EXHIBIT 19

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(54) **SYSTEM FOR PROVIDING CONTINUITY BETWEEN MESSAGING CLIENTS AND METHOD THEREFOR**

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G06F 1/26 (2006.01)

(52) **U.S. Cl.** **713/182**; 713/153; 713/161; 713/189; 713/193; 713/200; 713/201

(58) **Field of Classification Search** 713/182, 713/153, 161, 189, 193, 200, 201
See application file for complete search history.

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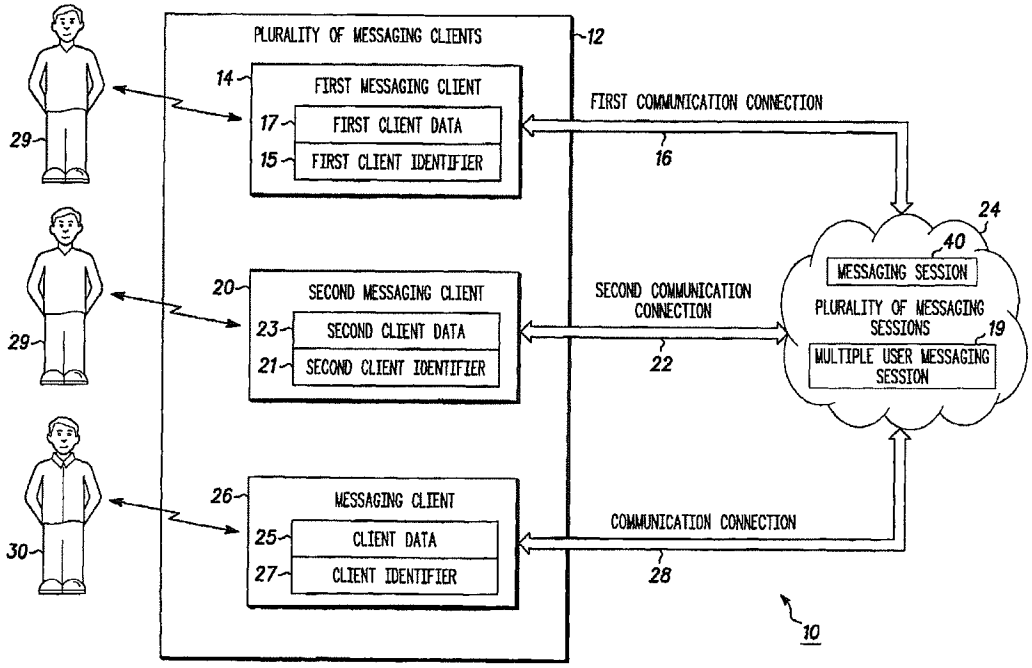
(57) **ABSTRACT**

A messaging communication system (**10**) includes a plurality of messaging clients (**12**). A first messaging client (**14**) establishes a first communication connection (**16**) operating using a plurality of client data (**25**). The first messaging client (**14**) transfers the plurality of client data (**25**) to a second messaging client (**20**). The second messaging client (**20**) establishes a second communication connection (**22**) operating using the plurality of client data (**25**).

