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(54) **Title:** METHODS AND APPARATUS FOR A COMPREHENSIVE SEARCHING ON A MOBILE DEVICE

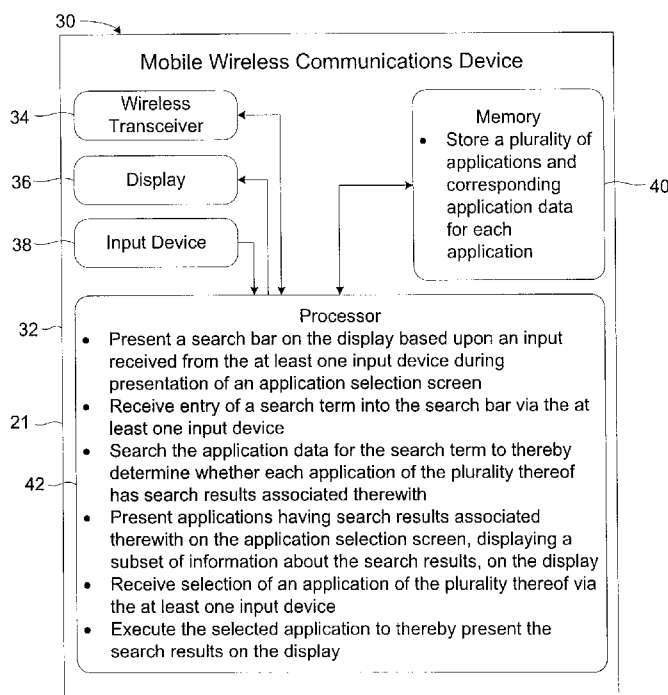


FIG. 1

(57) **Abstract:** A mobile wireless communications device includes a display, and a memory configured to store a plurality of applications and corresponding application data for each application. The mobile wireless communications device also includes at least one input device, and a processor. The processor is configured to search the application data for a search term to thereby determine whether each application of the plurality thereof has search results associated therewith, and present applications having search results associated therewith on an application selection screen, without displaying the search results, on the display. The processor is further configured to receive selection of an application of the plurality thereof via the at least one input device, and execute the selected application to thereby present the search results on the display.

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METHODS AND APPARATUS FOR A COMPREHENSIVE SEARCHING ON A MOBILE DEVICE

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Cross-Reference to Related Application

This application claims the benefit of and priority to claiming priority to U.S. Application Serial No. 61/304,665 filed February 15, 2010 and U.S. Provisional Application Serial No. 61/327,578 filed April 23, 2010.

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The content of the above patent application is hereby expressly incorporated by reference into the detailed description hereof.

Technical Field

15 **[0001]** The present disclosure related to the field of mobile wireless communications devices, and, more particularly, to the execution of content searches by mobile wireless communications devices.

Background

20 **[0002]** Mobile communication systems continue to grow in popularity and have become an integral part of both personal and business communications. Various mobile devices now incorporate Personal Digital Assistant (PDA) features such as calendars, address books, task lists, calculators, memo and writing programs, media players, games, etc. These multi-function devices also allow users to send and
25 receive electronic mail (email) messages wirelessly and access the Internet via a cellular network and/or a wireless local area network (WLAN), for example. In addition, these devices may allow users to send Short Messaging Service (SMS) messages, Personal Identification Number (PIN) messages, and instant messages.

30 **[0003]** Given the amount of information now stored on a mobile device itself, and the amount of data remotely accessible by the mobile device, a user may wish to search for a specific e-mail, media file, or contact, for example. To facilitate this, some mobile devices include search functionality. They may allow a user to search

for a specific contact, for e-mails from a given sender, or for songs by a certain performing artist.

[0004] This search functionality is typically associated a given application. For example, a user may open a list of his contacts, and search that list of contacts, or
5 may open a list of his music files, and search that list of music files. While such functionality advantageously allows a user to locate data more quickly than without a search function, further improvements in how a mobile device searches, and presents the results of, both its own content and external content may be desirable.

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Brief Description of the Drawings

[0005] For a better understanding of the various embodiments described herein and to show more clearly how they may be carried into effect, reference will now be made, by way of example only, to the accompanying drawings which show example embodiment and in which:

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[0006] FIG. 1 is schematic block diagram of an example embodiment of a mobile wireless communications device in accordance with the present disclosure;

[0007] FIG. 2 is a schematic block diagram of another example embodiment of a mobile wireless communications device in accordance with the present disclosure;

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[0008] FIG. 3 is a flowchart of a mobile wireless communications device in accordance with the present disclosure;

[0009] FIG. 4 is a block diagram of an example embodiment of a mobile device, such as may be used with the embodiments disclosed herein;

[0010] FIG. 5 is a block diagram of an example embodiment of a communication subsystem component of the mobile device of FIG. 4;

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[0011] FIG. 6 is an example block diagram of a node of a wireless network, such as may be used with the embodiments disclosed herein;

[0012] FIG. 7 is a block diagram illustrating components of a host system in one example configuration for use with the wireless network of FIG. 6 and the mobile device of FIG. 4;

[0013] FIGS. 8A-8Z illustrate a mobile wireless communications device, such as those of FIGS. 1, 2, and 4, performing a comprehensive search, in accordance with the present disclosure;

[0014] FIGS. 9A-9X illustrate a mobile wireless communications device, such as those of FIGS. 1, 2, and 4, performing a comprehensive search, in accordance with the present disclosure;

[0015] FIGS. 10A-10Y illustrate a mobile wireless communications device, such as those of FIGS. 1, 2, and 4, performing a comprehensive search, in accordance with the present disclosure;

[0016] FIGS. 11A-11Y illustrate a mobile wireless communications device, such as those of FIGS. 1, 2, and 4, performing a comprehensive search, in accordance with the present disclosure; and

[0017] FIGS. 12A-12L illustrate a mobile wireless communications device, such as those of FIGS. 1, 2, and 4, performing a comprehensive search, in accordance with the present disclosure.

Detailed Description

[0018] It will be appreciated that for simplicity and clarity of illustration, where considered appropriate, reference numerals may be repeated among the figures to indicate corresponding or analogous elements. In addition, numerous specific details are set forth in order to provide a thorough understanding of the embodiments described herein. However, it will be understood by those of ordinary skill in the art that the embodiments described herein may be practiced without these specific details. In other instances, well-known methods, procedures and components have not been described in detail so as not to obscure the embodiments described herein. Also, the description is not to be considered as limiting the scope of the embodiments described herein.

[0019] Generally speaking, a mobile wireless communications device (also referred to herein as a mobile device) may include a display, and a memory configured to store a plurality of applications and corresponding application data for each application. The mobile wireless communications device may also include at

least one input device and a processor configured to search the application data for a search term to thereby determine whether each application of the plurality thereof has search results associated therewith. The processor may also be configured to present applications having search results associated therewith on an application selection screen, without displaying the search results, on the display, and receive selection of an application of the plurality thereof via the at least one input device. The processor may be further configured to execute the selected application to thereby present the search results on the display.

[0020] The processor may be further configured to present a search bar on the display based upon an input received from the at least one input device during presentation of the application selection screen, and to receive entry of the search term into the search bar via the at least one input device. In addition, the processor may be configured to present the applications having search results associated therewith on the display by presenting respective icons representing the applications on the display, and by presenting an indication of a quantity of search results for each icon adjacent thereto. Furthermore, the processor may be configured to present the indication of the quantity of search results as a number.

[0021] In some instances, the application data may comprise application icons and labels associated therewith. The processor, when executing the application, may permit modification of the search term. Also, the processor may be configured to search the application data corresponding to the application for the modified search term to thereby generate modified search results. The processor, when executing the application, may be further configured to present the modified search results on the display.

[0022] The processor may also be configured to present a web search icon with the search results, and to search at least one associated web site for the search term based upon selection of the web search icon. The memory may be configured to store an Internet enabled application having application data associated therewith stored on an external server, and the processor may also be configured to present an icon for the Internet enabled application with the search results.

[0023] In some applications, the processor may be configured to search the external server for the search term via execution of the Internet enabled application, based upon selection of the icon for the Internet enabled application. The Internet enabled application may comprise a music streaming application or social networking application, for example.

[0024] A method aspect is directed to a method of searching application data using a mobile wireless communications device. The method may include storing a plurality of applications and corresponding application data for each application in a memory of the mobile wireless communication device, and searching the application data for a search term to thereby determine whether each application of the plurality thereof has search results associated therewith, using a processor of the mobile wireless communications device. The method may also include presenting applications having search results associated therewith on an application selection screen, without displaying the search results, on a display of the mobile wireless communications device, using the processor, and receiving selection of an application of the plurality thereof via at least one input device of the mobile wireless communications device, using the processor. The method may further include executing the selected application to thereby present the search results on the display, using the processor.

[0025] Referring now to FIG. 1, a mobile wireless communications device 30 is described. Example mobile wireless communications devices 30 may include portable or personal media players (e.g., music or MP3 players, video players, etc.), remote controls (e.g., television or stereo remotes, etc.), portable gaming devices, portable or mobile telephones, smartphones, tablet computers, etc.

[0026] The mobile wireless communications device 30 includes a housing 21 carrying a wireless transceiver 34, a display 36, an input device 38, a memory 40, and a processor 42. The wireless transceiver 34, display 36, input device, and memory 40 are coupled to the processor.

[0027] The wireless transceiver 34 may be a cellular transceiver, and may be configured to perform both voice and data cellular communications. The wireless

transceiver 34 may also have other wireless communications capability, such as WiFi and Bluetooth.

[0028] The input device 38 may be a keyboard, touch sensitive pad, trackball, thumbwheel, button, microphone, or other suitable device, for example. It should be appreciated that in some applications, the display 36 may be a touch sensitive display, and may therefore serve as the input device 38.

[0029] The memory 40 may include both volatile and non-volatile portions and is configured to store a plurality of applications and corresponding application data for each application. The applications may be any sort of applications, include a messaging application, a contacts application, a calendar application, a notes application, and a media player application, for example

[0030] The processor 42 is configured to present a search bar on the display 36 based upon an input received from the at least one input device 38 during presentation of a main application selection screen or "home screen." This application selection screen presents icons representing at least some of the applications stored in the memory 40, along with labels associated with those applications. An example application selection screen is shown in FIG. 8A. An example search bar is shown in FIG. 8B. As shown, the application selection screen is displayed in FIG. 8A, and a key has been pressed, so the search bar is therefore displayed in FIG. 8B.

[0031] The processor 42 is configured to receive entry of a search term into the search bar via the at least one input device 38. FIG. 8C illustrates the letter "c" being entered into the search bar. After entry of a search term, the processor 42 is configured to search the application data for the search term to thereby determine whether each application of the plurality thereof has search results associated therewith. The processor 42 presents applications having search results associated therewith on the application selection screen, without displaying the search results, on the display 36. FIG. 8U shows search results for the search term "c" being displayed. Applications having search results associated therewith, such as the calendar and contacts application are displayed.

[0032] The processor 42 is also configured to receive selection of an application of the plurality thereof via the at least one input device 38. The processor 42 then executes the selected application to thereby present the search results on the display 36. An example is shown in FIG. 8X, where the search term "col" has
5 been entered, and a messaging application has been launched to thereby show the search results associated therewith in FIG. 8Y. (The example search results associated therewith are emails from sender "Colin Davidson" and "Colton Chasey" and an email with the subject "FW: Color choices for next year".)

[0033] This mobile wireless communications 30 advantageously allows the
10 presentation of a variety of search results of different types in an organized fashion on a single search results screen. This helps to decrease the amount of time a user spends looking through the search results for a proper entry or entries.

[0034] Another example embodiment of the mobile wireless communications device 30' is now described with reference to FIG. 2. Here, the application data
15 stored in the memory 40' includes application icons and labels associated therewith. The memory 40' is also configured to store an Internet enabled application. It should be understood that an Internet enabled application is an application executed by the processor 42' that retrieves data from the Internet. Example Internet enabled applications include music streaming applications, video streaming applications, and
20 social networking application, for example. Application data for the Internet enabled application is stored on an external server 45'.

[0035] In addition, the processor 42' is configured to present the applications having search results associated therewith on the application selection screen, displaying a subset of the information about the search results, on the display, by
25 presenting respective icons representing the applications, and by presenting an indication of a quantity of search results (e.g. a number) for each icon adjacent thereto. This is shown in FIG. 8D, for example, where an icon and label for the messages application is displayed, and "(213)" is displayed adjacent to the label for the messages application icon, indicating that there are 213 search results for the
30 search term from among the application data stored for the messages application.

[0036] Furthermore, while executing the application, the processor 42' is configured to permit modification of the search term. The processor 42' searches the application data corresponding to the application for the modified search term to thereby generate modified search results, and presents the modified search results
5 on the display 36'. This feature usefully allows further refinement of a search from inside an application, without necessitating exiting the application and a return to the search bar.

[0037] The processor 42' is also configured to present a web search icon with the search results, as shown in FIG. 10O, which shows the display of a "Search
10 Google" icon during the display of search results. Upon selection of the web search icon, the processor 42' searches at least one associated web site for the search term, and displays the search from the at least one associated web site, as shown in FIG. 10P. This feature provides users with a quick and easy way to extend a search outside of the data stored on the mobile wireless communications device 30', without
15 requiring an exit of the search results screen, execution of a web browser, and subsequent manual entry of the search term into the web browser, as is typical in existing methods.

[0038] The processor 42' is also configured to present an icon for the Internet enabled application with the search results, as shown in FIG. 10L, which shows the
20 display of a "Slacker" icon during the display of search results, indicating the option of searching the Slacker music streaming application for the search term. Based upon selection of the icon for the Internet enabled application, the processor 42' searches the external server for the search term via execution of the Internet enabled application and displays the results, as shown in FIG. 10M, where the Slacker
25 application is executing and displaying search results for the search term "col." This feature provides users with a quick and easy way to extend a search outside of the data stored on the mobile wireless communications device 30', without requiring an exit of the search results screen, execution of an Internet enabled application, and subsequent manual entry of the search term into a search function of the Internet
30 enabled application, as is typical in the prior art.

[0039] A method of operating the mobile wireless communications devices 30, 30' described above is now discussed with reference to the flowchart 50 of FIG. 3. After the start (Block 52), a plurality of applications and corresponding application data for each application are stored in a memory of the mobile wireless communication device (Block 54). The application data is then searched for a search term to thereby determine whether each application of the plurality thereof has search results associated therewith, using a processor of the mobile wireless communications device (Block 56).

[0040] Applications having search results associated therewith are then presented on an application selection screen, without displaying the search results, on a display of the mobile wireless communications device, using the processor (Block 58). Selection of an application of the plurality thereof is then received via at least one input device of the mobile wireless communications device, using the processor (Block 60).

[0041] The selected application is then executed to thereby present the search results on the display, using the processor (Block 62). Block 64 indicates the end of the method.

[0042] In an example embodiment shown in FIG. 4, a mobile device 100 is configured to perform a comprehensive search on content accessible to the mobile device and implement other example embodiments disclosed herein. The searchable content may include software applications 136 and files located on the mobile device. The software applications 136 may include messaging application 138, PIM application 142, as well as other software applications which are not shown in FIG. 4, such as social networking and device help applications. The searchable content may also include files stored on the mobile device, such as media files such as photos, videos, songs or documents such as word processing documents or presentations documents. The searchable content may also include remote sources accessible to the mobile device through wireless network 200, such as a music library stored on a personal computer, documents stored on a work computer, and

data stored at host system 250, such as data stored at contact server 276 or message server 268.

[0043] Certain context information may be actively (by the user) or passively (by the mobile device) input into the comprehensive search method to tailor the search results. Examples of such context information include location context information such the current location of the mobile device, and a user's personal context information such as a user's search profile stored on the mobile device.

[0044] The results of comprehensive search (from e.g. searching on content from various sources located on the device and remote to the device), may be sorted and/or grouped or otherwise organized. For example, the search results may be grouped by the source of content searched, such as content stored on the mobile device or content obtained from a remote source. In another example, the search results may be grouped by context, such as location context or context provided by a user's preferences (e.g. in a user's search profile stored on the mobile device). In yet another example, the search results may be sorted by date of the content.

[0045] The comprehensive search on a mobile device can be invoked by a user typing in the home screen of the mobile device. Upon the user typing in the home screen, a search box window may pop up and the user may complete his/her search query in the window.

[0046] In some applications, if the user enters a URL into the search box at the home screen, the user is given the option to access to that URL. Upon further user input, such as the user performing an action on keyboard 116 (e.g. pressing a key) or performing an action on a device of the auxiliary subsystem 112 of the mobile device (e.g. touching a touchscreen of the mobile device, pressing trackball or pressing a track pad), a browser (with the web page of the URL) may then be launched.

[0047] With initial reference to FIGS. 8A-8Z, features of the comprehensive search are now described. As shown in FIG. 8A, the comprehensive search is easily accessible, and can be launched from the home screen, as there is a search icon in a status bar. The search may be triggered by an input device such as a keyboard, while the home screen is displayed.

[0048] When the search is triggered, a search bar is displayed on the screen, as shown in FIG. 8B. As each letter of the search term is entered, search results are graphically presented, as shown in FIG. 8C. Low instance matches may be shown individually (e.g. contacts, applications), while high instance matches may be
5 grouped into categories (e.g. messages, music), as shown in FIG. 8D.

[0049] The search results are presented in a variety of suitable order. A preferred order for presentation of search results, as shown in FIG. 8E, may be: 1. contacts, 2. applications, 3. application data stores, and 4. remote searches (e.g. web searches). Contacts may be grouped such that on device matches are presented
10 first, and remote matches are presented thereafter. Application matches may be presented in a same order as icons on the home screen, and hidden application matches may be shown as well. For application data stores, matches may be presented in a same order as the home screen icons. This comprehensive search advantageously offers the ability to search off the device for matches (e.g. remote
15 lookup, search music store, search web), as shown in FIG. 8F.

[0050] The input device may be a keyboard, and some keys thereof may have both a number and letter or other character assigned thereto. If these keys are configured such that a letter is entered into the search prompt, the comprehensive search may present an option to dial the phone number that the associated letters
20 represent, as shown in FIGS. 8G-8J.

[0051] If the letters or characters entered are such that no associated phone number corresponds to the entered letters or characters, the dial option may disappear, as shown in FIGS. 8K and 8L. As also shown in FIG. 8M, when a URL is entered into the search bar, an option to launch a browser directed to that URL is
25 presented.

[0052] As shown in FIGS. 8N and 8O, clicking on individual found contacts in the search results opens contact details. A search in progress is suspended, and the contact details are displayed in same screen that would be displayed by opening the contact in a contacts application. Pressing an escape key, or other key, may return to
30 the search results screen, as shown in FIG. 8P. If a search in progress was

suspended, it is resumed. A graphical short menu may be invoked when a contact is selected, and this short menu may provide similar features to those available from a full contacts screen, as shown in FIG. 8Q.

5 **[0053]** It should be appreciated that the comprehensive search may be launched from any application and not just the home screen. For example, the comprehensive search may be launched from a contacts screen, as shown in FIGS. 8R, 8S, and 8T.

10 **[0054]** As shown in FIGS. 8U and 8V, selecting a search result for a given application, such as the calendar application) launches that application. Pressing the escape key returns to the search bar, as shown in FIG. 8W. Selecting a message search result launches the message application, as shown in FIG. 8X. As shown in FIG. 8Y, the messages application displays the messages that match the search criteria. This is a same screen that would be displayed by opening the messages application to access to all messages. Pressing escape returns to the search screen,
15 as shown in FIG. 8Z.

20 **[0055]** As mentioned above, the comprehensive search may be launched from inside any application. FIG. 9A shows the messaging application screen. To launch the search, a menu is called in FIG. 9B, and the search option is selected. The search bar is then launched, as shown in FIG. 9C. As shown in FIG. 9D, as the user types, matching results (with C in From field or Subject are filtered) are displayed.

25 **[0056]** In the message application, by default, results are returned for matches in From field and Subject field, as shown in FIG. 9E. A find selector may be selected as shown in FIG. 9F, which presents options of different fields of the messages to search. The From field is selected in FIG. 9G, and in FIG. 9H, the listing of search results is updated to reflect this field selection.

[0057] As shown in FIG. 9I, there is an advanced search option available from the menu. The advanced search screen is shown in FIGS. 9J and 9K.

[0058] When the search field is selected, as shown in FIG. 9L, the focus of entered keystrokes is directed to the search field. However, when the focus is

changed to a search results, as shown in FIG. 9M, keystrokes may be treated as shortcuts. As shown in FIG. 9N, the “B” has been pressed, and the search results list has been automatically scrolled to the bottom thereof. The “S” key may then return the focus to the search field, as shown in FIG. 9O.

5 **[0059]** FIG. 9P shows a search results screen. If the calendar icon is selected, the calendar search results are shown as they would be from the calendar application, in FIG. 9Q. Here, the calendar application displays the events that match the criteria. This screen is similar to an agenda view with access to all calendar actions. As shown in FIG. 9R, pressing escape key results in a return to the search
10 results screen. If a search in progress was suspended, it may resume.

[0060] The search may be accessed from a menu in a calendar application, as shown in FIG. 9S. Upon selection of search, a search bar is shown, in FIG. 9T. Search results are shown in FIG. 9U. It should be noted that extended search results are also shown here, giving the option to search the entire device for the search term,
15 or to search the web for the search term.

[0061] Shown in FIG. 9V are search results including results in a memo application. In FIG. 9W, the memo search results have been selected, and are displayed in a same screen that would be displayed if the memo application had been launched separately. In FIG. 9X, the escape key has been pressed, and the
20 mobile device is again displaying the search results.

[0062] The search results shown in FIG. 10A include results in the tasks application. In FIG. 10B, the tasks search results have been selected, and are displayed in a same screen that would be displayed if the tasks application had been launched separately. In FIG. 10C, the escape key has been pressed, and the mobile
25 device is again displaying the search results.

[0063] The search results shown in FIG. 10D include results in the music application. In FIG. 10E, the music search results have been selected, and are displayed in a same screen that would be displayed if the music application had been launched separately. In FIG. 10F, the escape key has been pressed, and the mobile
30 device is again displaying the search results.

[0064] The comprehensive search can be accessed from the music application, as shown in FIG. 19G. Search results are shown in FIG. 10H, and extended search results are shown below the on device search results.

[0065] Search results may even be from the options application, as shown in FIG. 10I. When the options search results are selected, they are displayed in the options application, as shown in FIG. 10J. In FIG. 10K, the escape key has been pressed, and the mobile device is again displaying the search results.

[0066] In some cases, the comprehensive search may provide an option to search an application that retrieves data from the internet, such as music streaming applications. Shown in FIG. 10L are search results including an option to search the Slacker music streaming application. The Slacker search option has been selected in FIG. 10M, which displays search results from the slacker application. In FIG. 10N, the escape key has been pressed, and the mobile device is again displaying the search results.

[0067] The comprehensive search may also provide the option of searching the web. Shown in FIG. 10O are search results providing the option of searching Google. The search Google option has been selected in FIG. 10P, and Google has been loaded and is displaying search results. In FIG. 10Q, the escape key has been pressed, and the mobile device is again displaying the search results.

[0068] The comprehensive search may also search social networking notifications, and may be launched from inside a social networking application. For example, the comprehensive search may be launched from inside the Facebook application, as shown in FIG. 10R, may be launched from inside the MySpace application, as shown in FIG. 10S, or may be launched from inside the twitter application, as shown in FIG. 10T.

[0069] FIG. 10U illustrates music search results, including the option of searching outside sources. In FIG. 10V, the Slacker application has been selected for searching.

[0070] The option to perform the comprehensive search may appear in a graphical context menu, as shown in FIG. 10W. Here, the graphical context menu has been launched from inside a music application. In FIG. 10X, the search option in the graphical context menu has been selected, and a variety of additional search options are presented. In FIG. 10Y, a search device option has been selected, and search results are being displayed.

[0071] Shown in FIG. 11A is a menu opened inside a search screen, which includes an options selection. Applications registered with Universal Search will appear here, as shown in FIGS. 11B and 11C. The boxes can be checked or unchecked to include or exclude an application from the universal search results. Excluding an application from the search results does not disable search from within the application, but only from within universal search results, and from an Extend Search.

[0072] A typical search results screen is shown in FIG. 11D. Here, the results are presented in two lines with an application icon displayed adjacent. The first line contains primary identification that helps identify the found item, and the second line contains further supporting information that would assist a user in disambiguating the item. Shown in FIGS. 11E, 11F, and 11G are further examples of search result presentation.

[0073] FIG. 11H shows search results, including message search results. In FIG. 11I, the message search results have been selected, and FIG. 11J shows that once the escape key has been pressed, the search results screen is again displayed.

[0074] Shown in FIG. 11K is a messaging application. A menu containing a search option is called in FIG. 11L. When the search option is selected, a search bar appears at the top of the messaging application, as shown in FIG. 11M. Search results after entry of a search term are shown in FIG. 11N.

