiguous text input.

58. (New) The system of claim 57, wherein the input device is a phone, a mobile computing device, or a remote control device for a television.

59. (New) The system of claim 50, further comprising a display device for presenting the ordered one or more documents and associated actions, the display device having a minimal display area.

60. (New) The system of claim 59, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

61. (New) The system of claim 50, wherein the assigned popularity of one or more documents of the set of documents is based on a relative measure of popular opinion of the document.

62. (New) The system of claim 50, wherein the assigned popularity of one or more documents of the set of documents is based on a temporal relevance of the document or a location relevance of the document.

63. (New) The system of claim 50, wherein the order of the one or more documents and associated actions is further based on the number of prefixes of the received text.

64. (New) The system of claim 50, further comprising a second memory on a computer remote from the user for storing at least a second portion of the set of documents and associated actions.

65. (New) The system of claim 50, wherein the processor is disposed in a computer remote from the user.

REMARKS

Claims 1-33 were pending in the application and have been cancelled. Claims 34-65 have been added. Applicants respectfully request reconsideration of the application in view of the following remarks.

Rejections under 35 U.S.C. § 102(e)

Claims 1-9, 12-20, 23-31 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. Pub. 2005/0283468 by Kamvar et al. (herein "Kamvar"). These claims have been cancelled, and, thus, those rejections are moot. However, claims 34-65 are presented to more particularly claim the invention. The following comments are directed to the invention recited in new independent claim 34.

Kamvar discloses a system that monitors the input of a search query entered by a user. Before the user finishes entering the search query, the search system identifies and sends a portion of the query as a partial query to the search engine. Based on the partial query, the search engine creates a set of predicted queries. The predicted queries are sent back to the user for possible selection. The search engine may also return at least a portion of the search results corresponding to one or more of the predicted queries. See Kamvar at ¶ 5.

Kamvar is not concerned with a method for identifying and presenting a set of search results in a particular order based on text entered by a user and reordering the items in the set based on the number of text characters received from the user. The Office Action states "Kamvar discloses 'popularity ranking' and the difference in order due to length of query string" and points to ¶¶ 43-49 and Figs. 6 and 7. However, Kamvar merely describes that as more characters are

included in the partial search query, the number of results matching the partial search query may change. See Kamvar at ¶ 45. Kamvar does not disclose adjusting the relevance weights of descriptive terms associated with the search results based on the number of text characters received from the user and reordering at least a portion of the search results presented to the user based on the adjusted relevance weights.

In contrast to the cited references, applicants' claim 34 is directed to a user-interface method for identifying and presenting a set of documents and associated actions in an order so that relatively more relevant documents and associated actions appear earlier in the order. The presentation order is based on a popularity of the documents and on an informational relevance of descriptive terms identified by a user via minimal prefix text entry. The method also calls for reordering the documents and associated actions based on a number of text characters received from the user. Consequently, the relative positions of the individual search results within the presentation order can be adjusted as the user is entering characters of the prefix text entry. This, for example, enables search results having a relatively lower popularity rating to be ranked more preferably in the presentation order as the number of characters entered by the user increases. See Application at ¶¶ 40-43.

As set forth above, Kamvar does not teach or suggest adjusting the relevance weights of descriptive terms associated with the search results in response to the number of text characters received from the user and reordering at least a portion of the search results presented to the user based on the adjusted relevance weights of the descriptive terms. As applicants explain in their application, ordering the search results based only on their popularities causes highly popular

results to monopolize the most desirable positions in the presentation order, thereby "occluding" less popular results. This occurs despite the fact that the user has been presented with the popular results, has elected not to select the popular results, and continues to enter additional characters in the search text. This problem is especially troublesome when the search results are being presented on a display-constrained device (e.g., PDA or mobile telephone). See Application at ¶ 43.

Unlike Kamvar, applicants' claim 34 clearly recites adjusting the relevance weights of descriptive terms associated with the search results in response to the number of text characters received from the user and reordering at least a portion of the search results presented to the user based on the adjusted relevance weights of the descriptive terms. The application describes the discovery of the occlusion problem and the advantages of the solutions devised by applicants. Namely, by reordering the search results based on the number of text characters received from the user, search results desired by the user can be found with less text entered by the user. See Application at ¶¶ 40-43.

None of this is taught or suggested by Kamvar. Thus, applicants submit that claim 34 is patentable over Kamvar. Claims 35-49 depend from claim 34 and, therefore include the limitations of claim 34. Thus, applicants submit these claims are also patentable over Kamvar for the reasons given above.

New independent claim 50 also recites adjusting the relevance weights of the descriptive terms in response to the number of text characters received from the user and changing the order of at least a portion of the one or more documents and associated actions based on the adjusted

relevance weights of the descriptive terms. Thus, applicants submit that claim 50 is patentable over Kamvar for the reasons provided above in connection with claim 34.

Claims 51-65 depend from claim 50 and, therefore include the limitations of claim 50. Thus, applicants submit these claims are also patentable over Kamvar for the reasons given above.

Rejections under 35 U.S.C. § 103(a)

Claims 10-11, 21-22, and 32-33 were rejected under 35 U.S.C. § 103(a) as being obvious over Kamvar in view of U.S. Pat. Pub. 2004/0021691 by Dostie et al. (herein "Dostie"). These claims have been cancelled, and, thus, those rejections are moot.

As set forth above, Kamvar does not teach or suggest adjusting the relevance weights of descriptive terms associated with the search results in response to the number of text characters received from the user and reordering at least a portion of the search results presented to the user based on the adjusted relevance weights of the descriptive terms, as recited in new independent claims 34 and 50. Dostie, also, fails to teach or suggest these required elements.

Dostie discloses a system for receiving text entry from a user and for providing completion candidates based on the user's text enter. As the user enters a character, a partial text entry is created. The partial text entry is used to search a dictionary for completion candidates that begin with the partial text entry. Dostie also describes a navigation interface for retrieval of completion candidates. See Dostie at ¶¶ 6-10.

Dostie is silent regarding adjusting the relevance weights of descriptive terms associated with the search results in response to the number of text characters received from the user and reordering at least a portion of the search results presented to the user based on the adjusted

relevance weights of the descriptive terms.

Thus, applicants submit that claim 34 is patentable over Kamvar in view of Dostie. Claims 35-49 depend from claim 34 and, therefore include the limitations of claim 34. Thus, applicants submit these claims are also patentable over these cited references for the reasons given above.

As set forth above, new independent claim 50 also recites adjusting the relevance weights of the descriptive terms in response to the number of text characters received from the user and changing the order of at least a portion of the one or more documents and associated actions based on the adjusted relevance weights of the descriptive terms. Thus, applicants submit that claim 50 is patentable over the cited references for the reasons provided above in connection with claim 34.

Claims 51-65 depend from claim 50 and, therefore include the limitations of claim 50. Thus, applicants submit these claims are also patentable over the cited references for the reasons given above.

Rejections under 35 U.S.C. § 112

Claims 3, 6-7, 14, and 25 were rejected under 35 U.S.C. § 112 as being indefinite. These claims have been cancelled, and, thus, these rejections are moot.

Objection to the Claims

Claim 12 was objected to. That claim has been cancelled. Thus, the objection is moot.

Conclusion

Applicants respectfully request an early and favorable reconsideration and issuance of this application as amended herein. The Examiner is encouraged to contact the undersigned to

expedite prosecution of this application.

A request for a one-month extension of time accompanies this request. Authorization to charge the $60.00 fee in connection with the extension of time request is enclosed. No other fees are believed to be due in connection with this response. However, please charge any fees due in connection with this application or credit any overpayments to Deposit Acct. No. 08-0219.

Respectfully submitted,

Date: May 13, 2008

/John V. Hobgood/
John V. Hobgood
Registration No. 61,540
Attorney for Applicant

Wilmer Cutler Pickering Hale and Dorr LLP
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Boston, MA 02109
Tel: (617) 526-6658
Fax: (617) 526-5000

PTO/SB/22 (01-08)
Approved for use through 04/30/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless if displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2008 *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 0290672.00128US2
Application Number 11/246,432-Conf. #5356	Filed October 7, 2005
For METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICLALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT	
Art Unit 4171	Examiner H. Wong

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

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

		Fee	Small Entity Fee	
[X]	One month (37 CFR 1.17(a)(1))	$120	$60	$ 60.00
[ ]	Two months (37 CFR 1.17(a)(2))	$460	$230	$
[ ]	Three months (37 CFR 1.17(a)(3))	$1050	$525	$
[ ]	Four months (37 CFR 1.17(a)(4))	$1640	$820	$
[ ]	Five months (37 CFR 1.17(a)(5))	$2230	$1115	$

[X] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[ ] Payment by credit card. Form PTO-2038 is attached.

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

[X] The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 08-0219 . I have enclosed a duplicate copy of this sheet.

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

I am the

[ ] applicant/inventor.

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

[X] attorney or agent of record. Registration Number 61,540

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

/John V. Hobgood/	May 13, 2008
Signature	Date
John V. Hobgood	(617) 526-6000
Typed or printed name	Telephone Number

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

[ ] Total of 1 forms are submitted.

US1DOCS 6673484v1

Electronic Patent Application Fee Transmittal

Application Number:	11246432
Filing Date:	07-Oct-2005
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Filer:	John Verble Hobgood/Jeanne DeLuca
Attorney Docket Number:	0290672.00128US2
Filed as Small Entity	

Utility Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	60	60

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
		Total in USD ($)		60

Electronic Acknowledgement Receipt	
EFS ID:	3297485
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Diana Ruiz
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	13-MAY-2008
Filing Date:	07-OCT-2005
Time Stamp:	17:21:38
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$60
RAM confirmation Number	2736
Deposit Account	080219
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1		290672_128US2_Amendment_13-May-2008.pdf	117350 b03126d09bd7353182e9405931cf96492bb1e409	yes	13

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment - After Non-Final Rejection	1	1
Claims	2	7
Applicant Arguments/Remarks Made in an Amendment	8	13

Warnings:

Information:

2	Extension of Time	290672_128US2_EOT_13-May-2008.pdf	115225 b1e0f6e0aa1623c43931e4aa78b9bfce0bdfd605	no	1

Warnings:

Information:

3	Fee Worksheet (PTO-06)	fee-info.pdf	8259 5785d0001fd9b5a1e5803c603d87c26755687cee	no	2

Warnings:

Information:

Total Files Size (in bytes):	240834

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

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

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

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

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/246,432	Filing Date 10/07/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	05/13/2008	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 32	Minus	** 33	= 0	X $25 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $105 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/AJAY R. DAVID/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 09/23/2008

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
WONG, HUEN	
ART UNIT	**PAPER NUMBER**
2169	

NOTIFICATION DATE	DELIVERY MODE
09/23/2008	ELECTRONIC

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

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

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

michael.mathewson@wilmerhale.com
teresa.carvalho@wilmerhale.com
sharon.matthews@wilmerhale.com

Office Action Summary	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	Huen Wong	2169	

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

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

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

Status

1)☒ Responsive to communication(s) filed on *13 May 2008*.

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

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

Disposition of Claims

4)☒ Claim(s) *34-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

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

8)☒ Claim(s) *34-65* are subject to restriction and/or election requirement.

Application Papers

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

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

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

The amendment filed 05/13/2008 has been received and considered. Claims 34-65 are presented for examination.

Election/Restrictions

Newly submitted claims 34-65 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: The claims are directed to a method/system of identification and presentation of documents and associated actions while the invention originally claimed are directed to a method/system of processing item search requests.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 34-65 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

The amendment filed on 05/13/2008 canceling all claims drawn to the elected invention and presenting only claims drawn to a non-elected invention is non-responsive (MPEP § 821.03). The remaining claims are not readable on the elected invention because it changes the scope of invention, and presenting claims are drawn to the nonelected invention. More specifically, the claims are directed to a method/system of identification and presentation of documents and associated actions while the invention originally claimed are directed to a method/system of processing item search requests.

Since the above-mentioned amendment appears to be a *bona fide* attempt to reply, applicant is given a TIME PERIOD of ONE (1) MONTH or THIRTY (30) DAYS, whichever is longer, from the mailing date of this notice within which to supply the omission or correction in order to avoid abandonment. EXTENSIONS OF THIS TIME PERIOD UNDER 37 CFR 1.136(a) ARE AVAILABLE.

Conclusion

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Huen Wong whose telephone number is (571) 270-3426. The examiner can normally be reached on Monday - Friday (8:30 EST - 5:00 EST).

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Tony Mahmoudi can be reached on (571) 272-4078. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300 for regular communications and after final communications.

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

/Huen Wong/
Examiner, Art Unit 2169

/H. W./

September 15, 2008

/Tony Mahmoudi/

Supervisory Patent Examiner, Art Unit 2169

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
Final	Original	01/15/2008	09/10/2008							
	1	✓	-							
	2	✓	-							
	3	✓	-							
	4	✓	-							
	5	✓	-							
	6	✓	-							
	7	✓	-							
	8	✓	-							
	9	✓	-							
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	25	✓	-							
	26	✓	-							
	27	✓	-							
	28	✓	-							
	29	✓	-							
	30	✓	-							
	31	✓	-							
	32	✓	-							
	33		÷							
	34		÷							
	35		÷							
	36		÷							

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
Final	Original	01/15/2008	09/10/2008							
	37		÷							
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	39		÷							
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WILMERHALE

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john.hobgood@wilmerhale.com

Date October 17, 2008

To Examiner Huen Wong
USPTO

Fax 571 273-8300
Tel

cc

From John V. Hobgood

Pages 3 (including cover)

Re

Please see attached

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PAGE 1/3 * RCVD AT 10/17/2008 3:23:45 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/5 * DNIS:2738300 * CSID:16175265000 * DURATION (mm-ss):01-58

For discussion purposes only – not for entry into the record
U.S. Pat. App. No. 11/246,432

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OCT 17 2008

To: Examiner Huen Wong
Fax: (571) 273-8300

From: John V. Hobgood
Reg. 61,540
October 17, 2008

RE: U.S. Pat. App. No. 11/246,432

Examiner Wong,

Thank you again for agreeing to consider the claim amendments below. We will, of course, provide a proper amended claim set in accordance with the rules when submitting an amendment in response to the office action. I provide this proposed claim amendment for discussions purposes, and I kindly ask that it not be entered into the record at this time. I look forward to speaking with you soon.

Proposed replacement for claim 1:

34. (Currently Amended) A method of processing a search request received from a user operating a text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising: ~~A user-interface method for identifying and presenting a set of documents and associated actions in an order so that relatively more relevant documents and associated actions appear earlier in the order based on a popularity of the documents and on an informational relevance of descriptive terms identified by a user via minimal prefix text entry and for reordering the documents and associated actions based on a number of text characters received from the user, the method comprising:~~

providing the set of ~~documents and associated actions~~ items, the ~~documents~~ items having assigned popularities to indicate a relative measure of a likelihood that the ~~document~~ item is desired by the user;

for each ~~document~~ item, associating a set of ~~descriptive~~ terms to describe the ~~document~~ item and assigning a relevance weight for each term based on a relevance of ~~an informational content of~~ the term in identifying the ~~document~~ item;

US1DOCS 6856193v1

PAGE 2/3 * RCVD AT 10/17/2008 3:23:45 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/5 * DNIS:2738300 * CSID:16175265000 * DURATION (mm-ss):01-58

receiving text entered by the user, the text having one or more text characters of one or more prefixes for ~~descriptive~~ terms the user is using to identify a desired ~~document~~ item;

in response to receiving a text character, performing an incremental find to compare the user-entered prefixes with the ~~descriptive~~ terms and to retrieve the relevance weights for user-entered prefixes matching ~~descriptive~~ terms; and

ordering and presenting one or more ~~documents and associated actions~~ items to the user based on the assigned popularities of the ~~documents and~~ item, based on a weighing of the relevance weights for user-entered prefixes matching ~~descriptive~~ terms associated with the ~~documents~~ items, and based on the number of text characters received from the user so that relatively more popular and more relevant ~~documents and associated actions~~ items appear earlier in the order for user selection or activation and the order of the items is adjusted as characters are entered.;

~~adjusting the relevance weights of the descriptive terms in response to the number of text characters received from the user; and~~

~~reordering at least a portion of the one or more documents and associated actions presented to the user based on the adjusted relevance weights of the descriptive terms.~~

Assuming you conclude that the above amendments resolve the non-responsive amendment problem, we would make similar amendments in system claim 50. If you have any questions or concerns, please do not hesitate to contact me on 617-526-6658.

Sincerely,

John V. Hobgood
Reg. No. 61,540

PAGE 3/3 * RCVD AT 10/17/2008 3:23:45 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/5 * DNIS:2738300 * CSID:16175265000 * DURATION (mm-ss):01-58

PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/246,432	Filing Date 10/07/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	10/17/2008	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 32	Minus	** 33	= 0	X $26 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $110 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/VENESSA JONES/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Docket No.: 290672.128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Murali Aravamudan et al.	Confirmation No.:	5356
Application No.:	11/246,432	Art Unit:	4171
Filed:	October 7, 2005	Examiner:	Wong, Huen
Title:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT		

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

AMENDMENT

Dear Sir:

INTRODUCTORY COMMENTS

In response to the Office Action dated September 23, 2008, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 9 of this paper.

Amendments to the Claims:

The following listing of the claims will replace all prior versions and listings of claims in the application.

Listing of the Claims;

Claims 1-33 (Cancelled)

34. (Currently Amended) A method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:~~A user-interface method for identifying and presenting a set of documents and associated actions in an order so that relatively more relevant documents and associated actions appear earlier in the order based on a popularity of the documents and on an informational relevance of descriptive terms identified by a user via minimal prefix text entry and for reordering the documents and associated actions based on a number of text characters received from the user, the method comprising:~~

providing the set of ~~documents and associated actions~~ items, the ~~documents~~ items having assigned ~~popularities~~ popularity values to indicate a relative measure of a likelihood that the ~~document~~ item is desired by the user;

for each ~~document~~item, associating a set of ~~descriptive~~ terms to describe the ~~document~~ item and assigning a relevance ~~weight~~ value for each term based on a relevance of ~~an informational content of~~ the term in identifying the ~~document~~item;

receiving text on the hand-held text input device entered by the user, the text having one or more text characters of one or more prefixes for ~~descriptive~~ terms the user is using to identify a desired ~~document~~item;

IPR2017-00933 Page 0242

in response to receiving a text character, performing an incremental find to compare the user-entered prefixes with the ~~descriptive~~ terms associated with the items and to retrieve the relevance ~~weights~~ values for user-entered prefixes matching ~~descriptive~~ terms associated with the items; and

ordering and presenting one or more ~~documents and associated actions~~ items to the user based on (a) the assigned ~~popularities~~ popularity values of the ~~documents and~~ items, ~~based~~ (b) on a weighing of the relevance ~~weights~~ values for user-entered prefixes matching ~~descriptive~~ terms associated with the ~~documents~~items, and (c) on the number of text characters received from the user so that relatively more popular and more relevant ~~documents and associated actions~~ items appear earlier in the order for user selection or activation and the order of the items is adjusted as characters are entered.;

~~adjusting the relevance weights of the descriptive terms in response to the number of text characters received from the user; and~~

~~reordering at least a portion of the one or more documents and associated actions presented to the user based on the adjusted relevance weights of the descriptive terms.~~

35. (Currently Amended) The method of claim 34, further comprising the ~~descriptive~~ terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein ordering and presenting the one or more ~~documents and associated actions~~ items is further based on the relevance bias values of the subspace categories.

36. (Previously Presented) The method of claim 35, wherein the relevance bias values are based on the number of text characters received from the user.

37. (Currently Amended) The method of claim 35, wherein the subspace categories

include a personalized history category containing ~~descriptive~~ terms associated with ~~documents and associated actions~~ items identified from previous incremental finds conducted by the user.

38. (Currently Amended) The method of claim 35, wherein the ordering and presenting of one or more ~~documents and associated actions~~ items is limited to items ~~documents, and associated actions,~~ having associated ~~descriptive~~ terms of one or more selected subspace categories.

39. (Previously Presented) The method of claim 38, wherein the one or more selected subspace categories are selected based on the number of text characters received from the user.

40. (Currently Amended) The method of claim 35, wherein the ordered and presented one or more ~~documents and associated actions~~ items are presented on a display device, the display device having display space allocated according to the subspace categories.

41. (Currently Amended) The method of claim 34, wherein the ~~text entered by the user is entered on an~~ hand-held text input device includes[[ing]] a set of overloaded keys generating an ambiguous text input.

42. (Currently Amended) The method of claim 41, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

43. (Currently Amended) The method of claim 34, wherein the ordered and presented one or more ~~documents and associated actions~~ items are presented on a display device having a minimal display area.

44. (Previously Presented) The method of claim 43, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

45. (Currently Amended) The method of claim 34, wherein the assigned popularity values

of one or more ~~documents~~ items of the set of ~~documents~~ items is based on a relative measure of popular opinion of the document.

46. (Currently Amended) The method of claim 34, wherein the assigned popularity values of one or more ~~documents~~ items of the set of ~~documents~~ items is based on a temporal relevance of the ~~document~~ items or a location relevance of the ~~document~~items.

47. (Currently Amended) The method of claim 34, wherein ordering and presenting the one or more ~~documents and associated actions~~ items is further based on the number of prefixes of the received text.

48. (Currently Amended) The method of claim 34, wherein a portion of the set of ~~documents and associated actions~~ items resides on a computer remote from the user.

49. (Currently Amended) The method of claim 34, wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing an incremental find, ordering and presenting one or more ~~documents and associated actions~~ items to the user, and adjusting the relevance ~~weights~~ values of the ~~descriptive~~ terms associated with the items.

50. (Currently Amended) A system for processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the system comprising:~~A system for identifying and presenting a set of documents and associated actions in an order so that relatively more relevant documents and associated actions appear earlier in the order based on a popularity of the documents and on an informational relevance of descriptive terms identified by a user via minimal prefix text entry and for reordering the documents and associated actions based on a number of text characters received from the user, the system comprising:~~

a first memory for storing at least a first portion of the set of ~~documents and associated~~

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~~actions~~items, the ~~documents~~ items having assigned ~~popularities~~ popularity values to indicate a relative measure of a likelihood that the ~~document~~ item is desired by the user, and each ~~document~~ item being associated with a set of ~~descriptive~~ terms to describe the ~~document~~item, each term being assigned a relevance ~~weight~~ value based on a relevance of an informational content of the term in identifying the ~~document~~item;

a device input for receiving text entered by the user on a hand-held text input device, the text having one or more text characters of one or more prefixes for ~~descriptive~~ terms the user is using to identify a desired ~~document~~item;

a processor for performing an incremental find in response to receiving a text character and for ordering one or more ~~documents and associated actions~~items, the incremental find comparing the user-entered prefixes with the ~~descriptive~~ terms associated with the items and retrieving the relevance ~~weights~~ values for user-entered prefixes matching ~~descriptive~~ terms associated with the items, the order of the one or more ~~documents and associated actions~~ items being based on the assigned ~~popularities~~ popularity values of the ~~documents~~ items and being based on a weighing of the relevance ~~weights~~ values for user-entered prefixes matching ~~descriptive~~ terms associated with the documents, so that relatively more popular and more relevant ~~documents and associated actions~~ items appear earlier in the order for user selection or activation, the relevance ~~weights~~ values of the ~~descriptive~~ terms associated with the items being adjusted in response to the number of text characters received from the user, and the order of at least a portion of the one or more ~~documents and associated actions~~ items being changed based on the adjusted relevance ~~weights~~ values of the ~~descriptive~~ terms; and

a device output for presenting the ordered one or more ~~documents and associated actions~~ items to the user.

51. (Currently Amended) The system of claim 50, further comprising the ~~descriptive~~

terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein ordering and presenting the one or more ~~documents and associated actions~~ items is further based on the relevance bias values of the subspace categories.

52. (Previously Presented) The system of claim 51, wherein the relevance bias values are based on the number of text characters received from the user.

53. (Currently Amended) The system of claim 51, wherein the subspace categories include a personalized history category containing ~~descriptive~~ terms associated with ~~documents and associated actions~~ items identified from previous incremental finds conducted by the user.

54. (Currently Amended) The system of claim 51, wherein the incremental find is limited to items ~~documents, and associated actions,~~ having associated descriptive terms of one or more selected subspace categories.

55. (Previously Presented) The system of claim 54, wherein the one or more selected subspace categories are selected based on the number of text characters received from the user.

56. (Currently Amended) The system of claim 51, further comprising a display device for presenting the ordered one or more ~~documents and associated actions~~items, the display device having display space allocated according to the subspace categories.

57. (Currently Amended) The system of claim 50, wherein the text entered by the user ~~is entered on an~~ on the hand-held text input device includes[[ing]] a set of overloaded keys generating an ambiguous text input.

58. (Currently Amended) The system of claim 57, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

59. (Currently Amended) The system of claim 50, further comprising a display device for presenting the ordered one or more ~~documents and associated actions~~items, the display device having a minimal display area.

60. (Previously Presented) The system of claim 59, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

61. (Currently Amended) The system of claim 50, wherein the assigned ~~popularity~~ popularity value of one or more ~~documents~~ items of the set of ~~documents~~ items is based on a relative measure of popular opinion of the ~~document~~item.

62. (Currently Amended) The system of claim 50, wherein the assigned popularity value of one or more ~~documents~~ items of the set of ~~documents~~ items is based on a temporal relevance of the ~~document~~ item or a location relevance of the ~~document~~item.

63. (Currently Amended) The system of claim 50, wherein the order of the one or more ~~documents and associated actions~~ items is further based on the number of prefixes of the received text.

64. (Currently Amended) The system of claim 50, further comprising a second memory on a computer remote from the user for storing at least a second portion of the set of ~~documents and associated actions~~items.

65. (Previously Presented) The system of claim 50, wherein the processor is disposed in a computer remote from the user.

REMARKS

This Amendment is filed in response to the Office Action dated September 23, 2008. Claims 34-65 were pending in the application. Claims 34-35, 37-38, 40-43, 45-51, 53-54, 56-59, 61-64 have been amended. Applicants respectfully request reconsideration of the application in view of the following remarks.

Telephonic Interview of November 10, 2008

Applicants thank Examiner Wong for the telephonic interview on November 10, 2008, with the undersigned. During the interview, the participants discussed the claims as amended in the Amendment dated May 13, 2008. Applicants suggested amending the claims as set forth above to overcome the concerns stated in the Office Action dated September 23, 2008. The Examiner agreed that doing so would overcome the Office-imposed restriction requirement and enable the Examiner to proceed with an examination on the merits.

Election / Restriction

Claims 34-65 were withdrawn from consideration by the Office Action as directed to a non-elected invention. Applicants have amended these claims and respectfully request reconsideration.

Office Action dated January 23, 2008

The Office Action dated January 23, 2008, rejected all pending claims as set forth below. The following remarks address the those rejections in light of the newly amended claim set provided in this response. Reconsideration of those rejections is respectfully

requested.

Rejections under 35 U.S.C. § 102(e)

Claims 1-9, 12-20, 23-31 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. Pub. 2005/0283468 by Kamvar et al. (herein "Kamvar"). Those claims have been cancelled, and, thus, those rejections are moot. However, claims 34-65 are presented to more particularly claim the invention. The following comments are directed to the invention recited in new independent claim 34.

Kamvar discloses a system that monitors the input of a search query entered by a user. Before the user finishes entering the search query, the search system identifies and sends a portion of the query as a partial query to the search engine. Based on the partial query, the search engine creates a set of predicted queries. The predicted queries are sent back to the user for possible selection. The search engine may also return at least a portion of the search results corresponding to one or more of the predicted queries. See Kamvar at ¶ 5.

Kamvar is not concerned with a method of identifying and presenting one or more items in a particular order based at least in part on the number of text characters entered by a user where the order of the items is adjusted based on the number of text characters received from the user. The Office Action states "Kamvar discloses 'popularity ranking' and the difference in order due to length of query string" and points to ¶¶ 43-49 and Figs. 6 and 7. However, Kamvar merely describes that as more characters are included in the partial search query, the number of results matching the partial search query may change. See Kamvar at ¶ 45. Kamvar does not disclose ordering and presenting items from a search based at least in

part on the number of text characters received from the user so that relatively more popular and more relevant items appear earlier in the order for user selection or activation where the order of the items is adjusted as characters are entered.

In contrast to the cited references, applicants' claim 34 is directed to a method of processing a search request received from a user operating a hand-held text input device. The search request is directed at identifying a desired item from a set of items. Each of the items has one or more associated terms to describe the item. The presentation order of the identified items is based on popularity values of the items and on an informational relevance of terms associated with the items identified by a user via minimal prefix text entry. The method also calls for ordering the items based on a number of text characters received from the user and adjusting the order as characters are entered. Consequently, the relative positions of the individual search results within the presentation order can be adjusted as the user is entering characters of the prefix text entry. This, for example, enables search results having a relatively lower popularity rating to be ranked more preferably in the presentation order as the number of characters entered by the user increases. See Application at ¶¶ 40-43.

As set forth above, Kamvar does not teach or suggest ordering one or more identified items based in part on the number of text characters received from the user and adjusting the order of the items as characters are entered. As applicants explain in their application, ordering the search results based only on their popularities causes highly popular results to monopolize the most desirable positions in the presentation order, thereby "occluding" less popular results. This occurs despite the fact that the user has been presented with the popular

results, has elected not to select the popular results, and continues to enter additional characters in the search text. This problem is especially troublesome when the search results are being presented on hand-held, display-constrained device (e.g., PDA or mobile telephone). See Application at ¶ 43.