67 Claims, 24 Drawing Sheets



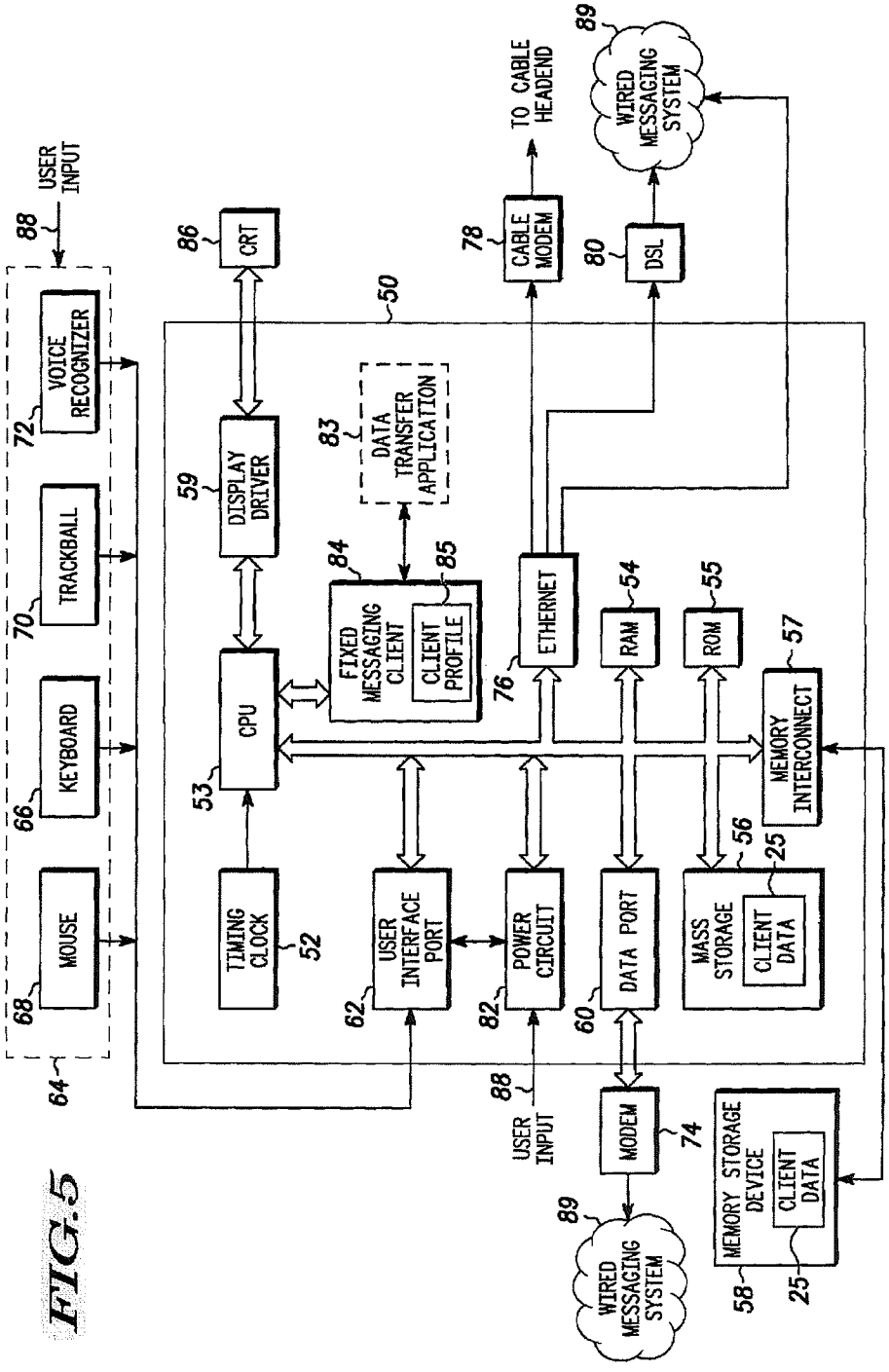

USER INPUT
88
VOICE RECOGNIZER
72
TRACKBALL
70
KEYBOARD
66
MOUSE
68
64
CRT
86
DISPLAY DRIVER
59
CPU
53
TIMING CLOCK
52
50
DATA TRANSFER APPLICATION
83
FIXED MESSAGING CLIENT
84
CLIENT PROFILE
85
USER INTERFACE PORT
62
POWER CIRCUIT
82
DATA PORT
60
ETHERNET
76
RAM
54
ROM
55
MEMORY INTERCONNECT
57
MASS STORAGE
56
CLIENT DATA
25
CABLE MODEM
78
DSL
80
TO CABLE HEADEND
WIRED MESSAGING SYSTEM
89
MODEM
74
MEMORY STORAGE DEVICE
58
CLIENT DATA
25
WIRED MESSAGING SYSTEM
89
USER INPUT
88