[0075] In the top right corner of the search results screen is a focus option, as shown in FIG. 11O. The focus option has been selected, as shown in FIG. 11P. It allows adjustment of the fields of data in the search results that are searched. For

example, in FIG. 11Q, the From field is being selected. FIG. 11R displays the search results after selecting the From field.

[0076] As explained earlier, a menu including a search option may be called from within the messaging application. This is shown in FIG. 11S. Here, there is also
5 an advanced search option, which allows further narrowing of the search results, shown in FIGS. 11T and 11U.

[0077] When the focus is the search bar, keystrokes are entered into the search bar and become part of the search term, as shown in FIG. 11V. However, when the focus is changed to the search results, such as in FIG. 11W, keystrokes are
10 interpreted as shortcut commands. For example, the last entry in the search results list is shown in FIG. 11X, because the "B" key has been pressed. In FIG. 11Y, the focus has returned to the search bar, because the "S" key has been pressed.

[0078] Shown in FIG. 12A are search results, including search results from the calendar application. Selecting the calendar icon from the search results launches
15 the calendar application, which then displays the search results, as shown in FIG. 12B. Pressing the escape key returns to the original search results screen, as shown in FIG. 12C.

[0079] The comprehensive search may be launched from within any application, for example the calendar application, as shown in FIGS. 12D-12F, the
20 memo application, as shown in FIGS. 12G-12I, and the tasks application, as shown in FIGS. 12J-12L.

[0080] The embodiments described herein generally relate to a mobile wireless communication device, hereafter referred to as a mobile device, which can be configured according to an IT policy. It should be noted that the term IT policy, in
25 general, refers to a collection of IT policy rules, in which the IT policy rules can be defined as being either grouped or non-grouped and global or per-user. The terms grouped, non-grouped, global and per-user are defined further below. Examples of applicable communication devices include pagers, cellular phones, cellular smart-phones, wireless organizers, personal digital assistants, computers, laptops,

handheld wireless communication devices, wirelessly enabled notebook computers and the like.

[0081] The mobile device is a two-way communication device with advanced data communication capabilities including the capability to communicate with other mobile devices or computer systems through a network of transceiver stations. The mobile device may also have the capability to allow voice communication. Depending on the functionality provided by the mobile device, it may be referred to as a data messaging device, a two-way pager, a cellular telephone with data messaging capabilities, a wireless Internet appliance, or a data communication device (with or without telephony capabilities). To aid the reader in understanding the structure of the mobile device and how it communicates with other devices and host systems, reference will now be made to FIGS. 4 through 7.

[0082] Referring first to FIG. 4, shown therein is a block diagram of a mobile device 100 which can be used to implement example embodiments disclosed herein. The mobile device 100 includes a number of components such as a main processor 102 that controls the overall operation of the mobile device 100. Communication functions, including data and voice communications, are performed through a communication subsystem 104. The communication subsystem 104 receives messages from and sends messages to a wireless network 200. In this example embodiment of the mobile device 100, the communication subsystem 104 is configured in accordance with the Global System for Mobile Communication (GSM) and General Packet Radio Services (GPRS) standards. The GSM/GPRS wireless network is used worldwide and it is expected that these standards will be superseded eventually by Enhanced Data GSM Environment (EDGE) and Universal Mobile Telecommunications Service (UMTS). New standards are still being defined, but it is believed that they will have similarities to the network behavior described herein, and it will also be understood by persons skilled in the art that the embodiments described herein are intended to use any other suitable standards that are developed in the future. The wireless link connecting the communication subsystem 104 with the wireless network 200 represents one or more different Radio Frequency (RF) channels, operating according to defined protocols specified for GSM/GPRS

communications. With newer network protocols, these channels are capable of supporting both circuit switched voice communications and packet switched data communications.

[0083] Although the wireless network 200 associated with mobile device 100 is
5 a GSM/GPRS wireless network in one example implementation, other wireless
networks may also be associated with the mobile device 100 in variant
implementations. The different types of wireless networks that may be employed
include, for example, data-centric wireless networks, voice-centric wireless networks,
and dual-mode networks that can support both voice and data communications over
10 the same physical base stations. Combined dual-mode networks include, but are not
limited to, Code Division Multiple Access (CDMA) or CDMA2000 networks,
GSM/GPRS networks (as mentioned above), and future third-generation (3G)
networks like EDGE and UMTS. Some other examples of data-centric networks
include WiFi 802.11, Mobitex™ and DataTACTM network communication systems.
15 Examples of other voice-centric data networks include Personal Communication
Systems (PCS) networks like GSM and Time Division Multiple Access (TDMA)
systems.

[0084] The main processor 102 also interacts with additional subsystems such
as a Random Access Memory (RAM) 106, a flash memory 108, a display 110, an
20 auxiliary input/output (I/O) subsystem 112, a data port 114, a keyboard 116, a
speaker 118, a microphone 120, short-range communications 122 and other device
subsystems 124.

[0085] Some of the subsystems of the mobile device 100 perform
communication-related functions, whereas other subsystems may provide “resident”
25 or on-device functions. By way of example, the display 110 and the keyboard 116
may be used for both communication-related functions, such as entering a text
message for transmission over the network 200, and device-resident functions such
as a calculator or task list.

[0086] The mobile device 100 can send and receive communication signals
30 over the wireless network 200 after required network registration or activation

procedures have been completed. Network access is associated with a subscriber or user of the mobile device 100. To identify a subscriber, the mobile device 100 requires a SIM/RUIM card 126 (i.e. Subscriber Identity Module or a Removable User Identity Module) to be inserted into a SIM/RUIM interface 128 in order to

5 communicate with a network. The SIM card or RUIM 126 is one type of a conventional "smart card" that can be used to identify a subscriber of the mobile device 100 and to personalize the mobile device 100, among other things. Without the SIM card 126, the mobile device 100 is not fully operational for communication with the wireless network 200. By inserting the SIM card/RUIM 126 into the

10 SIM/RUIM interface 128, a subscriber can access all subscribed services. Services may include: web browsing and messaging such as e-mail, voice mail, Short Message Service (SMS), and Multimedia Messaging Services (MMS). More advanced services may include: point of sale, field service and sales force automation. The SIM card/RUIM 126 includes a processor and memory for storing

15 information. Once the SIM card/RUIM 126 is inserted into the SIM/RUIM interface 128, it is coupled to the main processor 102. In order to identify the subscriber, the SIM card/RUIM 126 can include some user parameters such as an International Mobile Subscriber Identity (IMSI). An advantage of using the SIM card/RUIM 126 is that a subscriber is not necessarily bound by any single physical mobile device. The

20 SIM card/RUIM 126 may store additional subscriber information for a mobile device as well, including datebook (or calendar) information and recent call information. Alternatively, user identification information can also be programmed into the flash memory 108.

[0087] The mobile device 100 is a battery-powered device and includes a

25 battery interface 132 for receiving one or more rechargeable batteries 130. In at least some embodiments, the battery 130 can be a smart battery with an embedded microprocessor. The battery interface 132 is coupled to a regulator (not shown), which assists the battery 130 in providing power V+ to the mobile device 100. Although current technology makes use of a battery, future technologies such as

30 micro fuel cells may provide the power to the mobile device 100.

[0088] The mobile device 100 also includes an operating system 134 and software components 136 to 146 which are described in more detail below. The operating system 134 and the software components 136 to 146 that are executed by the main processor 102 are typically stored in a persistent store such as the flash memory 108, which may alternatively be a read-only memory (ROM) or similar storage element (not shown). Those skilled in the art will appreciate that portions of the operating system 134 and the software components 136 to 146, such as specific device applications, or parts thereof, may be temporarily loaded into a volatile store such as the RAM 106. Other software components can also be included, as is well known to those skilled in the art.

[0089] The subset of software applications 136 that control basic device operations, including data and voice communication applications, will normally be installed on the mobile device 100 during its manufacture. Other software applications include a message application 138 that can be any suitable software program that allows a user of the mobile device 100 to send and receive electronic messages. Various alternatives exist for the message application 138 as is well known to those skilled in the art. Messages that have been sent or received by the user are typically stored in the flash memory 108 of the mobile device 100 or some other suitable storage element in the mobile device 100. In at least some embodiments, some of the sent and received messages may be stored remotely from the device 100 such as in a data store of an associated host system that the mobile device 100 communicates with.

[0090] The software applications can further include a device state module 140, a Personal Information Manager (PIM) 142, and other suitable modules (not shown). The device state module 140 provides persistence, i.e. the device state module 140 ensures that important device data is stored in persistent memory, such as the flash memory 108, so that the data is not lost when the mobile device 100 is turned off or loses power.

[0091] The PIM 142 includes functionality for organizing and managing data items of interest to the user, such as, but not limited to, e-mail, contacts, calendar

events, voice mails, appointments, and task items. A PIM application has the ability to send and receive data items via the wireless network 200. PIM data items may be seamlessly integrated, synchronized, and updated via the wireless network 200 with the mobile device subscriber's corresponding data items stored and/or associated
5 with a host computer system. This functionality creates a mirrored host computer on the mobile device 100 with respect to such items. This can be particularly advantageous when the host computer system is the mobile device subscriber's office computer system.

[0092] The mobile device 100 also includes a connect module 144, and an IT
10 policy module 146. The connect module 144 implements the communication protocols that are required for the mobile device 100 to communicate with the wireless infrastructure and any host system, such as an enterprise system, that the mobile device 100 is authorized to interface with. Examples of a wireless infrastructure and an enterprise system are given in FIGS. 3 and 4, which are
15 described in more detail below.

[0093] The connect module 144 includes a set of APIs that can be integrated with the mobile device 100 to allow the mobile device 100 to use any number of services associated with the enterprise system. The connect module 144 allows the mobile device 100 to establish an end-to-end secure, authenticated communication
20 pipe with the host system. A subset of applications for which access is provided by the connect module 144 can be used to pass IT policy commands from the host system to the mobile device 100. This can be done in a wireless or wired manner. These instructions can then be passed to the IT policy module 146 to modify the configuration of the device 100. Alternatively, in some cases, the IT policy update can
25 also be done over a wired connection.

[0094] The IT policy module 146 receives IT policy data that encodes the IT policy. The IT policy module 146 then ensures that the IT policy data is authenticated by the mobile device 100. The IT policy data can then be stored in the flash memory 106 in its native form. After the IT policy data is stored, a global notification can be
30 sent by the IT policy module 146 to all of the applications residing on the mobile

device 100. Applications for which the IT policy may be applicable then respond by reading the IT policy data to look for IT policy rules that are applicable.

[0095] The IT policy module 146 can include a parser (not shown), which can be used by the applications to read the IT policy rules. In some cases, another
5 module or application can provide the parser. Grouped IT policy rules, described in more detail below, are retrieved as byte streams, which are then sent (recursively, in a sense) into the parser to determine the values of each IT policy rule defined within the grouped IT policy rule. In at least some embodiments, the IT policy module 146 can determine which applications are affected by the IT policy data and send a
10 notification to only those applications. In either of these cases, for applications that aren't running at the time of the notification, the applications can call the parser or the IT policy module 146 when they are executed to determine if there are any relevant IT policy rules in the newly received IT policy data.

[0096] All applications that support rules in the IT Policy are coded to know the
15 type of data to expect. For example, the value that is set for the "WEP User Name" IT policy rule is known to be a string; therefore the value in the IT policy data that corresponds to this rule is interpreted as a string. As another example, the setting for the "Set Maximum Password Attempts" IT policy rule is known to be an integer, and therefore the value in the IT policy data that corresponds to this rule is interpreted as
20 such.

[0097] After the IT policy rules have been applied to the applicable applications or configuration files, the IT policy module 146 sends an acknowledgement back to the host system to indicate that the IT policy data was received and successfully applied.

25 **[0098]** Other types of software applications can also be installed on the mobile device 100. These software applications can be third party applications, which are added after the manufacture of the mobile device 100. Examples of third party applications include games, calculators, utilities, etc.

[0099] The additional applications can be loaded onto the mobile device 100
30 through at least one of the wireless network 200, the auxiliary I/O subsystem 112, the

data port 114, the short-range communications subsystem 122, or any other suitable device subsystem 124. This flexibility in application installation increases the functionality of the mobile device 100 and may provide enhanced on-device functions, communication-related functions, or both. For example, secure
5 communication applications may enable electronic commerce functions and other such financial transactions to be performed using the mobile device 100.

[00100] The data port 114 enables a subscriber to set preferences through an external device or software application and extends the capabilities of the mobile device 100 by providing for information or software downloads to the mobile device
10 100 other than through a wireless communication network. The alternate download path may, for example, be used to load an encryption key onto the mobile device 100 through a direct and thus reliable and trusted connection to provide secure device communication.

[00101] The data port 114 can be any suitable port that enables data
15 communication between the mobile device 100 and another computing device. The data port 114 can be a serial or a parallel port. In some instances, the data port 114 can be a USB port that includes data lines for data transfer and a supply line that can provide a charging current to charge the battery 130 of the mobile device 100.

[00102] The short-range communications subsystem 122 provides for
20 communication between the mobile device 100 and different systems or devices, without the use of the wireless network 200. For example, the subsystem 122 may include an infrared device and associated circuits and components for short-range communication. Examples of short-range communication standards include standards developed by the Infrared Data Association (IrDA), Bluetooth, and the
25 802.11 family of standards developed by IEEE.

[00103] In use, a received signal such as a text message, an e-mail message, or web page download will be processed by the communication subsystem 104 and input to the main processor 102. The main processor 102 will then process the received signal for output to the display 110 or alternatively to the auxiliary I/O
30 subsystem 112. A subscriber may also compose data items, such as e-mail

messages, for example, using the keyboard 116 in conjunction with the display 110 and possibly the auxiliary I/O subsystem 112. The auxiliary subsystem 112 may include devices such as: a touch screen, mouse, track ball, infrared fingerprint detector, or a roller wheel with dynamic button pressing capability. The keyboard 116
5 is preferably an alphanumeric keyboard and/or telephone-type keypad. However, other types of keyboards may also be used. A composed item may be transmitted over the wireless network 200 through the communication subsystem 104.

[00104] For voice communications, the overall operation of the mobile device 100 is substantially similar, except that the received signals are output to the speaker
10 118, and signals for transmission are generated by the microphone 120. Alternative voice or audio I/O subsystems, such as a voice message recording subsystem, can also be implemented on the mobile device 100. Although voice or audio signal output is accomplished primarily through the speaker 118, the display 110 can also be used to provide additional information such as the identity of a calling party, duration of a
15 voice call, or other voice call related information.

[00105] Referring now to FIG. 5, an example block diagram of the communication subsystem component 104 is shown. The communication subsystem 104 includes a receiver 150, a transmitter 152, as well as associated components such as one or more embedded or internal antenna elements 154 and 156, Local
20 Oscillators (LOs) 158, and a processing module such as a Digital Signal Processor (DSP) 160. The particular design of the communication subsystem 104 is dependent upon the communication network 200 with which the mobile device 100 is intended to operate. Thus, it should be understood that the design illustrated in FIG. 2 serves only as one example.

[00106] Signals received by the antenna 154 through the wireless network 200 are input to the receiver 150, which may perform such common receiver functions as signal amplification, frequency down conversion, filtering, channel selection, and analog-to-digital (A/D) conversion. A/D conversion of a received signal allows more complex communication functions such as demodulation and decoding to be
25 performed in the DSP 160. In a similar manner, signals to be transmitted are
30

processed, including modulation and encoding, by the DSP 160. These DSP-processed signals are input to the transmitter 152 for digital-to-analog (D/A) conversion, frequency up conversion, filtering, amplification and transmission over the wireless network 200 via the antenna 156. The DSP 160 not only processes
5 communication signals, but also provides for receiver and transmitter control. For example, the gains applied to communication signals in the receiver 150 and the transmitter 152 may be adaptively controlled through automatic gain control algorithms implemented in the DSP 160.

[00107] The wireless link between the mobile device 100 and the wireless
10 network 200 can contain one or more different channels, typically different RF channels, and associated protocols used between the mobile device 100 and the wireless network 200. An RF channel is a limited resource that must be conserved, typically due to limits in overall bandwidth and limited battery power of the mobile device 100.

[00108] When the mobile device 100 is fully operational, the transmitter 152 is
15 typically keyed or turned on only when it is transmitting to the wireless network 200 and is otherwise turned off to conserve resources. Similarly, the receiver 150 is periodically turned off to conserve power until it is needed to receive signals or information (if at all) during designated time periods.

[00109] Referring now to FIG. 6, a block diagram of an example implementation
20 of a node 202 of the wireless network 200 is shown. In practice, the wireless network 200 comprises one or more nodes 202. In conjunction with the connect module 144, the mobile device 100 can communicate with the node 202 within the wireless network 200. In the example implementation of FIG. 3, the node 202 is configured in
25 accordance with General Packet Radio Service (GPRS) and Global Systems for Mobile (GSM) technologies. The node 202 includes a base station controller (BSC) 204 with an associated tower station 206, a Packet Control Unit (PCU) 208 added for GPRS support in GSM, a Mobile Switching Center (MSC) 210, a Home Location Register (HLR) 212, a Visitor Location Registry (VLR) 214, a Serving GPRS Support
30 Node (SGSN) 216, a Gateway GPRS Support Node (GGSN) 218, and a Dynamic

Host Configuration Protocol (DHCP) 220. This list of components is not meant to be an exhaustive list of the components of every node 202 within a GSM/GPRS network, but rather a list of components that are commonly used in communications through the network 200.

5 **[00110]** In a GSM network, the MSC 210 is coupled to the BSC 204 and to a landline network, such as a Public Switched Telephone Network (PSTN) 222 to satisfy circuit switched requirements. The connection through the PCU 208, the SGSN 216 and the GGSN 218 to a public or private network (Internet) 224 (also referred to herein generally as a shared network infrastructure) represents the data
10 path for GPRS capable mobile devices. In a GSM network extended with GPRS capabilities, the BSC 204 also contains the Packet Control Unit (PCU) 208 that connects to the SGSN 216 to control segmentation, radio channel allocation and to satisfy packet switched requirements. To track the location of the mobile device 100 and availability for both circuit switched and packet switched management, the HLR
15 212 is shared between the MSC 210 and the SGSN 216. Access to the VLR 214 is controlled by the MSC 210.

[00111] The station 206 is a fixed transceiver station and together with the BSC 204 form fixed transceiver equipment. The fixed transceiver equipment provides wireless network coverage for a particular coverage area commonly referred to as a
20 "cell". The fixed transceiver equipment transmits communication signals to and receives communication signals from mobile devices within its cell via the station 206. The fixed transceiver equipment normally performs such functions as modulation and possibly encoding and/or encryption of signals to be transmitted to the mobile device 100 in accordance with particular, usually predetermined,
25 communication protocols and parameters, under control of its controller. The fixed transceiver equipment similarly demodulates and possibly decodes and decrypts, if necessary, any communication signals received from the mobile device 100 within its cell. Communication protocols and parameters may vary between different nodes. For example, one node may employ a different modulation scheme and operate at
30 different frequencies than other nodes.

[00112] For all mobile devices 100 registered with a specific network, permanent configuration data such as a user profile is stored in the HLR 212. The HLR 212 also contains location information for each registered mobile device and can be queried to determine the current location of a mobile device. The MSC 210 is
5 responsible for a group of location areas and stores the data of the mobile devices currently in its area of responsibility in the VLR 214. Further, the VLR 214 also contains information on mobile devices that are visiting other networks. The information in the VLR 214 includes part of the permanent mobile device data transmitted from the HLR 212 to the VLR 214 for faster access. By moving additional
10 information from a remote HLR 212 node to the VLR 214, the amount of traffic between these nodes can be reduced so that voice and data services can be provided with faster response times and at the same time requiring less use of computing resources.

[00113] The SGSN 216 and the GGSN 218 are elements added for GPRS
15 support; namely packet switched data support, within GSM. The SGSN 216 and the MSC 210 have similar responsibilities within the wireless network 200 by keeping track of the location of each mobile device 100. The SGSN 216 also performs security functions and access control for data traffic on the wireless network 200. The GGSN 218 provides internetworking connections with external packet switched
20 networks and connects to one or more SGSN's 216 via an Internet Protocol (IP) backbone network operated within the network 200. During normal operations, a given mobile device 100 must perform a "GPRS Attach" to acquire an IP address and to access data services. This requirement is not present in circuit switched voice channels as Integrated Services Digital Network (ISDN) addresses are used for
25 routing incoming and outgoing calls. Currently, all GPRS capable networks use private, dynamically assigned IP addresses, thus requiring the DHCP server 220 connected to the GGSN 218. There are many mechanisms for dynamic IP assignment, including using a combination of a Remote Authentication Dial-In User Service (RADIUS) server and a DHCP server. Once the GPRS Attach is complete, a
30 logical connection is established from a mobile device 100, through the PCU 208, and the SGSN 216 to an Access Point Node (APN) within the GGSN 218. The APN

represents a logical end of an IP tunnel that can either access direct Internet compatible services or private network connections. The APN also represents a security mechanism for the network 200, insofar as each mobile device 100 must be assigned to one or more APNs and mobile devices 100 cannot exchange data without first performing a GPRS Attach to an APN that it has been authorized to use. The APN may be considered to be similar to an Internet domain name such as "myconnection.wireless.com".

[00114] Once the GPRS Attach operation is complete, a tunnel is created and all traffic is exchanged within standard IP packets using any protocol that can be supported in IP packets. This includes tunneling methods such as IP over IP as in the case with some IPSecurity (IPsec) connections used with Virtual Private Networks (VPN). These tunnels are also referred to as Packet Data Protocol (PDP) Contexts and there are a limited number of these available in the network 200. To maximize use of the PDP Contexts, the network 200 will run an idle timer for each PDP Context to determine if there is a lack of activity. When a mobile device 100 is not using its PDP Context, the PDP Context can be de-allocated and the IP address returned to the IP address pool managed by the DHCP server 220.

[00115] Referring now to FIG. 7, shown therein is a block diagram illustrating components of an example configuration of a host system 250 that the mobile device 100 can communicate with in conjunction with the connect module 144. The host system 250 will typically be a corporate enterprise or other local area network (LAN), but may also be a home office computer or some other private system, for example, in variant implementations. In this example shown in FIG. 4, the host system 250 is depicted as a LAN of an organization to which a user of the mobile device 100 belongs. Typically, a plurality of mobile devices can communicate wirelessly with the host system 250 through one or more nodes 202 of the wireless network 200.

[00116] The host system 250 comprises a number of network components connected to each other by a network 260. For instance, a user's desktop computer 262a with an accompanying cradle 264 for the user's mobile device 100 is situated on a LAN connection. The cradle 264 for the mobile device 100 can be coupled to

the computer 262a by a serial or a Universal Serial Bus (USB) connection, for example. Other user computers 262b-262n are also situated on the network 260, and each may or may not be equipped with an accompanying cradle 264. The cradle 264 facilitates the loading of information (e.g. PIM data, private symmetric encryption
5 keys to facilitate secure communications) from the user computer 262a to the mobile device 100, and may be particularly useful for bulk information updates often performed in initializing the mobile device 100 for use. The information downloaded to the mobile device 100 may include certificates used in the exchange of messages.

[00117] It will be understood by persons skilled in the art that the user
10 computers 262a-262n will typically also be connected to other peripheral devices, such as printers, etc. which are not explicitly shown in FIG. 4. Furthermore, only a subset of network components of the host system 250 are shown in FIG. 4 for ease of exposition, and it will be understood by persons skilled in the art that the host system 250 will comprise additional components that are not explicitly shown in FIG.
15 4 for this example configuration. More generally, the host system 250 may represent a smaller part of a larger network (not shown) of the organization, and may comprise different components and/or be arranged in different topologies than that shown in the example embodiment of FIG. 7.

[00118] To facilitate the operation of the mobile device 100 and the wireless
20 communication of messages and message-related data between the mobile device 100 and components of the host system 250, a number of wireless communication support components 270 can be provided. In some implementations, the wireless communication support components 270 can include a message management server 272, a mobile data server 274, a contact server 276, and a device manager module
25 278. The device manager module 278 includes an IT Policy editor 280 and an IT user property editor 282, as well as other software components for allowing an IT administrator to configure the mobile devices 100. In an alternative embodiment, there may be one editor that provides the functionality of both the IT policy editor 280 and the IT user property editor 282. The support components 270 also include a data
30 store 284, and an IT policy server 286. The IT policy server 286 includes a processor 288, a network interface 290 and a memory unit 292. The processor 288 controls the

operation of the IT policy server 286 and executes functions related to the standardized IT policy as described below. The network interface 290 allows the IT policy server 286 to communicate with the various components of the host system 250 and the mobile devices 100. The memory unit 292 can store functions used in
5 implementing the IT policy as well as related data. Those skilled in the art know how to implement these various components. Other components may also be included as is well known to those skilled in the art. Further, in some implementations, the data store 284 can be part of any one of the servers.

[00119] In this example embodiment, the mobile device 100 communicates with
10 the host system 250 through node 202 of the wireless network 200 and a shared network infrastructure 224 such as a service provider network or the public Internet. Access to the host system 250 may be provided through one or more routers (not shown), and computing devices of the host system 250 may operate from behind a firewall or proxy server 266. The proxy server 266 provides a secure node and a
15 wireless internet gateway for the host system 250. The proxy server 266 intelligently routes data to the correct destination server within the host system 250.