Unlike Kamvar, applicants' claim 34 clearly recites ordering the items in response to the number of text characters received from the user and adjusting the order as the characters are entered. The application describes the discovery of the occlusion problem and the advantages of the solutions devised by applicants. Namely, by basing the ordering of the search results on the number of text characters received from the user, search results desired by the user can be found with less text entered by the user. See Application at ¶¶ 40-43.

None of this is taught or suggested by Kamvar. Thus, applicants submit that claim 34 is patentable over Kamvar. Claims 35-49 depend from claim 34 and, therefore include the limitations of claim 34. Thus, applicants submit these claims are also patentable over Kamvar for the reasons given above.

New independent claim 50 recites adjusting the relevance values of the terms associated with items in response to the number of text characters received from the user and changing the order of at least a portion of the one or more items based on the adjusted relevance values of the terms associated with the items. Thus, applicants submit that claim 50 is patentable over Kamvar for the reasons provided above in connection with claim 34.

Claims 51-65 depend from claim 50 and, therefore include the limitations of claim 50. Thus, applicants submit these claims are also patentable over Kamvar for the reasons given

above.

Rejections under 35 U.S.C. § 103(a)

Claims 10-11, 21-22, and 32-33 were rejected under 35 U.S.C. § 103(a) as being obvious over Kamvar in view of U.S. Pat. Pub. 2004/0021691 by Dostie et al. (herein "Dostie"). These claims have been cancelled, and, thus, those rejections are moot.

As set forth above, Kamvar does not teach or suggest ordering the one or more items at least in part based on the number of text characters received from the user and adjusting the order as the characters are entered, as recited in new independent claim 34. Nor does Kamvar teach or suggest adjusting relevance values of terms associated with the search results in response to the number of text characters received from the user and reordering at least a portion of the search results presented to the user based on the adjusted relevance values of the terms, as recited in new independent claim 50. Dostie, also, fails to teach or suggest these required elements.

Dostie discloses a system for receiving text entry from a user and for providing completion candidates based on the user's text enter. As the user enters a character, a partial text entry is created. The partial text entry is used to search a dictionary for completion candidates that begin with the partial text entry. Dostie also describes a navigation interface for retrieval of completion candidates. See Dostie at ¶¶ 6-10.

Dostie is silent regarding ordering search results based on a number of text characters received from a user or adjusting the relevance values of terms associated with the search results in response to the number of text characters received from the user and reordering at

least a portion of the search results presented to the user based on the adjusted relevance values of the descriptive terms.

Thus, applicants submit that claims 34 are 50 are patentable over Kamvar in view of Dostie. Claims 35-49 depend from claim 34 and, therefore include the limitations of claim 34. Claims 51-65 depend from claim 50 and, therefore include the limitations of claim 50. Thus, applicants submit these claims are also patentable over the cited references for the reasons given above.

Rejections under 35 U.S.C. § 112

Claims 3, 6-7, 14, and 25 were rejected under 35 U.S.C. § 112 as being indefinite. These claims have been cancelled, and, thus, these rejections are moot.

Objection to the Claims

Claim 12 was objected to. That claim has been cancelled. Thus, the objection is moot.

Conclusion

Applicants respectfully request an early and favorable reconsideration and issuance of this application as amended herein. The Examiner is encouraged to contact the undersigned to expedite prosecution of this application.

A request for a one-month extension of time accompanies this request. Authorization to charge the $65.00 fee in connection with the extension of time request is enclosed. No other fees are believed to be due in connection with this response. However, please charge

any fees due in connection with this application or credit any overpayments to Deposit Acct. No. 08-0219.

Respectfully submitted,

Date: November 12, 2008

/John V. Hobgood/
John V. Hobgood
Registration No. 61,540
Attorney for Applicant

Wilmer Cutler Pickering Hale and Dorr LLP
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Boston, MA 02109
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Fax: (617) 526-5000

PTO/SB/22 (10-08)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2009 *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 0290672.00128US2
Application Number 11/246,432-Conf. #5356	Filed October 7, 2005
For METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICLALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT	
Art Unit 4171	Examiner H. Wong

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

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

		Fee	Small Entity Fee	
[X]	One month (37 CFR 1.17(a)(1))	$130	$65	$ 65.00
[ ]	Two months (37 CFR 1.17(a)(2))	$490	$245	$
[ ]	Three months (37 CFR 1.17(a)(3))	$1110	$555	$
[ ]	Four months (37 CFR 1.17(a)(4))	$1730	$865	$
[ ]	Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

[X] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[ ] Payment by credit card. Form PTO-2038 is attached.

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

[X] The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 08-0219 .

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

I am the

[ ] applicant/inventor.

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

[X] attorney or agent of record. Registration Number 61,540

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

/John V. Hobgood/	November 12, 2008
Signature	Date
John V. Hobgood	(617) 526-6000
Typed or printed name	Telephone Number

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

[ ] Total of 1 forms are submitted.

IPR2017-00933 Page 0256

Electronic Patent Application Fee Transmittal

Application Number:	11246432
Filing Date:	07-Oct-2005
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Filer:	John Verble Hobgood/Jeanne DeLuca
Attorney Docket Number:	0290672.00128US2

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
		Total in USD ($)		**65**

Electronic Acknowledgement Receipt	
EFS ID:	4272947
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Jeanne DeLuca
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	12-NOV-2008
Filing Date:	07-OCT-2005
Time Stamp:	14:11:42
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$65
RAM confirmation Number	15923
Deposit Account	080219
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees) Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees) Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	**Document Description**	**File Name**	**File Size(Bytes)/ Message Digest**	**Multi Part /.zip**	**Pages (if appl.)**
1		290672_128US2_Amendment_12-Nov-2008.pdf	152267 ebeb7a02a902cf1b44618b9dc6404896d4712d6b	yes	15
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	8	
	Applicant Arguments/Remarks Made in an Amendment		9	15	
Warnings:					
Information:					
2	Extension of Time	290672_128US2_ReqExTime_12_Nov_08.pdf	115324 7cb41ed7fc1bd7c635da6e6aa63a6150442cd23a	no	1
Warnings:					
Information:					
3	Fee Worksheet (PTO-06)	fee-info.pdf	30360 01ba56e74bd026ee5f7158dc1ca533f968183f93	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	297951		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/246,432	Filing Date 10/07/2005	☒ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	11/12/2008	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 32	Minus	** 33	= 0	X $26 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $110 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1)		(Column 2)	(Column 3)	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA					
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/KATRINA HARLING/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 11/18/2008

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
WONG, HUEN	
ART UNIT	**PAPER NUMBER**
2169	

NOTIFICATION DATE	DELIVERY MODE
11/18/2008	ELECTRONIC

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

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

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

michael.mathewson@wilmerhale.com
teresa.carvalho@wilmerhale.com
sharon.matthews@wilmerhale.com

Interview Summary	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	Huen Wong	2169	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Huen Wong*. (3)*John V. Hobgood (Reg. # 61,540)*.

(2) *Tony Mahmoudi*. (4)_____.

Date of Interview: *10 November 2008*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *34*.

Identification of prior art discussed: *N/A*.

Agreement with respect to the claims f)☐ was reached. g)☒ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *See Continuation Sheet*.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Tony Mahmoudi/
Supervisory Patent Examiner, Art Unit 2169

IPR2017-00933 Page 0264

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: The applicant's representative clarified how the present invention can be used, for example, to assist users in searching for items s/he desire. The applicant's representative submits proposed claim 34 in response to the Notice of Non-compliance sent on 09/23/2008. The examiner advised that the use of language in claims should be consistent with the contents of applicant's specification.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 02/05/2009

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER
WONG, HUEN

ART UNIT	PAPER NUMBER
2169	

NOTIFICATION DATE	DELIVERY MODE
02/05/2009	ELECTRONIC

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

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

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

michael.mathewson@wilmerhale.com
teresa.carvalho@wilmerhale.com
sharon.matthews@wilmerhale.com

Office Action Summary	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	Huen Wong	2169	

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *12 November 2008*.

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

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

Disposition of Claims

4)☒ Claim(s) *34-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34-65* is/are rejected.

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

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

Application Papers

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

10)☒ The drawing(s) filed on *07 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *25 March 2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed **11/12/2008** has been received and considered.

All of original claims 1-33 are cancelled.

Claims 34-35, 37-38, 40-43, 45-51, 53-54, 56-59, and 61-64 are amended.

Claims 34-65 are presented for examination.

2. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. The Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

Response to Amendment

3. The Examiner respectfully withdraws *Claim Objections* on claim 12 in view of Applicant's cancellation of the claim.

4. The Examiner respectfully withdraws *Claim Rejections - 35 USC § 112* on **claims 3, 6, 7, 14, and 25** in view of Applicant's cancellation of the claims.

Information Disclosure Statement

5. The information disclosure statement (IDS) submitted on **03/25/2008** is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claims 43, 45, 50, and 59** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. **Claims 45 and 50** recite the limitation "the document" and "the documents", respectively. There is insufficient antecedent basis for this limitation in the claim.

9. The term "**minimal display area**" in **claims 43 and 59** is a relative term, which renders the claims indefinite. The term is not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

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

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made

11. **Claims 34-40, 45-56 and 61-65 are rejected under U.S.C 103(a) as being unpatentable over US PGPUB 2005/0283468 by Kamvar et al. (hereinafter "Kamvar"), in view of US Patent 6711585 by Copperman et al. (hereinafter "Copperman").**

12. As to **claim 34**, Kamvar teaches a method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user (Kamvar: para. 0041-0047, Fig. 6; wherein Kamvar discloses associated popularity values);

receiving text on the hand-held text input device entered by the user, the text having one or more text characters of one or more prefixes for the terms the user is using to identify a desired item (Kamvar: Pg. 1, ¶ 0005, ¶ 0019; Pgs. 3-4, ¶ 0042 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses receiving query from user for what the user desire), the query input comprising one or more characters input by the user on the text input device (Kamvar: Pg. 1, ¶ 0020; Fig. 7; Fig. 11; wherein Kamvar discloses that query may be "few characters");

in response to receiving a text character, performing an incremental find to

compare the user-entered prefixes with the terms associated with the items and to retrieve the relevance values for user-entered prefixes matching terms associated with the items (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"); and

ordering and presenting one or more items to the user based on

(a) the assigned popularity values of the items (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string),

(c) on the number of text characters received from the user so that relatively more popular and more relevant items appear earlier in the order for user selection or activation and the order of the items is adjusted as characters are entered (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string).

Kamvar does not explicitly disclose for each item, associating a set of terms to describe the item and assigning a relevance value for each term based on a relevance of the term in identifying the item and (b) ordering and presenting based on a weighing of the relevance values for user-entered prefixes matching terms associated with the items, and

However, Copperman discloses relatedness (weight) assigned to terms in order to quickly deliver timely and highly relevant knowledge upon request (Copperman: Col. 2 Lines 5-29) and weight-based ranking (Copperman: Col. 2 Lines 5-29, Col. 36 Lines 8-45) in order to organize and retrieve information through taxonomies (Copperman:

Col. 2 Lines 5-29, Col. 36 Lines 8-45).

It would have been obvious to one of ordinary skill in the art at the time of he Applicant's invention that it is quite advantageous to incorporate Copperman's relatedness (weight) assigned to terms in order to quickly deliver timely and highly relevant knowledge upon request (Copperman: Col. 2 Lines 5-29) and weight-based ranking (Copperman: Col. 2 Lines 5-29, Col. 36 Lines 8-45) with the Kamvar's method in order to organize and retrieve information through taxonomies (Copperman: Col. 2 Lines 5-29, Col. 36 Lines 8-45).

Claim 50, a system claim, contains subject matter similar claim 34 and is rejected on the same ground.

13. As to **claim 35**, the combination of Kamvar and Copperman teaches the method of claim 34. Kamvar further discloses the terms associated with the items being organized into searchable subspace categories (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7), each subspace category having a relevance bias value, wherein ordering and presenting the one or more items is further based on the relevance bias values of the subspace categories (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", "user profiles", "user information", measure of how recent an item is and the difference in order due to length of query string).

Claim 51, a system claim, contains subject matter similar claim 35 and is rejected on the same ground.

14. As to **claim 36**, the combination of Kamvar and Copperman teaches the method of claim 35. Kamvar further discloses wherein the relevance bias values are based on the number of text characters received from the user (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 52, a system claim, contains subject matter similar claim 36 and is rejected on the same ground.

15. As to **claim 37**, the combination of Kamvar and Copperman teaches the method of claim 35. Kamvar further discloses wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses previous search requests).

Claim 53, a system claim, contains subject matter similar claim 37 and is rejected on the same ground.

16. As to **claim 38**, combination of Kamvar and Copperman teaches the method of claim 35. Kamvar further discloses wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string.

Claim 54, a system claim, contains subject matter similar claim 38 and is rejected on the same ground.

17. As to **claim 39**, the combination of Kamvar and Copperman teaches the method of claim 38. Kamvar further discloses wherein the one or more selected subspace categories are selected based on the number of text characters received from the user (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 55, a system claim, contains subject matter similar claim 39 and is rejected on the same ground.

18. As to **claim 40**, the combination of Kamvar and Copperman teaches the method of claim 35. Kamvar further discloses the ordered and presented one or more items are presented on a display device, the display device having display space allocated according to the subspace categories (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; Fig. 10; Fig. 11).

Claim 56, a system claim, contains subject matter similar claim 40 and is rejected on the same ground.

19. As to **claim 45**, the combination of Kamvar and Copperman teaches the method of claim 34. Kamvar further discloses wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the

document (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string).

Claim 61, a system claim, contains subject matter similar claim 45 and is rejected on the same ground.

20. As to **claim 46**, the combination of Kamvar and Copperman teaches the method of claim 34. Kamvar further discloses wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items (Kamvar: Pgs. 3-4, ¶ 0041 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses previous search requests).

Claim 62, a system claim, contains subject matter similar claim 46 and is rejected on the same ground.

21. As to **claim 47**, the combination of Kamvar and Copperman teaches the method of claim 34. Kamvar further discloses wherein ordering and presenting the one or more items is further based on the number of prefixes of the received text (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity ranking" and the difference in order due to length of query string)..

Claim 63, a system claim, contains subject matter similar claim 47 and is rejected on the same ground.

22. As to **claim 48**, the combination of Kamvar and Copperman teaches the method of claim 34. Kamvar further discloses wherein a portion of the set of items resides on a

computer remote from the user (Kamvar: ¶ 0005; ¶ 0019 - ¶ 0020; ¶ 0023 - ¶ 0024; ¶ 0028 - ¶ 0029; ¶ 0034 - ¶ 0035; ¶ 0043 - ¶ 0049; Fig. 1; Fig. 3; Fig. 4; Fig. 6, Fig. 7; wherein Kamvar discloses receiving and processing of search request by search engine remote from the user).

Claim 64, a system claim, contains subject matter similar claim 48 and is rejected on the same ground.

23. As to **claim 49**, the combination of Kamvar and Copperman teaches the method of claim 34. Kamvar further discloses wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing an incremental find, ordering and presenting one or more items to the user, and adjusting the relevance values of the terms associated with the items (Kamvar: ¶ 0005; ¶ 0019 - ¶ 0020; ¶ 0023 - ¶ 0024; ¶ 0028 - ¶ 0029; ¶ 0034 - ¶ 0035; ¶ 0043 - ¶ 0049; Fig. 1; Fig. 3; Fig. 4; Fig. 6, Fig. 7).

Claim 65, a system claim, contains subject matter similar claim 49 and is rejected on the same ground.

24. **Claims 41-44 and 57-60 are rejected under U.S.C 103(a) as being unpatentable over US PGPUB 2005/0283468 by Kamvar et al. (hereinafter "Kamvar"), in view of US Patent 6711585 by Copperman et al. (hereinafter "Copperman"), and in further view of US PGPUB 2004/0021691 by Dostie et al. (hereinafter "Dostie").**

25. As to **claim 41**, the combination of Kamvar and Copperman teaches the method of claim 34. Kamvar and Copperman do not explicitly disclose wherein the hand-held text_input device includes a set of overloaded keys generating an ambiguous text input.

However, Dostie discloses QWERTY input with overloaded keys used for generating ambiguous character input system (Dostie: Pgs. 6-7, ¶ 0079 - ¶ 0082; Fig. 3; wherein Dostie discloses that "each key [ ] can contain one of more letters") for the purpose of rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate the method taught by of Kamvar's and Copperman with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

Claim 57, a system claim, contains subject matter similar claim 41 and is rejected on the same ground.

26. As to **claim 42**, the combination of Kamvar, Copperman and Dostie teaches the method of claim 41. Kamvar and Copperman do not explicitly disclose wherein the hand-held text_input device is a phone, a mobile computing device, or a remote control device for a television.

However, Dostie discloses "personal computing devices" and "hand-held devices" with overloaded keys (Dostie: Pg. 5, ¶ 0067- ¶ 0068; Fig. 1; wherein Dostie discloses "personal computing devices" and "hand-held devices") for the purpose of rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate the method taught by Kamvar and Copperman with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

Claim 58, a system claim, contains subject matter similar claim 42 and is rejected on the same ground.

27. As to **claim 43**, the combination of Kamvar and Copperman teaches the method of claim 34. Kamvar and Copperman do not explicitly disclose wherein the ordered and presented one or more items are presented on a display device having a minimal display area.

However, Dostie discloses "personal computing devices" and "hand-held devices" with overloaded keys (Dostie: Pg. 5, ¶ 0067- ¶ 0068, ¶ 0071- ¶ 0073, Fig. 1; wherein Dostie discloses "personal computing devices" and "hand-held devices") for the purpose of rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate the method taught by Kamvar and Copperman method with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

Claim 59, a system claim, contains subject matter similar claim 43 and is rejected on the same ground.

28. As to **claim 44**, the combination of Kamvar, Copperman and Dostie teaches the method of claim 43. Kamvar and Copperman do not explicitly disclose wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

However, Dostie discloses “personal computing devices” and “hand-held devices” with overloaded keys (Dostie: Pg. 5, ¶ 0067- ¶ 0068, ¶ 0071- ¶ 0073, Fig. 1; wherein Dostie discloses “personal computing devices” and “hand-held devices”) for the purpose of rapidly entering data, such as text (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant’s invention that it is quite advantageous to incorporate the method taught by Kamvar and Copperman with Dostie’s "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

Claim 60, a system claim, contains subject matter similar claim 44 and is rejected on the same ground.

Response to Arguments

29. Applicant's arguments filed in the amendment filed **11/12/2008** have been considered but they are moot in view of new ground of rejections. The reasons are set forth above.

30. **Regarding amended claims 34 and 50, Applicant argues that:**

> Kamvar is not concerned with a method of identifying and presenting one or more items in a particular order based at least in part on the number of text characters entered by a user where the order of the items is adjusted based on the number of text characters received from the user. The Office Action states "Kamvar discloses 'popularity ranking' and the difference in order

due to length of query string" and points to ¶¶ 43-49 and Figs. 6 and 7. However, **Kamvar merely describes that as more characters are included in the partial search query, the number of results matching the partial search query may change**. See Kamvar at ¶ 45. **Kamvar does not disclose ordering and presenting items from a search based at least in part on the number of text characters received from the user so that relatively more popular and more relevant items appear earlier in the order for user selection or activation** where the order of the items is adjusted as characters are entered.

In contrast to the cited references, applicants' claim 34 is directed to a method of processing a search request received from a user operating a hand-held text input device. The search request is directed at identifying a desired item from a set of items. Each of the items has one or more associated terms to describe the item. The presentation order of the identified items is based on popularity values of the items and on an informational relevance of terms associated with the items identified by a user via minimal prefix text entry. The method also calls for ordering the items based on a number of text characters received from the user and adjusting the order as characters are entered. Consequently, the relative positions of the individual search results within the presentation order can be adjusted as the user is entering characters of the prefix text entry. This, for example, **enables search results having a relatively lower popularity rating to be ranked more preferably in the presentation order as the number of characters entered by the user increases**. See Application at ¶¶ 40-43.

As set forth above, **Kamvar does not teach or suggest ordering one or more identified items based in part on the number of text characters received from the user and adjusting the order of the items as characters are entered**.

The application describes the discovery of the occlusion problem and the advantages of the solutions devised by applicants. Namely, **by basing the ordering of the search results on the number of text characters received from the user, search results desired by the user can be found with less text entered by the user**.

In response, the Examiner respectfully disagrees and submits:

Kamvar discloses at paragraphs 43-49 that the “Bri” query is initially entered. With the “Bri" query as criteria, results matching “Bri” are returned. As the user type in more characters to form a different query “Britney”, results matching “Britney” are returned. We can see from Fig. 7 that if a different query “Brita” was formed, “Britain” would be ranked the highest. As such, ordering is changed and “Britain”, being more relevant to "Brita" than “Britney” would be returned.

Also, Kamvar discloses at paragraphs 43-49 that “for the purpose of this example, consider popularity ranking to be in decreasing order of popularity”.

Conclusion

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Huen Wong whose telephone number is (571) 270-3426. The examiner can normally be reached on Monday - Friday (8:30 EST - 5:00 EST).

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Tony Mahmoudi can be reached on (571) 272-4078. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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

/Tony Mahmoudi/

Supervisory Patent Examiner, Art Unit 2169

/Huen Wong/

Examiner, Art Unit 2169

January 22, 2009

/lsw/
2 February 2009

Notice of References Cited	Application/Control No. 11/246,432	Applicant(s)/Patent Under Reexamination ARAVAMUDAN ET AL.	
	Examiner Huen Wong	Art Unit 2169	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,711,585	03-2004	Copperman et al.	707/104.1
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	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
Final	Original	01/15/2008	01/22/2009							
	1	✓	-							
	2	✓	-							
	3	✓	-							
	4	✓	-							
	5	✓	-							
	6	✓	-							
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	32	✓	-							
	33	✓	-							
	34		✓							
	35		✓							
	36		✓							

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
Final	Original	01/15/2008	01/22/2009							
	37		✓							
	38		✓							
	39		✓							
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	64		✓							
	65		✓							

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	4171

SEARCHED			
Class	Subclass	Date	Examiner
707	1	1/10/2008	HW
707	3	1/10/2008	HW
707	5	1/10/2008	HW
707	6	1/10/2008	HW
707	7	1/10/2008	HW
709	230	1/10/2008	HW
709	231	1/10/2008	HW

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	1/10/2008	HW
Inventor Search	1/10/2008	HW
Google Search	1/10/2008	HW
Google Web, Patent Search	01/21/2009	HW

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Used in Lieu of PTO/SB/08A/B
(Based on PTO 10-07 version)

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 4

Complete if Known	
Application Number	11/246,432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	4171
Examiner Name	H. Wong
Attorney Docket Number	0290672.00128US2

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Examiner Signature	/Huen Wong/	Date Considered	09/10/2008

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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	11/246,432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	4171
Examiner Name	H. Wong
Attorney Docket Number	0290672.00128US2

/H.W./	AT1*	US-2007/0276821	11-29-2007	Aravamudan et al.		
	AU1*	US-2007/0276859	11-29-2007	ARAVAMUDAN et al.		
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/H.W./	AE3*	US-7,293,231	11-06-2007	Gunn et al.		

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Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
/H.W./	BA	EP-1143691	10-10-2001	Speeq S A		√
/H.W./	BB	WO-05/033967-A3	04-14-2005	Google, Inc.		√
/H.W./	BC	WO-05/084235-A2	09-15-2005	Melodeo, Inc.		√

Examiner Signature	/Huen Wong/	Date Considered	09/10/2008

US1DOCS 6605005v1

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Substitute for form 1449/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** *(Use as many sheets as necessary)*				***Complete if Known***	
				Application Number	11/246,432-Conf. #5356
				Filing Date	October 7, 2005
				First Named Inventor	Murali ARAVAMUDAN
				Art Unit	4171
				Examiner Name	H. Wong
Sheet	3	of	4	Attorney Docket Number	0290672.00128US2

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. * CITE NO.: Those application(s) which are marked with an single asterisk (*) next to the Cite No. are not supplied (under 37 CFR 1.98(a)(2)(iii)) because that application was filed after June 30, 2003 or is available in the IFW. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
/H.W./	CA	Digital Video Broadcasting, http://www.dvb.org (12 October 2007)	
	CB	GOOD, N. et al., Combining Collaborative Filtering with Personal Agents for Better Recommendations, in Proc. of the 16th National Conference on Artificial Intelligence, pp. 439-446, Orlando, Florida, July 18-22, 1999.	
	CC	International Search Report, International Application No. PCT/US06/25249, mailed January 29, 2008 (2 pages).	
	CD	International Search Report, International Application No. PCT/US06/33204, mailed 21 Sept. 2007 (2 pages)	
	CE	International Search Report, International Application No. PCT/US06/40005, mailed July 3, 2007 (4 Pages).	
	CF	International Search Report, International Application No. PCT/US07/65703, mailed January 25, 2008 (2 pages).	
	CG	International Search Report, International Application No. PCT/US07/67100, mailed March 7, 2008 (2 pages).	
	CH	MATTHOM, "Text Highlighting in Search Results", July 22, 2005. Available at www.matthom.com/archive/2005/07/22/text-highlighting-in-search-results; retrieved June 23, 2006. (4 pages)	
	CI	MOKOTOFF, Soundexing and Genealogy, Available at http://www.avotaynu.com/soundex.html, retrieved March 19, 2008, last updated September 8, 2007 (6 pages)	
	CJ	Review of Personalization Technologies: Collaborative Filtering vs. ChoiceStream's Attributized Bayesian Choice Modeling, Technology Brief, ChoiceStream Technologies, Cambridge, MA.	
	CK	TALBOT, David. "Soul of a New Mobile Machine." *Technology Review: The Design Issue* May/June 2007. (pp. 46-53)	
	CL	Wikipedia's entry for Levenshtein distance (n.d.). Retrieved 11/15/2006 from http://en.wikipedia.org/wiki/Levenshtein_distance	
	CM	Written Opinion of the International Searching Authority, International Application No. PCT/US06/25249, mailed January 29, 2008 (4 pages).	
	CN	Written Opinion of the International Searching Authority, International Application No. PCT/US06/33204, mailed September 21, 2007 (3 pages).	
	CO	Written Opinion of the International Searching Authority, International Application No. PCT/US06/40005, mailed July 3, 2007 (4 Pages).	
	CP	Written Opinion of the International Searching Authority, International Application No. PCT/US07/65703, mailed January 25, 2008 (4 pages).	
/H.W./	CQ	Written Opinion of the International Searching Authority, International Application No. PCT/US07/67100, mailed March 7, 2008 (3 pages).	

Examiner Signature	/Huen Wong/	Date Considered	09/10/2008

US1DOCS 6605005v1

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(Based on PTO 10-07 version)

Substitute for form 1449/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** *(Use as many sheets as necessary)*				***Complete if Known***	
				Application Number	11/246,432-Conf. #5356
				Filing Date	October 7, 2005
				First Named Inventor	Murali ARAVAMUDAN
				Art Unit	4171
				Examiner Name	H. Wong
Sheet	4	of	4	Attorney Docket Number	0290672.00128US2

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature		Date Considered	

US1DOCS 6605005v1

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (09-08)
Approved for use through 10/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	11246432	Filing Date	2005-10-07	Docket Number (if applicable)	0290672.00128US2	Art Unit	2169
First Named Inventor	Murali ARAVAMUDAN			Examiner Name	H. Wong		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☒ Other Extension of Time

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 08-0219

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (09-08)
Approved for use through 10/31/2008. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Signature of Registered U.S. Patent Practitioner			
Signature	/John V. Hobgood/	Date (YYYY-MM-DD)	2009-06-02
Name	John V. Hobgood	Registration Number	61540

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	11246432
Filing Date:	07-Oct-2005
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Filer:	John Verble Hobgood/Jeanne DeLuca
Attorney Docket Number:	0290672.00128US2

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	2801	1	405	405
		Total in USD ($)		**470**

Electronic Acknowledgement Receipt	
EFS ID:	5432838
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Jeanne DeLuca
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	02-JUN-2009
Filing Date:	07-OCT-2005
Time Stamp:	11:43:14
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$470
RAM confirmation Number	7173
Deposit Account	080219
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

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

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

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

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		290672_128US2_Amendment_RCE_2-June-2009.pdf	108090 25283cbffebe1e52d102c4a7e2a1596804a0de6b	yes	14
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment After Final		1	1	
	Claims		2	7	
	Applicant Arguments/Remarks Made in an Amendment		8	14	
Warnings:					
Information:					
2	Extension of Time	290672_128US2_ExofTime_2-June-2009.pdf	98092 e01e5496557d399a32743334536a8b017a7e17f6	no	1
Warnings:					
Information:					
3	Request for Continued Examination (RCE)	290672_128US2_RCE_2_Jun_2009.pdf	697149 75d5b9250b6a83463137cbc08e2f17e272cc6797	no	3
Warnings:					
Information:					
4	Fee Worksheet (PTO-875)	fee-info.pdf	32213 d7813749ee8f53998cefa9180a6aa0ee4cfe8f7e	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	935544		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

Docket No.: 290672.128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Murali Aravamudan et al.	Confirmation No.:	5356
Application No.:	11/246,432	Art Unit:	4171
Filed:	October 7, 2005	Examiner:	Wong, Huen
Title:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT		

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

AMENDMENT

Dear Sir:

INTRODUCTORY COMMENTS

In response to the Office Action dated February 5, 2009, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

Amendments to the Claims:

The following listing of the claims will replace all prior versions and listings of claims in the application.