FIG.5

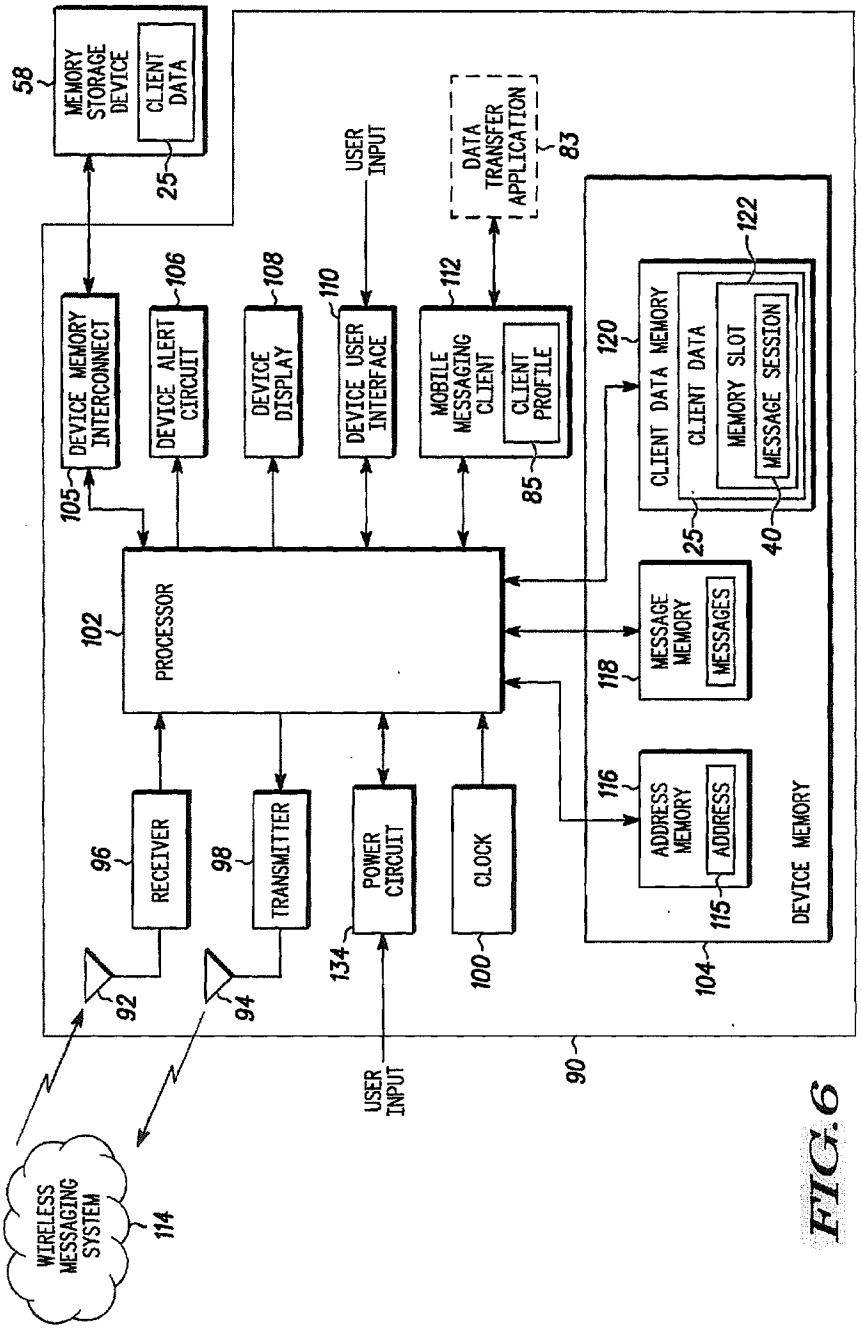

58
MEMORY STORAGE DEVICE
CLIENT DATA
25
DATA TRANSFER APPLICATION
83
USER INPUT
DEVICE MEMORY INTERCONNECT
105
DEVICE ALERT CIRCUIT
106
DEVICE DISPLAY
108
DEVICE USER INTERFACE
110
MOBILE MESSAGING CLIENT
CLIENT PROFILE
85
112
CLIENT DATA MEMORY
120
CLIENT DATA
MEMORY SLOT
MESSAGE SESSION
122
25
40
PROCESSOR
102
MESSAGE MEMORY
MESSAGES
118
ADDRESS MEMORY
ADDRESS
116
115
DEVICE MEMORY
104
RECEIVER
96
TRANSMITTER
98
POWER CIRCUIT
134
CLOCK
100
92
94
USER INPUT
90
WIRELESS MESSAGING SYSTEM
114