[00120] In some implementations, the host system 250 can include a wireless VPN router (not shown) to facilitate data exchange between the host system 250 and the mobile device 100. The wireless VPN router allows a VPN connection to be
20 established directly through a specific wireless network to the mobile device 100. The wireless VPN router can be used with the Internet Protocol (IP) Version 6 (IPV6) and IP-based wireless networks. This protocol can provide enough IP addresses so that each mobile device has a dedicated IP address, making it possible to push information to a mobile device at any time. An advantage of using a wireless VPN
25 router is that it can be an off-the-shelf VPN component, and does not require a separate wireless gateway and separate wireless infrastructure. A VPN connection can preferably be a Transmission Control Protocol (TCP)/IP or User Datagram Protocol (UDP)/IP connection for delivering the messages directly to the mobile device 100 in this alternative implementation.

[00121] Messages intended for a user of the mobile device 100 are initially received by a message server 268 of the host system 250. Such messages may originate from any number of sources. For instance, a message may have been sent by a sender from the computer 262b within the host system 250, from a different mobile device (not shown) connected to the wireless network 200 or a different wireless network, or from a different computing device, or other device capable of sending messages, via the shared network infrastructure 224, possibly through an application service provider (ASP) or Internet service provider (ISP), for example.

[00122] The message server 268 typically acts as the primary interface for the exchange of messages, particularly e-mail messages, within the organization and over the shared network infrastructure 224. Each user in the organization that has been set up to send and receive messages is typically associated with a user account managed by the message server 268. Some example implementations of the message server 268 include a Microsoft Exchange® server, a Lotus Domino™ server, a Novell Groupwise™ server, or another suitable mail server installed in a corporate environment. In some implementations, the host system 250 may comprise multiple message servers 268. The message server 268 may also be adapted to provide additional functions beyond message management, including the management of data associated with calendars and task lists, for example.

[00123] When messages are received by the message server 268, they are typically stored in a data store associated with the message server 268. In at least some embodiments, the data store may be a separate hardware unit, such as data store 284, that the message server 268 communicates with. Messages can be subsequently retrieved and delivered to users by accessing the message server 268. For instance, an e-mail client application operating on a user's computer 262a may request the e-mail messages associated with that user's account stored on the data store associated with the message server 268. These messages are then retrieved from the data store and stored locally on the computer 262a. The data store associated with the message server 268 can store copies of each message that is locally stored on the mobile device 100. Alternatively, the data store associated with the message server 268 can store all of the messages for the user of the mobile

device 100 and only a smaller number of messages can be stored on the mobile device 100 to conserve memory. For instance, the most recent messages (i.e. those received in the past two to three months for example) can be stored on the mobile device 100.

5 **[00124]** When operating the mobile device 100, the user may wish to have e-mail messages retrieved for delivery to the mobile device 100. The message application 138 operating on the mobile device 100 may also request messages associated with the user's account from the message server 268. The message application 138 may be configured (either by the user or by an administrator, possibly
10 in accordance with an organization's information technology (IT) policy) to make this request at the direction of the user, at some pre-defined time interval, or upon the occurrence of some pre-defined event. In some implementations, the mobile device 100 is assigned its own e-mail address, and messages addressed specifically to the mobile device 100 are automatically redirected to the mobile device 100 as they are
15 received by the message server 268.

[00125] The message management server 272 can be used to specifically provide support for the management of messages, such as e-mail messages, that are to be handled by mobile devices. Generally, while messages are still stored on the message server 268, the message management server 272 can be used to
20 control when, if, and how messages are sent to the mobile device 100. The message management server 272 also facilitates the handling of messages composed on the mobile device 100, which are sent to the message server 268 for subsequent delivery.

[00126] For example, the message management server 272 may monitor the
25 user's "mailbox" (e.g. the message store associated with the user's account on the message server 268) for new e-mail messages, and apply user-definable filters to new messages to determine if and how the messages are relayed to the user's mobile device 100. The message management server 272 may also compress and encrypt new messages (e.g. using an encryption technique such as Data Encryption
30 Standard (DES), Triple DES, or Advanced Encryption Standard (AES)) and push

them to the mobile device 100 via the shared network infrastructure 224 and the wireless network 200. The message management server 272 may also receive messages composed on the mobile device 100 (e.g. encrypted using Triple DES), decrypt and decompress the composed messages, re-format the composed
5 messages if desired so that they will appear to have originated from the user's computer 262a, and re-route the composed messages to the message server 268 for delivery.

[00127] Certain properties or restrictions associated with messages that are to be sent from and/or received by the mobile device 100 can be defined (e.g. by an
10 administrator in accordance with IT policy) and enforced by the message management server 272. These may include whether the mobile device 100 may receive encrypted and/or signed messages, minimum encryption key sizes, whether outgoing messages must be encrypted and/or signed, and whether copies of all secure messages sent from the mobile device 100 are to be sent to a pre-defined
15 copy address, for example.

[00128] The message management server 272 may also be adapted to provide other control functions, such as only pushing certain message information or pre-defined portions (e.g. "blocks") of a message stored on the message server 268 to the mobile device 100. For example, in some cases, when a message is initially
20 retrieved by the mobile device 100 from the message server 268, the message management server 272 may push only the first part of a message to the mobile device 100, with the part being of a pre-defined size (e.g. 2 KB). The user can then request that more of the message be delivered in similar-sized blocks by the message management server 272 to the mobile device 100, possibly up to a
25 maximum pre-defined message size. Accordingly, the message management server 272 facilitates better control over the type of data and the amount of data that is communicated to the mobile device 100, and can help to minimize potential waste of bandwidth or other resources.

[00129] The mobile data server 274 encompasses any other server that stores
30 information that is relevant to the corporation. The mobile data server 274 may

include, but is not limited to, databases, online data document repositories, customer relationship management (CRM) systems, or enterprise resource planning (ERP) applications.

5 **[00130]** The contact server 276 can provide information for a list of contacts for the user in a similar fashion as the address book on the mobile device 100.

Accordingly, for a given contact, the contact server 276 can include the name, phone number, work address and e-mail address of the contact, among other information.

The contact server 276 can also provide a global address list that contains the contact information for all of the contacts associated with the host system 250.

10 **[00131]** It will be understood by persons skilled in the art that the message management server 272, the mobile data server 274, the contact server 276, the device manager module 278, the data store 284 and the IT policy server 286 do not need to be implemented on separate physical servers within the host system 250. For example, some or all of the functions associated with the message management
15 server 272 may be integrated with the message server 268, or some other server in the host system 250. Alternatively, the host system 250 may comprise multiple message management servers 272, particularly in variant implementations where a large number of mobile devices need to be supported.

20 **[00132]** Alternatively, in some embodiments, the IT policy server 286 can provide the IT policy editor 280, the IT user property editor 282 and the data store 284. In some cases, the IT policy server 286 can also provide the device manager module 278. The processor 288 of the IT policy server 286 can be used to perform the various steps of a method for providing IT policy data that is customizable on a per-user basis as explained further below and in conjunction with FIGS. 5 to 8. The
25 processor 288 can execute the editors 280 and 282. In some cases, the functionality of the editors 280 and 282 can be provided by a single editor. In some cases, the memory unit 292 can provide the data store 284.

30 **[00133]** The device manager module 278 provides an IT administrator with a graphical user interface with which the IT administrator interacts to configure various settings for the mobile devices 100. As mentioned, the IT administrator can use IT

policy rules to define behaviors of certain applications on the mobile device 100 that are permitted such as phone, web browser or Instant Messenger use. The IT policy rules can also be used to set specific values for configuration settings that an organization requires on the mobile devices 100 such as auto signature text,

- 5 WLAN/VoIP/VPN configuration, security requirements (e.g. encryption algorithms, password rules, etc.), specifying themes or applications that are allowed to run on the mobile device 100, and the like.

[00134] Many modifications and other embodiments of the present disclosure will come to the mind of one skilled in the art having the benefit of the teachings
10 presented in the foregoing descriptions and the associated drawings. Therefore, it is understood that the present disclosure is not to be limited to the specific embodiments disclosed, and that modifications and embodiments are intended to be included within the scope of the appended claims.

THAT WHICH IS CLAIMED IS

1. A mobile wireless communications device comprising:
a display;
5 a memory configured to store a plurality of applications and
corresponding application data for each application;
at least one input device; and
a processor configured to
search the application data for a search term to thereby
10 determine whether each application of the plurality thereof has search
results associated therewith,
present applications having search results associated
therewith on an application selection screen, displaying a subset of
information about the search results, on the display,
15 receive selection of an application of the plurality thereof
via the at least one input device, and
execute the selected application to thereby present the
search results on the display.
- 20 2. The mobile wireless communications device of Claim 1, wherein
the processor is further configured to present a search bar on the display based upon
an input received from the at least one input device during presentation of the
application selection screen, and to receive entry of the search term into the search
bar via the at least one input device.
- 25 3. The mobile wireless communications device of Claim 1, wherein
the processor is configured to present the applications having search results
associated therewith on the display by presenting respective icons representing the
applications on the display, and by presenting an indication of a quantity of search
30 results for each icon adjacent thereto.

4. The mobile wireless communications device of Claim 3, wherein the processor is configured to present the indication of the quantity of search results as a number.

5 5. The mobile wireless communications device of Claim 1, wherein the application data comprises application icons and labels associated therewith.

6. The mobile wireless communications device of Claim 1, wherein the processor, when executing the application, permits modification of the search
10 term; wherein the processor is further configured to search the application data corresponding to the application for the modified search term to thereby generate modified search results; and wherein the processor, when executing the application, is further configured to present the modified search results on the display.

15 7. The mobile wireless communications device of Claim 1, wherein the processor is also configured to present a web search icon with the search results, and to search at least one associated web site for the search term based upon selection of the web search icon.

20 8. The mobile wireless communications device of Claim 1, wherein the memory is also configured to store an Internet enabled application having application data associated therewith stored on an external server; wherein the processor is also configured to present an icon for the Internet enabled application with the search results; and wherein the processor is configured to search the
25 external server for the search term via execution of the Internet enabled application, based upon selection of the icon for the Internet enabled application.

9. The mobile wireless communications device of Claim 8, wherein the Internet enabled application comprises a music streaming application.

30 10. The mobile wireless communications device of Claim 8, wherein the Internet enabled application comprises a social networking application.

11. A mobile wireless communications device comprising:
a display;
a memory configured to store a plurality of applications and
5 corresponding application data for each application;
at least one input device; and
a processor configured to
present a search bar on the display based upon an input
received from the at least one input device during presentation of an
10 application selection screen,
receive entry of a search term into the search bar via the
at least one input device,
search the application data for the search term to thereby
determine whether each application of the plurality thereof has search
15 results associated therewith,
present applications having search results associated
therewith on an application selection screen, displaying a subset of
information about the search results, on the display, by presenting
respective icons representing the applications on the display, and by
20 presenting an indication of a quantity of search results for each icon
adjacent thereto,
receive selection of an application of the plurality thereof
via the at least one input device, and
execute the selected application to thereby present the
25 search results on the display.

12. The mobile wireless communications device of Claim 11,
wherein the processor, when executing the application, permits modification of the
search term; wherein the processor is further configured to search the application
30 data corresponding to the application for the modified search term to thereby
generate modified search results; and wherein the processor, when executing the

application, is further configured to present the modified search results on the display.

13. The mobile wireless communications device of Claim 11,
5 wherein the processor is also configured to present a web search icon with the search results, and to search at least one associated web site for the search term based upon selection of the web search icon.

14. The mobile wireless communications device of Claim 11,
10 wherein the memory is also configured to store an Internet enabled application having application data associated therewith stored on an external server; wherein the processor is also configured to present an icon for the Internet enabled application with the search results; and wherein the processor is configured to search the external server for the search term via execution of the Internet enabled
15 application, based upon selection of the icon for the Internet enabled application.

15. A method of searching application data using a mobile wireless communications device comprising:
storing a plurality of applications and corresponding application data for
20 each application in a memory of the mobile wireless communication device;
searching the application data for a search term to thereby determine whether each application of the plurality thereof has search results associated therewith, using a processor of the mobile wireless communications device;
presenting applications having search results associated therewith on
25 an application selection screen, displaying a subset of information about the search results, on a display of the mobile wireless communications device, using the processor;
receiving selection of an application of the plurality thereof via at least one input device of the mobile wireless communications device, using the processor;
30 and
executing the selected application to thereby present the search results on the display, using the processor.

16. The method of Claim 15, further comprising presenting a search bar on the display based upon an input received from the at least one input device during presentation of the application selection screen, and receiving entry of the search term into the search bar via the at least one input device, using the processor.

17. The method of Claim 15, wherein the applications having search results associated therewith are presented on the display by presenting respective icons representing the applications on the display, and by presenting an indication of a quantity of search results for each icon adjacent thereto, using the processor.

18. The method of Claim 15, further comprising permitting modification of the search term when executing the application, using the processor; further comprising searching the application data corresponding to the application for the modified search term to thereby generate modified search results; and further comprising presenting the modified search results on the display, when executing the application, using the processor.

19. The method of Claim 15, further comprising presenting a web search icon with the search results, and searching at least one associated web site for the search term based upon selection of the web search icon, using the processor.

20. The method of Claim 15, further comprising storing, in the memory, an Internet enabled application having application data associated therewith stored on an external server; further comprising presenting an icon for the Internet enabled application with the search results, using the processor; and further comprising searching the external server for the search term via execution of the Internet enabled application, based upon selection of the icon for the Internet enabled application, using the processor.