Listing of the Claims;

Claims 1-33 (Cancelled)

34. (Currently Amended)A method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user;

for each item, associating a set of terms to describe the item and assigning a relevance value for each term based on a relevance of the term in identifying the item;

receiving text on the hand-held text input device entered by the user, the text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item;

in response to receiving a text character, performing an incremental find to compare the user-entered prefixes with the terms associated with the items and to retrieve the relevance values for user-entered prefixes matching terms associated with the items;[[and]]

adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered prefixes based on the

number of text characters received from the user; and

ordering and presenting one or more items to the user based on (a) the assigned popularity values of the items[[,]] and (b) on a weighing of the adjusted relevance values for user-entered prefixes matching terms associated with the items~~, and (c) on the number of text characters received from the user~~ so that ~~relatively more popular and more relevant items appear earlier in the order for user selection or activation and~~ the order of the items is adjusted as characters are entered.

35. (Previously Presented) The method of claim 34, further comprising the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein ordering and presenting the one or more items is further based on the relevance bias values of the subspace categories.

36. (Previously Presented) The method of claim 35, wherein the relevance bias values are based on the number of text characters received from the user.

37. (Previously Presented) The method of claim 35, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

38. (Previously Presented) The method of claim 35, wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories.

39. (Previously Presented) The method of claim 38, wherein the one or more selected subspace categories are selected based on the number of text characters received from the user.

40. (Previously Presented) The method of claim 35, wherein the ordered and presented one or more items are presented on a display device, the display device having display space allocated according to the subspace categories.

41. (Previously Presented) The method of claim 34, wherein the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

42. (Previously Presented) The method of claim 41, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

43. (Currently Amended) The method of claim 34, wherein the ordered and presented one or more items are presented on a display constrained device ~~having a minimal display area~~.

44. (Previously Presented) The method of claim 43, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

45. (Currently Amended) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the ~~document~~item.

46. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items.

47. (Previously Presented) The method of claim 34, wherein ordering and presenting the one or more items is further based on the number of prefixes of the received text.

48. (Previously Presented) The method of claim 34, wherein a portion of the set of items resides on a computer remote from the user.

49. (Previously Presented) The method of claim 34, wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing an incremental find, ordering and presenting one or more items to the user, and adjusting the relevance values of the terms associated with the items.

50. (Currently Amended) A system for processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired

item from a set of items, each of the items having one or more associated terms, the system comprising:

a first memory for storing at least a first portion of the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user, and each item being associated with a set of terms to describe the item, each term being assigned a relevance value based on a relevance of an informational content of the term in identifying the item;

a device input for receiving text entered by the user on a hand-held text input device, the text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item;

a processor for performing an incremental find in response to receiving a text character and for ordering one or more items, the incremental find comparing the user-entered prefixes with the terms associated with the items and retrieving the relevance values for user-entered prefixes matching terms associated with the items, the order of the one or more items being based on the assigned popularity values of the items and being based on a weighing of the relevance values for user-entered prefixes matching terms associated with the ~~documents~~ items, so that relatively more popular and more relevant items appear earlier in the order for user selection or activation, the relevance values of the terms associated with the items being adjusted in response to the number of text characters received from the user, and the order of at least a portion of the one or more items being changed based on the adjusted relevance values of the terms; and

a device output for presenting the ordered one or more items to the user.

51. (Previously Presented) The system of claim 50, further comprising the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein ordering and presenting the one or more

items is further based on the relevance bias values of the subspace categories.

52. (Previously Presented) The system of claim 51, wherein the relevance bias values are based on the number of text characters received from the user.

53. (Previously Presented) The system of claim 51, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

54. (Previously Presented) The system of claim 51, wherein the incremental find is limited to items having associated descriptive terms of one or more selected subspace categories.

55. (Previously Presented) The system of claim 54, wherein the one or more selected subspace categories are selected based on the number of text characters received from the user.

56. (Previously Presented) The system of claim 51, further comprising a display device for presenting the ordered one or more items, the display device having display space allocated according to the subspace categories.

57. (Previously Presented) The system of claim 50, wherein the text entered by the user on the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

58. (Previously Presented) The system of claim 57, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

59. (Currently Amended) The system of claim 50, further comprising a display constrained device for presenting the ordered one or more items~~, the display device having a minimal display area~~.

60. (Previously Presented) The system of claim 59, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

61. (Previously Presented) The system of claim 50, wherein the assigned popularity value of one or more items of the set of items is based on a relative measure of popular opinion of the item.

62. (Previously Presented) The system of claim 50, wherein the assigned popularity value of one or more items of the set of items is based on a temporal relevance of the item or a location relevance of the item.

63. (Previously Presented) The system of claim 50, wherein the order of the one or more items is further based on the number of prefixes of the received text.

64. (Previously Presented) The system of claim 50, further comprising a second memory on a computer remote from the user for storing at least a second portion of the set of items.

65. (Previously Presented) The system of claim 50, wherein the processor is disposed in a computer remote from the user.

REMARKS

This Amendment accompanies a Request for Continued Examination. Entry of this Amendment is respectfully requested before further consideration. This Amendment is filed in response to the Final Office Action dated February 5, 2009. Claims 34-65 were pending in the application. Claims 34, 43, 45, 50, and 59 have been amended. Applicants respectfully request reconsideration of the application in view of the following remarks.

Rejections under 35 U.S.C. § 112

Claims 43, 45, 50 and 59 were rejected under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. These claims have been amended in light of those rejections.

Specifically, claims 43 and 59 have been amended to recite a display constrained device. The problem of presenting a number of results on display constrained devices is discussed in the application, as well as the benefits of the solutions devised by applicants

Reconsideration of those rejections is respectfully requested.

Rejections under 35 U.S.C. § 103(a)

Claims 34-40, 45-56 and 61-65 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Pat. Pub. 2005/0283468 by Kamvar et al. (herein "Kamvar") in view of U.S. Pat. No. 6,711,585 to Copperman et al. (herein "Copperman").

Kamvar discloses a system that monitors the input of a search query entered by a user. Before the user finishes entering the search query, the search system identifies and sends a

portion of the query as a partial query to the search engine. Based on the partial query, the search engine creates a set of predicted queries. The predicted queries are sent back to the user for possible selection. The search engine may also return at least a portion of the search results corresponding to one or more of the predicted queries. See Kamvar at ¶ 5.

Kamvar is not concerned with a method of adjusting relevance values assigned to terms associated with items based on the number of text characters received from the user and then ordering and presenting items in a particular order based at least in part on the adjusted relevance values. The Office Action states that "With the 'Bri' query as criteria, results matching 'Bri' are returned. As the user type [sic] in more characters to form a different query 'Britney', results matching 'Britney' are returned." See Office Action at Pg. 14. Thus, while the results matching the query string change as more characters are entered, this is merely due to the fact that some portion of the results matching "Bri" are disqualified as those results no longer match "Britney". See Kamvar at ¶ 45. Kamvar does not disclose adjusting relevance values assigned to terms associated with items based on the number of text characters received from the user and then ordering and presenting items in a particular order based at least in part on the adjusted relevance values.

Copperman discloses a system for organizing and retrieving information through the use of taxonomies, a document classifier, and autocontextualization. Copperman describes that documents are first transformed from clear text into a structured record, and indexes are automatically constructed to help identify when the structured record is an appropriate response to a particular query. An automatic term extractor creates a list of terms that are

indicative of the subject matter contained in the documents, and then a subject matter expert identifies the terms that are relevant to the taxonomies. A term analysis system assigns the relevant terms to one or more taxonomies, and a suitable algorithm is then used to determine the relatedness between each list of terms and its associated taxonomy. The system then clusters documents for each taxonomy in accordance with the weights ascribed to the terms in the taxonomy's list and a directed acyclic graph structure is created. See Copperman at col. 2, lns. 8-31.

Copperman is not concerned with a method of adjusting relevance values assigned to terms associated with items based on the number of text characters received from the user and then ordering and presenting items in a particular order based at least in part on the adjusted relevance values. The Office Action states that Copperman discloses "relatedness" assigned to terms and weight-based ranking in order to organize and retrieve information through taxonomies. See Office Action at pg. 5. While Copperman describes using a natural language query to identify matches between the query and the concept nodes of a taxonomy, Copperman is silent regarding adjusting relevance values assigned to terms associated with items based on the number of text characters received from the user and then ordering and presenting items in a particular order based at least in part on the adjusted relevance values. See Copperman at col. 2, lns. 50-59.

In contrast to the cited references, applicants' claim 34 is directed to a method of processing a search request received from a user operating a hand-held text input device. The search request is directed at identifying a desired item from a set of items. Each of the items

has one or more associated terms to describe the item. The presentation order of the identified items is based on popularity values of the items and on an informational relevance value of terms associated with the items identified by a user via minimal prefix text entry. The method also calls for adjusting the relevance value assigned to at least one of the terms associated with one or more of the items identified in response to the user-entered prefixes based on the number of text characters received from the user. Consequently, the relative positions of the individual search results within the presentation order can be adjusted as the user is entering characters of the prefix text entry. This, for example, enables search results having a relatively lower popularity rating to be ranked more preferably in the presentation order as the number of characters entered by the user increases. See Application at ¶¶ 40-43.

As set forth above, the cited references do not teach or suggest adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered prefixes based on the number of text characters received from the user. Nor do the cited references teach or suggest ordering and presenting the one or more items based in part on the adjusted relevance values for user-entered prefixes matching terms associated with the retrieved items. As applicants explain in their application, ordering the search results based only on their popularities causes highly popular results to monopolize the most desirable positions in the presentation order, thereby "occluding" less popular results. This occurs despite the fact that the user has been presented with the popular results, has elected not to select the popular results, and continues to enter additional characters in the search text. This problem is especially troublesome when the search results are being presented on hand-held, display-constrained device (e.g., PDA or mobile telephone). See

Application at ¶ 43.

Unlike the cited references, applicants' claim 34 clearly recites adjusting the relevance value assigned to terms associated with the retrieved items based on the number of text characters received from the user. The retrieved items are ordered and presented to the user based in part on a weighing of these adjusted relevance values. The application describes the discovery of the occlusion problem and the advantages of the solutions devised by applicants. Namely, by basing the ordering of the search results in part on the number of text characters received from the user, search results desired by the user can be found with less text entered by the user. See Application at ¶¶ 40-43.

None of this is taught or suggested by the cited references. Thus, applicants submit that claim 34 is patentable over the cited references. Claims 35-40 and 45-49 depend from claim 34 and, therefore include the limitations of claim 34. Thus, applicants submit these claims are also patentable over the cited references for the reasons given above.

Independent claim 50 recites adjusting the relevance values of the terms associated with items in response to the number of text characters received from the user and changing the order of at least a portion of the one or more items based on the adjusted relevance values of the terms associated with the items. Thus, applicants submit that claim 50 is patentable over the cited references for the reasons provided above in connection with claim 34.

Claims 51-56 and 61-65 depend from claim 50 and, therefore include the limitations of claim 50. Thus, applicants submit these claims are also patentable over the cited references for the reasons given above.

Claims 41-44 and 57-60 were rejected under 35 U.S.C. § 103(a) as being obvious over Kamvar in view of Copperman, and in further view of U.S. Pat. Pub. 2004/0021691 by Dostie et al. (herein "Dostie").

Dostie discloses a system for receiving text entry from a user and for providing completion candidates based on the user's text enter. As the user enters a character, a partial text entry is created. The partial text entry is used to search a dictionary for completion candidates that begin with the partial text entry. Dostie also describes a navigation interface for retrieval of completion candidates. See Dostie at ¶¶ 6-10.

As with Kamvar and Copperman, Dostie is silent regarding adjusting the relevance values of terms associated with search results in response to the number of text characters received from the user and ordering and presenting search results based at least in part on the adjusted relevance values of the descriptive terms. Independent claims 34 and 50 clearly recite these limitations.

Thus, applicants submit that claims 34 are 50 are patentable over the cited references. Claims 41-44 depend from claim 34 and, therefore include the limitations of claim 34. Claims 57-60 depend from claim 50 and, therefore include the limitations of claim 50. Therefore, applicants submit these claims are also patentable over the cited references for the reasons given above.

Conclusion

Applicants respectfully request an early and favorable reconsideration and issuance of this application as amended herein. The Examiner is encouraged to contact the undersigned

to expedite prosecution of this application.

A request for a one-month extension of time accompanies this request. Authorization to charge the fees in connection with the extension of time request and Request for Continued Examination is enclosed. No other fees are believed to be due in connection with this response. However, please charge any fees due in connection with this application or credit any overpayments to Deposit Acct. No. 08-0219.

Respectfully submitted,

Date: June 2, 2009

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PTO/SB/22 (10-08)
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2009 *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 0290672.00128US2
Application Number 11/246,432-Conf. #5356	Filed October 7, 2005
For METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICLALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT	
Art Unit 2169	Examiner H. Wong

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

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

		Fee	Small Entity Fee	
[X]	One month (37 CFR 1.17(a)(1))	$130	$65	$ 65.00
[ ]	Two months (37 CFR 1.17(a)(2))	$490	$245	$
[ ]	Three months (37 CFR 1.17(a)(3))	$1110	$555	$
[ ]	Four months (37 CFR 1.17(a)(4))	$1730	$865	$
[ ]	Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

[X] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[ ] Payment by credit card. Form PTO-2038 is attached.

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

[X] The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 08-0219 .

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

I am the

[ ] applicant/inventor.

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

[X] attorney or agent of record. Registration Number 61,540

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

/John V. Hobgood/	June 2, 2009
Signature	Date
John V. Hobgood	(617) 526-6000
Typed or printed name	Telephone Number

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

[ ] Total of 1 forms are submitted.

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4).

Dated: June 2, 2009 Signature: _____ (John Hobgood)

US1DOCS 7184557v1

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/246,432	Filing Date 10/07/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	06/02/2009	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 32	Minus	** 33	= 0	X $26 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $110 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1)		(Column 2)	(Column 3)	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA					
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/EFREM WARREN/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 08/21/2009

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER
WONG, HUEN

ART UNIT	PAPER NUMBER
2169	

NOTIFICATION DATE	DELIVERY MODE
08/21/2009	ELECTRONIC

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

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

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

michael.mathewson@wilmerhale.com
teresa.carvalho@wilmerhale.com
sharon.matthews@wilmerhale.com

Office Action Summary	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	Huen Wong	2169	

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *02 June 2009*.

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

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

Disposition of Claims

4)☒ Claim(s) *34-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34-65* is/are rejected.

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

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

Application Papers

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

10)☒ The drawing(s) filed on *07 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. The amendment filed ***06/02/2009*** has been received and considered.

2. **Claim 34, 43, 45, 50, and 59** are amended.

Claims 1-33 are canceled.

Claims 34-65 are presented for examination.

3. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. The Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

Response to Arguments

4. Applicant's arguments are moot in view of new grounds of rejection.

Claim Rejections - 35 USC § 103

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

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

6. **Claims 34-40, 43, 45-56, 59, and 61-65 are rejected under U.S.C 103(a) as being unpatentable over US Patent 6480837 by Dutta, in view of US PGPUB 2005/0283468 by Kamvar et al. (hereinafter "Kamvar").**

7. As to **claim 34**, *Dutta* teaches a method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, **the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user** (*Dutta*: Fig. 2, Col. 4 Lines 31-42, Col. 5 Lines 7-20; averages of weights);

for each item, **associating a set of terms to describe the item** and **assigning a relevance value for each term based on a relevance of the term in identifying the item** (*Dutta*: Fig. 2, Col. 4 Lines 20-42, Col. 5 Lines 7-20; weights);

receiving text on the hand-held text input device entered by the user, **the text having one or more text characters of one or more terms the user is using to identify a desired item** (*Dutta*: Fig. 2, Col. 3 Lines 60-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20;

Col. 6 Lines 33-36; matching keywords);

in response to receiving text characters, **performing an incremental find** (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; matching keywords; also, searching incrementally by adding more search keywords and clicking on search button (*result set too large*) or erasing search keywords and clicking on search button (*result set too small*) is well-known) to **compare the user-entered terms with the terms associated with the items** and **to retrieve the relevance values for user-entered terms matching terms associated with the items** (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-42, Col. 5 Lines 2-20; Col. 6 Lines 33-36; receive search keywords; also, matching keywords; further, weights and averages of weights);

adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered terms based on the number of text characters received from the user (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-43 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; *number can be interpreted as a group of one kind*)**; and**

ordering and presenting one or more items to the user based on (a) the assigned popularity values of the items (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Abstract, Col. 3 Lines 60-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; also, ordering) and (b) on a weighing of the **adjusted** relevance values for user-entered terms matching terms associated with the items (*Dutta*: Fig. 2, Fig.

3a, Fig. 3b, Abstract, Col. 3 Lines 60-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; also, ordering) ~~, and (c) on the number of text characters received from the user~~ so that ~~relatively more popular and more relevant items appear earlier in the order for user selection or activation and~~ the order of the items is adjusted as characters are entered (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Abstract, Col. 3 Lines 60-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; also, ordering; one of ordinary skill would recognize that weights of search keywords continue to adjust and, as such, ordering based on these adjusted weights continues to adjust as search keywords consisting of characters are used to activate search).

Dutta discloses **receiving text having one or more text characters of one or more terms the user is using to identify a desired item**, but does not explicitly disclose **receiving text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item**. Also, *Dutta* discloses **in response to receiving** text characters, **performing an incremental find** to **compare the user-entered terms with the terms associated with the items** and **to retrieve the relevance values for user-entered terms matching terms associated with the items**, but does not explicitly disclose in response to **receiving a text character**, **performing an incremental find** to **compare the user-entered prefixes with the terms associated with the items** and **to retrieve the relevance values for user-entered prefixes matching terms associated with the items**. Also, *Dutta* discloses **adjusting the relevance value assigned to at least one of the terms associated with one or more of the items**

retrieved in response to the user-entered terms based on the number of text characters received from the user, but does not explicitly disclose **adjusting is in response to the user-entered prefixes**. Further, *Dutta* discloses ordering and presenting one or more items to the user based on (a) the assigned popularity values of the items and (b) on a weighing of the **adjusted** relevance values for user-entered terms matching terms associated with the items, but does not explicitly disclose based on a weighing of the **adjusted** relevance values for user-entered prefixes matching terms associated with the items.

However, *Kamvar* discloses **receiving text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item** (*Kamvar*: Pgs. 3-4, ¶0002, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein *Kamvar* discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"; also, top N most popular search terms),

in response to **receiving a text character**, **performing an incremental find** to **compare the user-entered prefixes with the terms associated with items** and **to retrieve the relevance values for user-entered prefixes matching terms associated with items** (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney");

user-entered prefixes as search terms that activate searches as more characters are inputted (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig.

7; portion or a few characters of query sent to search engine; also, as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney) in order to speed up query search by continuously sending search terms (including prefixes of search terms) to search engine (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0028-¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7).

It would have been obvious to one having ordinary skill in the art and the teachings of *Dutta* and *Kamvar* before them at the time the present invention was made to incorporate *Kamvar*'s features of **receiving text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item** (*Kamvar*: Pgs. 3-4, ¶0002, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein *Kamvar* discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"; also, top N most popular search terms),

in response to **receiving a text character**, **performing an incremental find** to **compare the user-entered prefixes with the terms associated with items** and **to retrieve the relevance values for user-entered prefixes matching terms associated with items** (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"); and

user-entered prefixes as search terms that activate searches as more characters are inputted (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7; portion or a few characters of query sent to search engine; also, as characters are

included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney) with the *Dutta*'s method.

The suggestions/motivations for doing so would have been to speed up query search by continuously sending search terms (including prefixes of search terms) to search engine (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0028-¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7).

Claim 50, a system claim, contains subject matter similar claim 34 and is rejected on the same ground.

8. As to **claim 35**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Kamvar* further discloses the terms associated with the items being organized into searchable subspace categories (*Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7), each subspace category having a relevance bias value, wherein ordering and presenting the one or more items is further based on the relevance bias values of the subspace categories (*Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 51, a system claim, contains subject matter similar claim 35 and is rejected on the same ground.

9. As to **claim 36**, the combination of *Dutta* and *Kamvar* teaches the method of claim 35. Kamvar further discloses wherein the relevance bias values are based on the number of text characters received from the user (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7;

wherein Kamvar discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 52, a system claim, contains subject matter similar claim 36 and is rejected on the same ground.

10. As to **claim 37**, the combination of *Dutta* and *Kamvar* teaches the method of claim 35. *Kamvar* further discloses wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user (*Kamvar*: Pgs. 3-4, ¶ 0041 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses previous search requests).

Claim 53, a system claim, contains subject matter similar claim 37 and is rejected on the same ground.

11. As to **claim 38**, the combination of *Dutta* and *Kamvar* teaches the method of claim 35. *Kamvar* further discloses wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories *Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string.

Claim 54, a system claim, contains subject matter similar claim 38 and is rejected on the same ground.

12. As to **claim 39**, the combination of *Dutta* and *Kamvar* teaches the method of claim 38. *Kamvar* further discloses wherein the one or more selected subspace categories are

selected based on the number of text characters received from the user (*Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 55, a system claim, contains subject matter similar claim 39 and is rejected on the same ground.

13. As to **claim 40**, the combination of *Dutta* and *Kamvar* teaches the method of claim 35 Kamvar further discloses the ordered and presented one or more items are presented on a display device, the display device having display space allocated according to the subspace categories (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; Fig. 10; Fig. 11).

Claim 56, a system claim, contains subject matter similar claim 40 and is rejected on the same ground.

14. As to **claim 43**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* further discloses wherein the ordered and presented one or more items are presented on a display constrained device ~~having a minimal display area~~ (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56; Col. 6 Lines 33-36; network and client submits searches to search engine; also, display of results; all displays have size constraints).

Claim 59, a system claim 43, contains subject matter similar to claim 48 and is rejected on the same ground.

15. As to **claim 45**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* further discloses wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the ~~document~~ item (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-43 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; weights and averages of weights, adjustment of weights).

Claim 61, a system claim 45, contains subject matter similar to claim 48 and is rejected on the same ground.

16. As to **claim 46**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items.

Dutta further discloses wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-43 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; weights and averages of weights, adjustment of weights based on matches and frequency of matches)

Claim 62, a system claim, contains subject matter similar claim 46 and is rejected on the same ground.

17. As to **claim 47**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* discloses wherein ordering and presenting the one or more items is further based on the number of terms of the received text (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b,

Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36. *Dutta* does not explicitly disclose wherein ordering and presenting the one or more items is further based on the number of prefixes of the received text.

However, *Kamvar* discloses **user-entered prefixes** as search terms that activate searches as more characters are inputted (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7; portion or a few characters of query sent to search engine; also, as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney) in order to speed up query search by continuously sending search terms (including prefixes of search terms) to search engine (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0028-¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7).

Claim 63, a system claim, contains subject matter similar claim 47 and is rejected on the same ground.

18. As to **claim 48**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* further discloses wherein a portion of the set of items resides on a computer remote from the user (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; network and client submits searches).

Claim 64, a system claim 48, contains subject matter similar to claim 48 and is rejected on the same ground.

19. As to **claim 49**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* further discloses wherein a computer remote from the user performs at least one

of the steps of receiving text entered by the user, performing an incremental find, ordering and presenting one or more items to the user, and adjusting the relevance values of the terms associated with the items (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; network and client submits searches to search engine).

20. As to **claim 65**, the combination of *Dutta* and *Kamvar* teaches the system of claim 50. *Dutta* further discloses wherein the processor is disposed in a computer remote from the user (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; network and client submits searches to search engine).

21. **Claims 41-42, 44 and 57-58, and 60 are rejected under U.S.C 103(a) as being unpatentable over US Patent 6480837 by Dutta, in view of US PGPUB 2005/0283468 by Kamvar et al. (hereinafter "Kamvar"), and in further view of US PGPUB 2004/0021691 by Dostie et al. (hereinafter "Dostie").**

22. As to **claim 41**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* and *Kamvar* do not explicitly disclose wherein the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

However, *Dostie* discloses QWERTY input with overloaded keys used for generating ambiguous character input system (*Dostie*: Pgs. 6-7, ¶ 0079 - ¶ 0082; Fig. 3; wherein *Dostie* discloses that "each key [ ] can contain one of more letters") for the purpose of rapidly entering data, such as text (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate the method taught by of *Dutta* and *Kamvar* with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

Claim 57, a system claim, contains subject matter similar claim 41 and is rejected on the same ground.

23. As to **claim 42**, the combination of *Dutta*, *Kamvar* and *Dostie* teaches the method of claim 41. *Dutta* and *Kamvar* do not explicitly disclose wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

However, *Dostie* discloses "personal computing devices" and "hand-held devices" with overloaded keys (*Dostie*: Pg. 5, ¶ 0067- ¶ 0068; Fig. 1; wherein *Dostie* discloses "personal computing devices" and "hand-held devices") for the purpose of rapidly entering data, such as text (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate the method taught by *Dutta* and *Kamvar* with *Dostie*'s "data entry system". The motivation for doing so would have been to allow rapid text entry by user (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

Claim 58, a system claim, contains subject matter similar claim 42 and is rejected on the same ground.

24. As to **claim 44**, the combination of *Dutta* and *Kamvar* teaches the method of claim 43. *Dutta* and *Kamvar* do not explicitly disclose wherein the display device is a phone, a

mobile computing device, or a non-intrusive interface display area of a television.

However, *Dostie* discloses “personal computing devices” and “hand-held devices” with overloaded keys (*Dostie*: Pg. 5, ¶ 0067- ¶ 0068, ¶ 0071- ¶ 0073, Fig. 1; wherein *Dostie* discloses “personal computing devices” and “hand-held devices”) for the purpose of rapidly entering data, such as text (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant’s invention that it is quite advantageous to incorporate the method taught by *Dutta* and *Kamvar* with *Dostie*’s "data entry system". The motivation for doing so would have been to allow rapid text entry by user (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

Claim 60, a system claim, contains subject matter similar claim 44 and is rejected on the same ground.

Prior Art

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- **US Patent 7424510** by **Gross et al.**
- **US Patent 6845374** by **Oliver et al.**
- **US Patent 7266551** by **Kravets**

Conclusion

26. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Huen Wong whose telephone number is (571) 270-3426. The examiner can normally be reached on Monday - Friday (8:30 EST - 5:00 EST).

