PAGING SYSTEM WITH IMPROVED TWO-WAY MESSAGING DEVICE FEATURES

A paging system with two-way messaging devices (15) that can access system operation features. The following system operation features can be changed at a two-way messaging device (15) (pager) by a subscriber: activating subscriber/caller interconnect; indicating subscriber status; activating a password access code; specifying prerecorded greeting to play; specifying device and device order if interconnect service links a caller's call through various subscriber receiving devices (e.g., office phone, home phone, mobile phone, etc.); and deleting or forwarding a received facsimile communication.
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PAGING SYSTEM WITH IMPROVED TWO-WAY MESSAGING DEVICE FEATURES

Field of the Invention

This invention relates generally to paging systems and, more particularly, to an improved two-way paging device.

Background of the Invention

A paging system is used to send electronic notices, called pages, to system subscribers to inform them that they have been called by other individuals. A typical paging system includes a wireless messaging system with a pacing terminal and one or more paging stations. The pacing terminal is connected to the publicly switched telephone network and is configured to receive incoming, telephone calls from individuals interested in accessing the system subscribers. In response to receiving a call, the paging terminal creates a page for the subscriber. The page is forwarded to the paging stations, which then broadcast the page. System subscribers carry pagers, which include miniaturized radio receivers. When a pager receives a page for the subscriber to whom the pager has been assigned, the pager actuates an internal audio annunciator and/or display to inform the subscriber of the page and its contents.

A paging system is typically configured so that a system subscriber can select the class or type of paging service that he wants to receive. The earliest available and most basic service many paging systems offer is to simply broadcast a page to the subscriber to inform the subscriber that he has been called. Once the subscriber has received this page, which is indicated by a beeping, tone and/or a flashing light, the subscriber must access the wireless messaging system to find the identity, or at
least the phone number, of the calling party. Many paging systems offer subscribers an intermediate level of service, which allows the subscribers to receive a short numeric or alphanumeric message as part of the page. This message is presented on a small display integral with the pager. Some paging systems allow a caller to leave a voice message that will be transmitted to the subscriber. A pager carried by a subscriber using this service includes a small audio signal-processing circuit that, upon receipt of the page, plays the message on a small speaker or a small display. Many paging systems also include some type of voice-mail storage capability that allows a caller to record a message that the subscriber can retrieve at his convenience. Some paging systems are configured to allow system subscribers to make customized greetings that instruct callers how to make a page and/or leave a voice-mail message. Many paging systems are configured to allow a subscriber to select the particular services via the PSTN and DTMF commands that form his/her package of pacing services.

More modern paging systems are two-way systems that not only transmit messages to the pagers, but also receive messages from the pagers. These received messages are typically simple acknowledgments of received pages. However, current paging systems with two-way messaging pagers fail to allow the subscriber to select the particular services that form his/her package of services. Presently, all subscriber service requests must be made by communicating with the messaging system manager or over a network connection. Thus, if a subscriber is waiting for an important phone call and is not in a place, such as a meeting, where he/she can call to change his/her service, the important phone call can be misdirected or improperly received.

Summary of the Invention

In accordance with this invention, a paging system for providing subscriber control of services through a pager is provided. The paging system includes a wireless messaging unit for providing and controlling subscriber paging, system services; and a two-way messaging device for receiving and responding to pages and providing signals for controlling subscriber-related paging system services at the wireless messaging unit. The two-way messaging device is a pager that further includes a receiver for receiving pates and paging system service selection signals from the wireless messaging unit, a selecting means for responding to page signals and selecting paging system services according the received paging system service selection signals, and a transceiver for transmitting responses and selections made using the selecting means.
In accordance with other aspects of the present invention, the pacing system service is specifying one of a number of predefined greetings to be played to callers, if the subscriber is absent or present to receive calls from callers, the enable status of the subscriber's paging system service, or enable status of the subscriber's paging system service's password access code.

In accordance with still other aspects of the present invention, the paging system service is a meet-me or find-me service. If the subscriber's paging system include forwarding phone number under call screening service is a find-me service, the paging system service is specifying devices and order of devices accessed through the find-me service.

In accordance with further aspects of the present invention, if the page is a facsimile, the paging system service is deleting the facsimile, choosing to forward the facsimile to another subscriber, choosing to forward the facsimile to a specific phone number or choosing to forward the facsimile to an e-mail address.

**Brief Description of the Drawings**

The invention is defined with particularity in the appended claims. The advantages of this invention may be understood by referring to the following detailed description in which:

FIGURE 1 is a block diagram illustrating the basic components of the paging system of the present invention;

FIGURE 2 is a block diagram illustrating the functions selectable through the pager; and

FIGURES 3A-H illustrate feature selection operation in accordance with the present invention.

**Detailed Description of the Preferred Embodiment**

The major components of a paging system 10 are illustrated in FIGURE 1. A common type of information that passes through paging systems are pages or faxes that are entered by a caller to be broadcast to a particular subscribers pager. The information of this type may be entered into the paging system 10 by a caller 11.