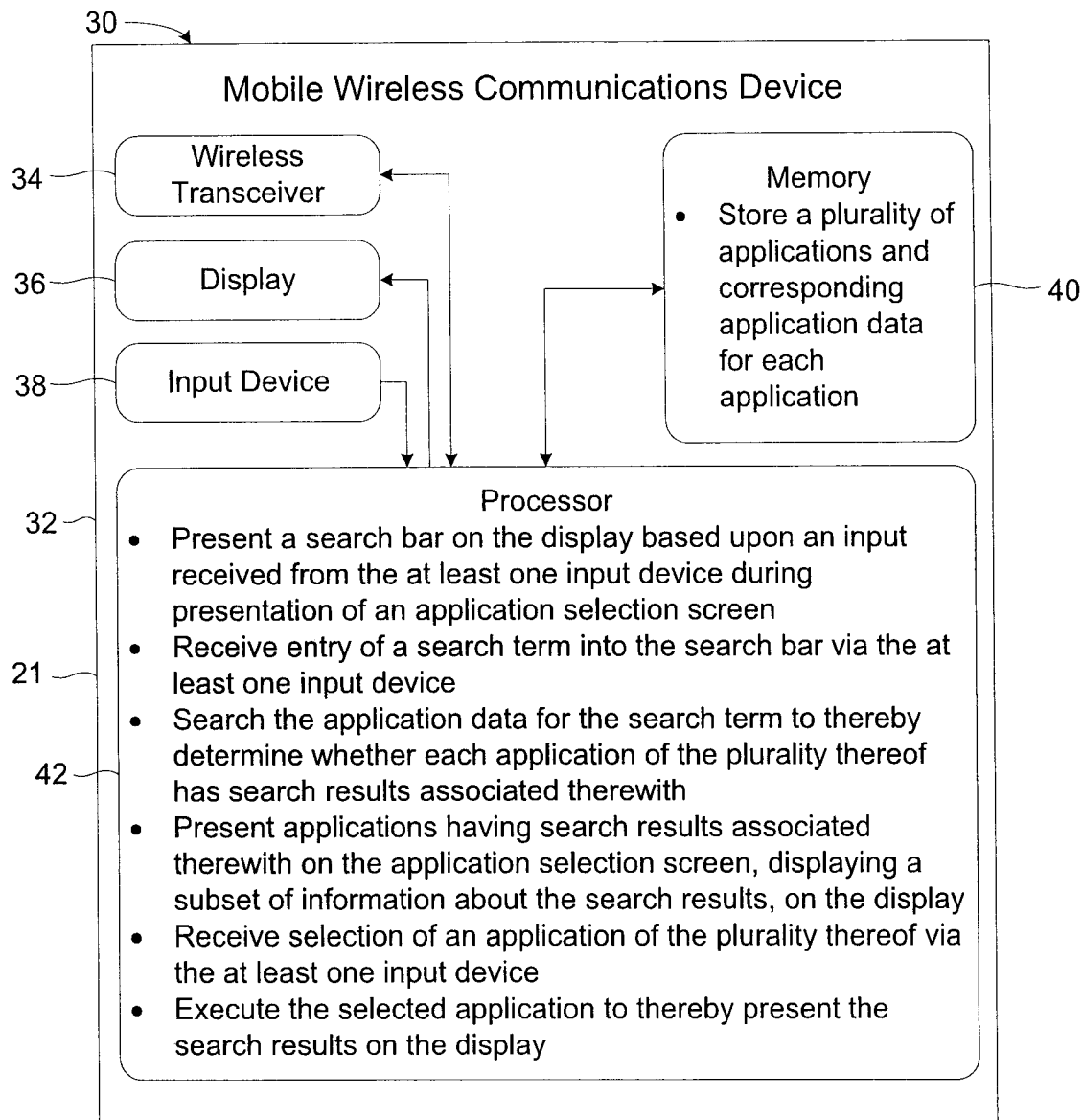


FIG. 1

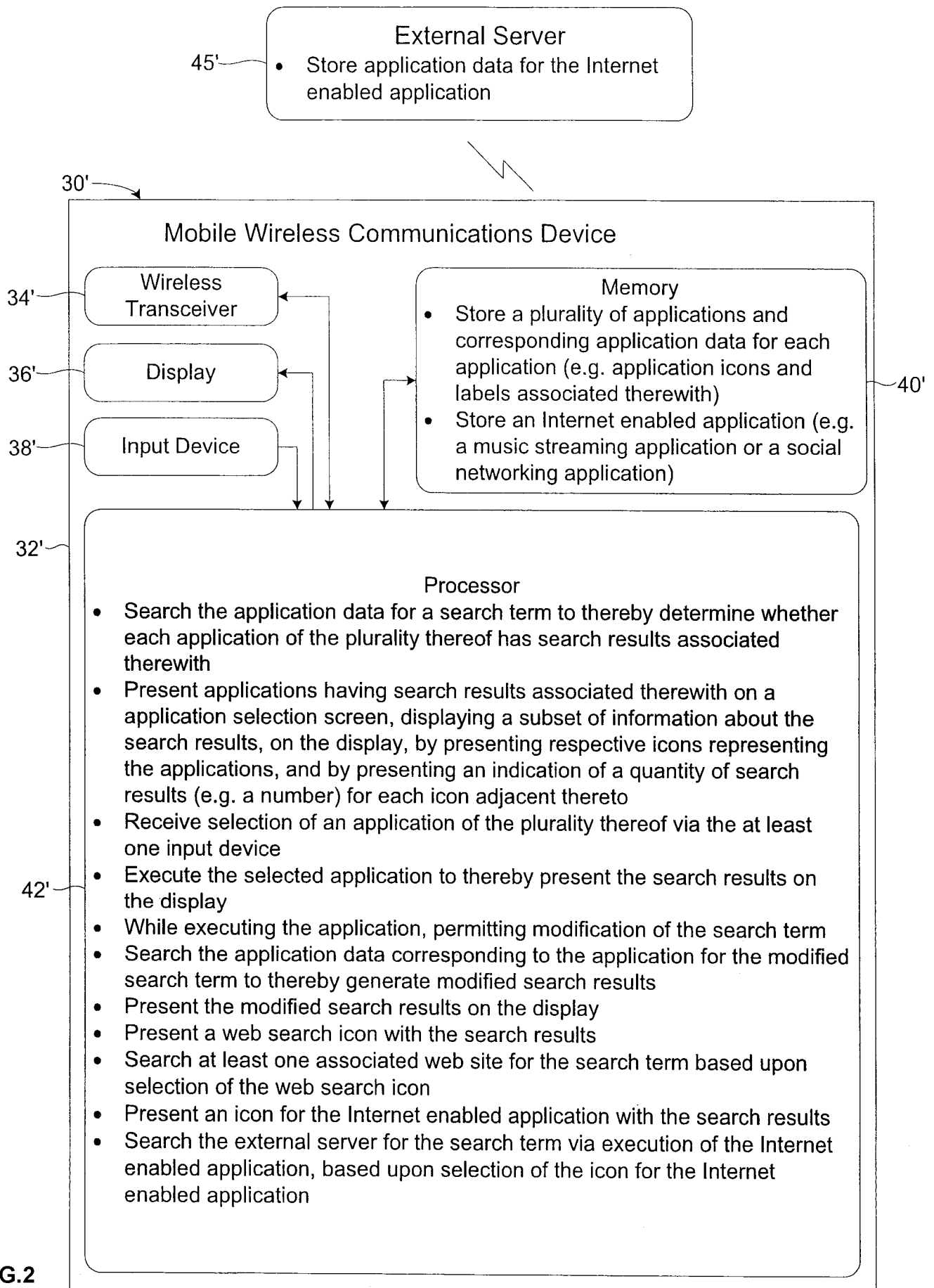


FIG.2

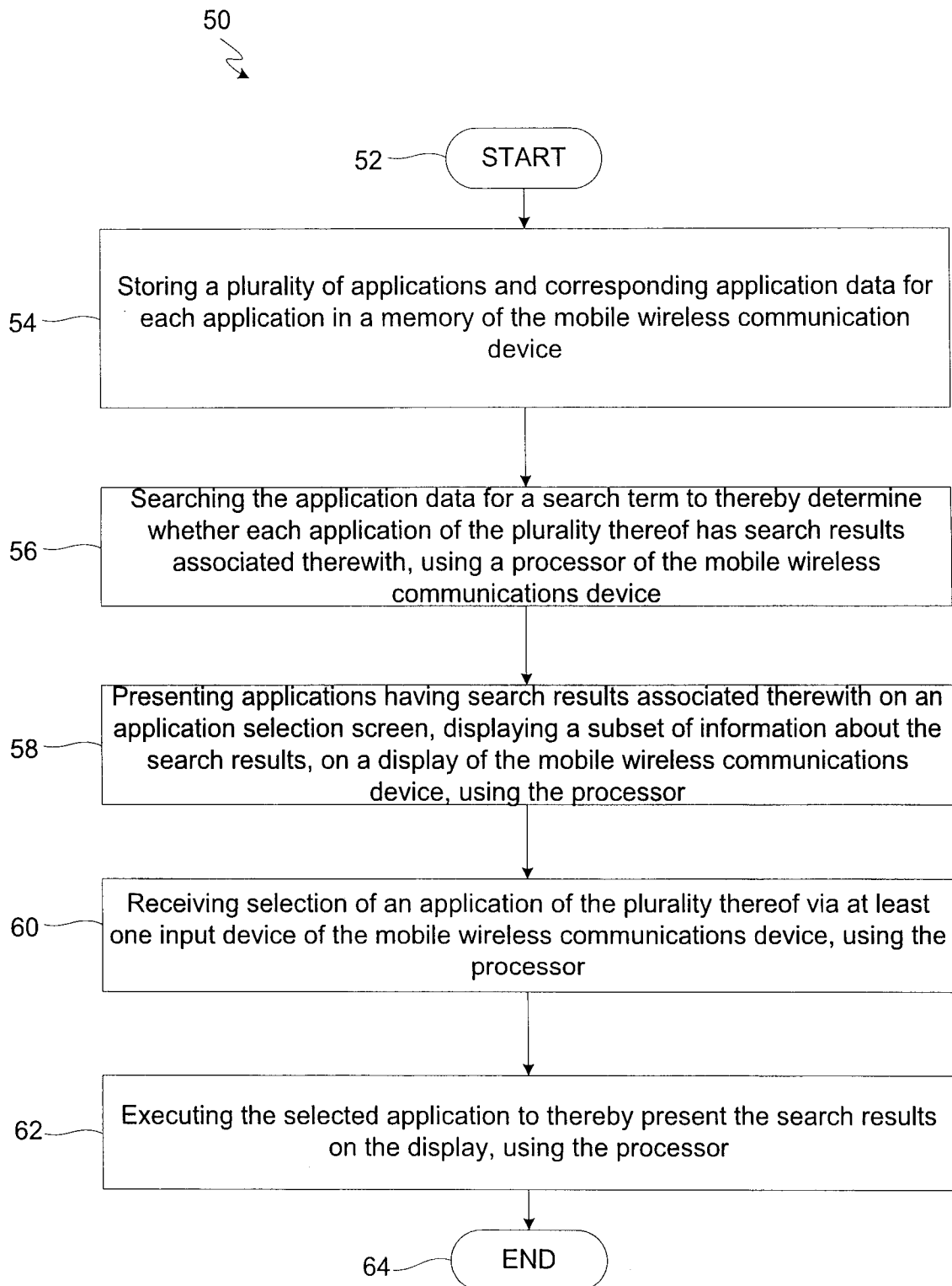


FIG. 3

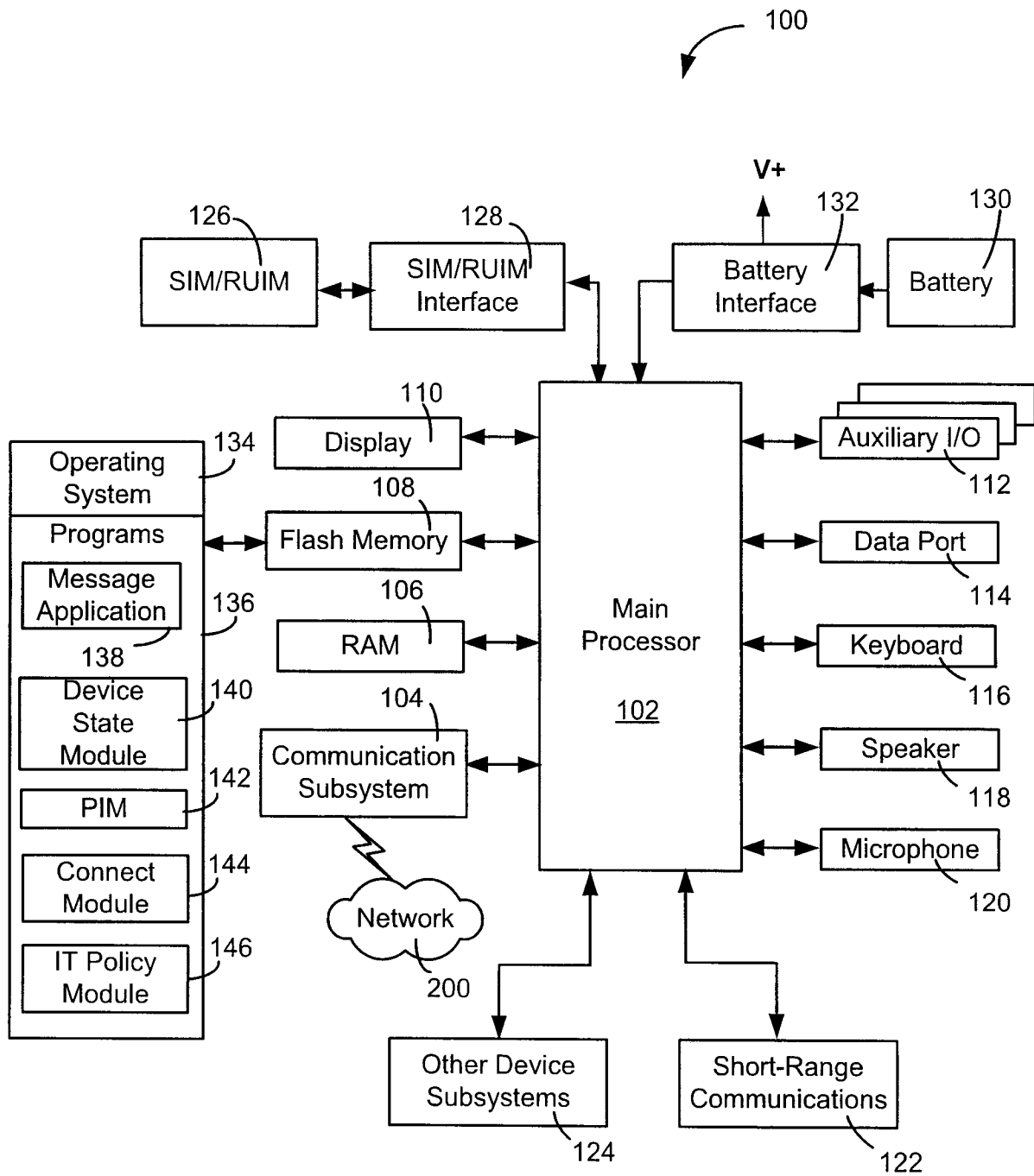


FIG. 4

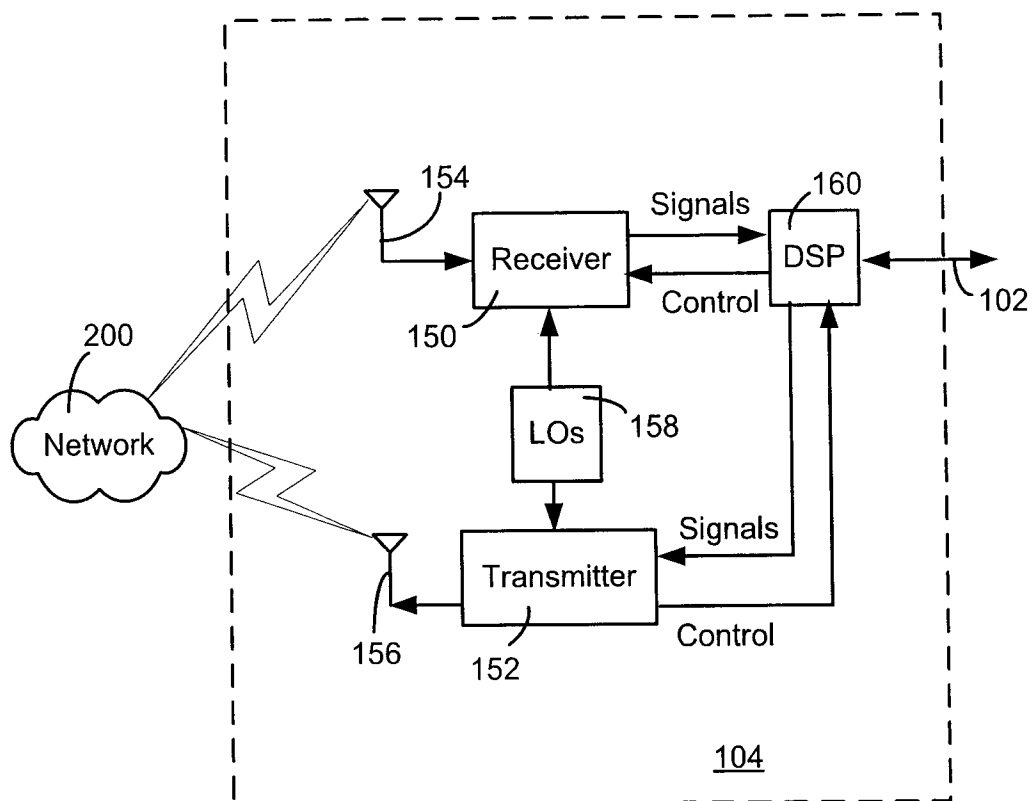


FIG. 5

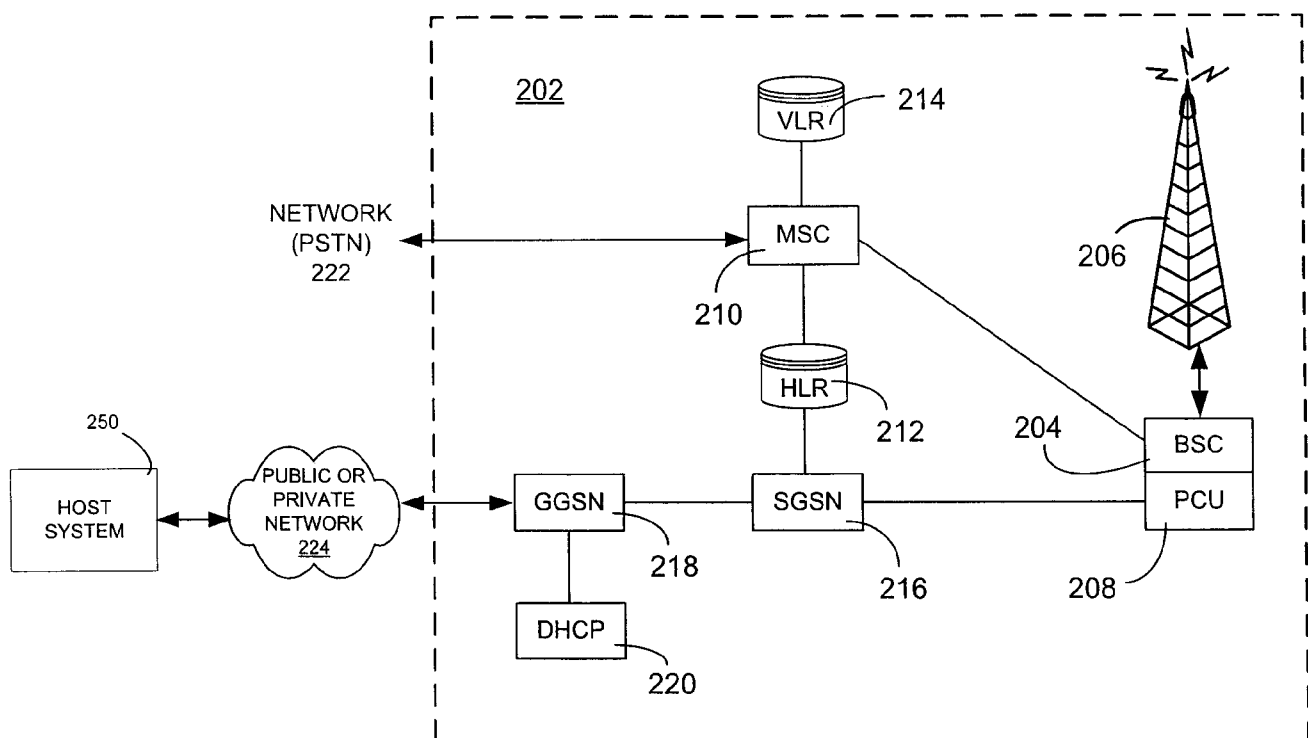


FIG. 6

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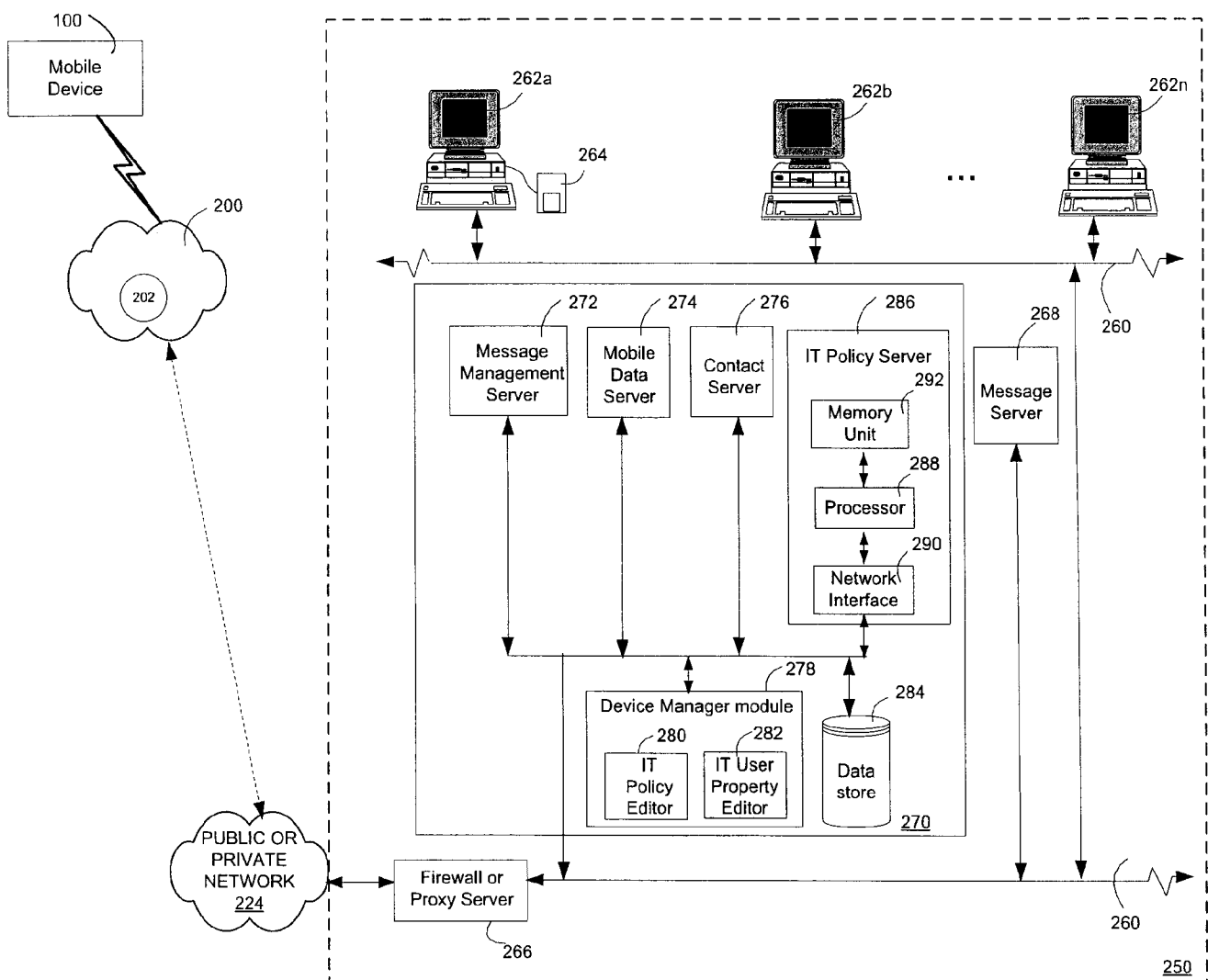