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Tony Mahmoudi can be reached on (571) 272-4078. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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

/H. W./

Examiner, Art Unit 2169

August 14, 2009

/Vincent Boccio/

Primary Examiner, Art Unit 2158

Notice of References Cited	Application/Control No. 11/246,432	Applicant(s)/Patent Under Reexamination ARAVAMUDAN ET AL.	
	Examiner Huen Wong	Art Unit 2169	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,266,551	09-2007	Kravets, Alexander N.	707/4
*	B	US-7,424,510	09-2008	Gross et al.	709/203
*	C	US-6,480,837	11-2002	Dutta, Rabindranath	707/3
*	D	US-6,845,374	01-2005	Oliver et al.	707/5
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
Final	Original	01/15/2008	01/22/2009	08/14/2009						
	1	✓	-	-						
	2	✓	-	-						
	3	✓	-	-						
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	32	✓	-	-						
	33	✓	-	-						
	34		✓	✓						
	35		✓	✓						
	36		✓	✓						

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
Final	Original	01/15/2008	01/22/2009	08/14/2009						
	37		✓	✓						
	38		✓	✓						
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	62		✓	✓						
	63		✓	✓						
	64		✓	✓						
	65		✓	✓						

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	4171

SEARCHED			
Class	Subclass	Date	Examiner
707	1	1/10/2008	HW
707	3	1/10/2008	HW
707	5	1/10/2008	HW
707	6	1/10/2008	HW
707	7	1/10/2008	HW
709	230	1/10/2008	HW
709	231	1/10/2008	HW
EAST	update search with text	08/13/2009	HW

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	1/10/2008	HW
Inventor Search	1/10/2008	HW
Google Search	1/10/2008	HW
Google Web, Patent Search	01/21/2009	HW
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	08/13/2009	HW
Google Web, Patent Search	08/14/2009	HW

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S217	171	(popularit$3 same (item$1 document$1)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:19
S218	23	S217 and ((incremental predict$3) near6 search$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:19
S219	23	S218 and (relevance weight$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:20
S220	15	S218 and (relevance weight$1).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:20
S221	7	S218 and (relevance weight$1).clm. and prefix.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:30
S222	2	"20070061321"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:33
S223	123	((ARAVAMUDAN with Murali) (Venkataraman with Sashikumar)).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:35

EAST Search History (Prior Art)

S224	31	S223 and ((incremental predict$4) near6 search$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:36
S225	18	S223 and ((incremental predict$4) near6 search$3) and popularit$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:37
S226	13	S223 and (weigh$4 (relevance near5 value$1)).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:43
S227	8	S223 and (weigh$4 (relevance near5 value$1)).clm. and popularity.clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:43
S228	94	"6438579"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:46
S229	2	"20070027861"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:51
S230	4	"20050240580"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:52

EAST Search History (Prior Art)

S23 1	4	fatima.xa.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:57
S23 2	2	"20040163032"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 20:58
S23 3	341	((term$1 keyword$1) near5 (score$1 weigh$3)) and ((incremental predictive adaptive) near5 search$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:03
S23 4	26	S233 and (((weigh$3 value$1 scor$3) with (chang$3 adjust$4 updat$3)) same ((enter$3 entry input type types typing) with user$1))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:06
S23 5	2	"20070043700"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:19
S23 6	9	google.as. and ((incremental predictive) near6 search$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:21
S23 7	24	"6622140"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:30

EAST Search History (Prior Art)

S238	2	"20060224593"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:39
S239	9	amazon.as. and ortega.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:43
S242	35	(ruben near5 ortega).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:45
S243	0	(ruben near5 ortega).in. and ((incremental predictive) near6 search$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:45
S244	18	(ruben near5 ortega).in. and predic$4	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:47
S245	2	"10875143"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:51
S246	2	"20050283468"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:53

EAST Search History (Prior Art)

S247	17	S244 and (weigh$3 score$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 21:56
S248	80897	(term$1 keyword$1 descriptor$1) near6 (score$1 weigh$3 (relevance near2 value$1))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:00
S249	468	S248 and (((incremental adaptive predictive prefix$2) near6 search$3) (autocomplet$3 auto$1complet$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:01
S250	62	S249 and ((updat$3 chang$3 adjust$3 modif$3) near6 (score$1 weigh$3 (relevance near2 value$1)) same (dynamic$4 instant$2 continuous$2 continue$1 (on near3 fly)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:06
S251	55	S248 and ((updat$3 chang$3 adjust$3 modif$3) near6 (score$1 weigh$3 (relevance near2 value$1)) same (dynamic$4 instant$2 continuous$2 continue$1 (on near3 fly)) same (user$1) same (types typing input$1 enter$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:16
S252	24435	((updat$3 chang$3 adjust$3 modif$3) near6 (score$1 weigh$3 (relevance near2 value$1)) same (dynamic$4 instant$2 continuous$2 continue$1 (on near3 fly)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:33
S253	5	S252 and ((updat$3 chang$3 adjust$3 modif$3) near6 (score$1 weigh$3 (relevance near2 value$1)) same ((user$1 client$1) with (enter$3 input$4 type types typing) with (character$1)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:35

EAST Search History (Prior Art)

S254	33	((updat$3 chang$3 adjust$3 modif$3) near6 (score$1 weigh$3 (relevance near2 value$1)) same ((user$1 client$1) with (enter$3 input$4 type types typing) with (character$1)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:36
S255	41	((updat$3 chang$3 adjust$3 modif$3) near6 (rank$3 score$1 weigh$3 (relevance near2 value$1)) same ((user$1 client$1) with (enter$3 input$4 type types typing) with (character$1)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:42
S256	0	(partial near6 quer$3) and ((updat$3 chang$3 adjust$3 modif$3) near6 (score$1 weigh$3 (relevance near2 value$1)) same ((user$1 client$1) with (enter$3 input$4 type types typing) with (character$1)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:46
S257	0	(partial near6 quer$3) and ((updat$3 chang$3 adjust$3 modif$3) near6 (score$1 weigh$3 (relevance near2 value$1)) same ((enter$3 input$4 type types typing) with (character$1)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:47
S258	0	(prefix$2 near6 quer$3) and ((updat$3 chang$3 adjust$3 modif$3) near6 (score$1 weigh$3 (relevance near2 value$1)) same ((enter$3 input$4 type types typing) with (character$1)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:48
S259	0	(incremental near5 search$3) and ((updat$3 chang$3 adjust$3 modif$3) near6 (score$1 weigh$3 (relevance near2 value$1)) same ((enter$3 input$4 type types typing) with (character$1)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:48
S260	6979	(incremental predict$3) near5 search$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:50

EAST Search History (Prior Art)

S261	722	S260 and ((enter$3 input$4 type types typing) with (character$1))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:50
S262	3	S261 and raub.in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:51
S263	119	S261 and ((updat$3 chang$3 adjust$3 modif$3 increas$3 decreas$3) near6 (score$1 weigh$3 (relevance near2 value$1)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:52
S264	71	S263 and (term$1 keyword$1 descriptor$1) near6 (score$1 weigh$3 (relevance near2 value$1))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 22:57
S265	2	"20050240966"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 23:06
S266	1767	(prefix$2) near5 search$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 23:24
S267	369	S266 and ((enter$3 input$4 type types typing) with (character$1))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 23:24

EAST Search History (Prior Art)

S268	40	S267 and ((updat$3 chang$3 adjust$3 modif$3 increas$3 decreas$3) near6 (score$1 weigh$3 (relevance near2 value$1)))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 23:25
S269	13	S268 and (term$1 keyword$1 descriptor$1) near6 (score$1 weigh$3 (relevance near2 value$1))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 23:25
S270	2	(Kawauchi with Hiroshi).in. and score$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/13 23:28
S271	122	(before with (typing input entry) with (done finish$2)) and search$3 and quer$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2009/08/14 13:53

Docket No.: 0290672.00128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Murali ARAVAMUDAN et al.	Confirmation No.:	5356
Application No.:	11/246,432	Art Unit:	2169
Filed:	October 7, 2005	Examiner:	H. Wong
Title:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICLALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT		

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

AMENDMENT IN RESPONSE TO NON-FINAL OFFICE ACTION

Dear Madam:

INTRODUCTORY COMMENTS

In response to the Office Action dated August 21, 2009, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 1 of this paper.

Remarks/Arguments begin on page 7 of this paper.

AMENDMENTS TO THE CLAIMS

Claims 1-33 (Cancelled)

34. (Previously Presented) A method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user;

for each item, associating a set of terms to describe the item and assigning a relevance value for each term based on a relevance of the term in identifying the item;

receiving text on the hand-held text input device entered by the user, the text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item;

in response to receiving a text character, performing an incremental find to compare the user-entered prefixes with the terms associated with the items and to retrieve the relevance values for user-entered prefixes matching terms associated with the items;

adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered prefixes based on the number of text characters received from the user; and

ordering and presenting one or more items to the user based on (a) the assigned popularity values of the items and (b) on a weighing of the adjusted relevance values for user-entered prefixes matching terms associated with the items so that the order of the items is adjusted as characters are entered.

35. (Previously Presented) The method of claim 34, further comprising the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein ordering and presenting the one or more items is further based on the relevance bias values of the subspace categories.

36. (Previously Presented) The method of claim 35, wherein the relevance bias values are based on the number of text characters received from the user.

37. (Previously Presented) The method of claim 35, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

38. (Previously Presented) The method of claim 35, wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories.

39. (Previously Presented) The method of claim 38, wherein the one or more selected subspace categories are selected based on the number of text characters received from the user.

40. (Previously Presented) The method of claim 35, wherein the ordered and presented one or more items are presented on a display device, the display device having display space allocated according to the subspace categories.

41. (Previously Presented) The method of claim 34, wherein the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

42. (Previously Presented) The method of claim 41, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

43. (Previously Presented) The method of claim 34, wherein the ordered and presented one or more items are presented on a display constrained device.

44. (Previously Presented) The method of claim 43, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

45. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the item.

46. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items.

47. (Previously Presented) The method of claim 34, wherein ordering and presenting the one or more items is further based on the number of prefixes of the received text.

48. (Previously Presented) The method of claim 34, wherein a portion of the set of items resides on a computer remote from the user.

49. (Previously Presented) The method of claim 34, wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing an incremental find, ordering and presenting one or more items to the user, and adjusting the relevance values of the terms associated with the items.

50. (Previously Presented) A system for processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the system comprising:

a first memory for storing at least a first portion of the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user, and each item being associated with a set of terms to describe the item, each term being assigned a relevance value based on a relevance of an informational content of the term in identifying the item;

a device input for receiving text entered by the user on a hand-held text input device, the text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item;

a processor for performing an incremental find in response to receiving a text character and for ordering one or more items, the incremental find comparing the user-entered prefixes with the terms associated with the items and retrieving the relevance values

for user-entered prefixes matching terms associated with the items, the order of the one or more items being based on the assigned popularity values of the items and being based on a weighing of the relevance values for user-entered prefixes matching terms associated with the items, so that relatively more popular and more relevant items appear earlier in the order for user selection or activation, the relevance values of the terms associated with the items being adjusted in response to the number of text characters received from the user, and the order of at least a portion of the one or more items being changed based on the adjusted relevance values of the terms; and

a device output for presenting the ordered one or more items to the user.

51. (Previously Presented) The system of claim 50, further comprising the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein ordering and presenting the one or more items is further based on the relevance bias values of the subspace categories.

52. (Previously Presented) The system of claim 51, wherein the relevance bias values are based on the number of text characters received from the user.

53. (Previously Presented) The system of claim 51, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

54. (Previously Presented) The system of claim 51, wherein the incremental find is limited to items having associated descriptive terms of one or more selected subspace categories.

55. (Previously Presented) The system of claim 54, wherein the one or more selected subspace categories are selected based on the number of text characters received from the user.

56. (Previously Presented) The system of claim 51, further comprising a display device for presenting the ordered one or more items, the display device having display space allocated according to the subspace categories.

57. (Previously Presented) The system of claim 50, wherein the text entered by the user on the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

58. (Previously Presented) The system of claim 57, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

59. (Previously Presented) The system of claim 50, further comprising a display constrained device for presenting the ordered one or more items.

60. (Previously Presented) The system of claim 59, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

61. (Previously Presented) The system of claim 50, wherein the assigned popularity value of one or more items of the set of items is based on a relative measure of popular opinion of the item.

62. (Previously Presented) The system of claim 50, wherein the assigned popularity value of one or more items of the set of items is based on a temporal relevance of the item or a location relevance of the item.

63. (Previously Presented) The system of claim 50, wherein the order of the one or more items is further based on the number of prefixes of the received text.

64. (Previously Presented) The system of claim 50, further comprising a second memory on a computer remote from the user for storing at least a second portion of the set of items.

65. (Previously Presented) The system of claim 50, wherein the processor is disposed in a computer remote from the user.

REMARKS

This Amendment is filed in response to the Non-Final Office Action dated August 21, 2009. Claims 34-65 were pending in the application. No claims have been amended, cancelled, or added. Applicants respectfully request reconsideration of the application in view of the following remarks.

Rejections under 35 U.S.C. § 103(a)

Claims 34-40, 43, 45-56, 59, and 61-65 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Pat. No. 6,480,837 to Dutta (herein "Dutta") in view of U.S. Pat. Pub. 2005/0283468 by Kamvar et al. (herein "Kamvar").

Dutta discloses a method for ordering electronic files subject to searching. Dutta describes associating at least one keyword with each file of a set of files. A physical location of each file is identified by a file address, and a popularity weight is associated with at least one file address and keyword pair. A file address is capable of having multiple associated keywords and one associated popularity weight for each file address and keyword pair. In response to executing a search query including search keywords, file address search results are received that have at least one associated keyword that matches at least one search keyword in response to executing the search query. The search results are ordered according to the popularity weight associated with each file address search result and keyword pair whose keyword matches the search keyword. The popularity weights are adjusted upward for the at least one requested file address search result and keyword pair matching the search keywords. Also, the popularity weights may be adjusted downward for those file address and keyword pairs matching the search keywords that were not requested. See Dutta at col. 2, ln. 15-col. 3, ln. 9.

Dutta does not teach or suggest adjusting the relevance value assigned to at least one term associated with an items based on the number of text characters received from the user as part of a search string to identify a desired item. Rather, Dutta discloses adjusting popularity weights associated with an item up or down depending on whether the item is selected from a list of possible search results. See Dutta at col. 4, lns. 31-67. Dutta explains that, "Only after selection is the popularity weight for the selected URL/keyword pair adjusted upward." See Dutta at col. 5, lns.55-

56 (emphasis added). In other words, Dutta is only concerned with "tracking the popularity of search results for the purpose of determining how to present or order search results in future searches." See Dutta at col. 6, lns. 41-44. Dutta completely ignores the number of text characters that is part of the search query entered by the user.

In contrast, claim 34 recites receiving text on the hand-held text input device entered by the user, performing an incremental search based on the received text, adjusting the relevance value assigned to at least one term associated with an items based on the number of text characters received from the user as part of a search string to identify a desired item. Thus, the invention set forth in claim 34 adjusts the relevance value of terms independent of the selection of items, but, rather, based on the number of text characters received from the user. Consequently, the relative positions of the individual search results within the presentation order can be adjusted as the user is entering characters of the prefix text entry. This, for example, enables search results having a relatively lower popularity rating to be ranked more preferably in the presentation order as the number of characters entered by the user increases. See Application at ¶¶ 40-43.

The Examiner states that the term "number can be interpreted as a group of one kind". See Office Action at pg. 4. Applicants disagree with the Examiner, as the Application clearly describes the "number of text characters" as an enumeration of the characters in the user's search string. See Application at ¶¶ 38-40. See also M.P.E.P at § 2111 ("During patent examination, the pending claims must be 'given their broadest reasonable interpretation consistent with the specification.'"). However, even if the Examiner's meaning is applied to the terms of claim 34, Dutta still does not teach or suggest the Examiner's interpretation of the claim limitation, as Dutta simply does not teach adjusting relevance weights based on the user's search input, as explained in more detail above.

Kamvar discloses a system that monitors the input of a search query entered by a user. Before the user finishes entering the search query, the search system identifies and sends a portion of the query as a partial query to the search engine. Based on the partial query, the search engine creates a set of predicted queries. The predicted queries are sent back to the user for possible

selection. The search engine may also return at least a portion of the search results corresponding to one or more of the predicted queries. See Kamvar at ¶ 5.

Kamvar is not concerned with a method of adjusting relevance values assigned to terms associated with items based on the number of text characters received from the user and then ordering and presenting items in a particular order based at least in part on the adjusted relevance values. The Office Action states that "With the 'Bri' query as criteria, results matching 'Bri' are returned. As the user type [sic] in more characters to form a different query 'Britney', results matching 'Britney' are returned." See Office Action at Pg. 14. Thus, while the results matching the query string change as more characters are entered, this is merely due to the fact that some portion of the results matching "Bri" are disqualified as those results no longer match "Britney". See Kamvar at ¶ 45. Kamvar does not disclose adjusting relevance values assigned to terms associated with items based on the number of text characters received from the user and then ordering and presenting items in a particular order based at least in part on the adjusted relevance values.

As set forth above, the cited references do not teach or suggest adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered prefixes based on the number of text characters received from the user. As applicants explain in their application, ordering the search results based only on their popularities causes highly popular results to monopolize the most desirable positions in the presentation order, thereby "occluding" less popular results. This occurs despite the fact that the user has been presented with the popular results, has elected not to select the popular results, and continues to enter additional characters in the search text. This problem is especially troublesome when the search results are being presented on hand-held, display-constrained device (e.g., PDA or mobile telephone). See Application at ¶ 43.

Unlike the cited references, applicants' claim 34 clearly recites adjusting the relevance value assigned to terms associated with the retrieved items based on the number of text characters received from the user. The retrieved items are ordered and presented to the user based in part on a weighing of these adjusted relevance values. The application describes the discovery of the occlusion problem and the advantages of the solutions devised by applicants. Namely, by basing

the ordering of the search results in part on the number of text characters received from the user, search results desired by the user can be found with less text entered by the user. See Application at ¶¶ 40-43.

None of this is taught or suggested by the cited references. Thus, applicants submit that claim 34 is patentable over the cited references. Claims 35-40, 43, 45-49 depend from claim 34 and, therefore include the limitations of claim 34. Thus, applicants submit these claims are also patentable over the cited references for the reasons given above.

Independent claim 50 recites adjusting the relevance values of the terms associated with items in response to the number of text characters received from the user and changing the order of at least a portion of the one or more items based on the adjusted relevance values of the terms associated with the items. Thus, applicants submit that claim 50 is patentable over the cited references for the reasons provided above in connection with claim 34.

Claims 51-56, 59, and 61-65 depend from claim 50 and, therefore include the limitations of claim 50. Thus, applicants submit these claims are also patentable over the cited references for the reasons given above.

Claims 41-42, 44 and 57-58, and 60 were rejected under 35 U.S.C. § 103(a) as being obvious over Dutta in view of Kamvar, and in further view of U.S. Pat. Pub. 2004/0021691 by Dostie et al. (herein "Dostie").

Dostie discloses a system for receiving text entry from a user and for providing completion candidates based on the user's text enter. As the user enters a character, a partial text entry is created. The partial text entry is used to search a dictionary for completion candidates that begin with the partial text entry. Dostie also describes a navigation interface for retrieval of completion candidates. See Dostie at ¶¶ 6-10.

As with Dutta and Kamvar, Dostie is silent regarding adjusting the relevance values of terms associated with search results in response to the number of text characters received from the user and ordering and presenting search results based at least in part on the adjusted relevance values of the descriptive terms. Independent claims 34 and 50 clearly recite these limitations.

Thus, applicants submit that claims 34 are 50 are patentable over the cited references. Claims 41-42 and 44 depend from claim 34 and, therefore include the limitations of claim 34. Claims 57-58 and 60 depend from claim 50 and, therefore include the limitations of claim 50. Therefore, applicants submit these claims are also patentable over the cited references for the reasons given above.

Conclusion

In view of the above amendment, applicants submit the pending application is in condition for allowance.

A request for a one-month extension of time and authorization to charge the fees associated therewith accompany this request. Applicants believe no other fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-0219, under Order No. 0290672.00128US2 from which the undersigned is authorized to draw.

Respectfully submitted,

Dated: December 15, 2009

/John V. Hobgood/
John V. Hobgood
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Electronic Patent Application Fee Transmittal

Application Number:	11246432
Filing Date:	07-Oct-2005
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Filer:	John Verble Hobgood/Jeanne DeLuca
Attorney Docket Number:	0290672.00128US2

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
		Total in USD ($)		**65**

Electronic Acknowledgement Receipt	
EFS ID:	6635815
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Jeanne DeLuca
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	15-DEC-2009
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Application Type:	Utility under 35 USC 111(a)

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Authorized User	HOBGOOD,JOHN V.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Extension of Time	290672_128US2_EOT_15_Dec_09.pdf	94241 08bd29e6cbd1affeaf4ad849090b5758ccea36e5	no	1
Warnings:					
Information:					
2		2900672_128US2_Amendment_15_Dec_09.pdf	103487 23399fd556d5477ea7e18221ec8ad4a9384454a7	yes	11

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Amendment/Req. Reconsideration-After Non-Final Reject	1	1
Claims	2	6
Applicant Arguments/Remarks Made in an Amendment	7	11

Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	30360 59f85512c860767729e3c7df6e0b32af1cae83f4	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	228088		

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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/SB/22 (01-09)
Approved for use through 02/28/2009. OMB 0651-0031
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2009 *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 0290672.00128US2
Application Number 11/246,432-Conf. #5356	Filed October 7, 2005
For METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICLALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT	
Art Unit 2169	Examiner H. Wong

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

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

		Fee	Small Entity Fee	
[X]	One month (37 CFR 1.17(a)(1))	$130	$65	$ 65.00
[ ]	Two months (37 CFR 1.17(a)(2))	$490	$245	$
[ ]	Three months (37 CFR 1.17(a)(3))	$1110	$555	$
[ ]	Four months (37 CFR 1.17(a)(4))	$1730	$865	$
[ ]	Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

[X] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[X] Payment by credit card. ~~Form PTO-2038 is attached.~~

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

[X] The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 08-0219 .

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

I am the

[ ] applicant/inventor.

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

[X] attorney or agent of record. Registration Number 61,540

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

/John V. Hobgood/	December 15, 2009
Signature	Date
John V. Hobgood	(617) 526-6000
Typed or printed name	Telephone Number

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

[ ] Total of 1 forms are submitted.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/246,432	Filing Date 10/07/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	12/15/2009	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 32	Minus	** 33	= 0	X $26 =	0	OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $110 =	0	OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1)		(Column 2)	(Column 3)	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA					
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/TYWANA P. LOVELACE/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 04/02/2010

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
WONG, HUEN	
ART UNIT	**PAPER NUMBER**
2169	

NOTIFICATION DATE	DELIVERY MODE
04/02/2010	ELECTRONIC

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

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

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

michael.mathewson@wilmerhale.com
teresa.carvalho@wilmerhale.com
sharon.matthews@wilmerhale.com

Office Action Summary	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	Huen Wong	2169	

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *15 December 2009*.

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

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

Disposition of Claims

4)☒ Claim(s) *34-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34-65* is/are rejected.

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

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

Application Papers

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

10)☒ The drawing(s) filed on *07 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

1. **Claims 34-65** are presented for examination.

2. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. The Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

Response to Arguments

3. Applicant's arguments have been considered, but they are not persuasive (*see below*). However, the Examiner welcomes any suggestion Applicant's Representative may have on moving prosecution forward.

4. **Applicant argues**:

Dutta does not teach or suggest adjusting the relevance value assigned to at least one term associated with an items based on the number of text characters received from the user as part of a search string to identify a desired item. Rather, Dutta discloses adjusting popularity weights associated with an item up or down depending on whether the item is selected from a list of possible search results. See Dutta at col. 4, lns. 31-67. Dutta explains that, "Only after selection is the popularity weight for the selected

URL/keyword pair adjusted upward." See Dutta at col. 5, lns.55-56 (emphasis added). In other words, Dutta is only concerned with "tracking the popularity of search results for the purpose of determining how to present or order search results in future searches." See Dutta at col. 6, lns. 41-44. Dutta completely ignores the number of text characters that is part of the search query entered by the user.

In response, the Examiner respectfully disagrees and submits:

Dutta is concerned with adjusting and tracking weight values of URL items. Claim 34 recites "adjusting the relevance value … based on the number of text characters received from the user", but does not recite limitation that requires said adjusting to be done without selection. *Dutta* does not ignore user's request input.

5. **Applicant further argues**:

The Examiner states that the term "number can be interpreted as a group of one kind". See Office Action at pg. 4. Applicants disagree with the Examiner, as the Application clearly describes the "number of text characters" as an enumeration of the characters in the user's search string. See Application at ¶¶ 38-40. See also M.P.E.P at § 2111 ("During patent examination, the pending claims must be 'given their broadest reasonable interpretation consistent with the specification.'"). However, even if the Examiner's meaning is applied to the terms of claim 34, Dutta still does not teach or suggest the Examiner's interpretation of the claim limitation, as Dutta simply does not teach adjusting relevance weights based on the user's search input, as explained in more detail above.

In response, the Examiner respectfully disagrees and submits:

"*Enumeration* of characters in the user's search string" is not found in Applicant's Specification. Also, Applicant's Specification does not appear to definitely assign a specific interpretation to "number of text characters". Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Dutta teaches said adjusting of at least one relevance weight value *based on* user's request input because the request input is used for said adjusting.

Claim Rejections - 35 USC § 103

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

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

7. **Claims 34-40, 43, 45-56, 59, and 61-65 are rejected under U.S.C 103(a) as being unpatentable over US Patent 6480837 by Dutta, in view of US PGPUB 2005/0283468 by Kamvar et al. (hereinafter "Kamvar").**

8. As to **claim 34**, *Dutta* teaches a method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, **the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user** (*Dutta*: Fig. 2, Col. 4 Lines 31-42, Col. 5 Lines 7-20; averages of weights);

for each item, **associating a set of terms to describe the item** and **assigning a relevance value for each term based on a relevance of the term in identifying the item** (*Dutta*: Fig. 2, Col. 4 Lines 20-42, Col. 5 Lines 7-20; weights);

receiving text on the hand-held text input device entered by the user, **the text having one or more text characters of one or more terms the user is using to identify a desired item** (*Dutta*: Fig. 2, Col. 3 Lines 60-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; matching keywords);

in response to receiving text characters, **performing an incremental find** (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; matching keywords; also, searching incrementally by adding more search keywords and clicking on search button (*result set too large*) or erasing search keywords and clicking on search button (*result set too small*) is well-known) to **compare the user-entered terms with the terms associated with the items** and **to retrieve the relevance values for user-entered terms matching terms associated with the items** (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-42, Col. 5 Lines 2-20; Col. 6 Lines 33-36; receive search keywords; also, matching keywords; further, weights and averages of weights);

adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-

entered terms based on the number of text characters received from the user (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-43 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; *number can be interpreted as a group of one kind*)**; and**

ordering and presenting one or more items to the user based on (a) the assigned popularity values of the items (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Abstract, Col. 3 Lines 60-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; also, ordering) and (b) on a weighing of the adjusted relevance values for user-entered terms matching terms associated with the items (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Abstract, Col. 3 Lines 60-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; also, ordering) the order of the items is adjusted as characters are entered (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Abstract, Col. 3 Lines 60-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; also, ordering; one of ordinary skill would recognize that weights of search keywords continue to adjust and, as such, ordering based on these adjusted weights continues to adjust as search keywords consisting of characters are used to activate search).

Dutta discloses **receiving text having one or more text characters of one or more terms the user is using to identify a desired item**, but does not explicitly disclose **receiving text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item**. Also, *Dutta* discloses **in response to receiving** text characters, **performing an incremental find** to **compare**

the user-entered terms with the terms associated with the items and **to retrieve the relevance values for user-entered terms matching terms associated with the items**, but does not explicitly disclose in response to **receiving a text character**, **performing an incremental find** to **compare the user-entered prefixes with the terms associated with the items** and **to retrieve the relevance values for user-entered prefixes matching terms associated with the items**. Also, *Dutta* discloses **adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered terms based on the number of text characters received from the user**, but does not explicitly disclose **adjusting is in response to the user-entered prefixes** . Further, *Dutta* discloses ordering and presenting one or more items to the user based on (a) the assigned popularity values of the items and (b) on a weighing of the **adjusted** relevance values for user-entered terms matching terms associated with the items, but does not explicitly disclose based on a weighing of the **adjusted** relevance values for user-entered prefixes matching terms associated with the items.

However, *Kamvar* discloses **receiving text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item** (*Kamvar*: Pgs. 3-4, ¶0002, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein *Kamvar* discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"; also, top N most popular search terms),

in response to **receiving a text character**, **performing an incremental find** to

compare the user-entered prefixes with the terms associated with items and **to retrieve the relevance values for user-entered prefixes matching terms associated with items** (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney");

user-entered prefixes as search terms that activate searches as more characters are inputted (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7; portion or a few characters of query sent to search engine; also, as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney) in order to speed up query search by continuously sending search terms (including prefixes of search terms) to search engine (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0028-¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7).

It would have been obvious to one having ordinary skill in the art and the teachings of *Dutta* and *Kamvar* before them at the time the present invention was made to incorporate *Kamvar*'s features of **receiving text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item** (*Kamvar*: Pgs. 3-4, ¶0002, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein *Kamvar* discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"; also, top N most popular search terms),

in response to **receiving a text character**, **performing an incremental find** to **compare the user-entered prefixes with the terms associated with items** and **to retrieve the relevance values for user-entered prefixes matching terms associated with items** (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"); and

user-entered prefixes as search terms that activate searches as more characters are inputted (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7; portion or a few characters of query sent to search engine; also, as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney) with the *Dutta*'s method.

The suggestions/motivations for doing so would have been to speed up query search by continuously sending search terms (including prefixes of search terms) to search engine (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0028-¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7).

Claim 50, a system claim, contains subject matter similar claim 34 and is rejected on the same ground.

9. As to **claim 35**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Kamvar* further discloses the terms associated with the items being organized into searchable subspace categories (*Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7), each subspace category having a relevance bias value, wherein ordering and

presenting the one or more items is further based on the relevance bias values of the subspace categories (*Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 51, a system claim, contains subject matter similar claim 35 and is rejected on the same ground.

10. As to **claim 36**, the combination of *Dutta* and *Kamvar* teaches the method of claim 35. Kamvar further discloses wherein the relevance bias values are based on the number of text characters received from the user (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 52, a system claim, contains subject matter similar claim 36 and is rejected on the same ground.

11. As to **claim 37**, the combination of *Dutta* and *Kamvar* teaches the method of claim 35. *Kamvar* further discloses wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user (*Kamvar*: Pgs. 3-4, ¶ 0041 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses previous search requests).

Claim 53, a system claim, contains subject matter similar claim 37 and is rejected on the same ground.

12. As to **claim 38**, the combination of *Dutta* and *Kamvar* teaches the method of claim 35. *Kamvar* further discloses wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories *Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string.

Claim 54, a system claim, contains subject matter similar claim 38 and is rejected on the same ground.

13. As to **claim 39**, the combination of *Dutta* and *Kamvar* teaches the method of claim 38. *Kamvar* further discloses wherein the one or more selected subspace categories are selected based on the number of text characters received from the user (*Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 55, a system claim, contains subject matter similar claim 39 and is rejected on the same ground.

14. As to **claim 40**, the combination of *Dutta* and *Kamvar* teaches the method of claim 35 Kamvar further discloses the ordered and presented one or more items are presented on a display device, the display device having display space allocated according to the subspace categories (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; Fig. 10; Fig. 11).

Claim 56, a system claim, contains subject matter similar claim 40 and is rejected on the same ground.

15. As to **claim 43**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* further discloses wherein the ordered and presented one or more items are presented on a display constrained device (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56; Col. 6 Lines 33-36; network and client submits searches to search engine; also, display of results; all displays have size constraints).

Claim 59, a system claim 43, contains subject matter similar to claim 48 and is rejected on the same ground.

16. As to **claim 45**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* further discloses wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the item (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-43 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; weights and averages of weights, adjustment of weights).

Claim 61, a system claim 45, contains subject matter similar to claim 48 and is rejected on the same ground.

17. As to **claim 46**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items.

Dutta further discloses wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-43 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; weights and averages of weights, adjustment of weights based on matches and frequency of matches)

Claim 62, a system claim, contains subject matter similar claim 46 and is rejected on the same ground.