FIG. 6

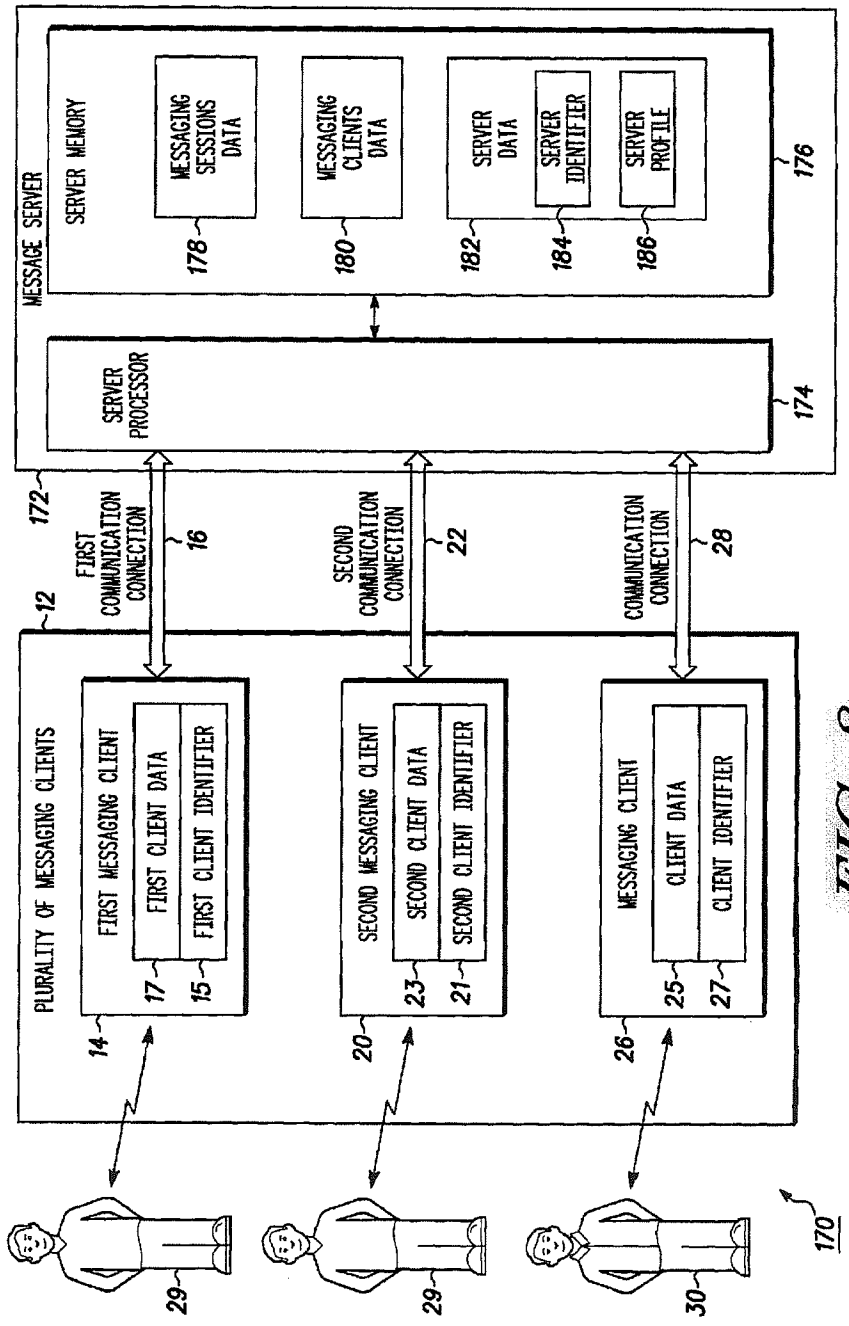

MESSAGE SERVER
SERVER MEMORY
MESSAGING SESSIONS DATA
MESSAGING CLIENTS DATA
SERVER DATA
SERVER IDENTIFIER
SERVER PROFILE
SERVER PROCESSOR
FIRST COMMUNICATION CONNECTION
SECOND COMMUNICATION CONNECTION
COMMUNICATION CONNECTION
PLURALITY OF MESSAGING CLIENTS
FIRST MESSAGING CLIENT
FIRST CLIENT DATA
FIRST CLIENT IDENTIFIER
SECOND MESSAGING CLIENT
SECOND CLIENT DATA
SECOND CLIENT IDENTIFIER
MESSAGING CLIENT
CLIENT DATA
CLIENT IDENTIFIER
12
14
15
16
17
20
21
22
23
25
26
27
28
29
30
170
172
174
176
178
180
182
184
186