FIG. 7

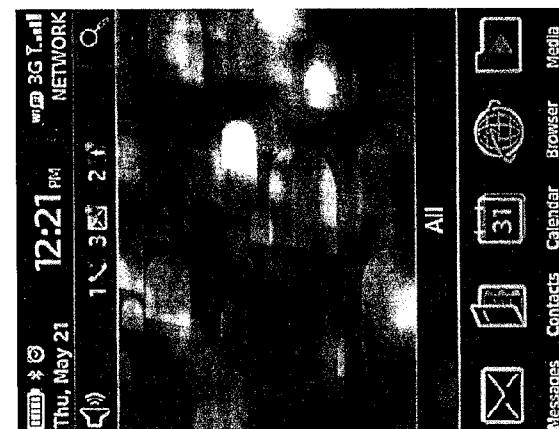


FIG. 8A

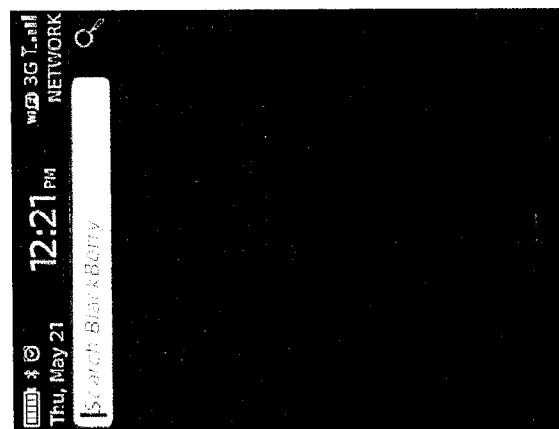


FIG. 8B

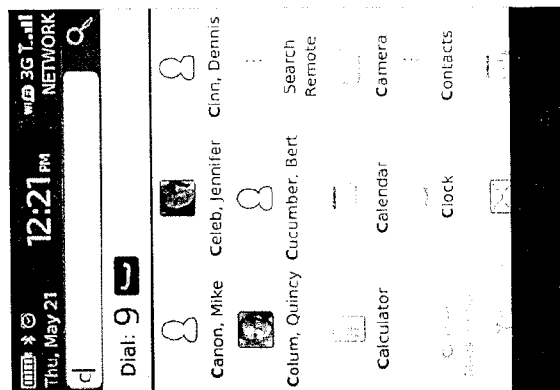


FIG. 8C

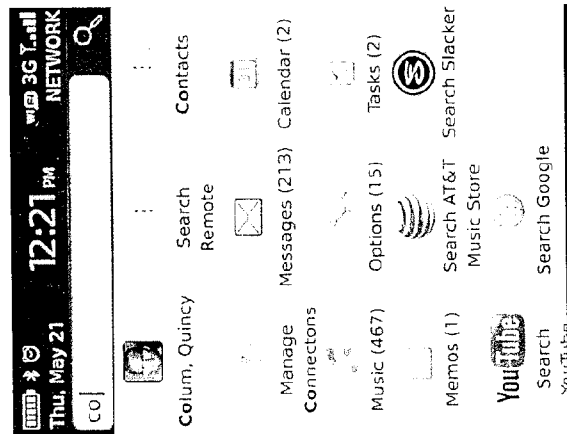


FIG. 8D

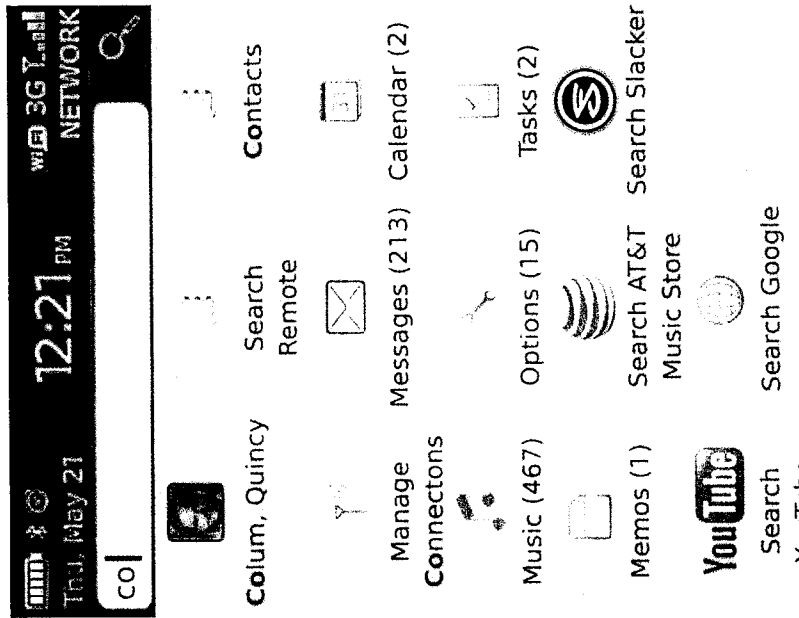


FIG. 8F

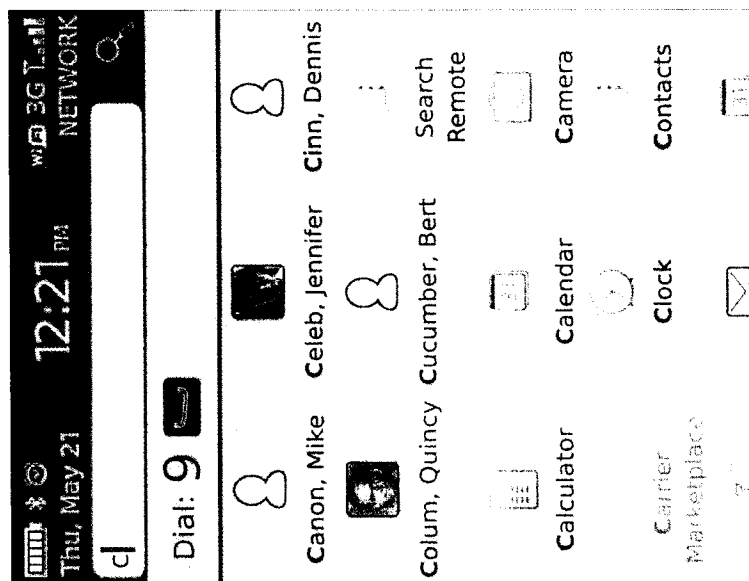


FIG. 8E

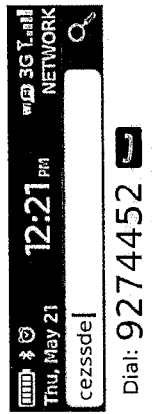


FIG. 8J

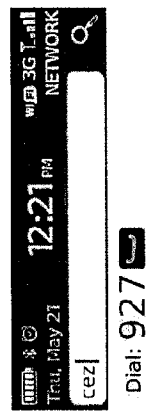


FIG. 8I

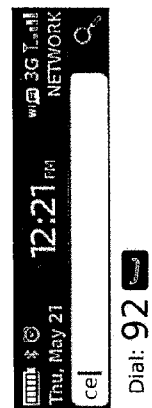


FIG. 8H

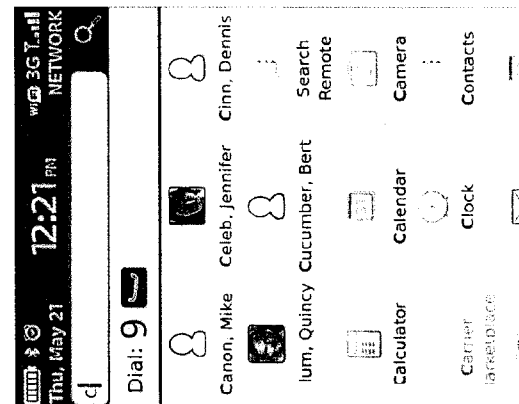


FIG. 8G

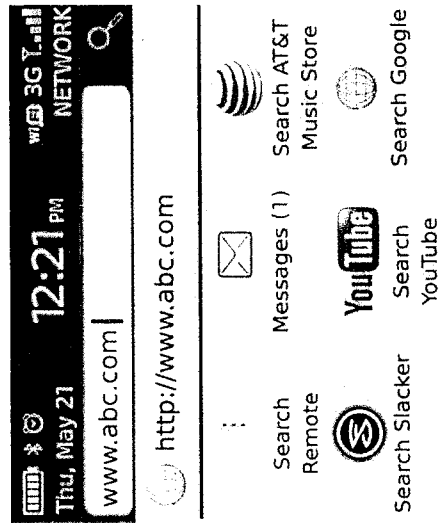


FIG. 8M

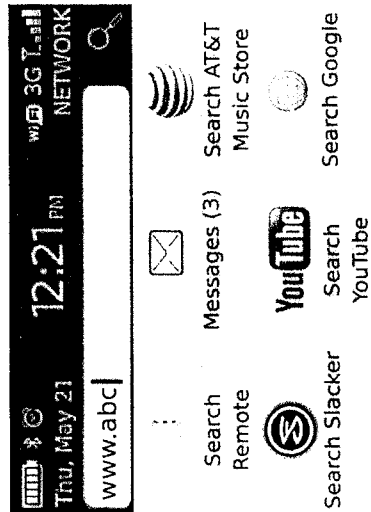


FIG. 8L

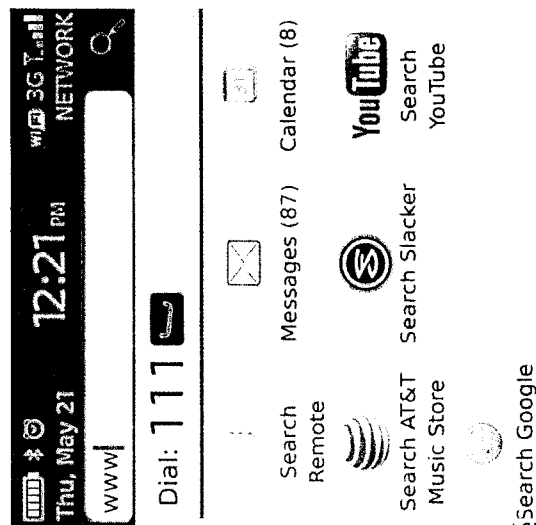


FIG. 8K

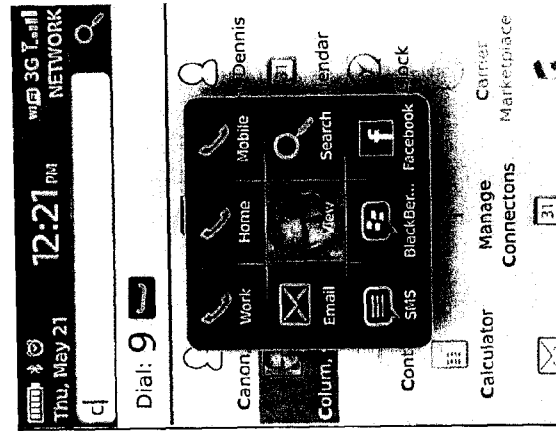


FIG. 8Q

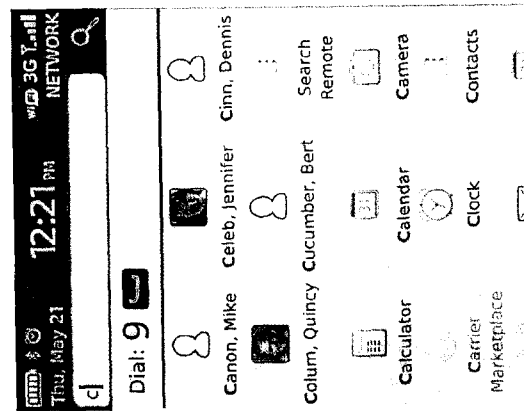


FIG. 8P

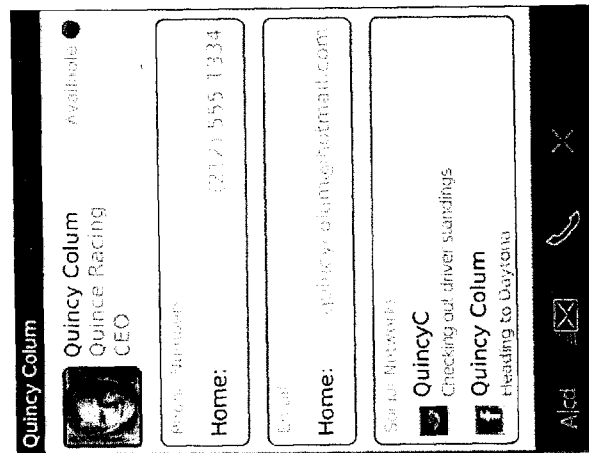


FIG. 8O

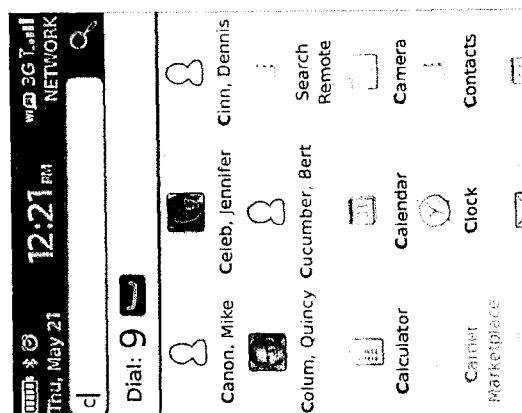


FIG. 8N

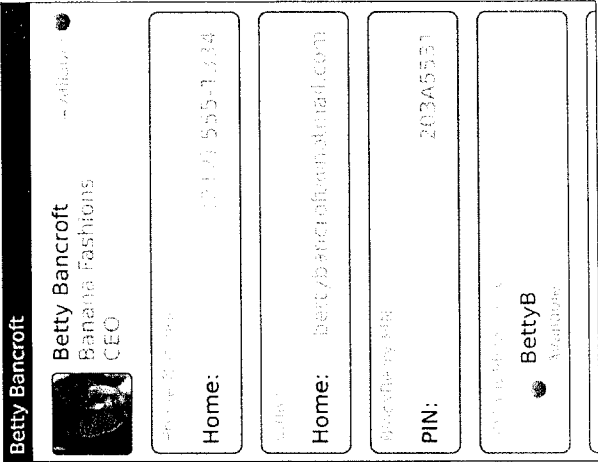


FIG. 8T

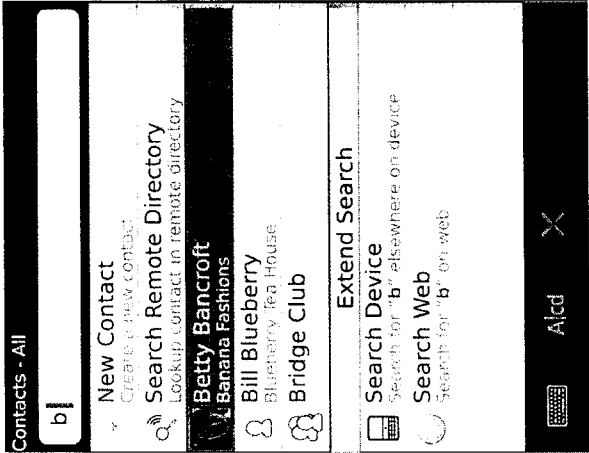


FIG. 8S

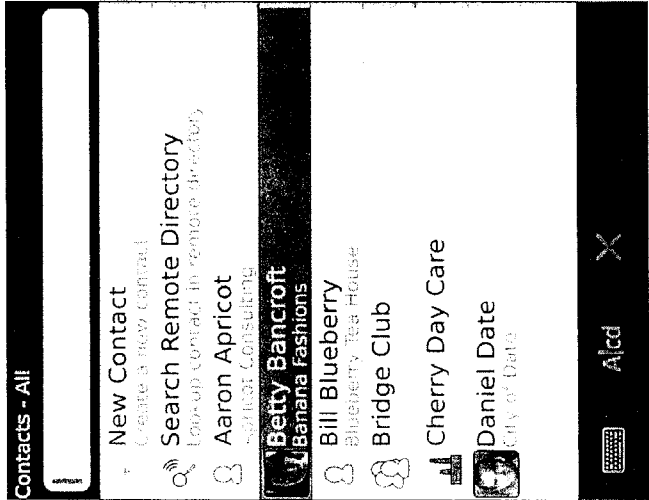


FIG. 8R

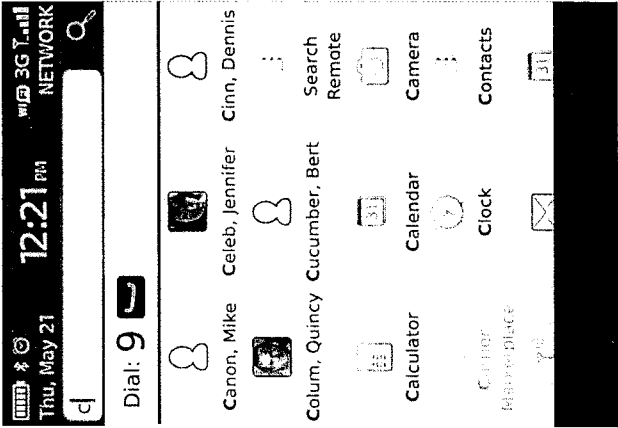


FIG. 8W

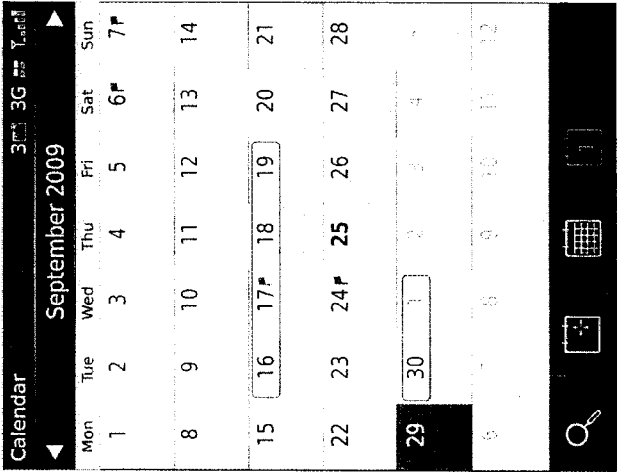


FIG. 8V

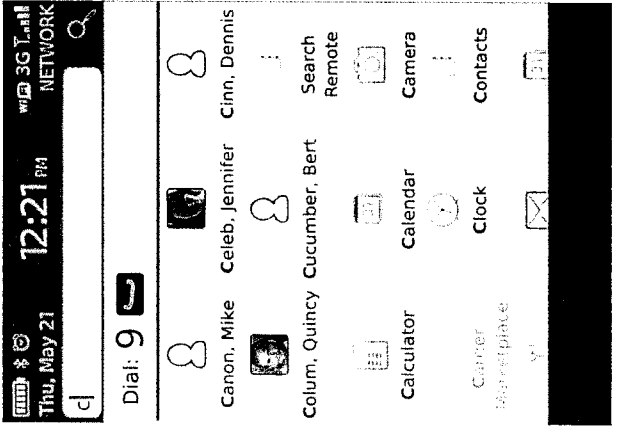


FIG. 8U

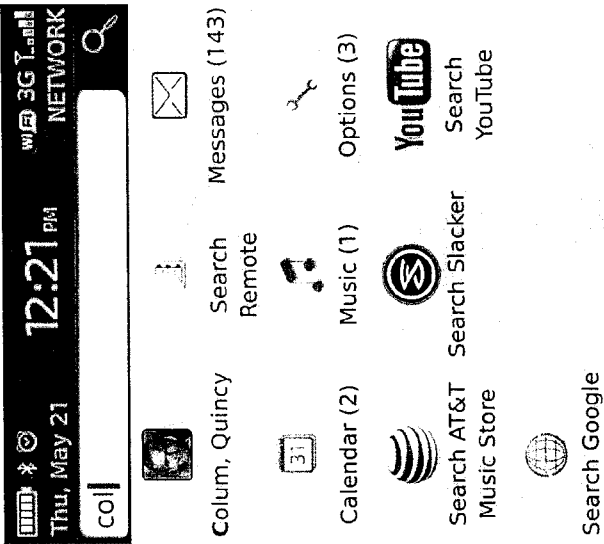


FIG. 8Z

10:59AM	3G	T-Mobile
col	Search Results (143)	
Tues, Nov 23rd 2009		
Colin Davidson	1:12pm	
Re: Holiday Pictures		
Mon, Nov 22nd 2009		
Colin Davidson	11:18am	
Re: Holiday Pictures		
Sat, Nov 20th 2009		
Colin Davidson	1:22pm	
Re: Squash Tue 7:45pm		
Tue, Nov 16th 2009		
Jennifer Celeb	1:22pm	
FW: Color choices for next year		
Tue, Nov 9th 2009		
Colin Davidson	3:22pm	
Meeting at the school		
Colton Chasey	1:22pm	
Tennis club closed		

FIG. 8Y

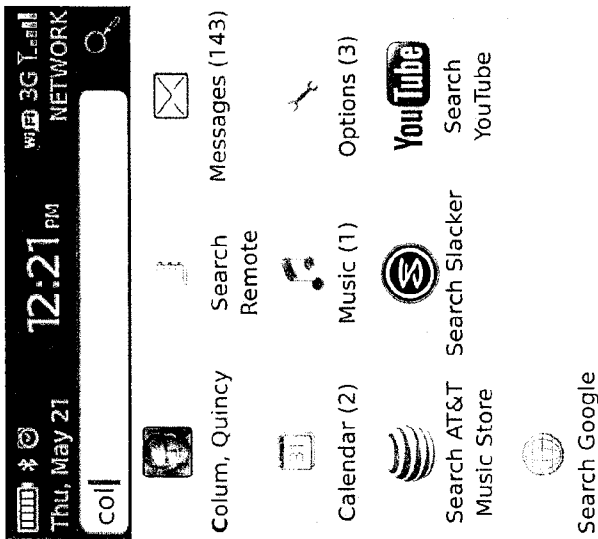


FIG. 8X

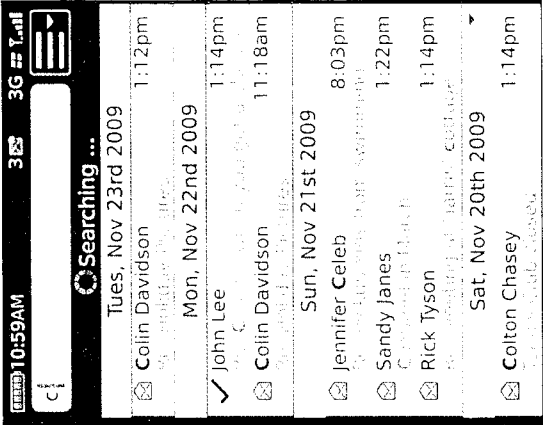


FIG. 9D

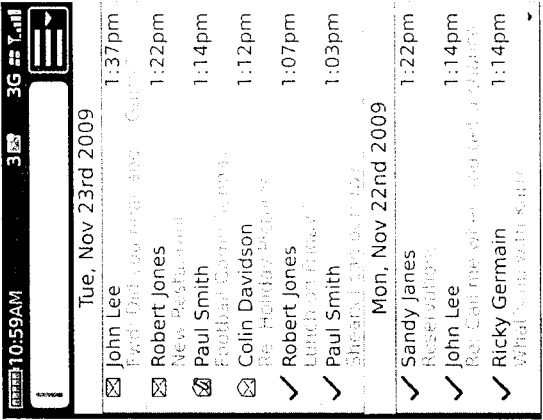


FIG. 9C

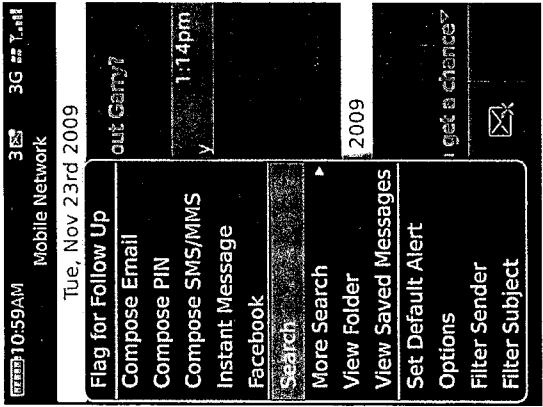


FIG. 9B

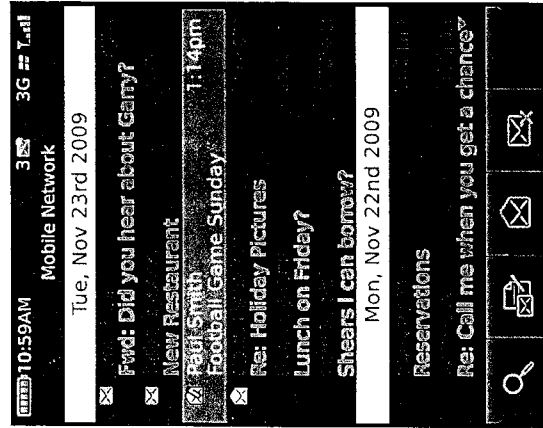


FIG. 9A

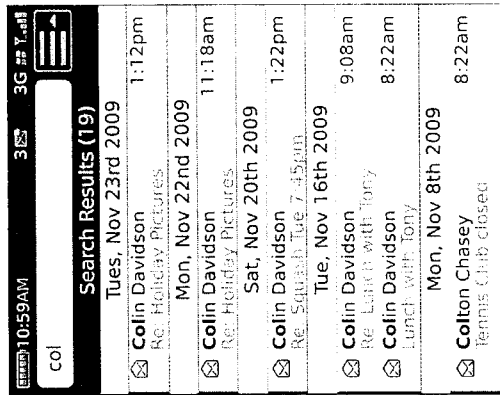


FIG. 9H

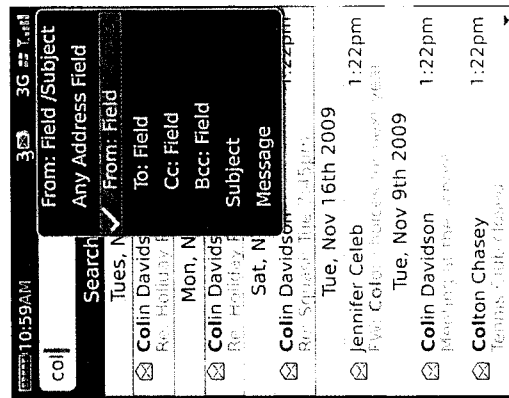


FIG. 9G

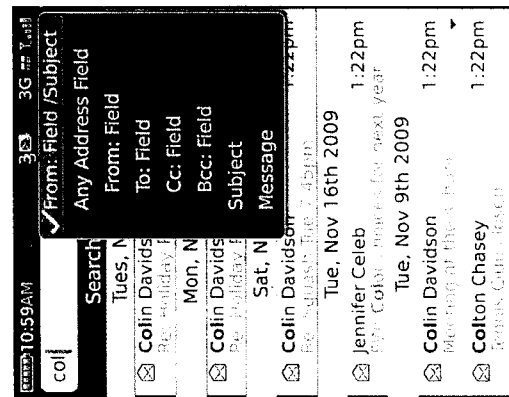


FIG. 9F

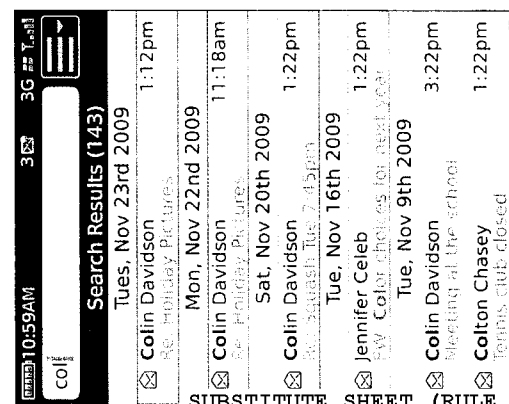


FIG. 9E

Messages - Advanced Search

Name:

Appears in: Any Address Field

Subject:

Body:

☐ include encrypted messages

Search in:

Accounts: All accounts

Folders: All folders

Show:

Message Type: All Email

Message Status: All folders

Search

FIG. 9K

Messages - Advanced Search

Search Messages:

On device

Find matches where:

Name:

Appears in: Any Address Field

Subject:

Body:

☐ include encrypted messages

Search in:

Accounts: All accounts

Folders: All folders

Show:

Message Type: All Email

FIG. 9J

10:59AM 3G Mobile Network Tue, Nov 23rd 2009

Flag for Follow Up

Compose Email

Compose PIN

Compose SMS/MMS

Instant Message

Facebook

Search

More Search

View Folder

View Saved Mess

Set Default Alert

Options

Filter Sender

Filter Subject

Search by Sender

Search by Subject

Advanced Search ...

Send Message

FIG. 9I

10:59AM	col	3G	Y	143
Search Results (143)				
Tues, Nov 23rd 2009				
☒	Colin Davidson	Re: Holiday Pictures	1:12pm	
Mon, Nov 22nd 2009				
☒	Colin Davidson	Re: Holiday Pictures	11:18am	
Sat, Nov 20th 2009				
☒	Colin Davidson	Re: Squash Tue 7:45pm	1:22pm	
Tue, Nov 16th 2009				
☒	Jennifer Celeb	FW: Color choices for next year	1:22pm	
Tue, Nov 9th 2009				
☒	Colin Davidson	Meeting at the school	1:22pm	
☒	Colton Chasey	Tennis Club closed	1:22pm	

FIG. 9O

10:59AM	col	3G	Y	143
Search Results (143)				
Wednesday's no good for me				
☒	Valerie Collins	School meeting on the 5th	1:17pm	
☒	Sandy Jones	Can't make it. Colton is sick.	1:17pm	
☒	Colin Davidson	Can't make it on Friday	1:12pm	
Mon, Sep 22nd 2009				
☒	John Lee	I have your Coleman stove	11:18am	
Sat, Sep 20th 2009				
☒	Colin Davidson	Bike ride Tues?	1:22pm	
Extend Search				
Search Device				
Search for "col" anywhere on device				
Search Web				
Search for "col" on web				

FIG. 9N

10:59AM	col	3G	Y	143
Search Results (143)				
Tues, Nov 23rd 2009				
☒	Colin Davidson	Re: Holiday Pictures	1:12pm	
Mon, Nov 22nd 2009				
☒	Colin Davidson	Re: Holiday Pictures	11:18am	
Sat, Nov 20th 2009				
☒	Colin Davidson	Re: Squash Tue 7:45pm	1:22pm	
Tue, Nov 16th 2009				
☒	Jennifer Celeb	FW: Color choices for next year	1:22pm	
Tue, Nov 9th 2009				
☒	Colin Davidson	Meeting at the school	1:22pm	
☒	Colton Chasey	Tennis Club closed	1:22pm	

FIG. 9M

10:59AM	col	3G	Y	143
Search Results (143)				
Tues, Nov 23rd 2009				
☒	Colin Davidson	Re: Holiday Pictures	1:12pm	
Mon, Nov 22nd 2009				
☒	Colin Davidson	Re: Holiday Pictures	11:18am	
Sat, Nov 20th 2009				
☒	Colin Davidson	Re: Squash Tue 7:45pm	1:22pm	
Tue, Nov 16th 2009				
☒	Jennifer Celeb	FW: Color choices for next year	1:22pm	
Tue, Nov 9th 2009				
☒	Colin Davidson	Meeting at the school	1:22pm	
☒	Colton Chasey	Tennis Club closed	1:22pm	