18. As to **claim 47**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* discloses wherein ordering and presenting the one or more items is further based on the number of terms of the received text (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36. *Dutta* does not explicitly disclose wherein ordering and presenting the one or more items is further based on the number of prefixes of the received text.

However, *Kamvar* discloses **user-entered prefixes** as search terms that activate searches as more characters are inputted (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7; portion or a few characters of query sent to search engine; also, as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney) in order to speed up query search by continuously sending search terms (including prefixes of search terms) to search engine (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0028-¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7).

Claim 63, a system claim, contains subject matter similar claim 47 and is rejected on the same ground.

19. As to **claim 48**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* further discloses wherein a portion of the set of items resides on a computer remote from the user (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; network and client submits searches).

Claim 64, a system claim 48, contains subject matter similar to claim 48 and is rejected on the same ground.

20. As to **claim 49**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* further discloses wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing an incremental find, ordering and presenting one or more items to the user, and adjusting the relevance values of the terms associated with the items (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; network and client submits searches to search engine).

21. As to **claim 65**, the combination of *Dutta* and *Kamvar* teaches the system of claim 50. *Dutta* further discloses wherein the processor is disposed in a computer remote from the user (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; network and client submits searches to search engine).

22. **Claims 41-42, 44 and 57-58, and 60 are rejected under U.S.C 103(a) as being unpatentable over US Patent 6480837 by Dutta, in view of US PGPUB 2005/0283468 by Kamvar et al. (hereinafter "Kamvar"), and in further view of US PGPUB 2004/0021691 by Dostie et al. (hereinafter "Dostie").**

23. As to **claim 41**, the combination of *Dutta* and *Kamvar* teaches the method of claim 34. *Dutta* and *Kamvar* do not explicitly disclose wherein the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

However, *Dostie* discloses QWERTY input with overloaded keys used for generating ambiguous character input system (*Dostie*: Pgs. 6-7, ¶ 0079 - ¶ 0082; Fig. 3; wherein *Dostie* discloses that "each key [ ] can contain one of more letters") for the purpose of rapidly entering data, such as text (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate the method taught by of *Dutta* and *Kamvar* with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

Claim 57, a system claim, contains subject matter similar claim 41 and is rejected on the same ground.

24. As to **claim 42**, the combination of *Dutta*, *Kamvar* and *Dostie* teaches the method of claim 41. *Dutta* and *Kamvar* do not explicitly disclose wherein the hand-held text_input device is a phone, a mobile computing device, or a remote control device for a

television.

However, *Dostie* discloses “personal computing devices” and “hand-held devices” with overloaded keys (*Dostie*: Pg. 5, ¶ 0067- ¶ 0068; Fig. 1; wherein *Dostie* discloses “personal computing devices” and “hand-held devices”) for the purpose of rapidly entering data, such as text (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant’s invention that it is quite advantageous to incorporate the method taught by *Dutta* and *Kamvar* with *Dostie*’s "data entry system". The motivation for doing so would have been to allow rapid text entry by user (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

Claim 58, a system claim, contains subject matter similar claim 42 and is rejected on the same ground.

25. As to **claim 44**, the combination of *Dutta* and *Kamvar* teaches the method of claim 43. *Dutta* and *Kamvar* do not explicitly disclose wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

However, *Dostie* discloses “personal computing devices” and “hand-held devices” with overloaded keys (*Dostie*: Pg. 5, ¶ 0067- ¶ 0068, ¶ 0071- ¶ 0073, Fig. 1; wherein *Dostie* discloses “personal computing devices” and “hand-held devices”) for the purpose of rapidly entering data, such as text (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant’s invention that it is quite advantageous to incorporate the method taught by *Dutta* and *Kamvar* with *Dostie*’s "data entry system". The motivation for doing so would

have been to allow rapid text entry by user (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

Claim 60, a system claim, contains subject matter similar claim 44 and is rejected on the same ground.

Conclusion

26. THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

27. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Huen Wong whose telephone number is (571) 270-3426. The examiner can normally be reached on Monday - Friday (8:30 EST - 5:00 EST).

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Tony Mahmoudi can be reached on (571) 272-4078. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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

/H. W./

Examiner, Art Unit 2169

26 March 2010

/Vincent Boccio/

Primary Examiner, Art Unit 2158

Notice of References Cited	Application/Control No. 11/246,432	Applicant(s)/Patent Under Reexamination ARAVAMUDAN ET AL.	
	Examiner Huen Wong	Art Unit 2169	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-6,438,579	08-2002	Hosken, Benjamin E.	709/203
*	B	US-2005/0086234	04-2005	Tosey, Joseph Peter Robert	707/100
*	C	US-2002/0199194	12-2002	Ali, Kamal	725/46
*	D	US-2005/0267994	12-2005	Wong et al.	709/246
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S19	3	(number near5 character$1).clm. and (incremental near3 search$3) and ((ARAVAMUDAN near5 MURALI) (BARVE near5 RAKESH) (VENKATARAMAN near5 SASHIKUMAR) (RAJASEKHARAN near5 AJIT)).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/03/25 20:42
S20	3	(number near5 character$1).clm. and (incremental near3 search$3) and ((ARAVAMUDAN near5 MURALI) (BARVE near5 RAKESH) (VENKATARAMAN near5 SASHIKUMAR) (RAJASEKHARAN near5 AJIT) (BARVE near5 RAKESH)).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/03/25 20:45
S21	16	(prefix$2).clm. and (incremental near3 search$3) and ((ARAVAMUDAN near5 MURALI) (BARVE near5 RAKESH) (VENKATARAMAN near5 SASHIKUMAR) (RAJASEKHARAN near5 AJIT) (BARVE near5 RAKESH)).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2010/03/25 20:46
S22	16	(prefix$2).clm. and (incremental near3 search$3) and ((ARAVAMUDAN near5 MURALI) (BARVE near5 RAKESH) (VENKATARAMAN near5 SASHIKUMAR) (RAJASEKHARAN near5 AJIT) (BARVE near5 RAKESH)).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2010/03/25 20:46
S23	15	S22 and (popularity likelihood probability).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2010/03/25 20:49
S24	119	"6438579"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2010/03/25 20:58
S25	1	"6438579".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2010/03/25 20:58

EAST Search History (Prior Art)

S26	1	"20040205065"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2010/03/25 21:08
S27	1	"20050086234"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2010/03/25 21:12
S28	1	"20050267994"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2010/03/25 21:24
S29	1	"20020199194"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; IBM_TDB	OR	OFF	2010/03/25 21:26

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
Final	Original	01/15/2008	01/22/2009	08/14/2009	03/26/2010					
	1	✓	-	-	-					
	2	✓	-	-	-					
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	34		✓	✓	✓					
	35		✓	✓	✓					
	36		✓	✓	✓					

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
Final	Original	01/15/2008	01/22/2009	08/14/2009	03/26/2010					
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	63		✓	✓	✓					
	64		✓	✓	✓					
	65		✓	✓	✓					

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	4171

SEARCHED			
Class	Subclass	Date	Examiner
707	1	1/10/2008	HW
707	3	1/10/2008	HW
707	5	1/10/2008	HW
707	6	1/10/2008	HW
707	7	1/10/2008	HW
709	230	1/10/2008	HW
709	231	1/10/2008	HW
EAST	update search with text	08/13/2009	HW
EAST	update search with text	03/25/2010	HW

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	1/10/2008	HW
Inventor Search	1/10/2008	HW
Google Search	1/10/2008	HW
Google Web, Patent Search	01/21/2009	HW
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	08/13/2009	HW
Google Web, Patent Search	08/14/2009	HW
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	03/25/2010	HW

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	11246432	Filing Date	2005-10-07	Docket Number (if applicable)	0290672.00128US2	Art Unit	2169
First Named Inventor	Murali ARAVAMUDAN			Examiner Name	H. Wong		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☒ Amendment/Reply
- ☐ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☒ Other Petition for Extension of Time

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____ (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 080219

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
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Signature of Registered U.S. Patent Practitioner			
Signature	/John V. Hobgood/	Date (YYYY-MM-DD)	2010-08-06
Name	John V. Hobgood	Registration Number	61540

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450.

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

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

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

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/22 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2009 *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 0290672.00128US2
Application Number 11/246,432-Conf. #5356	Filed October 7, 2005
For METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICLALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT	
Art Unit 2169	Examiner H. Wong

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

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

		Fee	Small Entity Fee	
☐	One month (37 CFR 1.17(a)(1))	$130	$65	$
☒	Two months (37 CFR 1.17(a)(2))	$490	$245	$ 245.00
☐	Three months (37 CFR 1.17(a)(3))	$1110	$555	$
☐	Four months (37 CFR 1.17(a)(4))	$1730	$865	$
☐	Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

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

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

☒ Payment by credit card. ~~Form PTO-2038 is attached~~.

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

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 08-0219 .

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

I am the

☐ applicant/inventor.

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

☒ attorney or agent of record. Registration Number 61,540

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

/John V. Hobgood/	August 6, 2010
Signature	Date
John V. Hobgood	(617) 526-6000
Typed or printed name	Telephone Number

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

☐ Total of 1 forms are submitted.

Electronic Patent Application Fee Transmittal

Application Number:	11246432
Filing Date:	07-Oct-2005
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Filer:	John Verble Hobgood/Miriam Brooks
Attorney Docket Number:	0290672.00128US2

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 2 months with $0 paid	2252	1	245	245

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	2801	1	405	405
		Total in USD ($)		**650**

Electronic Acknowledgement Receipt	
EFS ID:	8168092
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Miriam Brooks
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	06-AUG-2010
Filing Date:	07-OCT-2005
Time Stamp:	12:00:26
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$650
RAM confirmation Number	7945
Deposit Account	080219
Authorized User	HOBGOOD,JOHN V.

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

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

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

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		0290672_00128US2_response_to_final.pdf	122020 08f326d1b045d0073e52216e5afe387dca102b78	yes	14
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment After Final		1	1	
	Claims		2	7	
	Applicant Arguments/Remarks Made in an Amendment		8	14	
Warnings:					
Information:					
2	Request for Continued Examination (RCE)	0290672_00128_RCE.pdf	697413 7e42e8f7280c56411f456ae9b4d2c17042fb8196	no	3
Warnings:					
Information:					
3	Extension of Time	0290672_00128US2_extension.pdf	94528 87c7948cd9df1f809597878847314af266801728	no	1
Warnings:					
Information:					
4	Fee Worksheet (PTO-875)	fee-info.pdf	32289 29ded10e57e934e138ea921a2f3da418533501c5	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	946250		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

Docket No.: 0290672.00128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Murali ARAVAMUDAN et al.	Confirmation No.:	5356
Application No.:	11/246,432	Art Unit:	2169
Filed:	October 7, 2005	Examiner:	H. Wong
Title:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICLALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT		

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

AMENDMENT IN RESPONSE TO FINAL OFFICE ACTION UNDER 37 C.F.R. 1.114

Dear Sir:

INTRODUCTORY COMMENTS

In response to the Final Office Action dated April 2, 2010, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 1 of this paper.

Remarks/Arguments begin on page 8 of this paper.

AMENDMENTS TO THE CLAIMS

Claims 1-33 (Cancelled)

34. (Currently Amended) A method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user;

for each item, associating a set of terms to describe the item and assigning a relevance value for each term based on a relevance of the term in identifying the item;

receiving text on the hand-held text input device entered by the user, the text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item;

in response to receiving a text character, performing a[[n]] first incremental find to compare the user-entered prefixes with the terms associated with the items and to retrieve the relevance values for user-entered prefixes matching terms associated with the items;

determining a first ranking order of items found in the first incremental find based at least in part on the retrieved relevance values and the assigned popularity values of the items found in the first incremental find;

ordering and presenting one or more items to the user found in the first incremental find based on the first ranking order;

in response to receiving at least one subsequent text character, performing a second incremental find to compare the user-entered prefixes, including the at least one subsequent text character and any preceding text characters, with the terms associated with the items and to retrieve the relevance values for said user-entered prefixes matching terms associated with the items;

determining a count of the number of characters of text received from the user;

adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered prefixes based on the count of the number of text characters received from the user;[[and]]

determining a second ranking order of the items found in the second incremental find based at least in part on the adjusted relevance values and the assigned popularity values of the items found in the second incremental find; and

ordering and presenting one or more items to the user based on the second ranking order ~~(a) the assigned popularity values of the items and (b) on a weighing of the adjusted relevance values for user-entered prefixes matching terms associated with the items~~ so that the relative order of the items found in both the first and second incremental finds is adjusted as characters are entered.

35. (Currently Amended) The method of claim 34, further comprising the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein at least one of determining the first ranking order and determining the second ranking order ~~ordering and presenting the one or more items~~ is further based on the relevance bias values of the subspace categories.

36. (Currently Amended) The method of claim 35, wherein the relevance bias values are based on the count of the number of text characters received from the user.

37. (Previously Presented) The method of claim 35, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

38. (Previously Presented) The method of claim 35, wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories.

39. (Currently Amended) The method of claim 38, wherein the one or more selected subspace categories are selected based on the count of the number of text characters received from the user.

40. (Previously Presented) The method of claim 35, wherein the ordered and presented one or more items are presented on a display device, the display device having display space allocated according to the subspace categories.

41. (Previously Presented) The method of claim 34, wherein the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

42. (Previously Presented) The method of claim 41, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

43. (Previously Presented) The method of claim 34, wherein the ordered and presented one or more items are presented on a display constrained device.

44. (Previously Presented) The method of claim 43, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

45. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the item.

46. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items.

47. (Currently Amended) The method of claim 34, wherein at least one of determining the first ranking order and determining the second ranking order ~~ordering and presenting the one or more items~~ is further based on the number of prefixes of the received text.

48. (Previously Presented) The method of claim 34, wherein a portion of the set of items resides on a computer remote from the user.

49. (Currently Amended) The method of claim 34, wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing [[an]] the first incremental find, determining the first ranking order, performing the second incremental find,

determining the count of the number of characters of text received, ~~ordering and presenting one or more items to the user, and~~ adjusting the relevance values of the terms associated with the items, and determining the second ranking order.

50. (Currently Amended) A system for processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the system comprising:

a first memory for storing at least a first portion of the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user, and each item being associated with a set of terms to describe the item, each term being assigned a relevance value based on a relevance of an informational content of the term in identifying the item;

a device input for receiving text entered by the user on a hand-held text input device, the text having [[one]]two or more text characters of one or more prefixes for terms the user is using to identify a desired item, the two or more text characters including a first text portion and a second text portion, the second text portion being received subsequent to the first text portion;

a processor for performing a[[n]] first incremental find in response to receiving ~~a text character~~ the first text portion and for ordering one or more items found in the first incremental find based on a first ranking order, the first incremental find comparing the user-entered prefixes with the terms associated with the items and retrieving the relevance values for user-entered prefixes matching terms associated with the items, the first ranking order of the one or more items found in the first incremental find being based on the assigned popularity values of the items and being based on ~~a weighing of~~ the retrieved relevance values for user-entered prefixes matching terms associated with the items, so that relatively more popular and more relevant items appear earlier in the order for user selection or activation, the processor also for performing a second incremental find in response to receiving the second text portion and for ordering one or more items found in the second incremental find based on a

second ranking order, the second incremental find comparing the user-entered prefixes with the terms associated with the items and retrieving the relevance values for user-entered prefixes matching terms associated with the items, the second ranking order of the one or more items found in the second incremental find being based on the assigned popularity values of the items and being based on adjusted relevance values for user-entered prefixes matching terms associated with the items, the relevance values of the terms associated with the items being adjusted in response to the count of the number of text characters received from the user, and the order of at least a portion of the one or more items being changed based on the adjusted relevance values of the terms; and

a device output for presenting [[the]]at least one of the first and the second ordered one or more items to the user.

51. (Currently Amended) The system of claim 50, further comprising the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein at least one of the first and second ordering ~~and presenting~~ the one or more items is further based on the relevance bias values of the subspace categories.

52. (Currently Amended) The system of claim 51, wherein the relevance bias values are based on the count of the number of text characters received from the user.

53. (Previously Presented) The system of claim 51, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

54. (Previously Presented) The system of claim 51, wherein the incremental find is limited to items having associated descriptive terms of one or more selected subspace categories.

55. (Currently Amended) The system of claim 54, wherein the one or more selected subspace categories are selected based on the count of the number of text characters received from the user.

56. (Currently Amended) The system of claim 51, further comprising a display device for presenting the at least one of the first and the second ordered one or more items, the display device having display space allocated according to the subspace categories.

57. (Previously Presented) The system of claim 50, wherein the text entered by the user on the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

58. (Previously Presented) The system of claim 57, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

59. (Currently Amended) The system of claim 50, further comprising a display constrained device for presenting the at least one of the first and the second ordered one or more items.

60. (Previously Presented) The system of claim 59, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

61. (Previously Presented) The system of claim 50, wherein the assigned popularity value of one or more items of the set of items is based on a relative measure of popular opinion of the item.

62. (Previously Presented) The system of claim 50, wherein the assigned popularity value of one or more items of the set of items is based on a temporal relevance of the item or a location relevance of the item.

63. (Currently Amended) The system of claim 50, wherein [[the]]at least one of the first ranking order and the second ranking order of the one or more items is further based on a count of the number of prefixes of the received text.

64. (Previously Presented) The system of claim 50, further comprising a second memory on a computer remote from the user for storing at least a second portion of the set of items.

65. (Previously Presented) The system of claim 50, wherein the processor is disposed in a computer remote from the user.

REMARKS

This Amendment accompanies a Request for Continued Examination. Entry of this Amendment is respectfully requested before further consideration. This Amendment is filed in response to the Final Office Action dated April 2, 2009. Claims 34-65 were pending in the application. Claims 34-36, 39, 47, 49-52, 55-56, 59, and 63 have been amended. No claims have been cancelled or added. We respectfully request reconsideration of the application in view of the following remarks.

Telephonic Interview of August 4, 2010

We thank Examiners Wong and Boccio for the telephonic interview of August 4, 2010, with the undersigned. During the interview, the participants discussed claims 34-37 and the general disclosures of the art of record. We offered to amend the claims in order to clarify certain aspects of the claimed invention, and we have done so, as set forth in more detail herein.

Amendments to independent claims 34 and 50

We have amended claims 34 and 50 to more clearly recite the claimed subject matter. The comments that follow are directed to claim 34; claim 50 contains analogous limitations. Claim 34 now requires performing a first incremental find and determining a first ranking order of items found in the first incremental find followed by performing a second incremental find and determining a second ranking order of items found in the second incremental find. The first ranking order is based at least in part on relevance values for user-entered prefixes that match terms associated with the items. The second ranking order is based at least in part on adjusted relevance values. The relevance values are adjusted based on a count of the number of characters received from the user. Thus, as more characters are received from the user, the order of items that were found in both the first and second incremental finds changes. In other words, it is not result filtering due to the additional entered characters alone that causes the order of items to change.

Support for this amendment can be found throughout the application. Specifically, paragraphs 11, 38, and 40-45 describe the use of character count to adjust the relevance of items retrieved in response to a search. Note also that Figure 7 shows relevance adjustment based on one character, two characters, and three characters.

We provide the following illustrative example of the operation of one particular implementation of the claimed invention to further illustrate the distinctions between the claims and the prior art of record. Assume a first input "app" is received from the user. In response, the claimed invention finds a set of six items and determines the ranking order for the items based at least in part on relevance values for the user-entered prefix that matched terms associated with the items. The order is determined to be as follows:

Item A
Item B
Item C
Item D
Item E
Item F

Upon receiving a subsequent "l" input from the user, the search input becomes "appl". In response, the claimed invention returns a new set of six items and determines the ranking order based at least in part on adjusted relevance values. The relevance values are adjusted based on the count of the number of text characters (*i.e.*, four characters) received from the user. The new order is determined to be as follows:

Item D
Item B
Item A
Item G
Item C
Item H

Note that the first set and second set of results both contain Item A, Item B, Item C, and Item D. However, because the relevance values of the terms associated with these items changed as a result of the increased character count, the order of these items has changed. Thus, even though the

second set contains new items (*i.e.*, Item G and Item H), it is not the presence of these items alone that causes the order of Items A-D to change. In other words, if new Item G and Item H had not been included in the second set, the relative order of Items A-D in the second set would still differ from the order of those same items in the first set.

Rejections under 35 U.S.C. § 103(a)

Claims 34-40, 43, 45-56, 59, and 61-65 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Pat. No. 6,480,837 to Dutta (herein "Dutta") in view of U.S. Pat. Pub. 2005/0283468 by Kamvar et al. (herein "Kamvar").

Dutta discloses a method for ordering electronic files subject to searching. Dutta describes associating at least one keyword with each file of a set of files. A physical location of each file is identified by a file address, and a popularity weight is associated with at least one file address and keyword pair. A file address is capable of having multiple associated keywords and one associated popularity weight for each file address and keyword pair. In response to executing a search query including search keywords, file address search results are received that have at least one associated keyword that matches at least one search keyword in response to executing the search query. The search results are ordered according to the popularity weight associated with each file address search result and keyword pair whose keyword matches the search keyword. The popularity weights are adjusted upward for the at least one requested file address search result and keyword pair matching the search keywords. Also, the popularity weights may be adjusted downward for those file address and keyword pairs matching the search keywords that were not requested. See Dutta at col. 2, ln. 15-col. 3, ln. 9.

Dutta does not teach or suggest adjusting the relevance value assigned to at least one term associated with an items based on the count of the number of text characters received from the user as part of a search string to identify a desired item. Moreover, Dutta does not teach or suggest using the adjusted relevance value in determining a ranking order of items found in an incremental search. Thus, Dutta further lacks the feature of presenting a set of items so that the relative order of the items changes as additional characters are entered. Rather, Dutta discloses adjusting popularity

weights associated with an item up or down depending on whether the item is selected from a list of possible search results. See Dutta at col. 4, lns. 31-67. Dutta explains that, "Only after selection is the popularity weight for the selected URL/keyword pair adjusted upward." See Dutta at col. 5, lns.55-56 (emphasis added). In other words, Dutta is only concerned with "tracking the popularity of search results for the purpose of determining how to present or order search results in future searches." See Dutta at col. 6, lns. 41-44. Dutta does not count the number of text characters that is part of the search query entered by the user in order to adjust the relative ordering of the search results.

In contrast, claim 34 recites receiving text on the hand-held text input device entered by the user, performing incremental searches based on the received text, determining a count of the number of characters of text received from the user, and adjusting the relevance value assigned to at least one term associated with items based on the count of the number of text characters received from the user. Thus, the invention set forth in claim 34 adjusts the relevance value of terms independent of the selection of items, but, rather, based on a count of the number of text characters received from the user. Consequently, as explained in the example provided above, the relative positions of the individual search results within the presentation order can be adjusted as the user is entering characters of the prefix text entry. This, for example, enables search results having a relatively lower popularity rating to be ranked more preferably in the presentation order as the number of characters entered by the user increases. See Application at ¶¶ 40-43.

The Examiner states that our Specification does not appear to definitely assign a specific interpretation to the term "number of characters" and that "number can be interpreted as a group of one kind". See Office Action at pgs. 4 and 6. As set forth above, we have amended claim 34 to require determining a count of the number of characters of text received from the user and using this count as the basis for adjusting relevance values. We respectfully submit this amendment removes any ambiguity that may have existed regarding the meaning of this claim term.

Kamvar discloses a system that monitors the input of a search query entered by a user. Before the user finishes entering the search query, the search system identifies and sends a portion

of the query as a partial query to the search engine. Based on the partial query, the search engine creates a set of predicted queries. The predicted queries are sent back to the user for possible selection. The search engine may also return at least a portion of the search results corresponding to one or more of the predicted queries. See Kamvar at ¶ 5.

Kamvar is not concerned with a method of adjusting relevance values assigned to terms associated with items based on a count of the number of text characters received from the user and then reordering and presenting items in a particular order based at least in part on the adjusted relevance values. The Office Action states that Kamvar discloses that as characters are included in a search query, matching items are identified. See Office Action at pgs. 7-9. However, Kamvar does not disclose adjusting relevance values assigned to terms associated with items based on a count of the number of text characters received from the user and then reordering and presenting items in a particular order based at least in part on the adjusted relevance values.

As set forth above, the cited references do not teach or suggest adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered prefixes based on a count of the number of text characters received from the user. Moreover, the cited references lack using the adjusted relevance values to change the relative order of items that remaining in the search results as the search proceeds (as provided in the example above). As we explain in our application, ordering the search results based only on their popularities causes highly popular results to monopolize the most desirable positions in the presentation order, thereby "occluding" less popular results. This occurs despite the fact that the user has been presented with the popular results, has elected not to select the popular results, and continues to enter additional characters in the search text. This problem is especially troublesome when the search results are being presented on hand-held, display-constrained device (e.g., PDA or mobile telephone). See Application at ¶ 43.

Unlike the cited references, our claim 34 clearly recites retrieving relevance values assigned to terms associated with incrementally found items and adjusting the relevance values based on a count of the number of text characters received from the user. Incrementally found items are initially ordered based at least in part on the retrieved relevance values and then reordered and

presented to the user based at least in part on a weighing of these adjusted relevance values. The application describes the discovery of the occlusion problem and the advantages of the solutions devised by the inventors. Namely, by basing the ordering of the search results in part on a count of the number of text characters received from the user, search results desired by the user can be found with less overall text entered by the user. See Application at ¶¶ 40-43.

None of this is taught or suggested by the cited references. Therefore, we submit that claim 34 is patentable over the cited references. Claims 35-40, 43, 45-49 depend from claim 34 and, therefore include the limitations of claim 34. Thus, we submit these claims are also patentable over the cited references for the reasons given above.

Independent claim 50 recites adjusting the relevance values of the terms associated with items in response to a count of the number of text characters received from the user and changing the order of at least a portion of the one or more items based on the adjusted relevance values of the terms associated with the items as the search proceeds. Thus, we submit that claim 50 is patentable over the cited references for the reasons provided above in connection with claim 34.

Claims 51-56, 59, and 61-65 depend from claim 50 and, therefore include the limitations of claim 50. Thus, we submit these claims are also patentable over the cited references for the reasons given above.

Claims 41-42, 44 and 57-58, and 60 were rejected under 35 U.S.C. § 103(a) as being obvious over Dutta in view of Kamvar, and in further view of U.S. Pat. Pub. 2004/0021691 by Dostie et al. (herein "Dostie").

Dostie discloses a system for receiving text entry from a user and for providing completion candidates based on the user's text enter. As the user enters a character, a partial text entry is created. The partial text entry is used to search a dictionary for completion candidates that begin with the partial text entry. Dostie also describes a navigation interface for retrieval of completion candidates. See Dostie at ¶¶ 6-10.

As with Dutta and Kamvar, Dostie is silent regarding adjusting the relevance values of terms associated with search results in response to a count of the number of text characters received from

the user and ordering and presenting search results based at least in part on the adjusted relevance values of the descriptive terms. Independent claims 34 and 50 clearly recite these limitations.

Thus, we submit that claims 34 are 50 are patentable over the cited references. Claims 41-42 and 44 depend from claim 34 and, therefore include the limitations of claim 34. Claims 57-58 and 60 depend from claim 50 and, therefore include the limitations of claim 50. Therefore, we submit these claims are also patentable over the cited references for the reasons given above.

Conclusion

In view of the above amendment, we submit the pending application is in condition for allowance. We sincerely invite the Examiner to contact the undersigned to discuss any concerns that may remain after consideration of this Amendment.

A request for a two-month extension of time and authorization to charge the fees associated therewith accompany this request. Authorization to charge the fees for the Request for Continued Examination is also included. We believe no other fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-0219, under Order No. 0290672.00128US2 from which the undersigned is authorized to draw.

Respectfully submitted,

Dated: August 6, 2010

/John V. Hobgood /
John V. Hobgood
Registration No.: 61,540
Attorney for Applicant(s)

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PTO/SB/06 (07-06)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 11/246,432	Filing Date 10/07/2005	☐ To be Mailed

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☒		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	08/06/2010	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 32	Minus	** 33	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/ELMIRA HALL/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 08/12/2010

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
WONG, HUEN	
ART UNIT	**PAPER NUMBER**
2169	

NOTIFICATION DATE	DELIVERY MODE
08/12/2010	ELECTRONIC

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

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

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

teresa.carvalho@wilmerhale.com
whipusptopairs@wilmerhale.com

Interview Summary	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	Huen Wong	2169	

All participants (applicant, applicant's representative, PTO personnel):

(1) *Huen Wong*. (3)*John V. Hobgood (Reg. No. 61,540)*.

(2) *Vincent Boccio*. (4)_____.

Date of Interview: *04 August 2010*.

Type: a)☒ Telephonic b)☐ Video Conference
c)☐ Personal [copy given to: 1)☐ applicant 2)☐ applicant's representative]

Exhibit shown or demonstration conducted: d)☐ Yes e)☒ No.
If Yes, brief description: _____.

Claim(s) discussed: *34*.

Identification of prior art discussed: *n/a*.

Agreement with respect to the claims f)☐ was reached. g)☒ was not reached. h)☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: *See Continuation Sheet*.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN A NON-EXTENDABLE PERIOD OF THE LONGER OF ONE MONTH OR THIRTY DAYS FROM THIS INTERVIEW DATE, OR THE MAILING DATE OF THIS INTERVIEW SUMMARY FORM, WHICHEVER IS LATER, TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

/Vincent Boccio/ Primary Examiner, Art Unit 2158	/H.W./ Examiner AU2169

IPR2017-00933 Page 0413

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

———

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:

1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

Continuation of Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Applicant's Representative started with a description of the claimed invention. Applicant's Representative proposed adding the limitation "determining a count of the number of characters of text received from the user" and amending the relevance value adjusting step to include "user-entered prefixes based on the count of the number of text characters received" so as to overcome the prior art of record. Applicant's Representative explained that the instant invention serves to adjust the ranking/ordering of a group/set of items (e.g. songs, contacts, etc.); this feature can be implemented without eliminating any item(s) from the group/set of items.