FIG. 8

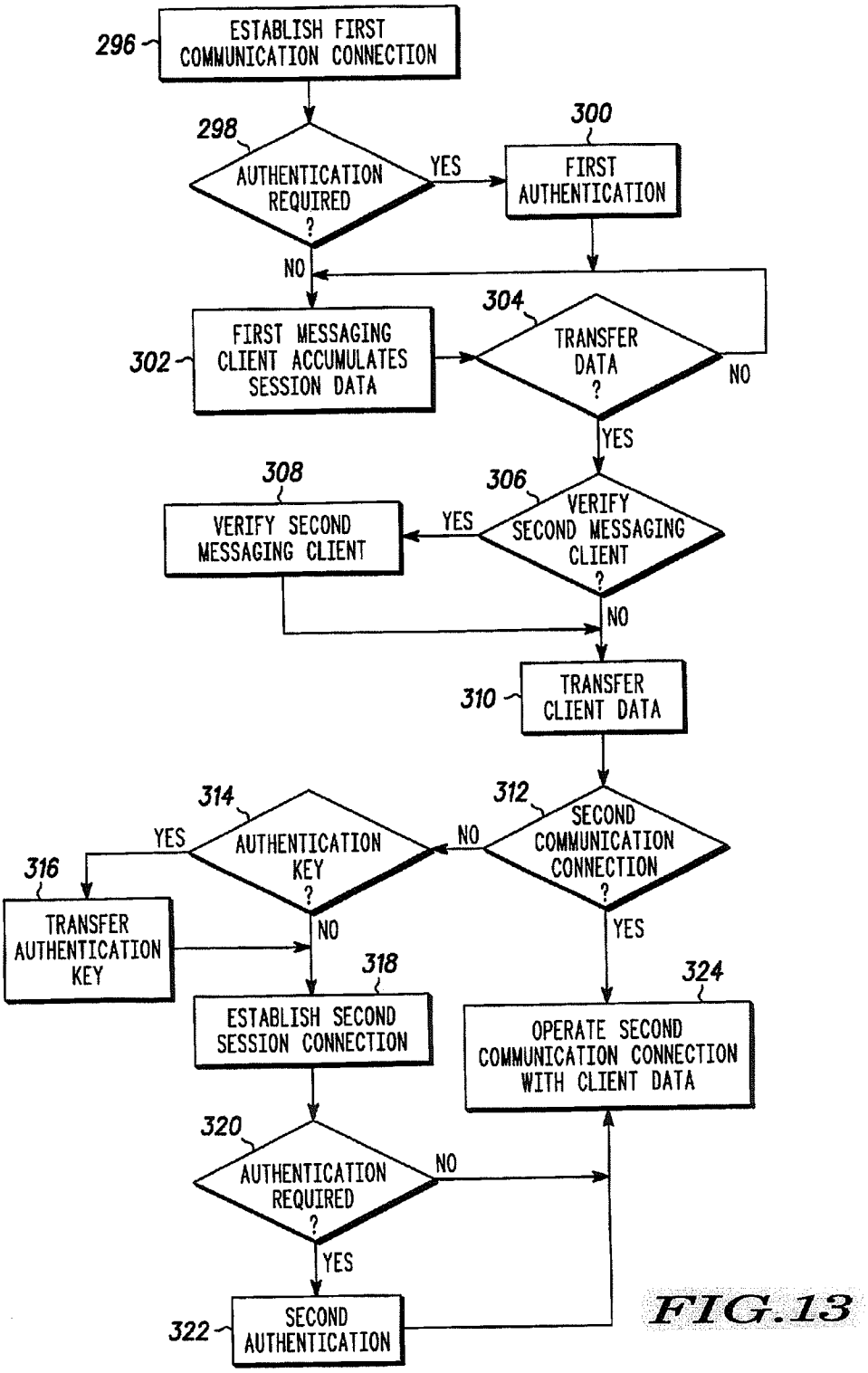

296
ESTABLISH FIRST COMMUNICATION CONNECTION
298
AUTHENTICATION REQUIRED ?
YES
300
FIRST AUTHENTICATION
NO
302
FIRST MESSAGING CLIENT ACCUMULATES SESSION DATA
304
TRANSFER DATA ?
NO
YES
306
VERIFY SECOND MESSAGING CLIENT ?
YES
308
VERIFY SECOND MESSAGING CLIENT
NO
310
TRANSFER CLIENT DATA
312
SECOND COMMUNICATION CONNECTION ?
NO
314
AUTHENTICATION KEY ?
YES
316
TRANSFER AUTHENTICATION KEY
NO
YES
318
ESTABLISH SECOND SESSION CONNECTION
324
OPERATE SECOND COMMUNICATION CONNECTION WITH CLIENT DATA
320
AUTHENTICATION REQUIRED ?
NO
YES
322
SECOND AUTHENTICATION

FIG. 13

SYSTEM FOR PROVIDING CONTINUITY BETWEEN MESSAGING CLIENTS AND METHOD THEREFOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates in general to communication systems and in particular to communication systems incorporating capabilities to provide continuity between messaging clients.