The caller entered information is received by a wireless messaging infrastructure 13 through a publicly switched telephone network. The wireless messaging infrastructure 13 processes the received caller information according to subscriber service information stored in a database 14, then delivers the processed caller information to the subscriber's pager 15, as a page, or to another location depending upon the type service the subscriber has signed up for. The nature of the
subscriber's service, such as meet-me or find-me, and features relating to this service are stored in database 14.

The pager 15 includes a receiver 16, a transmitter 18 and controls 20, all of which are coupled to a processor 22. The processor 22 interprets signals received by the receiver 16 for presentation to a user and generates signals for output through the transmitter 18 according to user activation of the controls 20. Thus, the subscriber can respond anytime to received pages or interact with the wireless messaging infrastructure 13 by simply operating controls 20 at the pager 15. The controls 20 on the pager 15 may be various forms of user activation devices, such as physical buttons, buttons on a touch screen or other forms of activation mechanisms that are coupled to the processor 22. Providing command selections through the pager 15 allows the subscriber to quietly interact with the wireless messaging infrastructure 13 in situations such as meeting and presentations. Calls to the service provider to perform a feature change would be disruptive in these situations.

The outputted page signal includes a header and command section. The header identifies the subscriber and the command section includes information commanding the wireless messaging infrastructure 13 to perform an operation with regard to the identified subscriber's service. When the wireless messaging infrastructure 13 receives a pager generated signal, the wireless messaging infrastructure 13 processes the response or command contained within the command section according to stored subscriber service information in the database 14. It should be understood that two-way messaging pagers 15 can be configured any number of ways for providing subscriber interaction with the wireless messaging unit 13. FIGURES 3A-H illustrate an example configuration.

As shown in FIGURE 2, a number of tasks or subscriber service feature selections can be performed by the subscriber through pager control 20 activation.

If the wireless messaging infrastructure 13 determines a fax is being sent to the subscriber, the pager 15 receives a page indicating so. The subscriber can process the fax in the following ways by selective operation of the controls 20. The subscriber may delete the received fax, or forward the fax to another subscriber, a phone number, or an e-mail address.

Through selective operation of other controls 20, the subscriber may perform selection of other service features available through the wireless messaging infrastructure 13. The subscriber may specify which prerecorded greeting is to be played for callers. The subscriber may also enable or disable the
meet-me or find-me service. The subscriber may activate a password access code for either a meet-me or find-me service. Finally, a subscriber may indicate that they are absent or present for the meet-me or find-me service. The subscriber can enter commands through the pager to change the state of the meet-me or find-me availability to indicate his/her willingness or unwillingness to accept meet-me or find-me pages.

Find-me service connects a caller to a subscriber by patching the caller through a predefined route of locations (phone numbers) until the location where the subscriber location is reached. The subscriber may select through control activation the locations and order in which locations, i.e. home phones, office phones, cellular phones, pagers, etc., are accessed in the subscribers find-me as well as the phone numbers themselves service.

How any particular pager 15 responds upon receiving a meet-me or find-me page will depend upon the construction of the particular pager. A tone pager will generate a specific sequence of tones or a single, specific, tone to indicate a meet-me or find-me page has been received. The display on a numeric or alphanumeric pager will present a preconfigured message indicating that a meet-me or find-me page has been received. A meet-me page sent to a voice pager will actually be a short message that is played to the subscriber to announce the page. Upon receipt of the meet-me page, if the subscriber so desires, he/she can call the paging system so as to be connected to the calling party.

FIGURES 3A-H illustrate examples of how options or features may be selected on a pager 40. These examples are for illustrative purposes only. Pager 40 includes an alphanumeric display screen 42, a control pad 44 with up, down, left, and right cursor activators 45, and a select button 46. Depression of the cursor activators 45 provides control of a cursor or selection box 50 presented within display screen 42. The select button 46 when depressed activates the option displayed within the selection box 50. The pager 40 generates and transmits a signal to the wireless messaging infrastructure. The transmitted signal includes a header and command section, wherein the command section contains the control data for commanding the wireless messaging infrastructure to execute the activated option.

As shown in FIGURE 3A, the pager 40 is in a service option selection mode. In this mode, the user is prompted to select from one of three broad topic option headings. The option headings are General, Meet-Me, and Find-Me. When
select button 46 is activated or the selection box 50 surrounds General, the wireless messaging infrastructure General Option of Choose Greeting is presented as shown in FIGURE 3B. If Choose Greeting is activated, the user can select from one of many pre-recorded greetings as shown in FIGURE 3C. 

5 If the Meet-Me option is selected from the option headings displayed in FIGURE 3A, the meet me options are presented as shown in FIGURE 3D. The meet me options displayed are Enable Service and Enable Password Code. If Enable Service or Enable Password Code is selected, it toggles to Disable Service or Disable Password Code and commands the wireless messaging infrastructure, via command information in a transmitted signal, to enable the subscriber's Meet-Me service or password code, respectively.