A new search of the prior art will be performed when amended claims are submitted to the Office.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 03/07/2011

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
WONG, HUEN	

ART UNIT	PAPER NUMBER
2169	

NOTIFICATION DATE	DELIVERY MODE
03/07/2011	ELECTRONIC

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

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

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

teresa.carvalho@wilmerhale.com
whipusptopairs@wilmerhale.com

Office Action Summary	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	Huen Wong	2169	

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *06 August 2010*.

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

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

Disposition of Claims

4)☒ Claim(s) *34-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34-65* is/are rejected.

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

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

Application Papers

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

10)☒ The drawing(s) filed on *07 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

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

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

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

Priority under 35 U.S.C. § 119

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

a)☐ All b)☐ Some * c)☐ None of:

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

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

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

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

Attachment(s)

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

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. The amendment filed ***08/06/2010*** has been received and considered.

2. **Claims 34-36, 39, 47, 49-52, 55-56, 59, and 63** are amended.

3. **Claims 34-65** are presented for examination.

4. The claims and only the claims form the metes and bounds of the invention. "Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. The Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

Response to Arguments

5. Applicant's arguments have been considered, but are moot in view of new ground(s) of rejection.

Remarks

6. **Claims 34 and 50** are amended to include at least the feature of "determining a count of the number of characters of text received from the user" and using said count of the number of characters in *adjusting relevance value* assigned to at least one of the terms associated with one or more items received. According to Applicant's Specification, the count of the number of characters appears to be strongly related to the feature of "subspace relevance biasing" (*see* Applicant's Specification, ¶0038-0042). As such, Applicant is respectfully suggested to include limitations that describe "subspace relevance biasing" and how the count of the number of characters is used in subspace relevance biasing.

7. **Amended Claim 1** recites "adjusting the relevance value assigned to … in response to the ***user-entered prefixes based on the count*** of the number of text characters …" It is the ***user-entered prefixes*** that is **based on** said **count of the number of text characters**.

Claim Objections

8. **Claim 34** is objected to because of the following informalities:

Claim 34 recites "... the text having one or more text characters of one or more prefixes for terms the user us using to identify a desired item" and "… first incremental

find to compare the user-entered prefixes with the terms associated with the items and to retrieve the relevance values for user-entered prefixes matching terms associated with the items". Since only "one or more text characters of one or more prefixes" are received on the hand-held text input device, the first incremental find cannot operate on ***the*** user-entered prefixes" (***note***: "user-entered prefixes" means at least two user-entered prefixes; this is not consistent with "one or more prefixes").

Claim 50 recites similar limitations, and is similarly objected to.

Appropriate correction(s) is required.

Claim Rejections - 35 USC § 103

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

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

10. **Claims 34-40, 43, 45-56, 59, and 61-65 are rejected under U.S.C 103(a) as being unpatentable over Dutta US Patent 6480837 in view of US PGPUB 2005/0283468 by Kamvar et al. (hereinafter "Kamvar"), and further in view of US PGPUB 2005/0256846 by Zigmond et al. ("Zigmond").**

11. As to **claim 34**, *Dutta* teaches a method of processing a search request received from a user operating a hand-held text input device, the search request directed at

identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, **the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user** (*Dutta*: Fig. 2, Col. 4 Lines 31-42, Col. 5 Lines 7-20; averages of weights; also, popularity weight\);

for each item, **associating a set of terms to describe the item** and **assigning a relevance value for each term based on a relevance of the term in identifying the item** (*Dutta*: Fig. 2, Col. 4 Lines 20-26, Col. 5 Lines 7-20; weights);

receiving text on the hand-held text input device entered by the user, **the text having one or more text characters of one or more terms the user is using to identify a desired item** (*Dutta*: Fig. 2, Col. 3 Lines 60-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; matching keywords);

in response to receiving text characters, **performing a first incremental find** (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; matching keywords; also, searching incrementally by adding more search keywords and clicking on search button (*result set too large*) or erasing search keywords and clicking on search button (*result set too small*) is well-known) to **compare the user-entered terms with the terms associated with the items** and **to retrieve the relevance values for user-entered terms matching terms associated with the items** (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-42, Col. 5

Lines 2-20; Col. 6 Lines 33-36; receive search keywords; also, matching keywords; further, weights and averages of weights);

determining a first ranking order of items found in the first incremental find based at least in part on the retrieved relevance values and the assigned popularity values of the items found in the first incremental find; ordering and presenting one or more items to the user found in the first incremental find based on the first ranking order (*Dutta*: *at least* Col. 2 Lines 1-7; Col. 3 Lines 1-9; "… ordering based on a measured popularity").

Dutta does not explicitly disclose **in response to receiving at least one subsequent text character, performing a second incremental find to compare the user-entered prefixes, including the at least one subsequent text character and any preceding text characters, with the terms associated with the items and to retrieve the relevance values for said user-entered prefixes matching terms associated with the items**.

However, performing a second incremental find appears to be merely *a repeat* of the first incremental find (***note***: this would read on entering more characters and pressing enter/return key to perform another search using *Dutta*'s invention).

Dutta further discloses **adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered terms based on the number of text characters received from the**

user (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-43 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; *number can be interpreted as a group of one kind*)**; and**

determining a second ranking order of the items found in the second incremental find based at least in part on the adjusted relevance values and the assigned popularity values of the items found in the second incremental find (*Dutta*: *at least* Col. 2 Lines 1-7; Col. 3 Lines 1-9; "… ordering based on a measured popularity"; ***note***: based on repeated find explained above)**; and**

ordering and presenting one or more items to the user based on **the second ranking order** ~~the assigned popularity values of the items and (b) on a weighing of the adjusted relevance values for user-entered terms matching terms associated with the items~~ so that the **relative** order of the items **found in both the first and second incremental finds** is adjusted as characters are entered (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Abstract, Col. 3 Lines 60-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; adjustment of weights; also, ordering; one of ordinary skill would recognize that weights of search keywords continue to adjust and, as such, ordering based on these adjusted weights continues to adjust as search keywords consisting of characters are used to activate search).

Dutta discloses **receiving text having one or more text characters of one or more terms the user is using to identify a desired item**, but does not explicitly disclose **receiving text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item**. Also, *Dutta* discloses **in**

response to receiving text characters, **performing a first incremental find** to **compare the user-entered terms with the terms associated with the items** and **to retrieve the relevance values for user-entered terms matching terms associated with the items**, but does not explicitly disclose in response to **receiving a text character**, **performing an incremental find** to **compare the user-entered prefixes with the terms associated with the items** and **to retrieve the relevance values for user-entered prefixes matching terms associated with the items**. Also, *Dutta* discloses **adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered terms based on the number of text characters received from the user**, but does not explicitly disclose **adjusting is in response to the user-entered prefixes**.

However, *Kamvar* discloses **receiving text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item** (*Kamvar*: Pgs. 3-4, ¶0002, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein *Kamvar* discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"; also, top N most popular search terms),

in response to **receiving a text character**, **performing an incremental find** to **compare the user-entered prefixes with the terms associated with items** and **to retrieve the relevance values for user-entered prefixes matching terms associated with items** (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein Kamvar discloses that as characters are included in search query, matching

items are identified; e.g. those items identified by "Bri" and those items identified by "Britney");

user-entered prefixes as search terms that activate searches as more characters are inputted (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7; portion or a few characters of query sent to search engine; also, as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney) in order to speed up query search by continuously sending search terms (including prefixes of search terms) to search engine (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0028-¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7).

It would have been obvious to one having ordinary skill in the art and the teachings of *Dutta* and *Kamvar* before them at the time the present invention was made to incorporate *Kamvar*'s features of **receiving text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item** (*Kamvar*: Pgs. 3-4, ¶0002, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein *Kamvar* discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"; also, top N most popular search terms),

in response to **receiving a text character**, **performing an incremental find** to **compare the user-entered prefixes with the terms associated with items** and **to retrieve the relevance values for user-entered prefixes matching terms associated with items** (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 6; Fig. 7; wherein

Kamvar discloses that as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney"); and

user-entered prefixes as search terms that activate searches as more characters are inputted (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7; portion or a few characters of query sent to search engine; also, as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney) with the *Dutta*'s method.

The suggestions/motivations for doing so would have been to speed up query search by continuously sending search terms (including prefixes of search terms) to search engine (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0028-¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7).

Dutta and *Kamvar* do not explicitly disclose **determining a count of the number of characters of text received from the user** and **prefixes based on the count**. However, *Zigmond* discloses **determining a count of the number of characters of text received from the user** and **prefixes based on the count** (*Zigmond*: Abstract, Figs. 2-4, ¶¶0039-0048; n-character prefix, claim 1) in order to continuously update search display using sparse subset of results.

It would have been obvious to one having ordinary skill in the art and the teachings of *Dutta*, *Kamvar* and *Zigmond* before them at the time the present invention

was made to incorporate *Zigmond*'s features of **determining a count of the number of characters of text received from the user** and **prefixes based on the count** (*Zigmond*: Abstract, Figs. 2-4, ¶¶0039-0048; n-character prefix, claim 1) with the method taught by *Dutta* and *Kamvar*.

The suggestion/motivation for doing so would have been to continuously update search display using sparse subset of results.

Claim 50, a system claim, contains subject matter similar claim 34 and is rejected on the same ground.

12. As to **claim 35**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 34. *Kamvar* further discloses the terms associated with the items being organized into searchable subspace categories (*Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7), each subspace category having a relevance bias value, wherein **at least one of determining the first ranking order and determining the second order** ~~ordering and presenting the one or more items~~ is further based on the relevance bias values of the subspace categories (*Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 51, a system claim, contains subject matter similar claim 35 and is rejected on the same ground.

13. As to **claim 36**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 35. Kamvar further discloses wherein the relevance bias values are based on **the count of** the number of text characters received from the user (Kamvar: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein Kamvar discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 52, a system claim, contains subject matter similar claim 36 and is rejected on the same ground.

14. As to **claim 37**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 35. *Kamvar* further discloses wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user (*Kamvar*: Pgs. 3-4, ¶ 0041 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses previous search requests).

Claim 53, a system claim, contains subject matter similar claim 37 and is rejected on the same ground.

15. As to **claim 38**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 35. *Kamvar* further discloses wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories *Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string.

Claim 54, a system claim, contains subject matter similar claim 38 and is rejected on the same ground.

16. As to **claim 39**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 38. *Kamvar* further discloses wherein the one or more selected subspace categories are selected based on **the count of** the number of text characters received from the user (*Kamvar*: Pg. 4, ¶ 0043 - ¶ 0051; Fig. 6; Fig. 7; wherein *Kamvar* discloses "popularity", “user profiles”, “user information”, measure of how recent an item is and the difference in order due to length of query string).

Claim 55, a system claim, contains subject matter similar claim 39 and is rejected on the same ground.

17. As to **claim 40**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 35 Kamvar further discloses the ordered and presented one or more items are presented on a display device, the display device having display space allocated according to the subspace categories (Kamvar: Pg. 4, ¶ 0043 - ¶ 0049; Fig. 6; Fig. 7; Fig. 10; Fig. 11).

Claim 56, a system claim, contains subject matter similar claim 40 and is rejected on the same ground.

18. As to **claim 43**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 34. *Dutta* further discloses wherein the ordered and presented one or more items are presented on a display constrained device (*Dutta*: Fig. 1, Fig. 2, Fig. 3a,

Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-50 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56; Col. 6 Lines 33-36; network and client submits searches to search engine; also, display of results; all displays have size constraints).

Claim 59, a system claim 43, contains subject matter similar to claim 48 and is rejected on the same ground.

19. As to **claim 45**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 34. *Dutta* further discloses wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the item (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-43 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; weights and averages of weights, adjustment of weights).

Claim 61, a system claim 45, contains subject matter similar to claim 48 and is rejected on the same ground.

20. As to **claim 46**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items. *Dutta* further discloses wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items (*Dutta*: Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 60-65, Col. 4 Lines 20-43 & 64-67, Col. 5 Lines 2-20 & 29-33 & 50-56, Col. 6 Lines 33-36; weights and averages of weights, adjustment of weights based on matches and frequency of

matches)

Claim 62, a system claim, contains subject matter similar claim 46 and is rejected on the same ground.

21. As to **claim 47**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 34. *Dutta* discloses wherein **at least one of determining the first ranking order and determining the second ranking order** ~~ordering and presenting the one or more items~~ is further based on the number of terms of the received text (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36. *Dutta* does not explicitly disclose wherein ordering and presenting the one or more items is further based on the number of prefixes of the received text.

However, *Kamvar* discloses **user-entered prefixes** as search terms that activate searches as more characters are inputted (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7; portion or a few characters of query sent to search engine; also, as characters are included in search query, matching items are identified; e.g. those items identified by "Bri" and those items identified by "Britney) in order to speed up query search by continuously sending search terms (including prefixes of search terms) to search engine (*Kamvar*: Pgs. 3-4, ¶ 0002, ¶ 0020, ¶ 0028-¶ 0031, ¶ 0041 - ¶ 0049; Fig. 1, Fig. 6; Fig. 7).

Claim 63, a system claim, contains subject matter similar claim 47 and is rejected on the same ground.

22. As to **claim 48**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 34. *Dutta* further discloses wherein a portion of the set of items resides on a computer remote from the user (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; network and client submits searches).

Claim 64, a system claim 48, contains subject matter similar to claim 48 and is rejected on the same ground.

23. As to **claim 49**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 34. *Dutta* further discloses wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing [[an]] **the first** incremental find, **determining the first ranking order , performing the second incremental find, determining the count of characters of text received,** ~~ordering and presenting one or more items to the user, and~~ adjusting the relevance values of the terms associated with the items**, and determining the second ranking order** (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; network and client submits searches to search engine).

24. As to **claim 65**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the system of claim 50. *Dutta* further discloses wherein the processor is disposed in a computer remote from the user (*Dutta*: Fig. 1, Fig. 2, Fig. 3a, Fig. 3b, Col. 3 Lines 47-

65, Col. 4 Lines 20-42, Col. 5 Lines 7-20; Col. 6 Lines 33-36; network and client submits searches to search engine).

25. **Claims 41-42, 44 and 57-58, and 60 are rejected under U.S.C 103(a) as being unpatentable over US Patent 6480837 by Dutta, in view of US PGPUB 2005/0283468 by Kamvar et al. (hereinafter "Kamvar"), and further in view of US PGPUB 2005/0256846 by Zigmond et al. ("Zigmond"), and in further view of US PGPUB 2004/0021691 by Dostie et al. (hereinafter "Dostie").**

26. As to **claim 41**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 34. *Dutta* and *Kamvar* do not explicitly disclose wherein the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

However, *Dostie* discloses QWERTY input with overloaded keys used for generating ambiguous character input system (*Dostie*: Pgs. 6-7, ¶ 0079 - ¶ 0082; Fig. 3; wherein *Dostie* discloses that "each key [ ] can contain one of more letters") for the purpose of rapidly entering data, such as text (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate the method taught by of *Dutta* and *Kamvar* with Dostie's "data entry system". The motivation for doing so would have been to allow rapid text entry by user (Dostie: Pg. 1, ¶ 0007- ¶ 0008).

Claim 57, a system claim, contains subject matter similar claim 41 and is rejected on the same ground.

27. As to **claim 42**, the combination of *Dutta*, *Kamvar*, *Zigmond* and *Dostie* teaches the method of claim 41. *Dutta* and *Kamvar* do not explicitly disclose wherein the hand-held text_input device is a phone, a mobile computing device, or a remote control device for a television.

However, *Dostie* discloses “personal computing devices” and “hand-held devices” with overloaded keys (*Dostie*: Pg. 5, ¶ 0067- ¶ 0068; Fig. 1; wherein *Dostie* discloses “personal computing devices” and “hand-held devices”) for the purpose of rapidly entering data, such as text (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant’s invention that it is quite advantageous to incorporate the method taught by *Dutta* and *Kamvar* with *Dostie*’s "data entry system". The motivation for doing so would have been to allow rapid text entry by user (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

Claim 58, a system claim, contains subject matter similar claim 42 and is rejected on the same ground.

28. As to **claim 44**, the combination of *Dutta*, *Kamvar* and *Zigmond* teaches the method of claim 43. *Dutta* and *Kamvar* do not explicitly disclose wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

However, *Dostie* discloses “personal computing devices” and “hand-held devices” with overloaded keys (*Dostie*: Pg. 5, ¶ 0067- ¶ 0068, ¶ 0071- ¶ 0073, Fig. 1; wherein *Dostie* discloses “personal computing devices” and “hand-held devices”) for the purpose of rapidly entering data, such as text (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention that it is quite advantageous to incorporate the method taught by *Dutta* and *Kamvar* with *Dostie*'s "data entry system". The motivation for doing so would have been to allow rapid text entry by user (*Dostie*: Pg. 1, ¶ 0007- ¶ 0008).

Claim 60, a system claim, contains subject matter similar claim 44 and is rejected on the same ground.

Conclusion

29. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Huen Wong whose telephone number is (571) 270-3426. The examiner can normally be reached on Monday - Friday (8:30 EST - 5:00 EST).

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Tony Mahmoudi can be reached on (571) 272-4078. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/H. W./

Examiner, Art Unit 2169

25 February 2011

/Vincent Boccio/

Primary Examiner, Art Unit 2158

Notice of References Cited	Application/Control No. 11/246,432	Applicant(s)/Patent Under Reexamination ARAVAMUDAN ET AL.	
	Examiner Huen Wong	Art Unit 2169	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2005/0256846	11-2005	Zigmond et al.	707/003
*	B	US-2005/0120004	06-2005	Stata et al.	707/003
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
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Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	4171

SEARCHED			
Class	Subclass	Date	Examiner
707	1	1/10/2008	HW
707	3	1/10/2008	HW
707	5	1/10/2008	HW
707	6	1/10/2008	HW
707	7	1/10/2008	HW
709	230	1/10/2008	HW
709	231	1/10/2008	HW
EAST	update search with text	08/13/2009	HW
EAST	update search with text	03/25/2010	HW
EAST	update search with text	02/24/2011	HW

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	1/10/2008	HW
Inventor Search	1/10/2008	HW
Google Search	1/10/2008	HW
Google Web, Patent Search	01/21/2009	HW
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	08/13/2009	HW
Google Web, Patent Search	08/14/2009	HW
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	03/25/2010	HW
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	02/24/2011	HW

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L11	4	("6480837" "20050283468").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/02/28 07:29
L12	8	search$3as$6typ$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/02/28 07:29
L13	0	l2 and (weigh$3 scor$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/02/28 07:29
L14	2	("6480837" "20050283468").pn. and (rank$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/02/28 07:29
L15	3	"11246432"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/02/28 07:29
L16	1	"11246432" and (count counting) and (bias$2 biasing)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/02/28 07:29
L17	2	("6480837" "20050283468").pn. and (rank$3) and (popularity) and weigh$3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/02/28 07:29

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EAST Search History (Prior Art)

L18	3	"20050256846"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/02/28 07:29
L19	2	"20050256846" and $3character$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/02/28 07:29

Docket No.: 0290672.00128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Murali ARAVAMUDAN et al.	Confirmation No.:	5356
Application No.:	11/246,432	Art Unit:	2169
Filed:	October 7, 2005	Examiner:	H. Wong
Title:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICLALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT		

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

AMENDMENT IN RESPONSE TO NON-FINAL OFFICE ACTION UNDER 37 C.F.R. 1.111

Dear Sir:

INTRODUCTORY COMMENTS

In response to the Non-Final Office Action dated March 7, 2011, please amend the above-identified U.S. patent application as follows:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

AMENDMENTS TO THE CLAIMS

Claims 1-33 (Cancelled)

34. (Currently Amended) A method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user;

for each item, associating a set of terms to describe the item and assigning a relevance value for each term based on a relevance of the term in identifying the item;

receiving text on the hand-held text input device entered by the user, the text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item;

in response to receiving a text character, performing a first incremental find to compare the one or more user-entered prefixes with the terms associated with the items and to retrieve the relevance values for the one or more user-entered prefixes matching terms associated with the items;

determining a first ranking order of items found in the first incremental find based at least in part on the retrieved relevance values and the assigned popularity values of the items found in the first incremental find;

ordering and presenting one or more items to the user found in the first incremental find based on the first ranking order;

in response to receiving at least one subsequent text character, performing a second incremental find to compare the one or more user-entered prefixes, including the at least one subsequent text character and any preceding text characters, with the terms associated with the items and to retrieve the relevance values for said one or more user-entered prefixes matching terms associated with the items;

determining a count of the number of characters of text received from the user;

adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the one or more user-entered prefixes based on the count of the number of text characters received from the user;

determining a second ranking order of the items found in the second incremental find based at least in part on the adjusted relevance values and the assigned popularity values of the items found in the second incremental find; and

ordering and presenting one or more items to the user based on the second ranking order so that the relative order of the items found in both the first and second incremental finds is adjusted as characters are entered.

35. (Previously Presented) The method of claim 34, further comprising the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein at least one of determining the first ranking order and determining the second ranking order is further based on the relevance bias values of the subspace categories.

36. (Previously Presented) The method of claim 35, wherein the relevance bias values are based on the count of the number of text characters received from the user.

37. (Previously Presented) The method of claim 35, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

38. (Previously Presented) The method of claim 35, wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories.

39. (Previously Presented) The method of claim 38, wherein the one or more selected subspace categories are selected based on the count of the number of text characters received from the user.

40. (Previously Presented) The method of claim 35, wherein the ordered and presented one or more items are presented on a display device, the display device having display space allocated

according to the subspace categories.

41. (Previously Presented) The method of claim 34, wherein the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

42. (Previously Presented) The method of claim 41, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

43. (Previously Presented) The method of claim 34, wherein the ordered and presented one or more items are presented on a display constrained device.

44. (Previously Presented) The method of claim 43, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

45. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the item.

46. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items.

47. (Previously Presented) The method of claim 34, wherein at least one of determining the first ranking order and determining the second ranking order is further based on the number of prefixes of the received text.

48. (Previously Presented) The method of claim 34, wherein a portion of the set of items resides on a computer remote from the user.

49. (Previously Presented) The method of claim 34, wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing the first incremental find, determining the first ranking order, performing the second incremental find, determining the count of the number of characters of text received, adjusting the relevance values of the terms associated with the items, and determining the second ranking order.

50. (Currently Amended) A system for processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the system comprising:

a first memory for storing at least a first portion of the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user, and each item being associated with a set of terms to describe the item, each term being assigned a relevance value based on a relevance of an informational content of the term in identifying the item;

a device input for receiving text entered by the user on a hand-held text input device, the text having two or more text characters of one or more prefixes for terms the user is using to identify a desired item, the two or more text characters including a first text portion and a second text portion, the second text portion being received subsequent to the first text portion;

a processor for performing a first incremental find in response to receiving the first text portion and for ordering one or more items found in the first incremental find based on a first ranking order, the first incremental find comparing the one or more user-entered prefixes with the terms associated with the items and retrieving the relevance values for the one or more user-entered prefixes matching terms associated with the items, the first ranking order of the one or more items found in the first incremental find being based on the assigned popularity values of the items and being based on the retrieved relevance values for the one or more user-entered prefixes matching terms associated with the items, so that relatively more popular and more relevant items appear earlier in the order for user selection or activation, the processor also for performing a second incremental find in response to receiving the second text portion and for ordering one or more items found in the second incremental find based on a second ranking order, the second incremental find comparing the one or more user-entered prefixes with the terms associated with the items and retrieving the relevance values for the one or more user-entered prefixes matching terms associated with the items, the second ranking order of the one or more items found in the second

incremental find being based on the assigned popularity values of the items and being based on adjusted relevance values for the one or more user-entered prefixes matching terms associated with the items, the relevance values of the terms associated with the items being adjusted in response to the count of the number of text characters received from the user, and the order of at least a portion of the one or more items being changed based on the adjusted relevance values of the terms; and

a device output for presenting at least one of the first and the second ordered one or more items to the user.

51. (Previously Presented) The system of claim 50, further comprising the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value, wherein at least one of the first and second ordering the one or more items is further based on the relevance bias values of the subspace categories.

52. (Previously Presented) The system of claim 51, wherein the relevance bias values are based on the count of the number of text characters received from the user.

53. (Previously Presented) The system of claim 51, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

54. (Previously Presented) The system of claim 51, wherein the incremental find is limited to items having associated descriptive terms of one or more selected subspace categories.

55. (Previously Presented) The system of claim 54, wherein the one or more selected subspace categories are selected based on the count of the number of text characters received from the user.

56. (Previously Presented) The system of claim 51, further comprising a display device for presenting the at least one of the first and the second ordered one or more items, the display device having display space allocated according to the subspace categories.

57. (Previously Presented) The system of claim 50, wherein the text entered by the user on the

hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

58. (Previously Presented) The system of claim 57, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

59. (Previously Presented) The system of claim 50, further comprising a display constrained device for presenting the at least one of the first and the second ordered one or more items.

60. (Previously Presented) The system of claim 59, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

61. (Previously Presented) The system of claim 50, wherein the assigned popularity value of one or more items of the set of items is based on a relative measure of popular opinion of the item.

62. (Previously Presented) The system of claim 50, wherein the assigned popularity value of one or more items of the set of items is based on a temporal relevance of the item or a location relevance of the item.

63. (Previously Presented) The system of claim 50, wherein at least one of the first ranking order and the second ranking order of the one or more items is further based on a count of the number of prefixes of the received text.

64. (Previously Presented) The system of claim 50, further comprising a second memory on a computer remote from the user for storing at least a second portion of the set of items.

65. (Previously Presented) The system of claim 50, wherein the processor is disposed in a computer remote from the user.

REMARKS

This Amendment is filed in response to the Non-Final Office Action dated March 7, 2011. Claims 34-65 were pending in the application. Claims 34 and 50 have been amended. No claims have been cancelled or added. We respectfully request reconsideration of the application in view of the following remarks.

Claim Objections

Claims 34 and 50 were objected to due to informalities. We have amended these claims and respectfully request reconsideration.

Rejections under 35 U.S.C. § 103(a)

Claims 34-40, 43, 45-56, 59, and 61-65 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Pat. No. 6,480,837 to Dutta (herein "Dutta") in view of U.S. Pat. Pub. 2005/0283468 by Kamvar et al. (herein "Kamvar"), and further in view of U.S. Pat. Pub. 2005/0256846 by Zigmond et al. (herein "Zigmond").

The rejection of the above-mentioned claims is based on a claim interpretation in which the Examiner interprets the limitation "adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered prefixes based on the count of the number of text characters received from the user" of claim 34 to mean that "It is the ***user-entered prefixes*** that is **based on** said **count of the number of text characters**." See Office Action at pg. 3 (emphasis in the original). We submit this interpretation is incorrect for the reasons that follow.

First, it is common practice in method claims to recite a step of performing an action **based on** *a determined value*. Thus, we submit that one having ordinary skill in the art would understand the limitation to mean that it is the relevance values that are adjusted, and this adjustment is **based on** *the count of the number of text characters received from the user*. More specifically, the relevance values that are adjusted are those that are assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered prefixes.

Second, the Examiner's proposed interpretation is contrary to the other limitations recited in claim 34. For example, (1) the second element establishes that relevance values are assigned to terms that are associated with the items and (2) the fourth element requires retrieving those relevance values for the one or more user-entered prefixes matching terms associated with the items. Thus, these two elements provide the antecedent basis for the claim term "the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the one or more user-entered prefixes" that appears in the limitation in question. In other words, the claim term "the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the one or more user-entered prefixes" is specifically identifying which relevance values are to be adjusted.

Third, the Examiner's proposed interpretation is inconsistent with the specification. The specification clearly describes that the user-entered prefixes are provided by the user to find desired items. See ¶¶ 27, 32-33, and 38. The user is not basing the prefixes on the count of the number of text characters of the prefix. If anything, the user is merely basing the prefixes on what the user seeks. Thus, we submit it is inconsistent with the specification to assign the meaning proposed by the Examiner to this claim term. Moreover, claim 34 clearly states that the method receives text entered by the user, and the text has one or more text characters of one or more prefixes for terms the user is using to identify a desired item. See claim 34 at 3rd element.

Because the interpretation of claim 34 is incorrect, the Examiner's position that certain elements of claim 34 are found in the cited references is also incorrect when the correct claim interpretation is applied. Specifically, the cited references do not teach or suggest the claim elements "determining a count of the number of characters of text received from the user" and "adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the one or more user-entered prefixes based on the count of the number of text characters received from the user".

The Office Action states that, "Dutta further discloses adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the user-entered prefixes based on the number of text characters received from the user" (emphasis

added) reasoning that "number can be interpreted as a group of one kind." See Office Action at pg. 6-7. The Examiner continues, stating "Zigmond discloses determining a count of the number of characters of text received from the user and prefixes based on the count." See Office Action at pg. 10. However, as set forth in detail above, this analysis is based on an erroneous interpretation of the language of the claim. We submit that the Examiner's position that "number can be interpreted as a group of one kind" is no longer relevant in view of the proper interpretation of the language of claim 34 because the claim term "number" does not stand alone in the claim. Rather, the claim requires adjusting the relevance value based on **the count of** the number of text characters. None of the references alone or in combination teach or suggest this limitation.