FIG. 9L

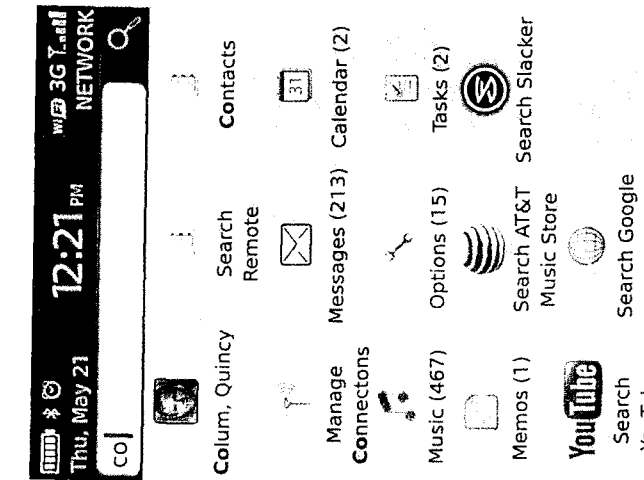


FIG. 9R

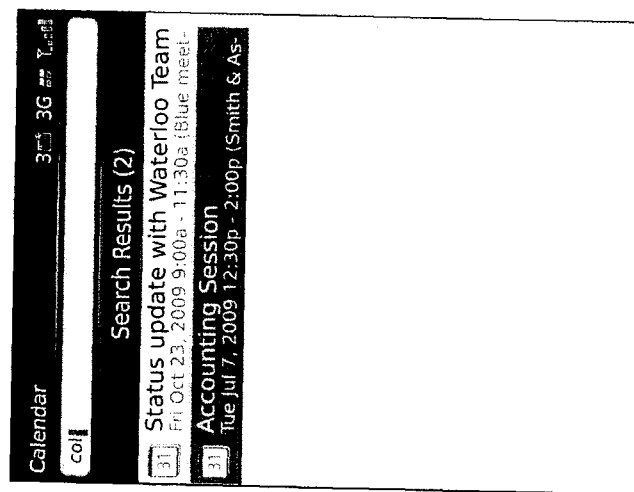


FIG. 9Q

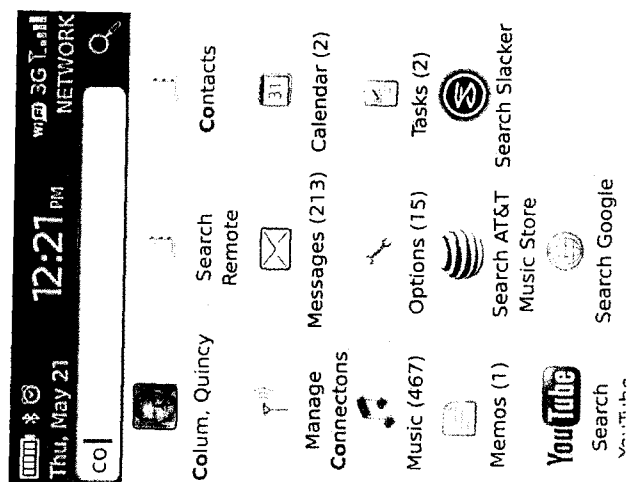


FIG. 9P

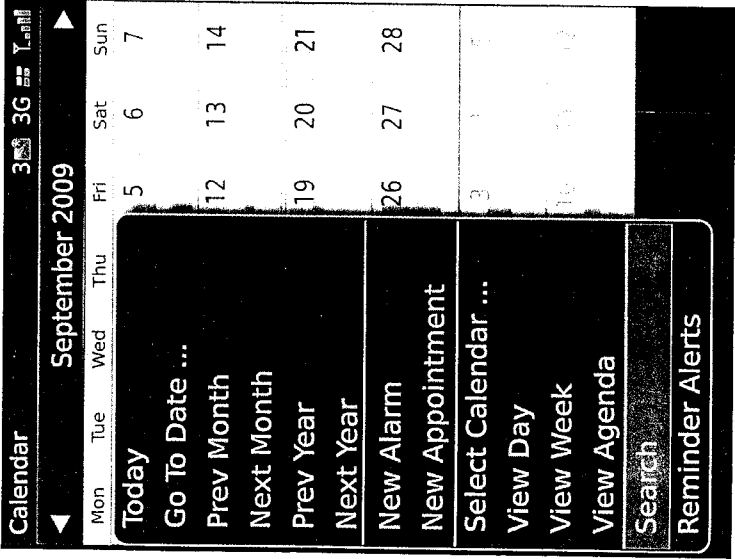


FIG. 9S

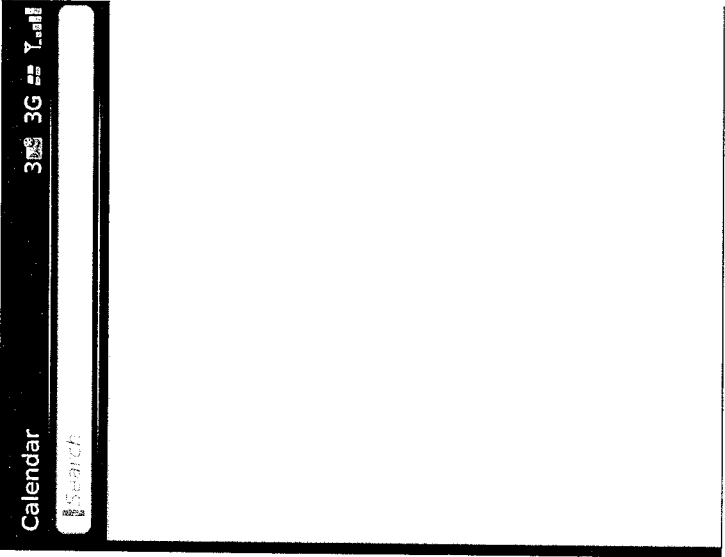


FIG. 9T

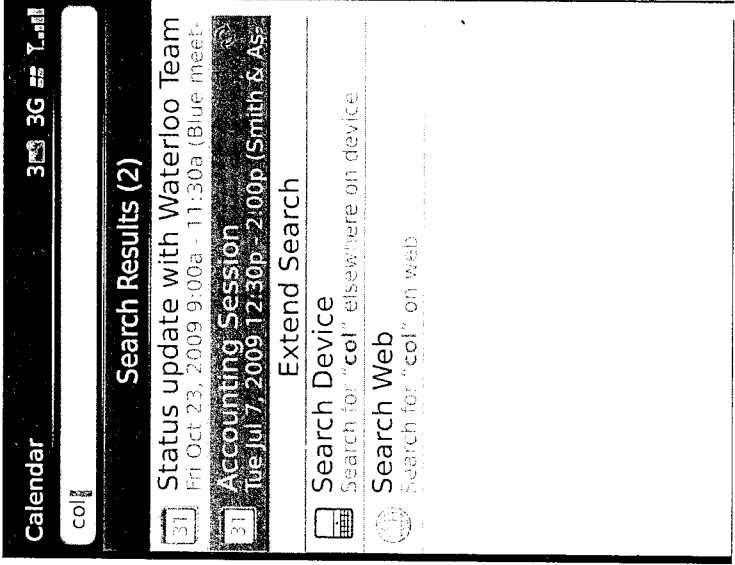


FIG. 9U

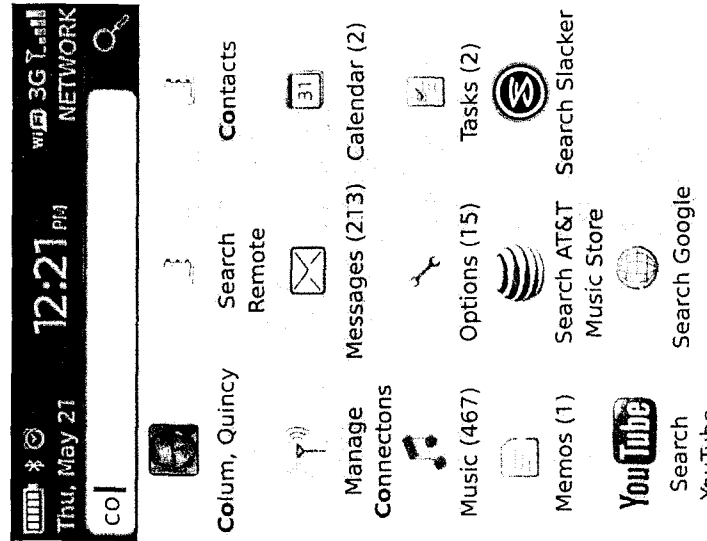


FIG. 9X

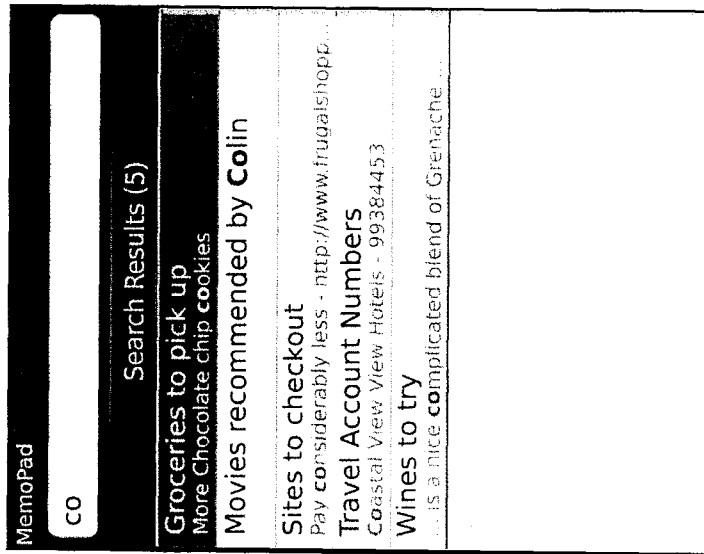


FIG. 9W

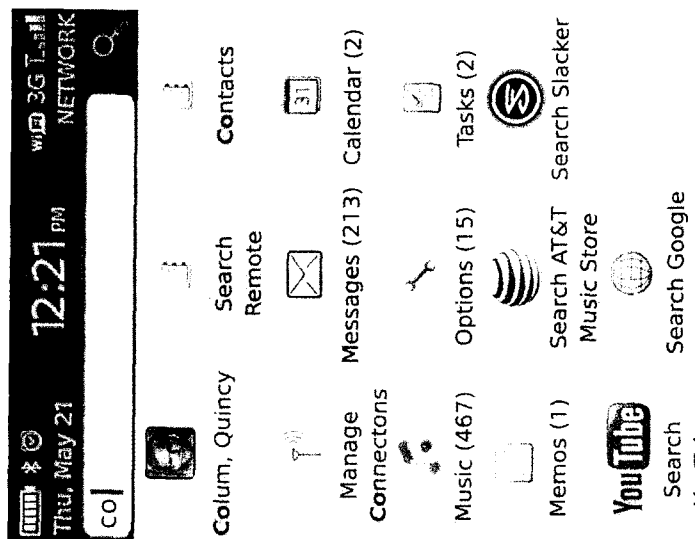


FIG. 9V

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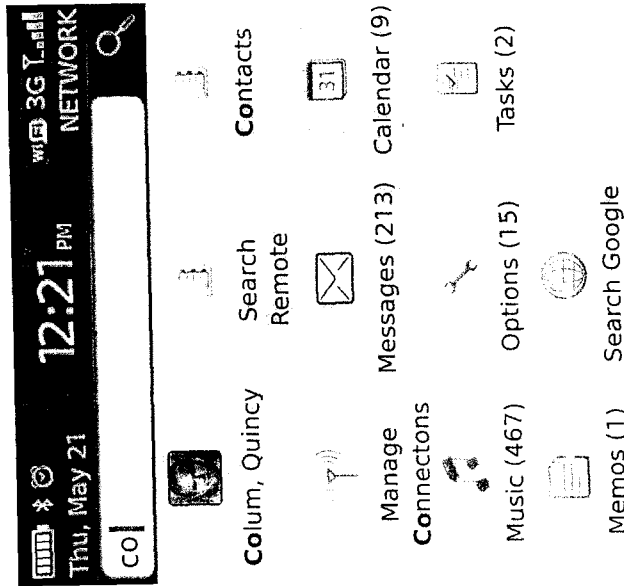