2. Description of the Related Art

With the proliferation of the Internet, the way people communicate is changing. Electronic communication such as electronic mail (email), and real time electronic messaging (e.g. instant messaging and chat messaging) is quickly replacing traditional telephonic communication and handwritten letters. Real time electronic messaging allows the simultaneous access to a message or a plurality of messages by multiple account users, with each account user capable of inputting a message or a plurality of messages to a messaging session. Each inputted message is relayed to messaging clients operating on messaging devices (such as computers) of the other account users who have chosen to participate in that messaging session. The other session participants can respond with their own messages, which are likewise relayed to all the participating devices. These messages are typically text messages that are delivered to the intended recipient(s) of the message in a real time manner. However, these messages may be in a variety of different media formats or combinations thereof such as audio, animation, video, images, etc. A session history of the messages received and transmitted by all participants involved in the messaging session is typically maintained on the individual participants' devices and typically presented on the screen of the respective device in the form of a scrolling dialog. This text history constitutes one of the attributes of the look and feel of the real time electronic messaging experience.

There are currently several standard methods available for account users to participate in messaging communications. For example, personal instant messaging typically occurs between two individuals. An individual can establish a private chat room so that multiple users can participate in a common on-line conversation. Participants gain access to the private chat room by accepting an invitation from the creator of the private chat room. Non-restricted public chat rooms are available to anyone interested in the topic being discussed by simply selecting the desired chat room descriptor on the account user's device. In addition to the non-restricted public chat rooms there are limited access public chat rooms. An example of one such restriction is the limiting of the number of account users allowed to participate in the chat room. Electronic gaming is available to participants who register and login to join at least one other participant in playing one or more games. Communication of participants' "moves" are made through electronic message communications in messaging sessions.

Each messaging session can have various types of session attributes such as session type, session connection info, participants, filter settings, colors, relative font sizes, etc. The account user can also have various types of preferences such as colors, relative font sizes, buddy lists, nicknames, and parental control settings. These are only a few examples of the attributes and preferences that can effect a messaging session.

Several different devices, such as personal computers, interactive broadcast receivers and mobile communication devices, can be utilized to participate in messaging communications. Although these different devices can be utilized to participate in a messaging communication they all do not have the same set of features and capabilities. For example, display size, support for different media types, and cost of sending messages can all be different for different devices. Some messaging service providers maintain the same user preference settings such as screen names, buddy list groups, electronic mailboxes, and parental control settings regardless of which device is used to access the service. By having this capability the service providers are providing continuity of user preferences from device to device, which simplifies the use of multiple devices in the messaging system.

In order to utilize real time electronic messaging, a device is pre-configured with, or the user installs, application client software distributed by a particular service provider. The client software connects to a message server for communication. To access the message server, via a logon procedure, the client sends the routing information (e.g. IP address and number of the port assigned to the client, mobile phone number) of the device being used, the account user's username, the account user's password, and the account user's current availability setting to the message server. The message server temporarily stores the routing and availability information for the account user's device. In response to the account user's login information (username and password), the message server provides the messaging client with the account user's contact list. The message server then determines the presence and availability of the account users in that contact list. If the message server finds any of the contacts logged in (i.e. presence setting is online), it sends a message back to the messaging client on the account user's device with the presence and availability information for that account user. The message server also sends the account user's presence and availability information to the people that have the account user in their contact list. The account user can click on the name of a person in his/her contact list who is online, and a window is created in which the account user can enter a message. The account user enters a message and clicks "send" to communicate with that person. The other person gets the message and can respond. Messages between account users may be addressed directly to the account user's device or may be addressed to the username and sent via the message server.

The window that the session participants see on their respective messaging devices typically includes a scrolling dialog of the session history. Each participant's messages appear in this window on all participating devices. Messages can have different attributes such as message formatting, sender identification, timestamps and others. For example, messages related to a particular electronic game could contain graphics enhancing the "look and feel" of the electronic game for the participants.

When the messaging session is complete, the account users close the message window for that messaging session. When the account user signs off, his/her messaging client sends a message to the message server to terminate the account user's participation in the plurality of messaging sessions. The message server then sends an update of the account user's presence and availability information to the people that have the account user in their contact list to indicate the account user has signed off. Finally, the message server discards the routing and availability information for the account user's device.

Some messaging services support access of a single account from multiple devices. Further, some messaging services also support simultaneous login of devices on the

same account. Still further, some messaging services utilize a resource extension to describe the device that is being utilized to communicate. For example an account user logging in with a mobile device can choose to use "mobile device" as their resource extension while logging into the same account from the home personal computer may utilize a resource extension of "home computer".