Dutta does not teach or suggest adjusting the relevance value assigned to at least one term associated with an item based on the count of the number of text characters received from the user as part of a search string to identify a desired item. Rather, Dutta discloses adjusting popularity weights associated with an item up or down depending on whether the item is selected from a list of possible search results. See Dutta at col. 4, lns. 31-67. Dutta explains that, "Only after selection is the popularity weight for the selected URL/keyword pair adjusted upward." See Dutta at col. 5, lns. 55-56 (emphasis added). In other words, any adjustment to any relevance values or popularity weighting in Dutta is done after the selection and not as part of the search process based on user input. Moreover, any popularity adjustment is done based on selection of the item and not based on user search input.

Meanwhile, whether or not Zigmond discloses determining a count of the number of characters of text received from the user, which it does not, Zigmond does not teach or suggest adjusting the relevance value assigned to at least one term associated with an item based on the count of the number of text characters received from the user as part of a search string to identify a desired item. Moreover, Zigmond is silent regarding the use of variable relevance values for the purpose of ordering items found during an incremental find. Rather, Zigmond merely organizes programming titles into sparse subsets of all titles, the size of which is based on the number of display entries of a display screen associated with a client device. See Zigmond at ¶ 17.

Specifically, Zigmond discloses presenting an initial sparse subset corresponding to an initial character input and prefetching a second sparse subset of titles that have the initial input character as their initial character. When a user inputs a second character, the portion of the second sparse subset corresponding to the second and first characters is presented. See Zigmond at ¶¶ 17-19. Zigmond uses the nomenclature "zero-character prefix", "one-character prefix", "two-character prefix", and so on to describe corresponding indexes. See Zigmond at ¶¶ 39-40. However, Zigmond is not counting the number of characters entered by the user to determine which index to provide. Rather, Zigmond matches the characters of the user's input to characters associated with the indexes to determine which set of program titles to display. See Zigmond at ¶¶ 42-48.

In contrast, claim 34 requires determining a count of a number of characters of text received from the user, and adjusting the relevance value assigned to at least one term associated with items based on the count of the number of text characters received from the user. Thus, the invention set forth in claim 34 adjusts the relevance value of terms independent of the selection of items, but, rather, based on a count of the number of text characters received from the user. As explained above, one of skill in the art would understand "count of the number of text characters" to mean a numerical value and not "group of one kind" as suggested by the examiner. Consequently, the relative positions of the individual search results within the presentation order can be adjusted as the user is entering characters of the prefix text entry. This, for example, enables search results having a relatively lower popularity rating to be ranked more preferably in the presentation order as the number of characters entered by the user increases. See Application at ¶¶ 40-43.

As set forth above, the cited references do not teach or suggest adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the one or more user-entered prefixes based on a count of the number of text characters received from the user. Moreover, the cited references lack using the adjusted relevance values to change the relative order of items that remain in the search results as the search proceeds. As we explain in our application, ordering the search results based only on their popularities causes highly popular results to monopolize the most desirable positions in the presentation order, thereby "occluding" less popular results. This occurs despite the fact that the user has been presented with the popular

results, has elected not to select the popular results, and continues to enter additional characters in the search text. This problem is especially troublesome when the search results are being presented on hand-held, display-constrained device (e.g., PDA or mobile telephone). See Application at ¶ 43.

Unlike the cited references, our claim 34 clearly recites retrieving relevance values assigned to terms associated with incrementally found items and adjusting the relevance values based on a count of the number of text characters received from the user. Incrementally found items are initially ordered based at least in part on the retrieved relevance values and then reordered and presented to the user based at least in part on a weighing of these adjusted relevance values. The application describes the discovery of the occlusion problem and the advantages of the solutions devised by the inventors. Namely, by basing the ordering of the search results in part on a count of the number of text characters received from the user, search results desired by the user can be found with less overall text entered by the user. See Application at ¶¶ 40-43.

None of this is taught or suggested by the cited references. Therefore, we submit that claim 34 is patentable over the cited references. Claims 35-40, 43, 45-49 depend from claim 34 and, therefore include the limitations of claim 34. Thus, we submit these claims are also patentable over the cited references for the reasons given above.

Independent claim 50 recites adjusting the relevance values of the terms associated with items in response to a count of the number of text characters received from the user and changing the order of at least a portion of the one or more items based on the adjusted relevance values of the terms associated with the items as the search proceeds. Thus, we submit that claim 50 is patentable over the cited references for the reasons provided above in connection with claim 34.

Claims 51-56, 59, and 61-65 depend from claim 50 and, therefore include the limitations of claim 50. Thus, we submit these claims are also patentable over the cited references for the reasons given above.

Claims 41-42, 44 and 57-58, and 60 were rejected under 35 U.S.C. § 103(a) as being obvious over Dutta in view of Kamvar and Zigmond, and in further view of U.S. Pat. Pub. 2004/0021691 by Dostie et al. (herein "Dostie").

The Office Action relies on the combination of Dutta, Kamvar, and Zigmond to supply the limitations of independent claim 34 and turns to Dostie for the additional limitations found in the dependent claims. As set forth in detail above, we submit that the Office Action fails to provide a *prima* facie case against claims 34 are 50. Claims 41-42 and 44 depend from claim 34 and, therefore include the limitations of claim 34. Claims 57-58 and 60 depend from claim 50 and, therefore include the limitations of claim 50. Therefore, we submit these claims are also patentable over the cited references for the reasons given above.

Conclusion

In view of the above amendment, we submit the pending application is in condition for allowance. We sincerely invite the Examiner to contact the undersigned to discuss any concerns that may remain after consideration of this Amendment.

A request for a one-month extension of time and authorization to charge the fees associated therewith accompany this request. We believe no other fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-0219, under Order No. 0290672.00128US2 from which the undersigned is authorized to draw.

Respectfully submitted,

Dated: July 6, 2011

/John V. Hobgood/
John V. Hobgood
Registration No.: 61,540
Attorney for Applicant(s)

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PTO/SB/22 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
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Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless if displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a) FY 2009 *(Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).)*	Docket Number (Optional) 0290672.00128US2
Application Number 11/246,432-Conf. #5356	Filed October 7, 2005
For METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT	
Art Unit 2169	Examiner H. Wong

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

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

		Fee	Small Entity Fee	
[X]	One month (37 CFR 1.17(a)(1))	$130	$65	$ 65.00
[ ]	Two months (37 CFR 1.17(a)(2))	$490	$245	$
[ ]	Three months (37 CFR 1.17(a)(3))	$1110	$555	$
[ ]	Four months (37 CFR 1.17(a)(4))	$1730	$865	$
[ ]	Five months (37 CFR 1.17(a)(5))	$2350	$1175	$

[X] Applicant claims small entity status. See 37 CFR 1.27.

[ ] A check in the amount of the fee is enclosed.

[X] Payment by credit card. ~~Form PTO-2038 is attached.~~

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

[X] The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 08-0219 .

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

I am the

[ ] applicant/inventor.

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

[X] attorney or agent of record. Registration Number 61,540

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

/John V. Hobgood/	July 6, 2011
Signature	Date
John V. Hobgood	(617) 526-6000
Typed or printed name	Telephone Number

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

[ ] Total of 1 forms are submitted.

US1DOCS 7988924v1

Electronic Patent Application Fee Transmittal

Application Number:	11246432
Filing Date:	07-Oct-2005
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Filer:	John Verble Hobgood/Jody Begley
Attorney Docket Number:	0290672.00128US2

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	2251	1	65	65

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
		Total in USD ($)		**65**

Electronic Acknowledgement Receipt	
EFS ID:	10458319
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	Method and system for incremental search with reduced text entry where the relevance of results is a dynamically computed function of user input search string character count
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Jody Begley
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	06-JUL-2011
Filing Date:	07-OCT-2005
Time Stamp:	14:13:12
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$65
RAM confirmation Number	484
Deposit Account	080219
Authorized User	HOBGOOD,JOHN V.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees) Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees) Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)					
File Listing:					
Document Number	**Document Description**	**File Name**	**File Size(Bytes)/ Message Digest**	**Multi Part /.zip**	**Pages (if appl.)**
1		128US2amendment.pdf	138177 ca7d99ea8d89ede691705589c8eacaaf7107f970	yes	13
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	7	
	Applicant Arguments/Remarks Made in an Amendment		8	13	
Warnings:					
Information:					
2	Extension of Time	128US2EOT.pdf	94262 23d0221c01a9ee9cf75f6f5ad8a4ac1dbfe8d398	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30363 864f14ea9a35d07ed418cf1a24dd1b79e9c8bbd1	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	262802		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
11/246,432	10/07/2005	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☒ RATE ($)	SMALL ENTITY ☒ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 07/06/2011

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 32	Minus	** 33	= 0	X $26 =	0	OR	X $ =	
Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X $110 =	0	OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE	0	OR	TOTAL ADD'L FEE	

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

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

Legal Instrument Examiner:
/TINA J. BARDEN/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Examiner-Initiated Interview Summary	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	HUEN WONG	2154	

All participants (applicant, applicant's representative, PTO personnel):

(1) *HUEN WONG*.

(2) *Vincent Boccio*.

(3)*JOHN V. HOBGOOD (REG. 61,540)*.

(4)_____.

Date of Interview: *26 September 2011*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☒ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☐103 ☒Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *34 and 50*.

Identification of prior art discussed: *The Examiner suggested amendments to independent claims 34 and 50 that put them in condition for allowance. Applicant's Representative agreed to the suggested amendments.*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

_____.

Applicant recordation instructions: It is not necessary for applicant to provide a separate record of the substance of interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/Vincent Boccio/ Primary Examiner, Art Unit 2158	/H. W./ Examiner, AU 2154

UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

23483 7590 10/19/2011

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER
WONG, HUEN

ART UNIT	PAPER NUMBER
2154	

DATE MAILED: 10/19/2011

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

TITLE OF INVENTION: METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	01/19/2012

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

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

HOW TO REPLY TO THIS NOTICE:

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 the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

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

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

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop 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.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

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

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

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

23483 7590 10/19/2011

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

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

Certificate of Mailing or Transmission

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

TITLE OF INVENTION: METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	01/19/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
WONG, HUEN	2154	707-003000

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

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

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

2. For printing on the patent front page, list

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

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____

2 _____

3 _____

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

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

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

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

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

❑ Issue Fee

❑ Publication Fee (No small entity discount permitted)

❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**

❑ A check is enclosed.

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

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

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

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

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

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

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 10/19/2011

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER	
WONG, HUEN	

ART UNIT	PAPER NUMBER
2154	

DATE MAILED: 10/19/2011

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 184 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 184 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

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

Privacy Act Statement

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

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

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

Notice of Allowability	Application No.	Applicant(s)	
	11/246,432	ARAVAMUDAN ET AL.	
	Examiner	Art Unit	
	HUEN WONG	2154	

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

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

1. ☒ This communication is responsive to *Interview on 09/26/2011 and Examiner's Amendment*.

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

3. ☒ The allowed claim(s) is/are *34, 36-50, and 52-65* .

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

   * Certified copies not received: _____.

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

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

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

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

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

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 3/25/2008
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *09/26/2011* .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Vincent Boccio/ Primary Examiner, Art Unit 2158	/H. W./ Examiner, AU 2154

DETAILED ACTION

1. **Claims 34, 36-50, and 52-65** are allowed.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to Applicants, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given **John V. Hobgood (Reg. No. 61,540)** on 26 September 2011.

3. **The application has been amended as follows.**

4. **This listing of claims, *replace all* prior versions and listings of claims in the applications.**

Claims 1-33 (Cancelled)

34. (Currently Amended) A method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user;

for each item, associating a set of terms to describe the item and assigning a relevance value for each term based on a relevance of the term in identifying the item, the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value;

receiving text on the hand-held text input device entered by the user, the text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item;

in response to receiving a text character, performing a first incremental find to compare the one or more user-entered prefixes with the terms associated with the items and to retrieve the relevance values for the one or more user-entered prefixes matching terms associated with the items;

determining a first ranking order of items found in the first incremental find based at least in part on the retrieved relevance values and the assigned popularity values of the items found in the first incremental find;

ordering and presenting one or more items to the user found in the first incremental find based on the first ranking order;

in response to receiving at least one subsequent text character, performing a second incremental find to compare the one or more user-entered prefixes, including the at least one subsequent text character and any preceding text characters, with the terms associated with the items and to

retrieve the relevance values for said one or more user-entered prefixes matching terms associated with the items;

determining a count of the number of characters of text received from the user;

adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the one or more user-entered prefixes, wherein the adjusting of the relevance value is based on the count of the number of text characters received from the user;

determining a second ranking order of the items found in the second incremental find based at least in part on the adjusted relevance values and the assigned popularity values of the items found in the second incremental find; and

ordering and presenting one or more items to the user based on the second ranking order so that the relative order of the items found in both the first and second incremental finds is adjusted as characters are entered;

wherein at least one of determining the first ranking order and determining the second ranking order is further based on the relevance bias values of the subspace categories.

35. (Cancelled)

36. (Currently Amended) The method of claim [[0]] 34, wherein the relevance bias values are based on the count of the number of text characters received from the user.

37. (Currently Amended) The method of claim [[0]] 34, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

38. (Currently Amended) The method of claim [[0]] 34, wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories.

39. (Previously Presented) The method of claim 0, wherein the one or more selected subspace categories are selected based on the count of the number of text characters received from the user.

40. (Currently Amended) The method of claim [[0]] 34, wherein the ordered and presented one or more items are presented on a display device, the display device having display space allocated according to the subspace categories.

41. (Previously Presented) The method of claim 34, wherein the hand-held text input

device includes a set of overloaded keys generating an ambiguous text input.

42. (Previously Presented) The method of claim 0, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

43. (Previously Presented) The method of claim 34, wherein the ordered and presented one or more items are presented on a display constrained device.

44. (Previously Presented) The method of claim 0, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

45. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the item.

46. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items.

47. (Previously Presented) The method of claim 34, wherein at least one of determining the first ranking order and determining the second ranking order is further based on the number of prefixes of the received text.

48. (Previously Presented) The method of claim 34, wherein a portion of the set of items resides on a computer remote from the user.

49. (Previously Presented) The method of claim 34, wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing the first incremental find, determining the first ranking order, performing the second incremental find, determining the count of the number of characters of text received, adjusting the relevance values of the terms associated with the items, and determining the second ranking order.

50. (Currently Amended) A system for processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the system comprising:

a first memory for storing at least a first portion of the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user, and each item being

associated with a set of terms to describe the item, each term being assigned a relevance value based on a relevance of an informational content of the term in identifying the item, the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value;

a device input for receiving text entered by the user on a hand-held text input device, the text having two or more text characters of one or more prefixes for terms the user is using to identify a desired item, the two or more text characters including a first text portion and a second text portion, the second text portion being received subsequent to the first text portion;

a processor for performing a first incremental find in response to receiving the first text portion and for ordering one or more items found in the first incremental find based on a first ranking order, the first incremental find comparing the one or more user-entered prefixes with the terms associated with the items and retrieving the relevance values for the one or more user-entered prefixes matching terms associated with the items, the first ranking order of the one or more items found in the first incremental find being based on the assigned popularity values of the items and being based on the retrieved relevance values for the one or more user-entered prefixes matching terms associated with the items, so that relatively more popular and more relevant items appear earlier in the order for user selection or activation, the processor also for performing a

second incremental find in response to receiving the second text portion and for ordering one or more items found in the second incremental find based on a second ranking order, the second incremental find comparing the one or more user-entered prefixes with the terms associated with the items and retrieving the relevance values for the one or more user-entered prefixes matching terms associated with the items, the second ranking order of the one or more items found in the second incremental find being based on the assigned popularity values of the items and being based on adjusted relevance values for the one or more user-entered prefixes matching terms associated with the items, the relevance values of the terms associated with the items being adjusted in response to the count of the number of text characters received from the user, [[and]]the order of at least a portion of the one or more items being changed based on the adjusted relevance values of the terms, and at least one of the first ranking order and the second ranking order being further based on the relevance bias values of the subspace categories; and

a device output for presenting at least one of the first and the second ordered one or more items to the user.

51. (Cancelled)

52. (Currently Amended) The system of claim [[0]] 50, wherein the relevance bias values are based on the count of the number of text characters received from the user.

53. (Currently Amended) The system of claim [[0]] 50, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

54. (Currently Amended) The system of claim [[0]] 50, wherein the incremental find is limited to items having associated descriptive terms of one or more selected subspace categories.

55. (Previously Presented) The system of claim **Error! Reference source not found.**, wherein the one or more selected subspace categories are selected based on the count of the number of text characters received from the user.

56. (Currently Amended) The system of claim [[0]] 50, further comprising a display device for presenting the at least one of the first and the second ordered one or more items, the display device having display space allocated according to the subspace categories.

57. (Previously Presented) The system of claim 0, wherein the text entered by the user on the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

58. (Previously Presented) The system of claim 0, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

59. (Previously Presented) The system of claim 0, further comprising a display constrained device for presenting the at least one of the first and the second ordered one or more items.

60. (Previously Presented) The system of claim 0, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

61. (Previously Presented) The system of claim 0, wherein the assigned popularity value of one or more items of the set of items is based on a relative measure of popular opinion of the item.

62. (Previously Presented) The system of claim 0, wherein the assigned popularity value of one or more items of the set of items is based on a temporal relevance of the item or a location relevance of the item.

63. (Previously Presented) The system of claim 0, wherein at least one of the first ranking order and the second ranking order of the one or more items is further based on a count of the number of prefixes of the received text.

64. (Previously Presented) The system of claim 0, further comprising a second memory on a computer remote from the user for storing at least a second portion of the set of items.

65. (Previously Presented) The system of claim 0, wherein the processor is disposed in a computer remote from the user.

Allowable Subject Matter

5. **Claims 34, 36-50, and 52-65** are allowed.

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

The combination, as claimed in the independent claims, are not deemed taught, disclosed, or fairly suggested by the prior art of record.

The scope of each independent claim is substantially similar and the independent claims are allowed for substantially the same reasons.

Also see Applicant's Remarks filed 06 July 2011.

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

Conclusion

7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Huen Wong whose telephone number is (571) 270-3426. The examiner can normally be reached on Monday - Friday (9:30 EST - 6:00 EST).

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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

/H. W./

Examiner, Art Unit 2154

27 September 2011

/Vincent Boccio/

Primary Examiner, Art Unit 2158

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	188	((ARAVAMUDAN near5 MURALI) (BARVE near5 RAKESH) (VENKATARAMAN near5 SASHIKUMAR) (RAJASEKHARAN near5 AJIT)).in.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 00:47
L2	57	l1 and prefix$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 00:48
L6	36	l1 and prefix$2 and (bias$2 weigh$4 scor$4 popularit$3) and (categor$5 subspace$1 sub$1space$1) and relevance$1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 00:53
L7	13	l1 and prefix$2 and (bias$2 weigh$4 scor$4 popularit$3) and (categor$5 subspace$1 sub$1space$1) and (relevance$1 near6 (word$1 keyword$1 term$1))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 00:53
L8	2	l1 and prefix$2 and (bias$2 weigh$4 scor$4 popularit$3) and (categor$5 subspace$1 sub$1space$1).clm. and (relevance$1 near6 (word$1 keyword$1 term$1))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 00:56
L9	3980	707/752.ccls. 707/706.ccls. 707/748.ccls. 715/816.ccls. 725/39.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:02
L10	2182	(707/752.ccls. 707/706.ccls. 707/748.ccls. 715/816.ccls. 725/39.ccls.) and (@ad<"20051015" @rlad<"20051015")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:03

EAST Search History (Prior Art)

L11	99	l10 and prefix$2	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:03
L12	128	l10 and (prefix$2 (partial near5 search$4))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:04
L13	47	l10 and (prefix$2 (partial near5 search$4)) and ((number count$3) near5 (character$1 letter$1))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:06
L17	21	l10 and (prefix$2 (partial near5 search$4)) and ((number count$3) near5 (character$1 letter$1)) and (bias$2 weigh$4 scor$4 popularit$3 favorite relevance$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:14
L18	4	l17 and (bias$3 skew$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:15
L22	8	l10 and (prefix$2 (partial near5 search$4)) and ((number count$3) near5 (character$1 letter$1)) and (favorite$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:16
L23	12	l10 and (prefix$2 (partial near5 search$4)) and (incremental$2 near4 search$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:22

EAST Search History (Prior Art)

L24	8	l10 and (autocomplet$4 auto$1complet$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:23
L26	3	l10 and (prefix$2 (partial near5 search$4)) and (autocomplet$4 auto$1complet$4)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:25
L27	2	l10 and (autocomplet$4 auto$1complet$4) and (bias$2 weigh$4 scor$4 popularit$3 relevance$1)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/10/01 01:29

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L33	55	((prefix$2 (partial near4 search$3) (autocomplet$4 auto$1complet$4)) and (bias$2 weigh$4 scor$4 popularit$3 relevance) and (categor$5 subcategor$5 sub$1categor$5 subspace$1 sub$1space$1)).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2011/10/01 01:43
L34	5	((prefix$2 (partial near4 search$3) (autocomplet$4 auto$1complet$4)) and ((adjust$3 chang$4 modif$4 modification modify$4 increas$4 decreas$4 reduc$4) near5 (bias$2 weigh$4 scor$4 popularit$3 relevance)) and (categor$5 subcategor$5 sub$1categor$5 subspace$1 sub$1space$1)).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2011/10/01 01:45
L44	5	((prefix$2 (partial near4 search$3) (autocomplet$4 auto$1complet$4)) and ((adapt$4 adjust$3 chang$4 modif$4 modification modify$4 increas$4 decreas$4 reduc$4) near5 (bias$2 weigh$4 scor$4 popularit$3 relevance)) and (categor$5 subcategor$5 sub$1categor$5 subspace$1 sub$1space$1)).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2011/10/01 01:53

EAST Search History (Interference)

L45	5	((prefix$2 (partial near4 search$3) (autocomplet$4 auto$1complet$4)) and ((re$1adjust$4 readjust$4 adapt$4 adjust$3 chang$4 modif$4 modification modify$4 increas$4 decreas$4 reduc$4) near5 (bias$2 weigh$4 scor$4 popularit$3 relevance)) and (categor$5 subcategor$5 sub$1categor$5 subspace$1 sub$1space$1)).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2011/10/01 01:53
L46	6	((prefix$2 (partial near4 search$3) (autocomplet$4 auto$1complet$4)) and ((re$1adjust$4 readjust$4 adapt$4 adjust$3 chang$4 modif$4 modification modify$4 increas$4 decreas$4 reduc$4) with (bias$2 weigh$4 scor$4 popularit$3 relevance)) and (categor$5 subcategor$5 sub$1categor$5 subspace$1 sub$1space$1)).clm.	US-PGPUB; USPAT; UPAD	OR	OFF	2011/10/01 01:56

Used in Lieu of PTO/SB/08A/B
(Based on PTO 10-07 version)

Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 4

Complete if Known	
Application Number	11/246,432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	~~4174~~ 2154
Examiner Name	H. Wong
Attorney Docket Number	0290672.00128US2

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	AA*	US-60/548,589	09-01-2005	Flinchem	
	AB*	US-11/855661		Venkataraman et al.	
	AC*	US-11/862917		Aravamudan	
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	AW*	US-2006/0163337-A1	07-27-2006	Unruh	
	AX*	US-2006/0167676-A1	07-27-2006	Plumb	
	AY*	US-2006/0167859	07-27-2006	Verbeck Sibley et al.	
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Examiner Signature	/Huen Wong/	Date Considered	10/11/2011

US1DOCS 6605005v1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.W./

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(Based on PTO 10-07 version)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 2 of 4

Complete if Known	
Application Number	11/246,432-Conf. #5356
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Art Unit	~~4171~~ 2154
Examiner Name	H. Wong
Attorney Docket Number	0290672.00128US2

	AT1*	US-2007/0276821	11-29-2007	Aravamudan et al.		
	AU1*	US-2007/0276859	11-29-2007	ARAVAMUDAN et al.		
	AV1*	US-2007/0288456	12-13-2007	Aravamudan et al.		
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	AH2*	US-5,953,541	09-14-1999	King et al.		
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	AM2*	US-6,260,050	07-10-2001	Yost et al.		
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	AZ2*	US-7,013,304	03-14-2006	Schuetze et al.		
	AA3*	US-7,136,854-B2	11-14-2006	Smith		
	AB3*	US-7,225,180	05-29-2007	Donaldson et al.		
	AC3*	US-7,225,184	05-29-2007	Carrasco et al.		
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Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	BA	EP-1143691	10-10-2001	Speeq S A		√
	BB	WO-05/033967-A3	04-14-2005	Google, Inc.		√
	BC	WO-05/084235-A2	09-15-2005	Melodeo, Inc.		√

Examiner Signature	/Huen Wong/	Date Considered	10/11/2011

US1DOCS 6605005v1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.W./

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(Based on PTO 10-07 version)

Substitute for form 1449/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** *(Use as many sheets as necessary)*				***Complete if Known***	
				Application Number	11/246,432-Conf. #5356
				Filing Date	October 7, 2005
				First Named Inventor	Murali ARAVAMUDAN
				Art Unit	~~4174~~ 2154
				Examiner Name	H. Wong
Sheet	3	of	4	Attorney Docket Number	0290672.00128US2

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. * CITE NO.: Those application(s) which are marked with an single asterisk (*) next to the Cite No. are not supplied (under 37 CFR 1.98(a)(2)(iii)) because that application was filed after June 30, 2003 or is available in the IFW. [1] Applicant's unique citation designation number (optional). [2] See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. [3] Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). [4] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [5] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [6] Applicant is to place a check mark here if English language Translation is attached.

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	CA	Digital Video Broadcasting, http://www.dvb.org (12 October 2007)	
	CB	GOOD, N. et al., Combining Collaborative Filtering with Personal Agents for Better Recommendations, in Proc. of the 16th National Conference on Artificial Intelligence, pp. 439-446, Orlando, Florida, July 18-22, 1999.	
	CC	International Search Report, International Application No. PCT/US06/25249, mailed January 29, 2008 (2 pages).	
	CD	International Search Report, International Application No. PCT/US06/33204, mailed 21 Sept. 2007 (2 pages)	
	CE	International Search Report, International Application No. PCT/US06/40005, mailed July 3, 2007 (4 Pages).	
	CF	International Search Report, International Application No. PCT/US07/65703, mailed January 25, 2008 (2 pages).	
	CG	International Search Report, International Application No. PCT/US07/67100, mailed March 7, 2008 (2 pages).	
	CH	MATTHOM, "Text Highlighting in Search Results", July 22, 2005. Available at www.matthom.com/archive/2005/07/22/text-highlighting-in-search-results; retrieved June 23, 2006. (4 pages)	
	CI	MOKOTOFF, Soundexing and Genealogy, Available at http://www.avotaynu.com/soundex.html, retrieved March 19, 2008, last updated September 8, 2007 (6 pages)	
	CJ	Review of Personalization Technologies: Collaborative Filtering vs. ChoiceStream's Attributized Bayesian Choice Modeling, Technology Brief, ChoiceStream Technologies, Cambridge, MA. JULY 2007 /HW/	
	CK	TALBOT, David. "Soul of a New Mobile Machine." *Technology Review: The Design Issue* May/June 2007. (pp. 46-53)	
	CL	Wikipedia's entry for Levenshtein distance (n.d.). Retrieved 11/15/2006 from http://en.wikipedia.org/wiki/Levenshtein_distance	
	CM	Written Opinion of the International Searching Authority, International Application No. PCT/US06/25249, mailed January 29, 2008 (4 pages).	
	CN	Written Opinion of the International Searching Authority, International Application No. PCT/US06/33204, mailed September 21, 2007 (3 pages).	
	CO	Written Opinion of the International Searching Authority, International Application No. PCT/US06/40005, mailed July 3, 2007 (4 Pages).	
	CP	Written Opinion of the International Searching Authority, International Application No. PCT/US07/65703, mailed January 25, 2008 (4 pages).	
	CQ	Written Opinion of the International Searching Authority, International Application No. PCT/US07/67100, mailed March 7, 2008 (3 pages).	

Examiner Signature	/Huen Wong/	Date Considered	10/11/2011

US1DOCS 6605005v1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.W./

Used in Lieu of PTO/SB/08A/B
(Based on PTO 10-07 version)

Substitute for form 1449/PTO **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** *(Use as many sheets as necessary)*				***Complete if Known***	
				Application Number	11/246,432-Conf. #5356
				Filing Date	October 7, 2005
				First Named Inventor	Murali ARAVAMUDAN
				Art Unit	~~2174~~ 2154
				Examiner Name	H. Wong
Sheet	4	of	4	Attorney Docket Number	0290672.00128US2

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1]Applicant's unique citation designation number (optional). [2]Applicant is to place a check mark here if English language Translation is attached.