10 As shown in FIGURE 3E, the find me options are presented when Find-Me is selected from the option headings displayed in FIGURE 3A. Like meet-me options the find-me options include enable service and enable password code options. Additionally, find-me options include Select Receiving Devices and Order which when activated presents the receiving devices and device order of the subscriber's service, as shown in FIGURE 3F. The numbered lines indicate a phone number of a device and the order in which that device is accessed in the find me service. If the user wishes to change or enter a value into a numbered line, the selection box is activated at that position in order to generate a device phone number generating window as shown in FIGURE 3G. The phone number generating window includes a numbered key pad 60 and a numbered display area 62. Numbers are entered into the display area 62 by activating a selection box over a number within key pad 60. Once a phone number has been properly entered into display area 62, a Done command within the display is selected for entering the number displayed in display area 62 into the selection box highlighted numbered line within the previous display.

20 As shown in FIGURE 3H, facsimile options are presented when the pager 40 determines that a facsimile transmission has been received. The options presented are Delete and Forward. Selection of the Delete simply deletes the received facsimile. If Forward is selected, the subscriber may forward the received facsimile to a previously defined phone number or e-mail address from a displayed list.

25 While the preferred embodiment of the invention has been illustrated and described, it will be appreciated that various changes can be made therein without departing from the spirit and scope of the invention.
The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A paging system for providing subscriber control of services through a pager, said paging system comprising:
   a wireless messaging unit for maintaining and controlling subscriber paging system services; and
   a two-way messaging device for receiving pages and controlling subscriber-related paging system services, said subscriber pager further comprising:
   a receiver for receiving page and paging system service selection signals from the wireless messaging unit;
   a selecting means for responding to page signals and selecting paging system services according the received paging system service selection signals; and
   a transceiver for transmitting responses and selections made using the selecting means.

2. The paging system of Claim 1, wherein the paging system service is specifying one of a number of predefined greetings to be played to callers.

3. The paging system of Claim 1, wherein the paging system service is specifying if the subscriber is absent or present to receive calls from callers.

4. The paging system of Claim 1, wherein the paging system service is specifying the enable status of the subscriber's paging system service.

5. The paging system of Claim 4, wherein the paging system service is a meet-me service.

6. The paging system of Claim 4, wherein the paging system service is a find-me service.

7. The paging system of Claim 1, wherein the pacing system service is specifying enable status of the subscriber's paging system service's password access code.
8. The paging system of Claim 1, wherein if the subscriber's paging system service is a find-me service, the paging system service is specifying devices and order of devices accessed through the find-me service.

9. The paging system of Claim 1, wherein if the page is a facsimile, the paging system service is deleting the facsimile.

10. The paging system of Claim 1, wherein if the page is a facsimile, the paging system service is choosing to forward the facsimile to another subscriber.

11. The paging system of Claim 1, wherein if the page is a facsimile, the paging system service is choosing to forward the facsimile to a specific phone number.

12. The paging system of Claim 1, wherein if the page is a facsimile, the paging, system service is choosing to forward the facsimile to an e-mail address.

13. The paging system of Claim 1, wherein the transmitted selections made using the selecting means comprise blocks of information with a header and command sections.

14. The paging system of Claim 13, wherein the command section comprises information that commands the wireless messaging unit to perform operations associated with the transmitted selections.
Fig. 2.

AT TWO-WAY MESSAGING DEVICE

SPECIFY

PROCESS FAX

- CHOOSE A GREETING TO PLAY FOR CALLERS
- ENABLE STATUS OF MEET-ME OR FIND-ME SERVICE
- FORWARD FAX TO
  - OTHER SUBSCRIBER
  - A PHONE NUMBER
  - AN E-MAIL ADDRESS
- DEVICE ORDER FOR FIND-ME SERVICE
- SUBSCRIBER STATUS FOR MEET-ME OR FIND-ME SERVICE
Fig. 3A.

SERVICE OPTIONS:
GENERAL
MEET-ME
FIND-ME
EXIT

Fig. 3B.

GENERAL OPTIONS:
CHOOSE GREETING
EXIT

SUBSTITUTE SHEET (RULE 26)
**Fig. 3C.**

CHOOSE GREETING:
- GREETING 1
- GREETING 2
- GREETING 3
- GREETING 4

**Fig. 3D.**

MEET-ME OPTIONS:
- ENABLE SERVICE
- ENABLE PASSWORD CODE

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Fig. 3G.

Fig. 3H.

INCOMING FAX FROM #XXX-XXXX
DELETE
FORWARD TO:
1. 555-1111
2. BOSS@OFFICE.COM

SUBSTITUTE SHEET (RULE 26)
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**
IPC(6) : H04B 7/00  
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)

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

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

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[X] Further documents are listed in the continuation of Box C.  
See patent family annex.

Date of the actual completion of the international search: **08 FEBRUARY 2000**

Date of mailing of the international search report: **23 FEB 2000**

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