When using messaging services that allow access from multiple devices, an account user can log on with a first messaging device and engage in conversations with other account users and later log on with a second messaging device. For example, users of mobile devices would typically benefit if a messaging session in progress on a fixed network device could be continued on a mobile device. This would allow the account user to continue the messaging session when the account user is no longer in proximity to the fixed network device. In addition the account user would benefit if a messaging session that was in progress on a mobile device could be continued on a fixed network device that may have a superior user interface.

In order to switch to a different device with existing technology, the account user may have to cause the currently connected device to disconnect from the message server. The account user would then have to cause the second device to connect to the message server and login. Finally, the account user would have to re-initiate each messaging session (one-to-one, public chat, private chat, electronic game) that was in progress on the first device. The disadvantage of this method is the numerous manual operations required of the account user to change devices. A further disadvantage is the lack of messaging session continuity. For example, the second device will not have the session history that was available on the first device, and the second device may not be able to re-connect to chat rooms that restrict the number of active account users since another account user may have connected to the chat room after the account user's first device disconnected.

What is needed is a system and method for maintaining continuity between messaging clients.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be described by way of exemplary embodiments, but not limitations, illustrated in the accompanying drawings in which like references denote similar elements, and in which:

FIG. **1** is an electronic block diagram of a messaging communication system, in accordance with the preferred embodiment of the present invention;

FIG. **2** illustrates client data for use within the messaging communication system of FIG. **1**, in accordance with the preferred embodiment of the present invention;

FIGS. **3** and **4** illustrate more detail of the client data of FIG. **2**, in accordance with the preferred embodiment of the present invention;

FIGS. **5**, **6**, and **7** are electronic block diagrams of various embodiments of a messaging device in which a messaging client of FIG. **1** operates;

FIG. **8** is an electronic block diagram of an alternate embodiment of a messaging communication system, in accordance with the preferred embodiment of the present invention;

FIGS. **9** to **12** are electronic block diagrams of various embodiments of the messaging communication system of FIGS. **1** and **8**, in accordance with the preferred embodiment of the present invention;

FIGS. **13** to **18** are flowcharts illustrating the operation of the messaging communication system of FIGS. **1** and **8**, in accordance with the preferred embodiment of the present invention;

FIG. **19** illustrates a message for use within the messaging communication system of FIGS. **1** and **8**, in accordance with the preferred embodiment of the present invention; and

FIGS. **20** to **24** are signaling flow diagrams illustrating the interaction between the elements of the messaging communication system of FIGS. **1** and **8**, in accordance with the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention, which may be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention in virtually any appropriately detailed structure. Further, the terms and phrases used herein are not intended to be limiting; but rather, to provide an understandable description of the invention.

Referring to FIG. **1**, an electronic block diagram of a messaging communication system **10** in accordance with the present invention is shown. As illustrated, the messaging communication system **10** preferably includes a plurality of messaging clients **12** for participation within a plurality of messaging sessions **24**. As illustrated, the plurality of messaging sessions **24** can include a messaging session **40** and/or a multiple user messaging session **19**. The plurality of messaging sessions **24**, for example, can include the communication of a plurality of electronic messages such as chat sessions, instant message sessions, and electronic mail, facilitating substantially real time communication among the plurality of messaging clients **12**. Similarly, the plurality of messaging sessions **24** can include communication of gaming messages for one or more gaming sessions (e.g. battleship, checkers, chess, tic tac toe and doom). It will be appreciated by one of ordinary skill in the art that the plurality of messaging sessions **24** can include any of the messaging sessions mentioned herein or an equivalent. Each of the plurality of messaging clients **12** such as a first messaging client **14** and a second messaging client **20** includes client software to interface within the messaging communication system **10**. The client software, for example, can include a software application for communication through an Internet service provider. Further, the client software can include a software application for participation in one or more electronic games offered by a gaming software provider. It will be appreciated by one of ordinary skill in the art that the client software can be any of those mentioned herein or an equivalent. Further, it will be appreciated by one of ordinary skill in the art that in accordance with the present invention, the interface capabilities of the client software can also be designed into client hardware of a messaging client. Each messaging client **26** of the plurality of messaging clients **12** further includes a client identifier **27**. For example, the first messaging client **14** includes a first client identifier **15** and the second messaging client **20** includes a second client identifier **21**. The client identifier **27** of the messaging client **26** is a unique identification within the messaging communication system **10** for directing mes-