Examiner Signature	/Huen Wong/	Date Considered	10/11/2011

US1DOCS 6605005v1

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /H.W./

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

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

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

CLAIM		DATE								
Final	Original	01/15/2008	01/22/2009	08/14/2009	03/26/2010	01/27/2011	02/25/2011	09/27/2011		
	1	✓	-	-	-	-	-	-		
	2	✓	-	-	-	-	-	-		
	3	✓	-	-	-	-	-	-		
	4	✓	-	-	-	-	-	-		
	5	✓	-	-	-	-	-	-		
	6	✓	-	-	-	-	-	-		
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	9	✓	-	-	-	-	-	-		
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	32	✓	-	-	-	-	-	-		
	33	✓	-	-	-	-	-	-		
	34		✓	✓	✓	✓	✓	=		
	35		✓	✓	✓	✓	✓	-		
	36		✓	✓	✓	✓	✓	=		

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	2169

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
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☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	01/15/2008	01/22/2009	08/14/2009	03/26/2010	01/27/2011	02/25/2011	09/27/2011		
	37		✓	✓	✓	✓	✓	=		
	38		✓	✓	✓	✓	✓	=		
	39		✓	✓	✓	✓	✓	=		
	40		✓	✓	✓	✓	✓	=		
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	42		✓	✓	✓	✓	✓	=		
	43		✓	✓	✓	✓	✓	=		
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	61		✓	✓	✓	✓	✓	=		
	62		✓	✓	✓	✓	✓	=		
	63		✓	✓	✓	✓	✓	=		
	64		✓	✓	✓	✓	✓	=		
	65		✓	✓	✓	✓	✓	=		

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	**Art Unit**
	HUEN WONG	2154

ORIGINAL		INTERNATIONAL CLASSIFICATION															
CLASS	SUBCLASS	CLAIMED										NON-CLAIMED					
707	752	G	0	6	F	7 / 00 (2006.01.01)											
CROSS REFERENCE(S)		G	0	6	F	13 / 00 (2006.01.01)											
		G	0	6	F	3 / 048 (2006.01.01)											

CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
707	706	748			
715	816				
725	39				

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

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

/HUEN WONG/ Examiner.AU 2154	9/28/2011	**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	30	
/Vincent Boccio/ Primary Examiner, Art Unit 2158		O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	5

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	11246432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	Wong, Huen	4171

SEARCHED			
Class	Subclass	Date	Examiner
707	1	1/10/2008	HW
707	3	1/10/2008	HW
707	5	1/10/2008	HW
707	6	1/10/2008	HW
707	7	1/10/2008	HW
709	230	1/10/2008	HW
709	231	1/10/2008	HW
EAST	update search with text	08/13/2009	HW
EAST	update search with text	03/25/2010	HW
EAST	update search with text	02/24/2011	HW
707	706, 748, 752	09/27/2011	HW
715	816	09/27/2011	HW
725	39	09/27/2011	HW

SEARCH NOTES		
Search Notes	Date	Examiner
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	1/10/2008	HW
Inventor Search	1/10/2008	HW
Google Search	1/10/2008	HW
Google Web, Patent Search	01/21/2009	HW
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	08/13/2009	HW
Google Web, Patent Search	08/14/2009	HW
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	03/25/2010	HW
EAST Search (US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB)	02/24/2011	HW
Consulted with Primary Examiner Vincent Boccio	09/27/2011	HW
Conducted search in EAST using Class/Subclass and Inventors	09/27/2011	HW

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

INTERFERENCE SEARCH			
Class	**Subclass**	**Date**	**Examiner**
	Claims, EAST search attached	09/27/2011	HW

Docket No.: 0290672.00128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Murali ARAVAMUDAN et al.	Confirmation No.:	5356
Application No.:	11/246,432	Art Unit:	2169
Filed:	October 7, 2005	Examiner:	H. Wong
Title:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT		

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

AMENDMENT AFTER ALLOWANCE UNDER 37 C.F.R. 1.312

Dear Sir:

INTRODUCTORY COMMENTS

Prior to issuance of the patent, applicant respectfully requests entry on this amendment under 37 C.F.R. 1.312 for the above-captioned patent application.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 8 of this paper.

AMENDMENTS TO THE CLAIMS

Claims 1-33 (Cancelled)

34. (Previously Presented) A method of processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the method comprising:

providing the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user;

for each item, associating a set of terms to describe the item and assigning a relevance value for each term based on a relevance of the term in identifying the item, the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value;

receiving text on the hand-held text input device entered by the user, the text having one or more text characters of one or more prefixes for terms the user is using to identify a desired item;

in response to receiving a text character, performing a first incremental find to compare the one or more user-entered prefixes with the terms associated with the items and to retrieve the relevance values for the one or more user-entered prefixes matching terms associated with the items;

determining a first ranking order of items found in the first incremental find based at least in part on the retrieved relevance values and the assigned popularity values of the items found in the first incremental find;

ordering and presenting one or more items to the user found in the first incremental find based on the first ranking order;

in response to receiving at least one subsequent text character, performing a second incremental find to compare the one or more user-entered prefixes, including the at least one subsequent text character and any preceding text characters, with the terms associated with the items and to retrieve the relevance values for said one or more user-entered prefixes matching terms associated with the items;

determining a count of the number of characters of text received from the user;

adjusting the relevance value assigned to at least one of the terms associated with one or more of the items retrieved in response to the one or more user-entered prefixes, wherein the adjusting of the relevance value is based on the count of the number of text characters received from the user;

determining a second ranking order of the items found in the second incremental find based at least in part on the adjusted relevance values and the assigned popularity values of the items found in the second incremental find; and

ordering and presenting one or more items to the user based on the second ranking order so that the relative order of the items found in both the first and second incremental finds is adjusted as characters are entered;

wherein at least one of determining the first ranking order and determining the second ranking order is further based on the relevance bias values of the subspace categories.

35. (Cancelled)

36. (Previously Presented) The method of claim 34, wherein the relevance bias values are based on the count of the number of text characters received from the user.

37. (Previously Presented) The method of claim 34, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

38. (Previously Presented) The method of claim 34, wherein the ordering and presenting of one or more items is limited to items having associated terms of one or more selected subspace categories.

39. (Currently Amended) The method of claim [[0]]38, wherein the one or more selected subspace categories are selected based on the count of the number of text characters received from the user.

40. (Previously Presented) The method of claim 34, wherein the ordered and presented one or more items are presented on a display device, the display device having display space allocated according to the subspace categories.

41. (Previously Presented) The method of claim 34, wherein the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

42. (Currently Amended) The method of claim [[0]]41, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

43. (Previously Presented) The method of claim 34, wherein the ordered and presented one or more items are presented on a display constrained device.

44. (Currently Amended) The method of claim [[0]]43, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

45. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a relative measure of popular opinion of the item.

46. (Previously Presented) The method of claim 34, wherein the assigned popularity values of one or more items of the set of items is based on a temporal relevance of the items or a location relevance of the items.

47. (Previously Presented) The method of claim 34, wherein at least one of determining the first ranking order and determining the second ranking order is further based on the number of prefixes of the received text.

48. (Previously Presented) The method of claim 34, wherein a portion of the set of items resides on a computer remote from the user.

49. (Previously Presented) The method of claim 34, wherein a computer remote from the user performs at least one of the steps of receiving text entered by the user, performing the first incremental find, determining the first ranking order, performing the second incremental find,

determining the count of the number of characters of text received, adjusting the relevance values of the terms associated with the items, and determining the second ranking order.

50. (Previously Presented) A system for processing a search request received from a user operating a hand-held text input device, the search request directed at identifying a desired item from a set of items, each of the items having one or more associated terms, the system comprising:

a first memory for storing at least a first portion of the set of items, the items having assigned popularity values to indicate a relative measure of a likelihood that the item is desired by the user, and each item being associated with a set of terms to describe the item, each term being assigned a relevance value based on a relevance of an informational content of the term in identifying the item, the terms associated with the items being organized into searchable subspace categories, each subspace category having a relevance bias value;

a device input for receiving text entered by the user on a hand-held text input device, the text having two or more text characters of one or more prefixes for terms the user is using to identify a desired item, the two or more text characters including a first text portion and a second text portion, the second text portion being received subsequent to the first text portion;

a processor for performing a first incremental find in response to receiving the first text portion and for ordering one or more items found in the first incremental find based on a first ranking order, the first incremental find comparing the one or more user-entered prefixes with the terms associated with the items and retrieving the relevance values for the one or more user-entered prefixes matching terms associated with the items, the first ranking order of the one or more items found in the first incremental find being based on the assigned popularity values of the items and being based on the retrieved relevance values for the one or more user-entered prefixes matching terms associated with the items, so that relatively more popular and more relevant items appear earlier in the order for user selection or activation, the processor also for performing a second incremental find in response to receiving the second text portion and for ordering one or more items found in the second incremental find based on a

second ranking order, the second incremental find comparing the one or more user-entered prefixes with the terms associated with the items and retrieving the relevance values for the one or more user-entered prefixes matching terms associated with the items, the second ranking order of the one or more items found in the second incremental find being based on the assigned popularity values of the items and being based on adjusted relevance values for the one or more user-entered prefixes matching terms associated with the items, the relevance values of the terms associated with the items being adjusted in response to the count of the number of text characters received from the user, the order of at least a portion of the one or more items being changed based on the adjusted relevance values of the terms, and at least one of the first ranking order and the second ranking order being further based on the relevance bias values of the subspace categories; and

a device output for presenting at least one of the first and the second ordered one or more items to the user.

51. (Cancelled)

52. (Previously Presented) The system of claim 50, wherein the relevance bias values are based on the count of the number of text characters received from the user.

53. (Previously Presented) The system of claim 50, wherein the subspace categories include a personalized history category containing terms associated with items identified from previous incremental finds conducted by the user.

54. (Previously Presented) The system of claim 50, wherein the incremental find is limited to items having associated descriptive terms of one or more selected subspace categories.

55. (Currently Amended) The system of claim ~~Error! Reference source not found.~~54, wherein the one or more selected subspace categories are selected based on the count of the number of text characters received from the user.

56. (Previously Presented) The system of claim 50, further comprising a display device for presenting the at least one of the first and the second ordered one or more items, the display device having display space allocated according to the subspace categories.

57. (Currently Amended) The system of claim [[0]]50, wherein the text entered by the user on the hand-held text input device includes a set of overloaded keys generating an ambiguous text input.

58. (Currently Amended) The system of claim [[0]]57, wherein the hand-held text input device is a phone, a mobile computing device, or a remote control device for a television.

59. (Currently Amended) The system of claim [[0]]50, further comprising a display constrained device for presenting the at least one of the first and the second ordered one or more items.

60. (Currently Amended) The system of claim [[0]]59, wherein the display device is a phone, a mobile computing device, or a non-intrusive interface display area of a television.

61. (Currently Amended) The system of claim [[0]]50, wherein the assigned popularity value of one or more items of the set of items is based on a relative measure of popular opinion of the item.

62. (Currently Amended) The system of claim [[0]]50, wherein the assigned popularity value of one or more items of the set of items is based on a temporal relevance of the item or a location relevance of the item.

63. (Currently Amended) The system of claim [[0]]50, wherein at least one of the first ranking order and the second ranking order of the one or more items is further based on a count of the number of prefixes of the received text.

64. (Currently Amended) The system of claim [[0]]50, further comprising a second memory on a computer remote from the user for storing at least a second portion of the set of items.

65. (Currently Amended) The system of claim [[0]]50, wherein the processor is disposed in a computer remote from the user.

REMARKS

This Amendment is in response to the Notice of Allowance dated October 19, 2011, which included an Examiner's amendment. We agreed to the substance of the Examiner's amendment on September 26, 2011. However, it appears in the recitation of the Examiner's amendment that document problems caused errors to be introduced in the claim dependencies. We submit this Amendment under 37 CFR 1.312 to correct those errors. The markups in the claims above are relative to the Examiner's amendment.

If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark Office determines that an extension is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 08-0219 referencing docket no. 0290672.00128US2.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 08-0219, under Order No. 0290672.00128US2 from which the undersigned is authorized to draw.

Respectfully submitted,

Dated: November 2, 2011

/John V. Hobgood/
John V. Hobgood
Registration No.: 61,540
Attorney for Applicant(s)

Wilmer Cutler Pickering Hale and Dorr LLP
60 State Street
Boston, Massachusetts 02109
(617) 526-6000 (telephone)
(617) 526-5000 (facsimile)

Electronic Acknowledgement Receipt

EFS ID:	11316366
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Jeanne DeLuca
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	02-NOV-2011
Filing Date:	07-OCT-2005
Time Stamp:	11:43:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		290672_128US2_Amendment_2_Nov_11.pdf	85250 4ebac9b5d9b34a3bff1b1ac9ba1c890254ec02b5	yes	8

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment after Notice of Allowance (Rule 312)	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	8
Warnings:			
Information:			
	Total Files Size (in bytes):	85250	

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

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

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

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

-ENTER 312
HW 11/19/2011

Docket No.: 0290672.00128US2
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Murali ARAVAMUDAN et al.	Confirmation No.:	5356
Application No.:	11/246,432	Art Unit:	2169
Filed:	October 7, 2005	Examiner:	H. Wong
Title:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT		

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

AMENDMENT AFTER ALLOWANCE UNDER 37 C.F.R. 1.312

Dear Sir:

INTRODUCTORY COMMENTS

Prior to issuance of the patent, applicant respectfully requests entry on this amendment under 37 C.F.R. 1.312 for the above-captioned patent application.

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Remarks/Arguments begin on page 8 of this paper.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

23483 7590 11/28/2011

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

EXAMINER
WONG, HUEN

ART UNIT	PAPER NUMBER
2154	

NOTIFICATION DATE	DELIVERY MODE
11/28/2011	ELECTRONIC

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

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

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

teresa.carvalho@wilmerhale.com
whipusptopairs@wilmerhale.com

Response to Rule 312 Communication	Application No.	Applicant(s)
	11/246,432	ARAVAMUDAN ET AL.
	Examiner	Art Unit
	HUEN WONG	2154

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

1. ☒ The amendment filed on *02 November 2011* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

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

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

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

/H. W./ Examiner, AU 2154	/Vincent Boccio/ Primary Examiner, Art Unit 2158

PART B - FEE(S) TRANSMITTAL

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

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

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

23483 7590 10/19/2011
WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

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

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

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2	5356

TITLE OF INVENTION: METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	YES	$870	$300	$0	$1170	01/19/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
WONG, HUEN	2154	707-003000

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

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

1 Wilmer Cutler
2 Pickering Hale
3 & Dorr LLP.

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

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

(A) NAME OF ASSIGNEE: Veveo, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Andover, Massachusetts

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

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

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ☐ A check is enclosed.
- ☒ Payment by credit card. ~~Form PTO-2038 is attached.~~
- ☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 08-0219 (enclose an extra copy of this form).

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

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

Authorized Signature _____ Date 11-Jan-12

Typed or printed name John V. Hobgood Registration No. 61,540

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

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Electronic Patent Application Fee Transmittal

Application Number:	11246432
Filing Date:	07-Oct-2005
Title of Invention:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT
First Named Inventor/Applicant Name:	Murali Aravamudan
Filer:	John Verble Hobgood/Kathleen Bastarache
Attorney Docket Number:	0290672.00128US2

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	2501	1	870	870
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1170**

Electronic Acknowledgement Receipt	
EFS ID:	11806995
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Kathleen Bastarache
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	11-JAN-2012
Filing Date:	07-OCT-2005
Time Stamp:	15:24:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1170
RAM confirmation Number	2008
Deposit Account	080219
Authorized User	HOBGOOD,JOHN V.
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

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

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

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

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	01112011_ISSUEFEETRANS.pdf	156460 7abf166ccd77fa169593d38c1594a4d86e25acac	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32472 54c5a863b78b8cb5742f93f102edd9cb01647e73	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	188932		

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

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

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

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/246,432	02/21/2012	8122034	0290672.00128US2	5356

23483 7590 02/01/2012

WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 394 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

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

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

Murali Aravamudan, Windham, NH;
Rakesh D. Barve, Bangalore, INDIA;
Sashikumar Venkataraman, Bangalore, INDIA;
Ajit Rajasekharan, West Windsor, NJ;

PTO/SB/81 (01-09)
Approved for use through 11/30/2011. OMB 0651-0035
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POWER OF ATTORNEY OR REVOCATION OF POWER OF ATTORNEY WITH A NEW POWER OF ATTORNEY AND CHANGE OF CORRESPONDENCE ADDRESS

Application Number	11/246,432
Filing Date	October 7, 2005
First Named Inventor	Murali Aravamudan
Title	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH ...
Art Unit	2155
Examiner Name	H. Wong
Attorney Docket No.	V0251.70004US01

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

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) to prosecute the application identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: 23628

OR

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

Practitioner(s) Name	Registration Number	Practitioner(s) Name	Registration Number

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

☐ The address associated with the above-mentioned Customer Number:

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name

Address					
City		State		Zip	
Country		Telephone		Email	

I am the:

☐ Applicant/Inventor.

OR

☒ Assignee of record of the entire interest. See 37 CFR 3.71.

Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Applicant or Assignee of Record

Signature	Fergus Ryan	Date	12/6/13
Name	Fergus Ryan	Telephone	978-687-8240
Title and Company	Controller, Veveo, Inc.		

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

☐ *Total of _____ forms are submitted.

Certificate of Electronic Filing Under 37 CFR 1.8

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4).

Dated: December 6, 2013 Signature: Darlene J. Morin (Darlene J. Morin)

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

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Veveo, Inc.

Application No./Patent No.: 8,122,034 Filed/Issue Date: February 21, 2012

Titled: METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

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

states that it is:

1. [X] the assignee of the entire right, title, and interest in;

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

3. [ ] an assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made) the patent application/patent identified above by virtue of either:

A. [X] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 017107, Frame 0602, or for which a copy thereof is attached.

OR

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

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

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

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

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

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

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

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

Fergus Ryan — Signature
12/6/13 — Date
Fergus Ryan — Printed or Typed Name
Controller — Title

Certificate of Electronic Filing Under 37 CFR 1.8

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4).

Dated: December 6, 2013 Signature: Darlene J. Morin (Darlene J. Morin)

3314464.1

Electronic Acknowledgement Receipt

EFS ID:	17589865
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	Thomas A. Franklin/Darlene Morin
Filer Authorized By:	Thomas A. Franklin
Attorney Docket Number:	0290672.00128US2
Receipt Date:	06-DEC-2013
Filing Date:	07-OCT-2005
Time Stamp:	14:59:30
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	V025170004US01-TRN-TAF.pdf	69396 ff2ff609caa31b5815b88186122539de62f5378f	no	1

Warnings:	
Information:	

2	Power of Attorney	V025170004US01-POA-TAF.pdf	131062 efc6d8a8d9e202d9a5181759cc923eea34f641b5	no	1
Warnings:					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73.	V025170004US01-373-TAF.pdf	115179 28edcc84942b0df85ca440ca672ad4f3a06bf317	no	1
Warnings:					
Information:					
		Total Files Size (in bytes):	315637		

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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/SB/21 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission	3	Application Number	Patent#: 8,122,034
		Filing Date	Issued: February 21, 2012
		First Named Inventor	Murali Aravamudan
		Art Unit	2154
		Examiner Name	H. Wong
		Attorney Docket Number	V0251.70004US01

ENCLOSURES (*Check all that apply*)

☐ Fee Transmittal Form	☐ Drawing(s)	☐ After Allowance Communication to TC
☐ Fee Attached	☐ Licensing-related Papers	☐ Appeal Communication to Board of Appeals and Interferences
☐ Amendment/Reply	☐ Petition	☐ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
☐ After Final	☐ Petition to Convert to a Provisional Application	☐ Proprietary Information
☐ Affidavits/declaration(s)	☒ Power of Attorney, Revocation Change of Correspondence Address	☐ Status Letter
☐ Extension of Time Request	☐ Terminal Disclaimer	☒ Other Enclosure(s) (please Identify below):
☐ Express Abandonment Request	☐ Request for Refund	Statement Under 37 CFR 3.73(b)
☐ Information Disclosure Statement	☐ CD, Number of CD(s) _____	
☐ Certified Copy of Priority Document(s)	☐ Landscape Table on CD	
☐ Reply to Missing Parts/ Incomplete Application	Remarks	
☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	WOLF, GREENFIELD & SACKS, P.C.		
Signature	Thomas A. Franklin		
Printed name	Thomas A. Franklin		
Date	12-6-2013	Reg. No.	63,456

Certificate of Electronic Filing Under 37 CFR 1.8

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with 37 CFR § 1.6(a)(4).

Dated: December 6, 2013 Signature: Darlene J. Morin (Darlene J. Morin)

3314464.1

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/246,432	10/07/2005	Murali Aravamudan	V0251.70004US01

CONFIRMATION NO. 5356

23628
WOLF GREENFIELD & SACKS, P.C.
600 ATLANTIC AVENUE
BOSTON, MA 02210-2206

POA ACCEPTANCE LETTER

OC000000065464619

Date Mailed: 12/11/2013

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/06/2013.

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

/rmturner myles/

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2

CONFIRMATION NO. 5356

23483
WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

POWER OF ATTORNEY NOTICE

OC000000065464611

Date Mailed: 12/11/2013

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 12/06/2013.

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

/rmturner myles/

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

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

Patent Number	8,122,034
Issue Date	February 21, 2012
First Named Inventor	Murali ARAVAMUDAN
Title	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY, etc.
Attorney Docket No.	0290672.00128US2

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

☐ A Power of Attorney is submitted herewith.

OR

☒ I hereby appoint Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s) with respect to the patent identified above, and to transact all business in the United States Patent and Trademark Office connected therewith: 23483

OR

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

Practitioner(s) Name	Registration Number	Practitioner(s) Name	Registration Number

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

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

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I am the:

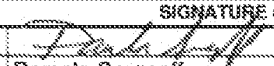
☐ Inventor, having ownership of the patent.

OR

☒ Patent owner.

Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Inventor or Patent Owner

Signature		Date	5/23/14
Name	Pamela Sergeeff	Telephone	408-582-8400
Title and Company	Secretary, Veveo, Inc.		

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

☐ *Total of 1 forms are submitted.

PTO/SB/96 (07-09)
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Murali ARAVAMUDAN, et al.

Application No./Patent No.: 11/246,432 / 8,122,034 Filed/Issue Date: Oct. 7, 2005 / Feb. 21, 2012

Titled: METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT

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

states that it is:

1. [x] the assignee of the entire right, title, and interest in;

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

3. [ ] an assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made) the patent application/patent identified above by virtue of either:

A. [x] An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 017107, Frame 0602, or for which a copy thereof is attached.

OR

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

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

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

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

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

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

/Pamela Sergeeff/ (Signature) 5/23/14 (Date)

Pamela Sergeeff (Printed or Typed Name) Secretary (Title)

Electronic Acknowledgement Receipt

EFS ID:	19152391
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23628
Filer:	John Verble Hobgood/DIANA MOSLEY
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	V0251.70004US01
Receipt Date:	28-MAY-2014
Filing Date:	07-OCT-2005
Time Stamp:	19:02:08
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	0290672_00128US2_POASTATEMENT_20140528.PDF	82450 addeb184cb8a6ca582c2751caff9734413acac50	no	2

Warnings:

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Total Files Size (in bytes):	82450

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

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

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United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/246,432	10/07/2005	Murali Aravamudan	V0251.70004US01

CONFIRMATION NO. 5356

23628
WOLF GREENFIELD & SACKS, P.C.
600 ATLANTIC AVENUE
BOSTON, MA 02210-2206

POWER OF ATTORNEY NOTICE

OC000000068788368

Date Mailed: 06/05/2014

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/28/2014.

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

/ddinh/

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

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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2

CONFIRMATION NO. 5356

23483
WILMERHALE/BOSTON
60 STATE STREET
BOSTON, MA 02109

POA ACCEPTANCE LETTER

OC000000068788402

Date Mailed: 06/05/2014

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/28/2014.

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

/ddinh/

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PTO/SB/123 (11-08)
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CHANGE OF CORRESPONDENCE ADDRESS
Patent

Address to:
Mail Stop Post Issue
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Patent Number	8,122,034
Issue Date	February 21, 2012
Application Number	11/246,432
Filing Date	October 7, 2005
First Named Inventor	Murali ARAVAMUDAN
Attorney Docket Number	0290672.00128US2

Please change the Correspondence Address for the above-identified patent to:

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[ ] **Firm *or* Individual Name**

Address

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Telephone	**Email**

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I am the:

[ ] Patentee.

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

[x] Attorney or agent of record. Registration Number 61,540 .

Signature	/John V. Hobgood/		
Typed or Printed Name	John V. Hobgood		
Date	5-Mar-2015	Telephone	(617) 526-6000

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

[ ] *Total of 1 forms are submitted.

Electronic Acknowledgement Receipt

EFS ID:	21684711
Application Number:	11246432
International Application Number:	
Confirmation Number:	5356
Title of Invention:	METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT
First Named Inventor/Applicant Name:	Murali Aravamudan
Customer Number:	23483
Filer:	John Verble Hobgood/Miranda Mitchell
Filer Authorized By:	John Verble Hobgood
Attorney Docket Number:	0290672.00128US2
Receipt Date:	05-MAR-2015
Filing Date:	07-OCT-2005
Time Stamp:	13:47:27
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Change of Address	128US2_Change_of_Correspondence_Address.PDF	82527 0ebb4831f81dcfb0329e7c9000c0c87e968639a5	no	1

Warnings:	
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New International Application Filed with the USPTO as a Receiving Office
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OR
REVOCATION OF POWER OF ATTORNEY
WITH A NEW POWER OF ATTORNEY
AND
CHANGE OF CORRESPONDENCE ADDRESS

Application Number	See Schedule A attached
Filing Date	See Schedule A attached
First Named Inventor	See Schedule A attached
Title	See Schedule A attached
Art Unit	See Schedule A attached
Examiner Name	See Schedule A attached
Attorney Docket No.	See Schedule A attached

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

☐ A Power of Attorney is submitted herewith.

OR

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

75563

OR

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

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Address					
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Country		Telephone		Email	

I am the:

☐ Applicant/inventor.

OR

☒ Assignee of record of the entire interest. See 37 CFR 3.71.
Statement under 37 CFR 3.73(b) (Form PTO/SB/96) submitted herewith or filed on _____

SIGNATURE of Applicant or Assignee of Record

Signature		Date	10/27/16
Name	Milan Patel		(408) 562-8400
Title and Company	Vice President of Patent Strategy, Veveo, Inc.		

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

☒ *Total of 1 forms are submitted.

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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: See Schedule A

Application No./Patent No.: See Schedule A Filed/Issue Date: See Schedule A

Entitled: See Schedule A

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

states that it is:

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

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

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

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[ ] Additional documents in the chain of title are listed on a supplemental sheet.

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

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

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

/Anne-Raphaelle Aubry/	November 14, 2016
Signature	Date
Anne-Raphaelle Aubry	(617) 235-4087
Printed or Typed Name	Telephone Number
Agent for Assignee	
Title	

5935701D_1

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Schedule A
(VEVEO, INC.)

003597-1213-101

Application #: 11246432 Filing Dt: 10/07/200 Patent #: 8122034 Issue Dt: 02/21/2012
PCT #: NONE Intl Reg #: Publication #: US20070005563 Pub Dt: 01/04/200
Inventors: Murali Aravamudan, Rakesh D. Barve, Sashikumar Venkataraman, Ajit Rajasekharan
Title: METHOD AND SYSTEM FOR INCREMENTAL SEARCH WITH REDUCED TEXT ENTRY WHERE THE RELEVANCE OF RESULTS IS A DYNAMICALLY COMPUTED FUNCTION OF USER INPUT SEARCH STRING CHARACTER COUNT
Assignment: 1
Reel/Frame: 031609 / 0350 Received: 11/08/2013 Recorded: 11/08/2013 Mailed: 11/18/2013
Conveyance: CHANGE OF NAME (SEE DOCUMENT FOR DETAILS).
Assignor: VEVEO.TV INC. Exec Dt: 08/18/2005
Assignee: VEVEO, INC.
44 SHATTUCK ROAD, SUITE 303
ANDOVER, MASSACHUSETTS 01810

59620321_1

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FAX TRANSMISSION

DATE: November 14, 2016

PTO IDENTIFIER: **Application Number** See Schedule A
Patent Number
Inventor: See Schedule A

MESSAGE TO: US Patent and Trademark Office

FAX NUMBER: (571) 273-8300

FROM: ROPES & GRAY LLP
Anne Raphaelle-Aubry

PHONE: (617) 951-4912

Attorney Dkt. #: Veveo, Inc.

PAGES (Including Cover Sheet): 4

CONTENTS:
POA or Authorization of Agent (1 page)
Statement Under 37 CFR 3.73(b) (1 page)
Schedule A (1 page)
This Facsimile Cover Sheet (1 page)

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ROPES & GRAY LLP
800 Boylston Street, Boston, Massachusetts 02199
Telephone: (617) 951-7000 Facsimile: (617) 235-9492

PAGE 1/12 * RCVD AT 11/14/2016 4:34:43 PM [Eastern Standard Time] * SVR:W-PTOFAX-002/33 * DNIS:2738300 * CSID:6179517050 * DURATION (mm-ss):03-36

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2

CONFIRMATION NO. 5356

POWER OF ATTORNEY NOTICE

75563
ROPES & GRAY LLP
PATENT DOCKETING 39/361
1211 AVENUE OF THE AMERICAS
NEW YORK, NY 10036-8704

OC000000087402245

Date Mailed: 11/25/2016

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

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/tnguyen/

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
11/246,432	10/07/2005	Murali Aravamudan	0290672.00128US2

CONFIRMATION NO. 5356

POA ACCEPTANCE LETTER

75563
ROPES & GRAY LLP
PATENT DOCKETING 39/361
1211 AVENUE OF THE AMERICAS
NEW YORK, NY 10036-8704

OC000000087402260

Date Mailed: 11/25/2016

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/tnguyen/