FIG. 10C

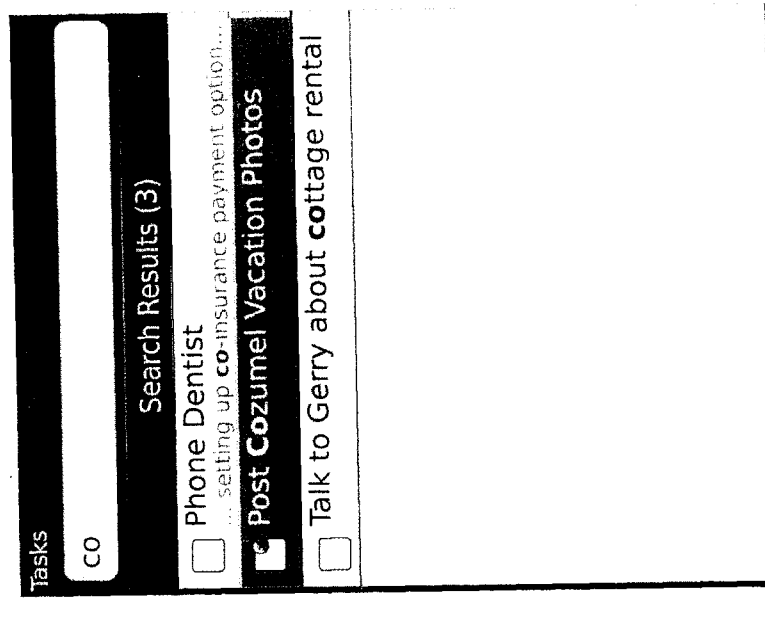


FIG. 10B

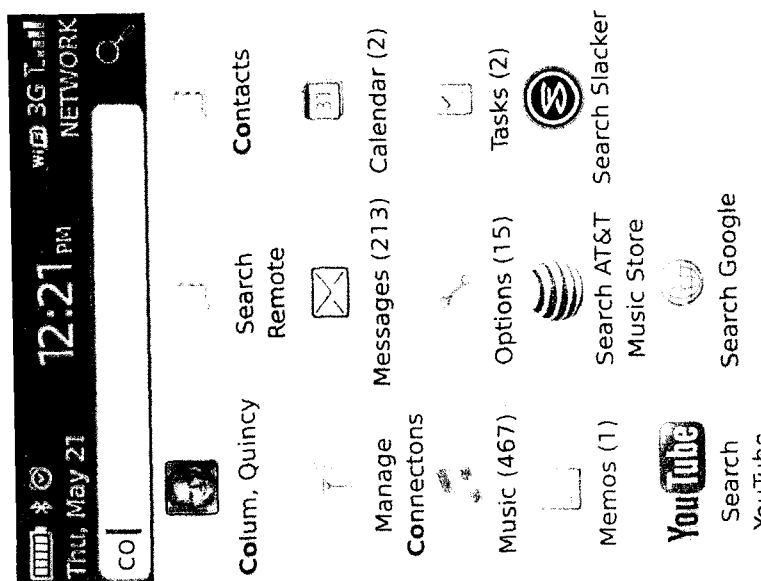


FIG. 10A

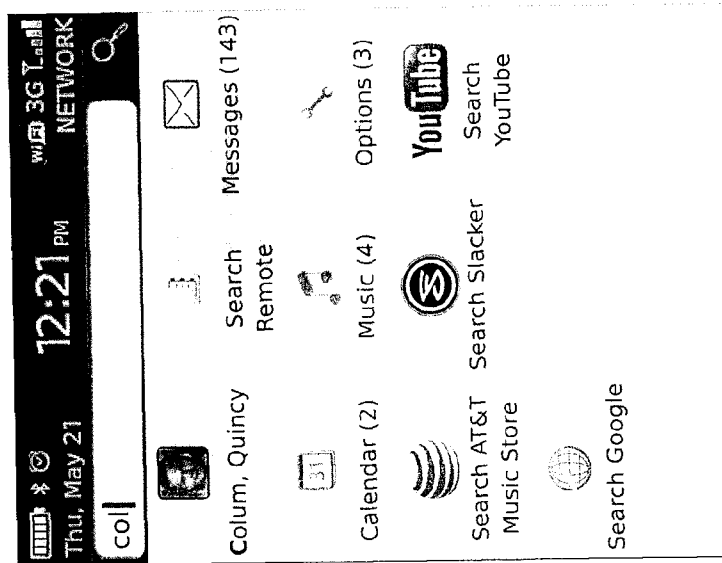


FIG. 10F

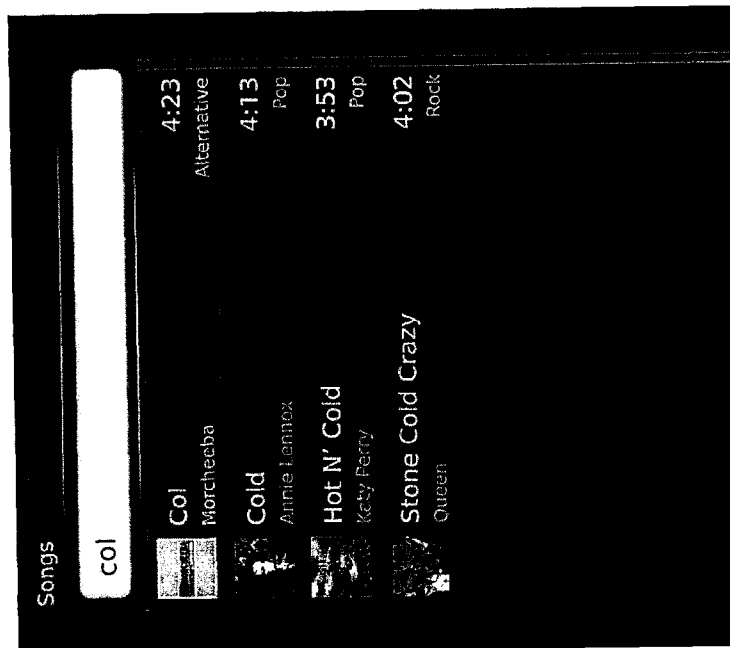


FIG. 10E

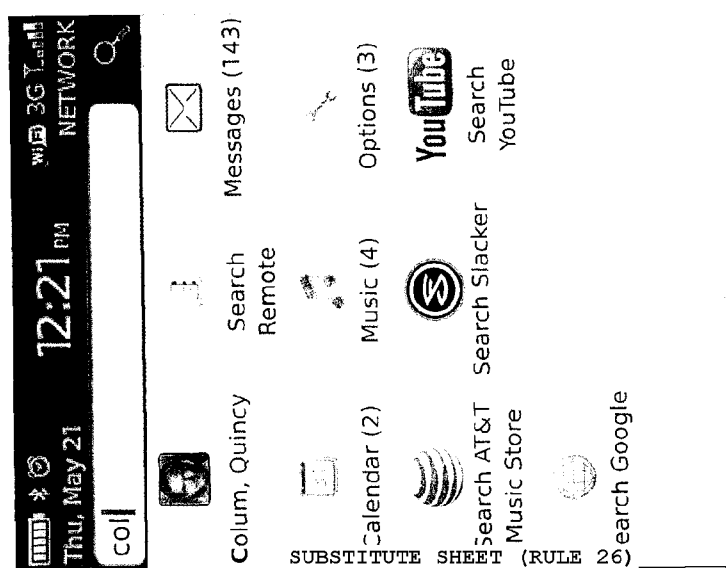


FIG. 10D

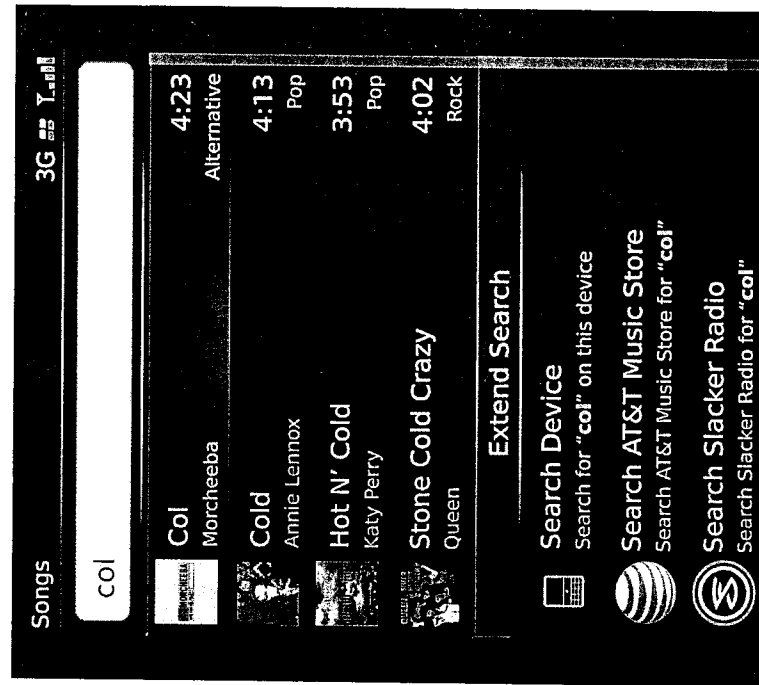


FIG. 10H

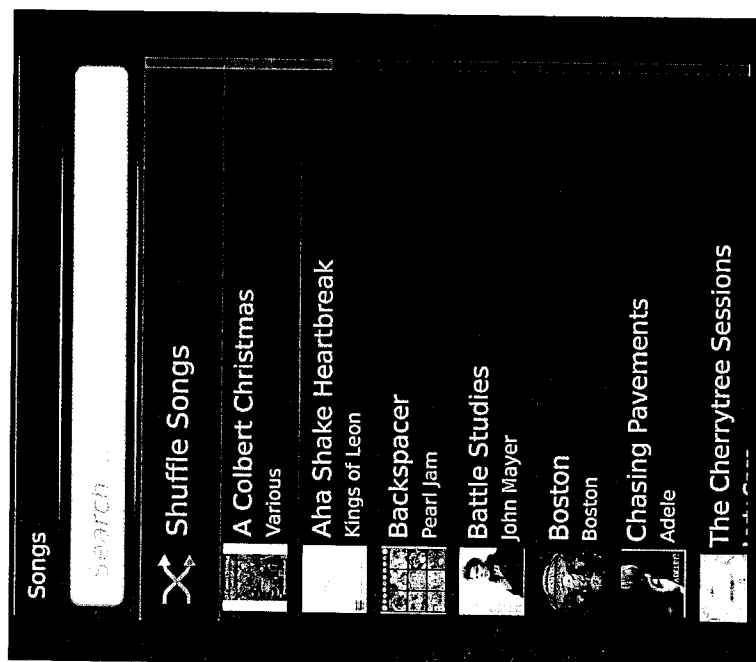


FIG. 10G

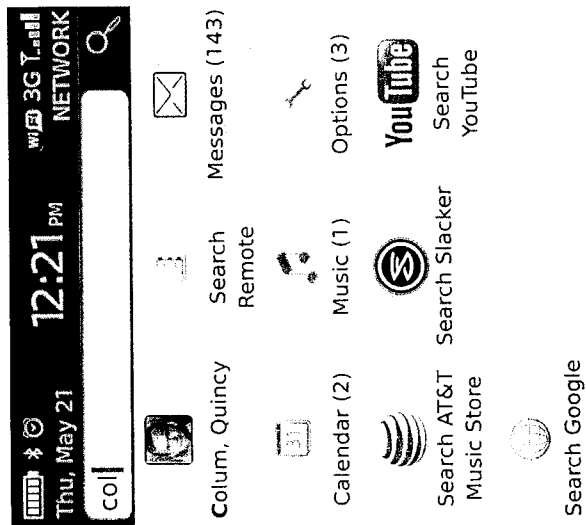


FIG. 10K

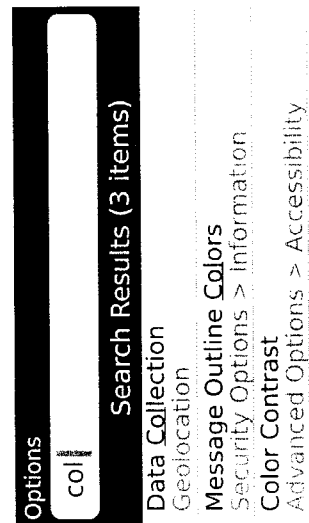


FIG. 10J

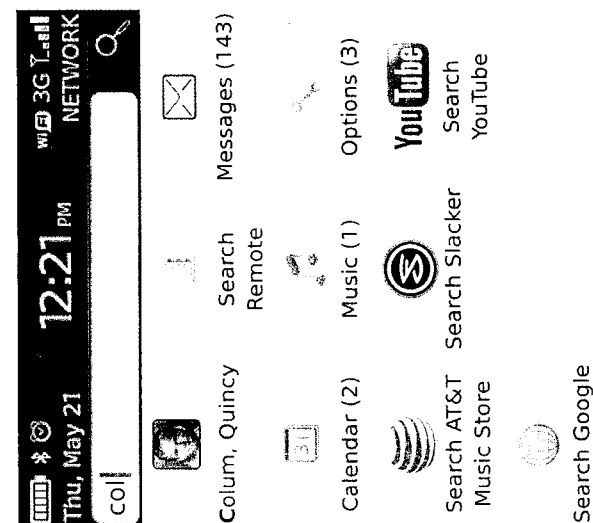


FIG. 10I

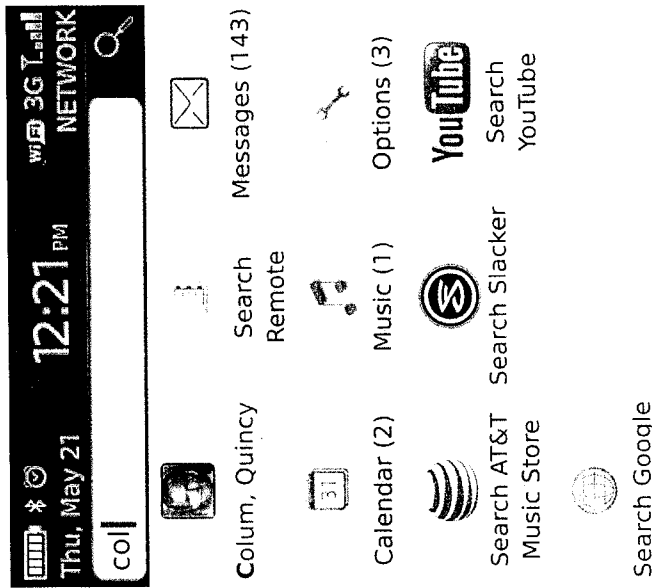


FIG. 10N

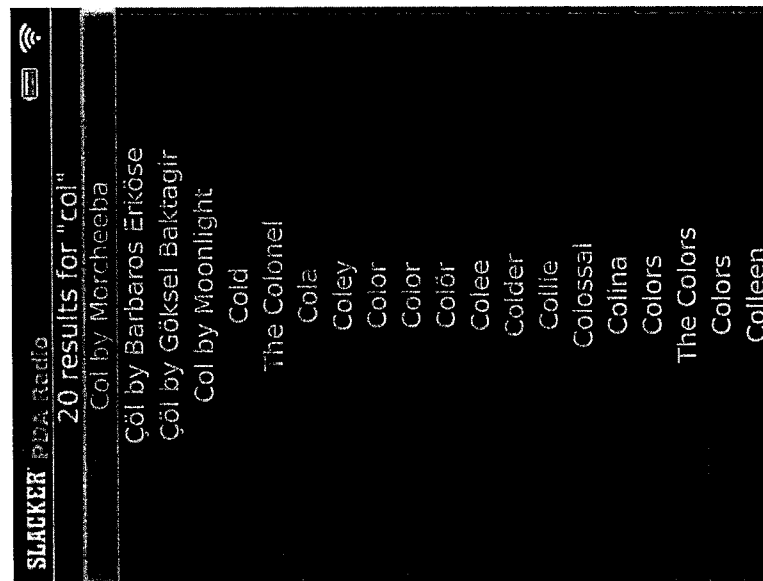


FIG. 10M

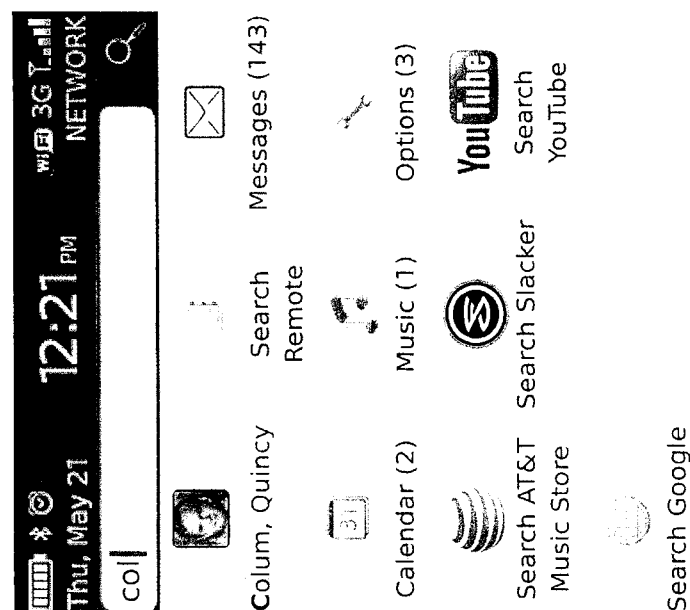


FIG. 10L

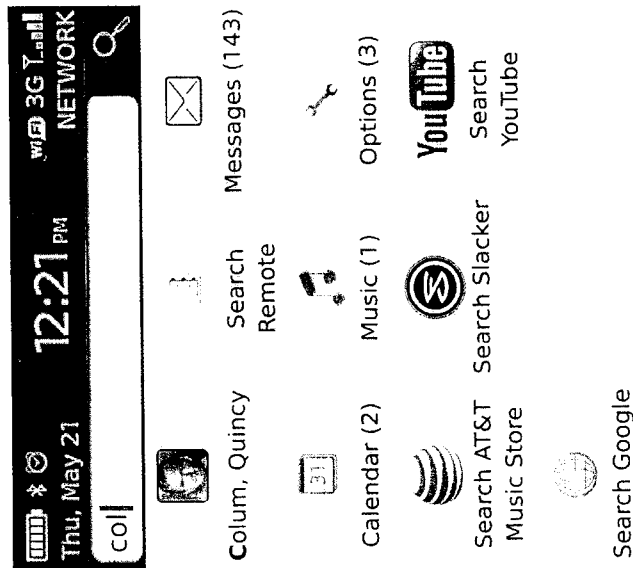


FIG. 10Q

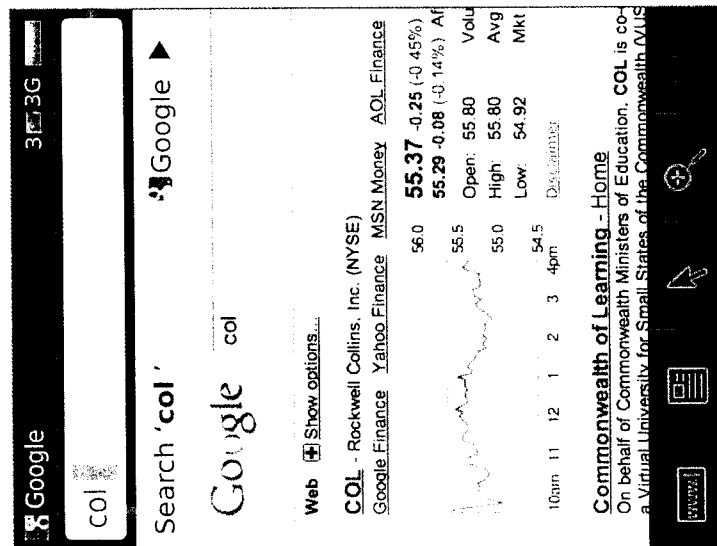


FIG. 10P

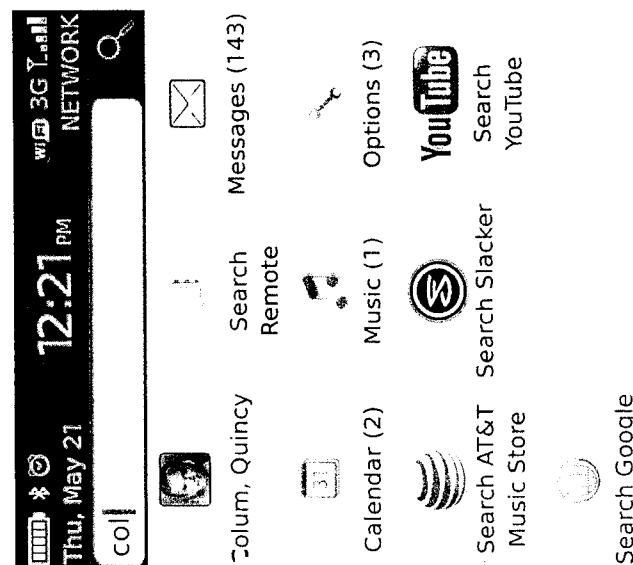


FIG. 100

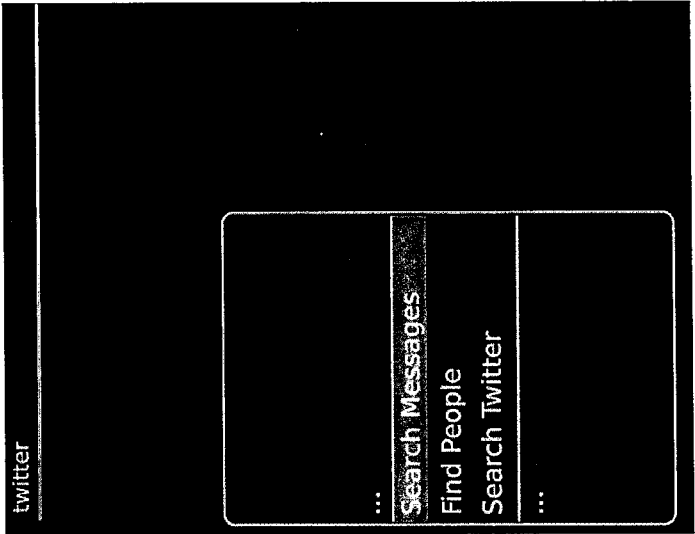


FIG. 10T

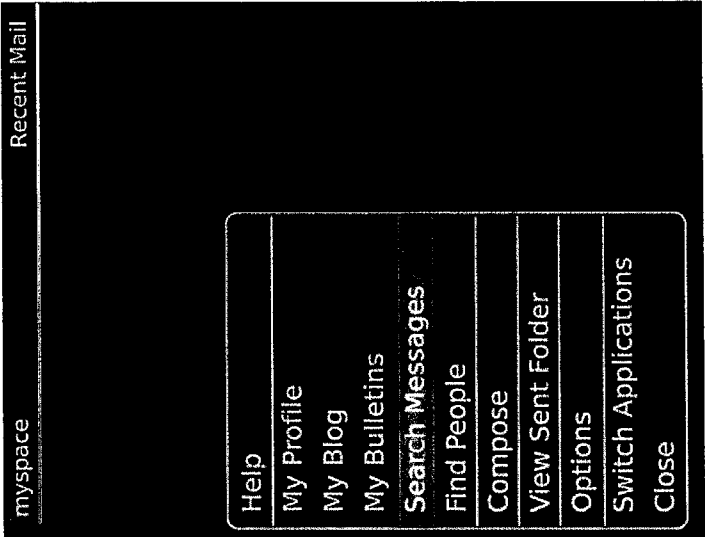


FIG. 10S

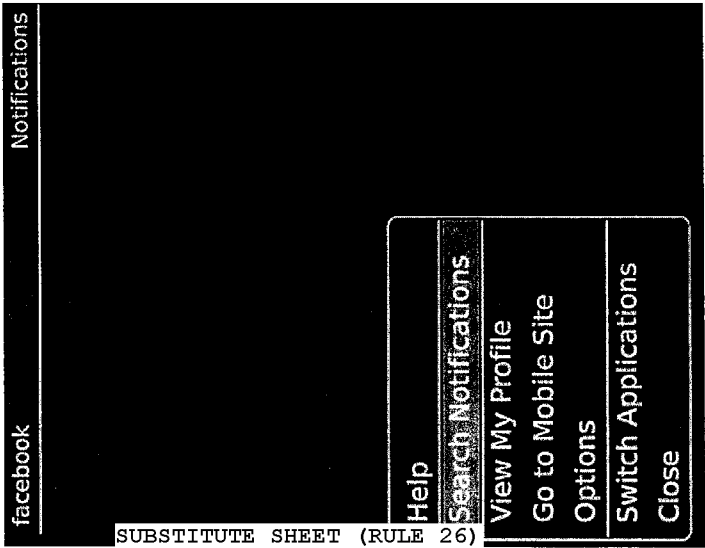


FIG. 10R

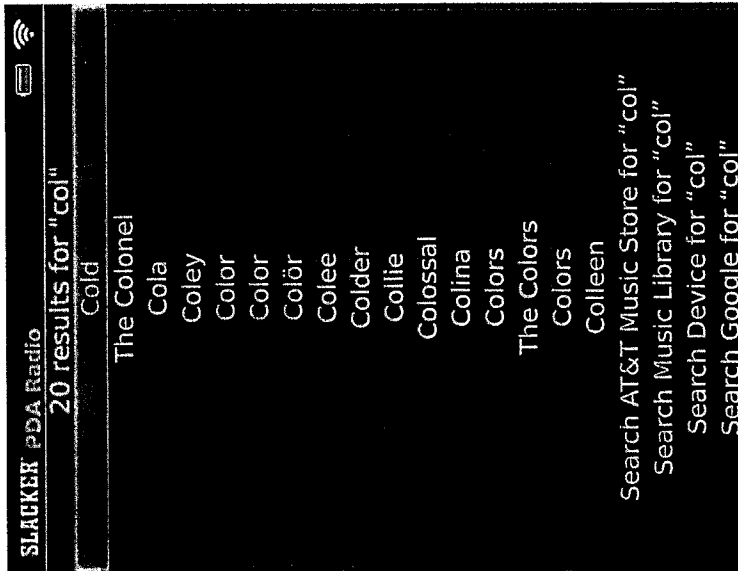


FIG. 10V

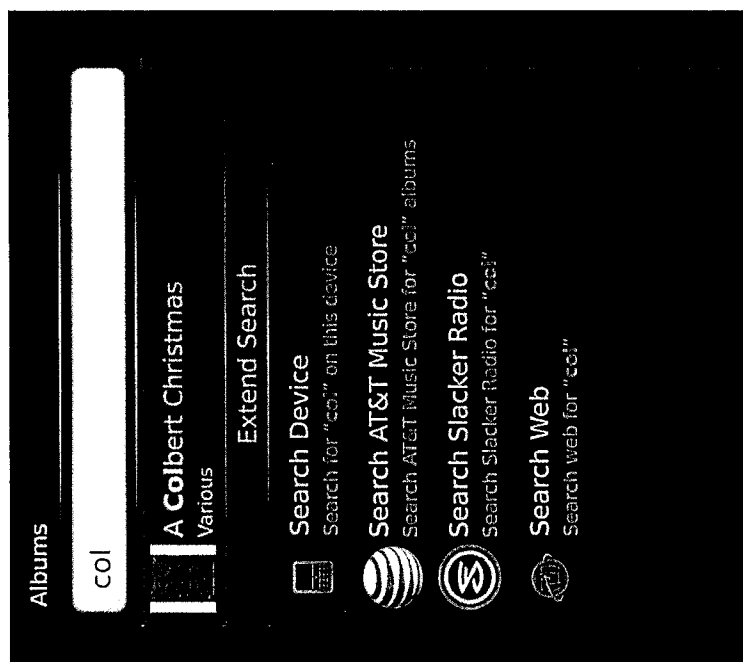


FIG. 10U

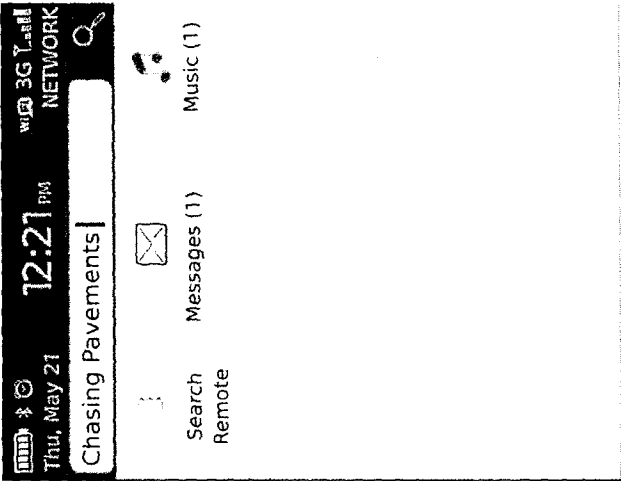


FIG. 10Y

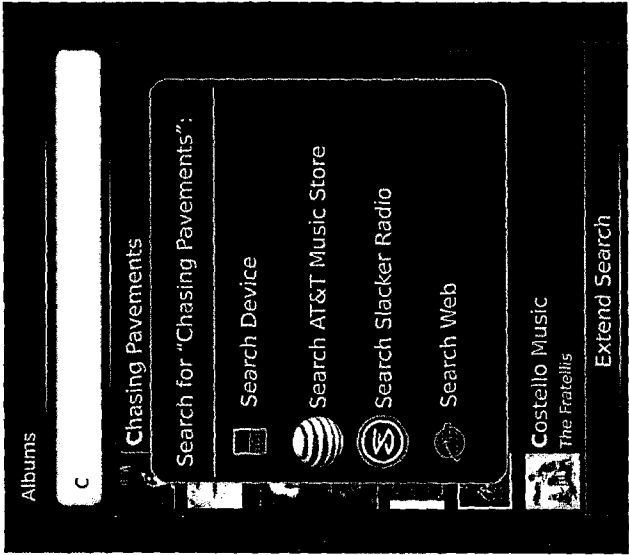


FIG. 10X

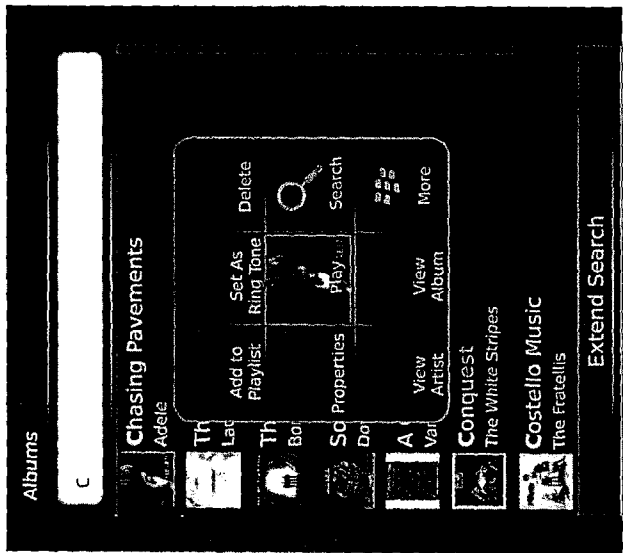


FIG. 10W

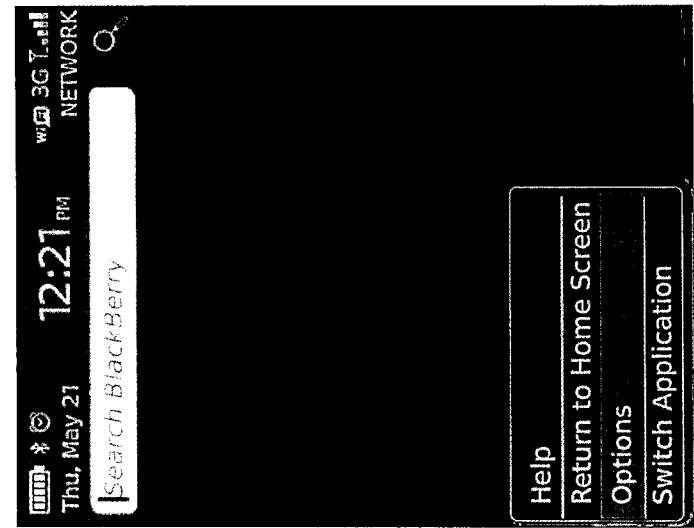


FIG. 11A

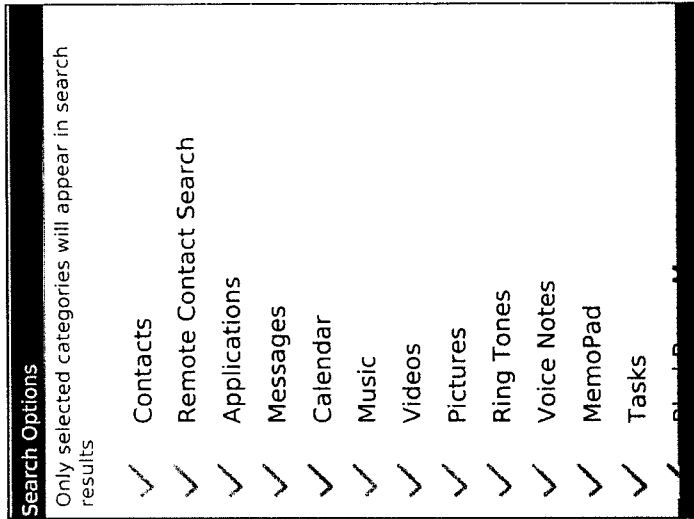


FIG. 11B

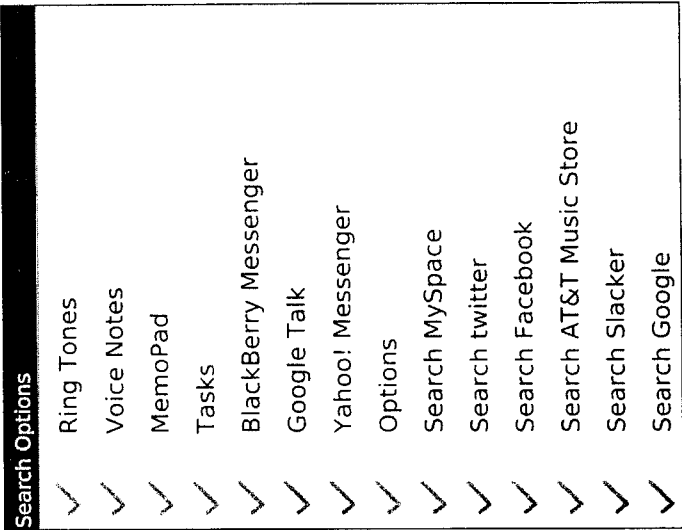


FIG. 11C

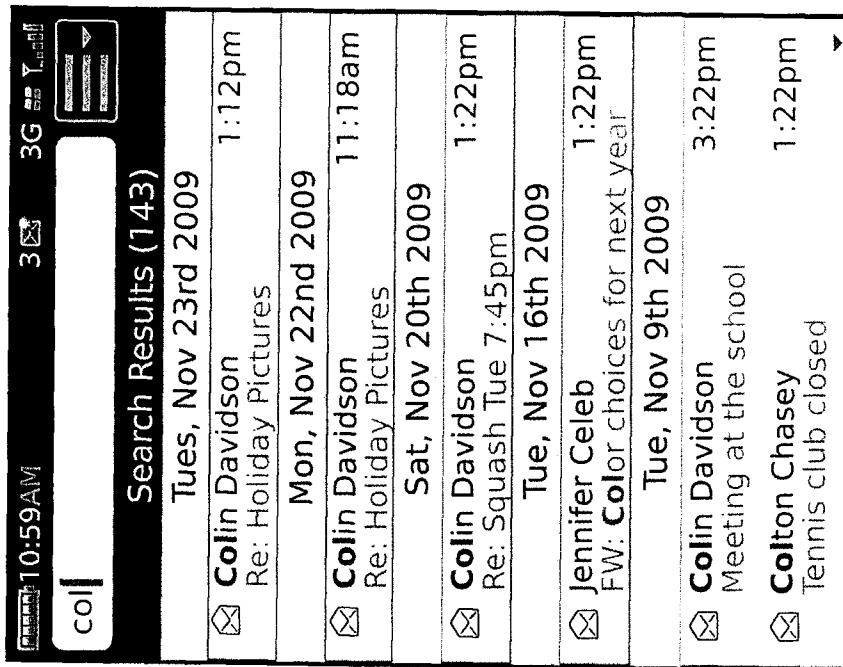


FIG. 11D

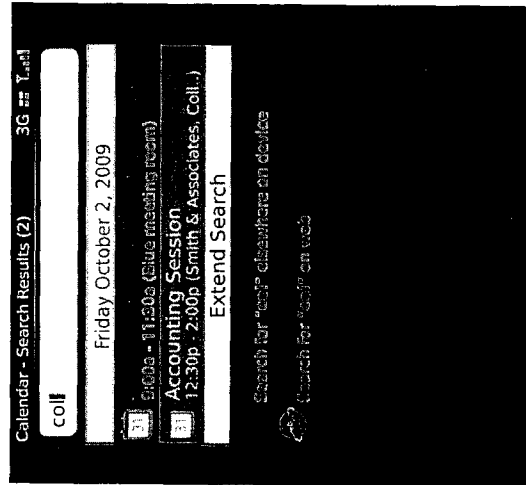


FIG. 11G

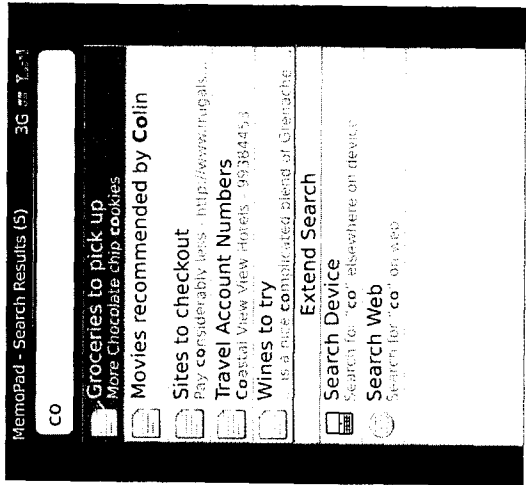


FIG. 11F

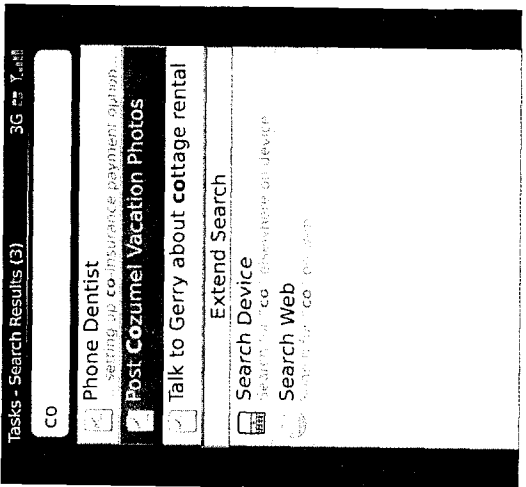


FIG. 11E

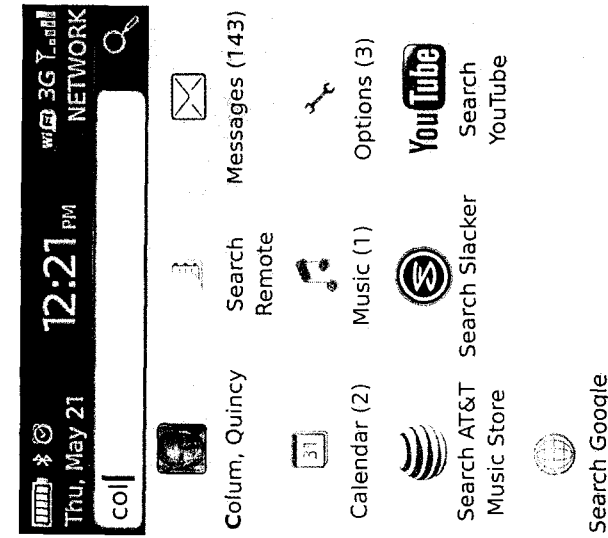


FIG. 11J

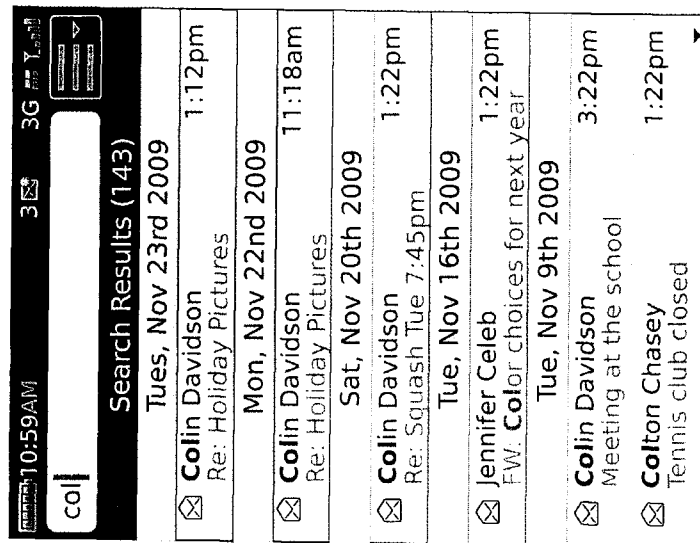


FIG. 11I

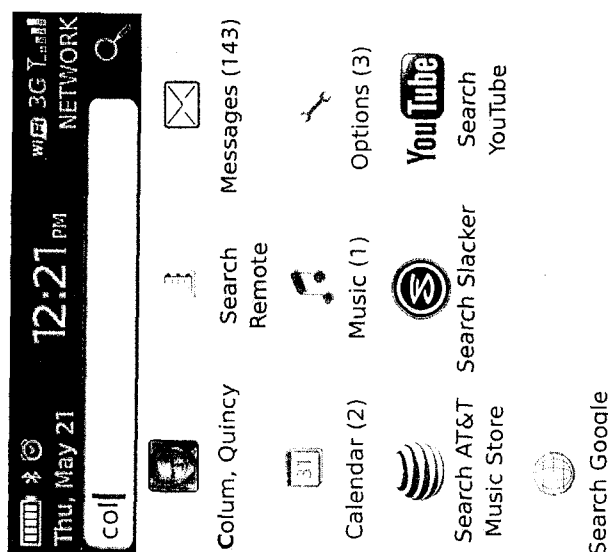


FIG. 11H

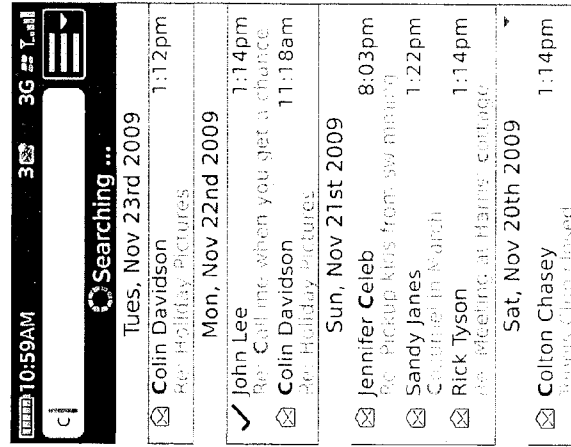


FIG. 11N

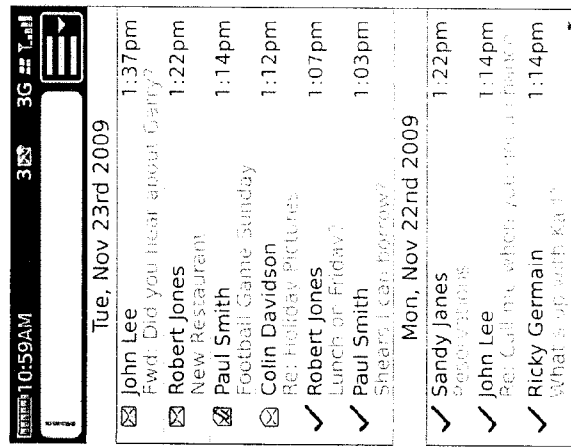


FIG. 11M

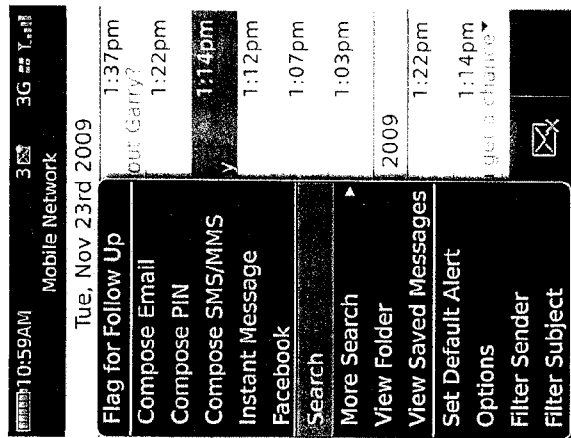


FIG. 11L

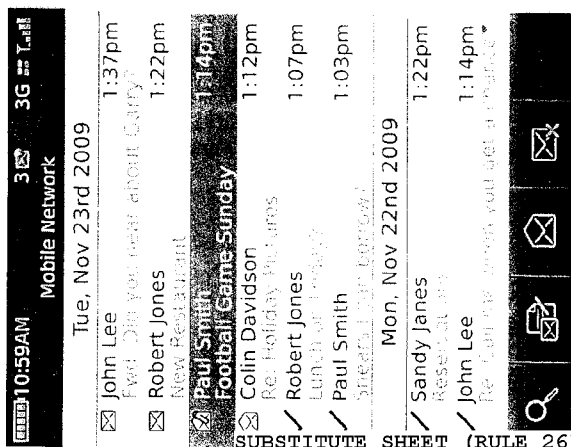


FIG. 11K

SUBSTITUTE SHEET (RULE 26)

[illegible]

FIG. 11R

The screenshot shows an iPhone screen with a black status bar at the top displaying 'Verizon', '10:59AM', and '3G'. Below the status bar is a navigation bar with a 'col' button on the left and a 'Search' button on the right. The main area displays an email inbox with the following entries:

Time	From	Subject
Tue, Nov 9 2009	Colin Davidson	Re: Holiday
Mon, Nov 9 2009	Colin Davidson	Re: Holiday
Sat, Nov 7 2009	Colin Davidson	Re: Squash Tue 7:45pm
Tue, Nov 16 2009	Jennifer Celeb	FW: Color choices for next year
Tue, Nov 9 2009	Colin Davidson	Meeting at the school
	Colton Chasey	Tennis Club closed

The email for 'Colin Davidson' with subject 'Re: Holiday' is selected, and its details are shown in a white box with a black border. The details include:

- From:** Field /Subject
- Any Address Field**
- From:** Field
- To:** Field
- Cc:** Field
- Bcc:** Field
- Subject**
- Message**

The time '1:22pm' is displayed on the right side of the details box.

FIG. 11Q

[illegible]

FIG. 11P

SEARCH RESULTS (143)	
Tues, Nov 23rd 2009	
☒ Colin Davidson Re: Holiday Pictures	1:12pm
Mon, Nov 22nd 2009	
☒ Colin Davidson Re: Holiday Pictures	11:18am
Sat, Nov 20th 2009	
☒ Colin Davidson Re: Squash Tue 7:45pm	1:22pm
Tue, Nov 16th 2009	
☒ Jennifer Celeb FW: Color choices for next year	1:22pm
Tue, Nov 9th 2009	
☒ Colin Davidson Meeting at the school	3:22pm
Colton Chasey Tennis club closed	1:22pm

FIG. 110

Messages - Advanced Search

Name:

Appears in: Any Address Field

Subject:

Body:

☐ include encrypted messages

Search in:

Accounts: All accounts

Folders: All folders

Message Type: All Email

Message Status: All folders

Search

FIG. 11U

Messages - Advanced Search

Search Messages: On device

Find matches where:

Name:

Appears in: Any Address Field

Subject:

Body:

☐ include encrypted messages

Search in:

Accounts: All accounts

Folders: All folders

Message Type: All Email

FIG. 11T

10:59AM 3G Mobile Network

Tue, Nov 23rd 2009

Flag for Follow Up

Compose Email

Compose PIN

Compose SMS/MMS

Instant Message

Facebook

Search

More Search

View Folder

View Saved Messages

Set Default Alert

Options

Filter Sender

Filter Subject

Search by Sender

Search by Subject

Advanced Search ...

1:37pm out Garry?

1:22pm

1:14pm

1:12pm

1:07pm

1:14pm get a chance

FIG. 11S

FIG. 11T

FIG. 11U

SUBSTITUTE SHEET (RULE 26)

10:59AM	3G	Y	col	Search Results (143)	
Tues, Nov 23rd 2009					
☒	Colin Davidson	Re: Holiday Pictures	1:12pm		
Mon, Nov 22nd 2009					
☒	Colin Davidson	Re: Holiday Pictures	11:18am		
Sat, Nov 20th 2009					
☒	Colin Davidson	Re: Squash Tue 7:45pm	1:22pm		
Tue, Nov 16th 2009					
☒	Jennifer Celeb	FW: Color choices for next year	1:22pm		
Tue, Nov 9th 2009					
☒	Colin Davidson	Meeting at the school	1:22pm		
☒	Colton Chasey	Tennis Club closed	1:22pm		

FIG. 11Y

10:59AM	3G	Y	col	Search Results (143)	
Wednesday's no good for me					
☒	Valerie Collins	School meeting on the 3th	1:17pm		
☒	Sandy Jones	Can't make it. Colton is sick	1:17pm		
☒	Colin Davidson	Can't make it on Friday	1:12pm		
Mon, Sep 22nd 2009					
☒	John Lee	I have your Coleman stove	11:18am		
Sat, Sep 20th 2009					
☒	Colin Davidson	Bike ride Tues?	1:22pm		
Extend Search					
Search Device					
Search for "col" elsewhere on device					
Search Web					
Search for "col" on web					

FIG. 11X

10:59AM	3G	Y	col	Search Results (143)	
Tues, Nov 23rd 2009					
☒	Colin Davidson	Re: Holiday Pictures	1:12pm		
Mon, Nov 22nd 2009					
☒	Colin Davidson	Re: Holiday Pictures	11:18am		
Sat, Nov 20th 2009					
☒	Colin Davidson	Re: Squash Tue 7:45pm	1:22pm		
Tue, Nov 16th 2009					
☒	Jennifer Celeb	FW: Color choices for next year	1:22pm		
Tue, Nov 9th 2009					
☒	Colin Davidson	Meeting at the school	1:22pm		
☒	Colton Chasey	Tennis Club closed	1:22pm		

FIG. 11W

10:59AM	3G	Y	col	Search Results (143)	
Tues, Nov 23rd 2009					
☒	Colin Davidson	Re: Holiday Pictures	1:12pm		
Mon, Nov 22nd 2009					
☒	Colin Davidson	Re: Holiday Pictures	11:18am		
Sat, Nov 20th 2009					
☒	Colin Davidson	Re: Squash Tue 7:45pm	1:22pm		
Tue, Nov 16th 2009					
☒	Jennifer Celeb	FW: Color choices for next year	1:22pm		
Tue, Nov 9th 2009					
☒	Colin Davidson	Meeting at the school	1:22pm		
☒	Colton Chasey	Tennis Club closed	1:22pm		

FIG. 11V

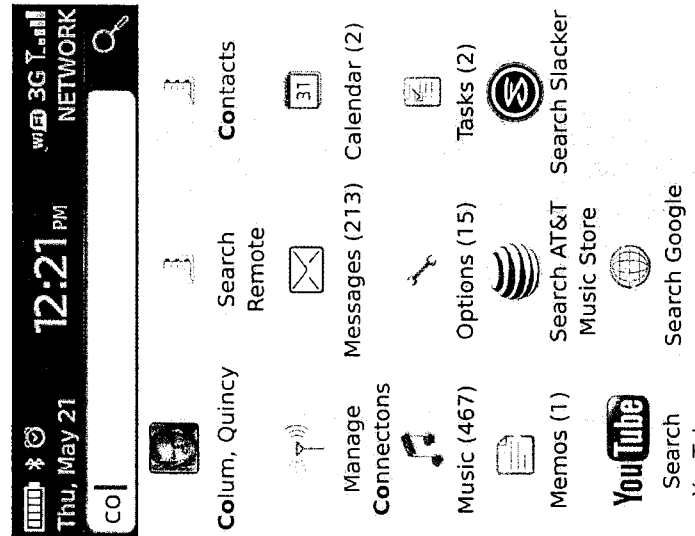


FIG. 12C

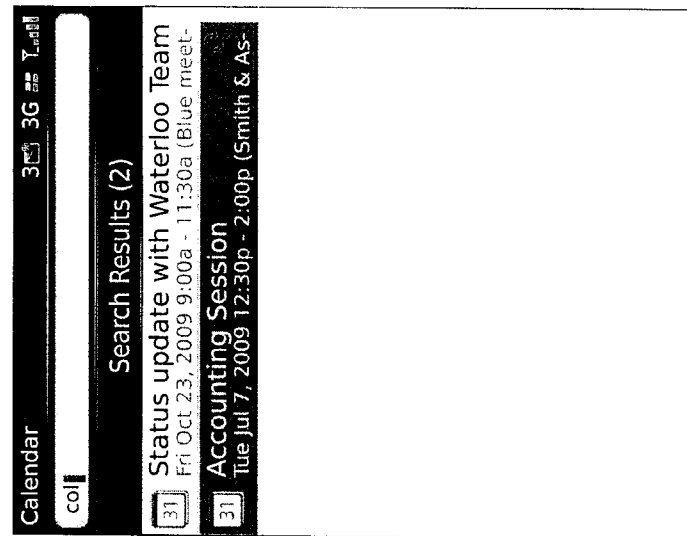


FIG. 12B

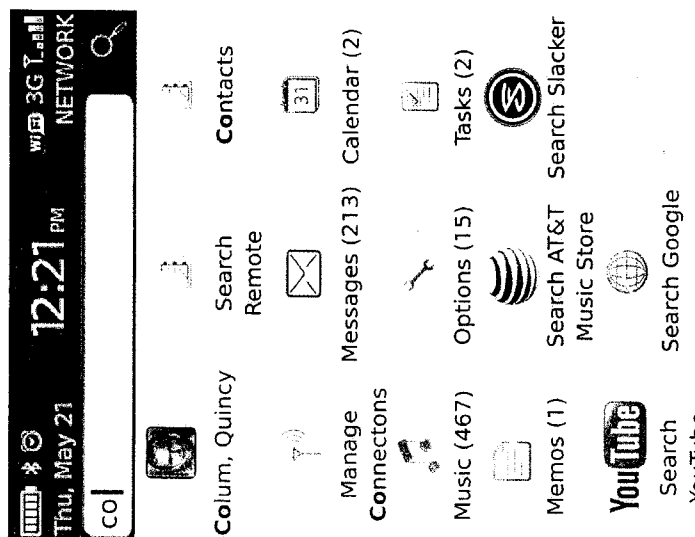


FIG. 12A

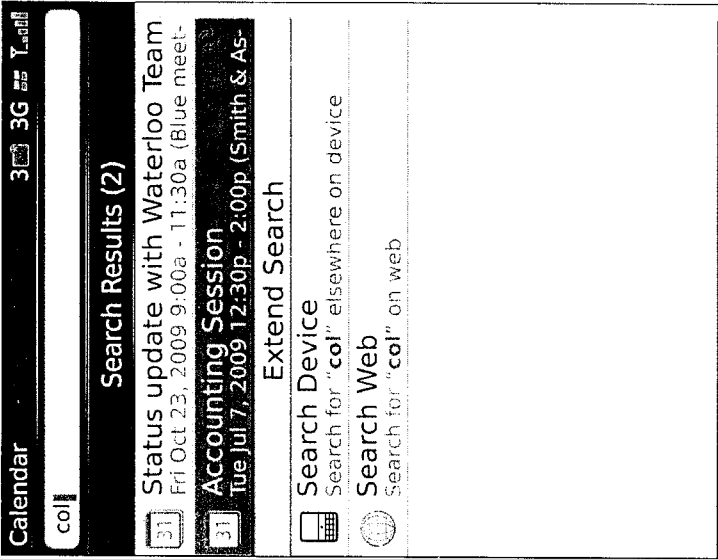


FIG. 12F

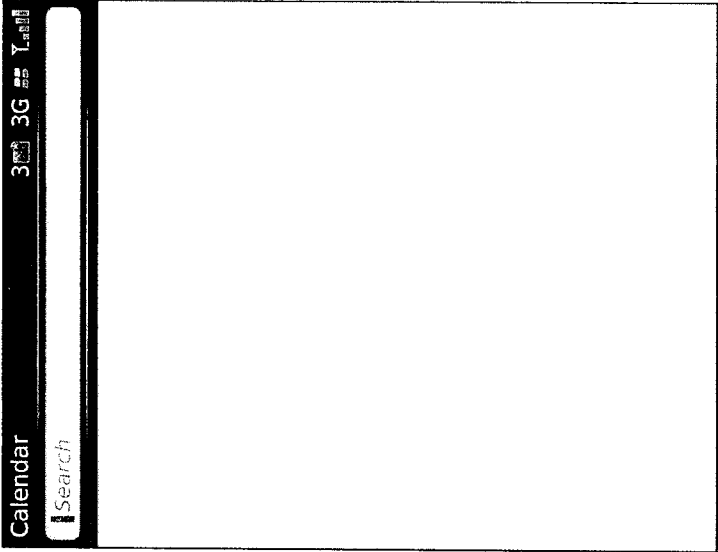


FIG. 12E

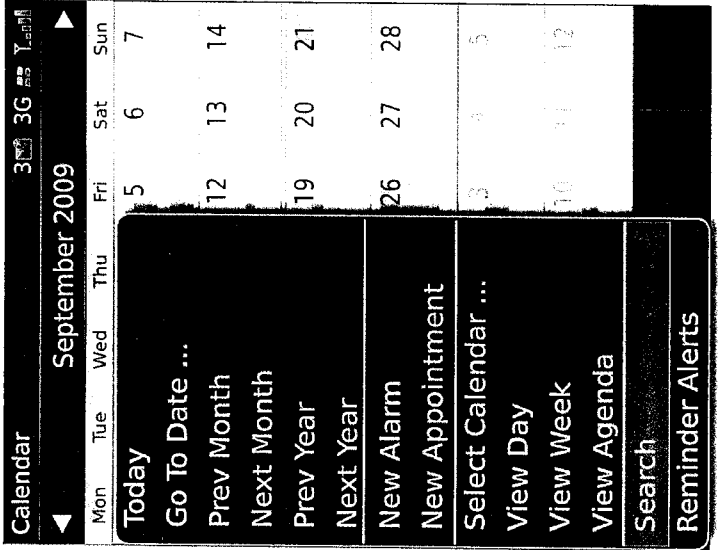


FIG. 12D

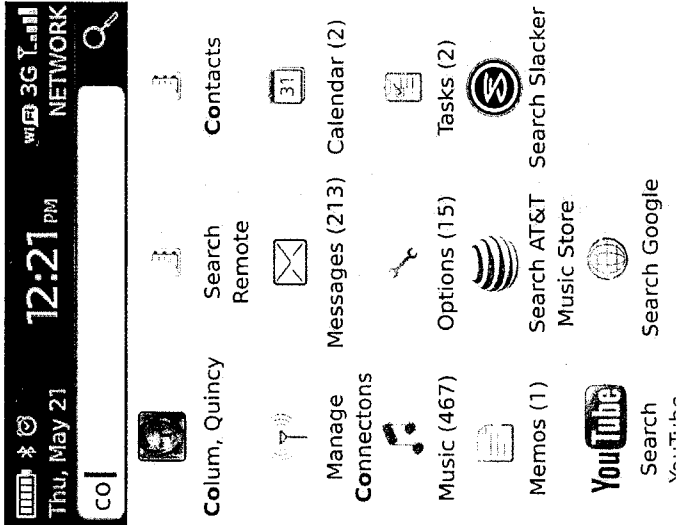


FIG. 12I

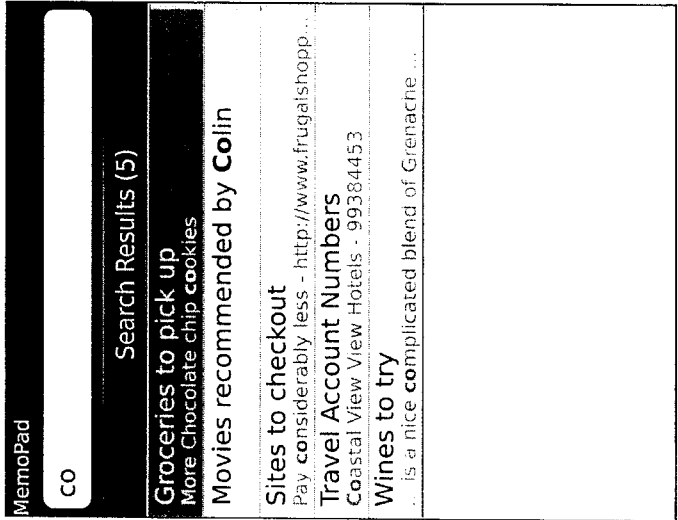


FIG. 12H

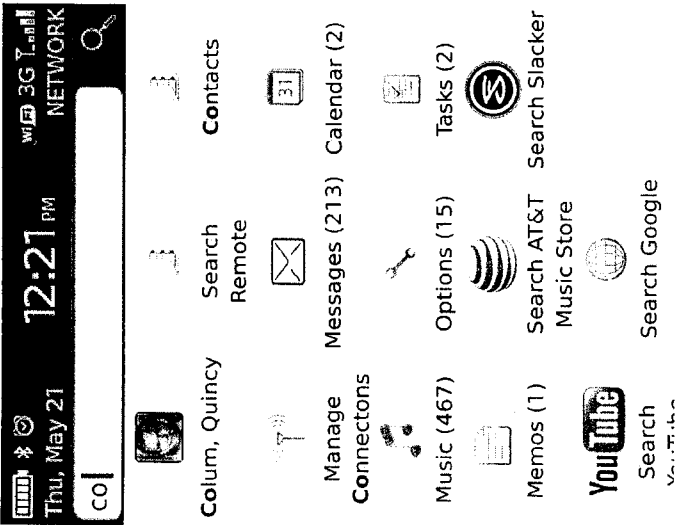


FIG. 12G

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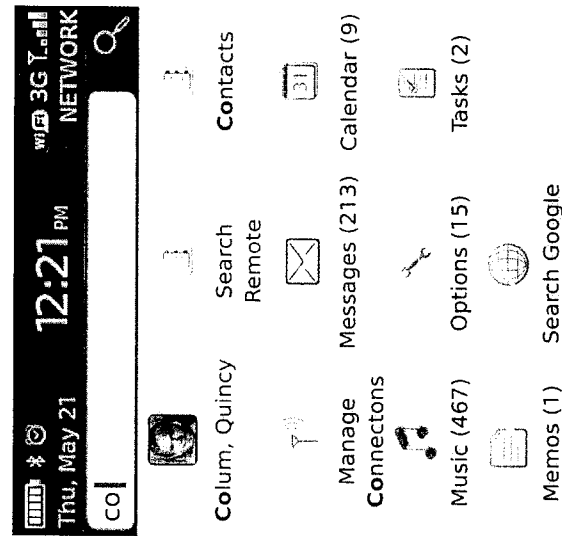


FIG. 12L

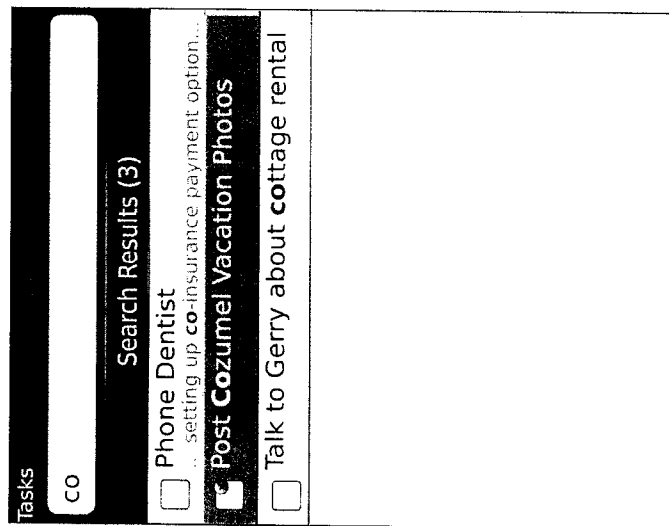


FIG. 12K

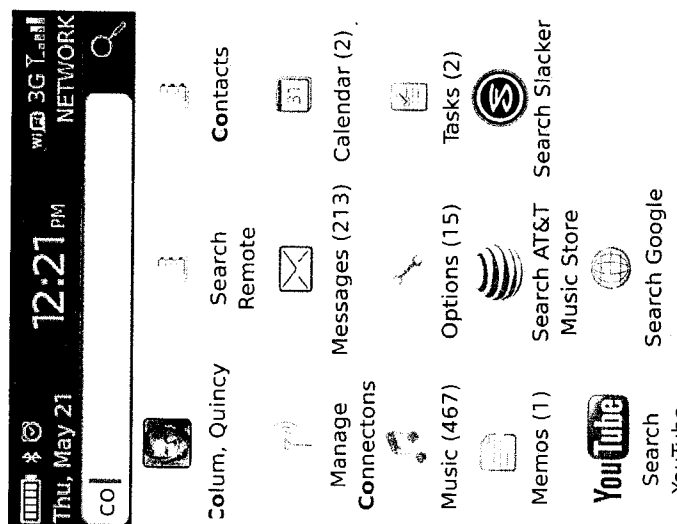


FIG. 12J

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2011/050093

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **H04W 4/00** (2009.01) , **G06F 17/30** (2006.01) , **H04W 88/02** (2009.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: H04W 4/00 (2009.01) , G06F 17/30 (2006.01) , H04W 88/02 (2009.01)

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

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

Epoque: Epodoc, US Full Txt, Canadian Patent Database: (Keywords: mobile wireless communication, display, applications, search results, selection screen, input device, quantity, mobile search, search engine, number, IOS 3.0, spotlight, Iphone)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	Cheng, Jacqui: "Hands on review: iPhone OS 3.0 chock full of changes", Ars Technica 2009 Conde Nast Digital, June 17, 2009, pp 1-5 URL:< http://replay.web.archive.org/20090619184311/http://arstechnica.com/apples/reviews/2009/06/hands-on-review-iphone-os-30-chock-full-of-changes.ars > Retrieved from the Internet: May 10, 2011	1-3, 5-20 4
Y	US 2009/0240672 (Costello) 24 September 2009 (24-09-2009) (abstract, Fig. 2)	4

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search

11 May 2011 (11-05-2011)

Date of mailing of the international search report

18 May 2011 (18-05-2011)

Name and mailing address of the ISA/CA
Canadian Intellectual Property Office
Place du Portage I, C114 - 1st Floor, Box PCT
50 Victoria Street
Gatineau, Quebec K1A 0C9
Facsimile No.: 001-819-953-2476

Authorized officer

Camran Syed (819) 934-4550

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2011/050093

Patent Document Cited in Search Report	Publication Date	Patent Family Member(s)	Publication Date
US2009240672A1	24 September 2009 (24-09-2009)	US2009240672A1	24 September 2009 (24-09-2009)
		US2009240685A1	24 September 2009 (24-09-2009)
		US2009241018A1	24 September 2009 (24-09-2009)
		US2009241044A1	24 September 2009 (24-09-2009)
		US2009241058A1	24 September 2009 (24-09-2009)
		US2009241065A1	24 September 2009 (24-09-2009)
		US2009241066A1	24 September 2009 (24-09-2009)
		WO2009117273A2	24 September 2009 (24-09-2009)
		WO2009117273A3	07 January 2010 (07-01-2010)