sages to a particular messaging client. For example, the client identifier **27** can be an address of a mobile device or an IP address and number of the port of a fixed network device. To communicate within at least one of the plurality of messaging sessions **24** the messaging client **26** establishes a communication connection **28**. For example, the first messaging client **14** establishes a first communication connection **16** for communication within at least one of the plurality of messaging sessions **24**. Similarly, the second messaging client **20** establishes a second communication connection **22** for communication within at least one of the plurality of messaging sessions **24**. It will be appreciated by one of ordinary skill in the art that the communication connection **28**, the first communication connection **16**, and the second communication connection **22** can be a physical connection, or alternatively can be a logical connection where the act of connecting and disconnecting is a logical one. Each messaging client **26** of the plurality of messaging clients **12** is operated by at least one account user **30**. The account user **30** is an individual who uses one or more messaging clients to communicate with other account users within the plurality of messaging sessions **24**. It will be appreciated by one of ordinary skill in the art that the account user **30** can communicate using one or more messaging clients. For example, a first account user **29** can establish communication within the plurality of messaging sessions **24** using the first messaging client **14**, and, in accordance with the present invention, also using the second messaging client **20**.

Each messaging client **26** preferably includes a plurality of client data **25**. The plurality of client data **25** includes data associated with the messaging client **26** and data associated with each messaging session for which the messaging client **26** is currently participating, has participated in, or plans to participate in. The plurality of client data **25** can be divided up into one or more client data portions **18** as illustrated in FIG. **2**. The first messaging client **14** includes a first client data **17** and the second messaging client **20** includes a second client data **23**. FIG. **2** illustrates the plurality of client data **25** included within the messaging client **26** of FIG. **1**. It will be appreciated by one of ordinary skill in the art that the plurality of client data **25** as illustrated in FIG. **2** can be the first client data **17** or the second client data **23**. As illustrated, the plurality of client data **25** preferably includes a client version identifier (not shown), an account identifier **31**, a server identifier **32**, an authentication key **33**, a plurality of contact data **34**, a plurality of user preferences **35**, and a plurality of session data **36**. It will be appreciated by one of ordinary skill in the art that the plurality of client data **25** can include any of the client data mentioned herein or an equivalent.

The client version identifier is preferably the name and version or other similar indication of the messaging client being used. The account identifier **31** is preferably a user name or other identification of the account user **30** currently using the messaging client **26**. In an embodiment of the present invention in which a message server is utilized to manage the plurality of messaging sessions **24**, the server identifier **32** identifies the message server. For example, the server identifier **32** can be a wireless address, an IP (internet protocol) address, or an IP address accompanied by a number of the port assigned to the message server. The authentication key **33** preferably includes a code that is used to authenticate the account user **30** to the messaging communication system **10**. For example, the authentication key **33** could be derived from a password known only to the account user **30** and the messaging communication system **10**. The plurality of contact data **34** is a listing of information relating to the various account users in which the account user **30** currently using the messaging client **26** communicates, plans to communicate, or has communicated with in the past. For example, the plurality of contact data **34** can be a "buddy list" for the account user **30**. The plurality of contact data **34** preferably includes a plurality of account information **37** for each of a plurality of accounts. For example, the plurality of account information **37** for an Nth account can include an Nth account identifier **38** and further can include an Nth account contact information **39** associated with the Nth account identifier **38**. The Nth account contact information **39**, for example, can include Nth account user presence, Nth account user availability, Nth account phone number, Nth account mailing address, or Nth account user preferred communication means. It will be appreciated by one of ordinary skill in the art that the Nth account contact information can be any of the contact information mentioned herein or an equivalent. The plurality of account information **37** can further include, for example, billing information, favorite topics, associates, group lists, age, obscenity rating, and optional services. It will be appreciated by one of ordinary skill in the art that the plurality of account information **37** can include any of the information mentioned herein or an equivalent. In one embodiment of the present invention, each of the plurality of messaging clients **12** of FIG. **1** operates using at least one account. Further, each account user can have one or more accounts. For example, the account user **30** can have a business account and a personal account both operated using the messaging client **26**.

The plurality of user preferences **35** defines certain attributes settable by the account user **30** for communicating within the plurality of messaging sessions **24** using the messaging client **26**. The plurality of user preferences **35**, for example, can include text font attributes, filter settings, blocking settings, screen names per account identifier, alert settings per screen name, buddy list groups, electronic mailboxes, electronic voice mail, and parental control settings. It will be appreciated by one of ordinary skill in the art that the plurality of user preferences **35**, in accordance with the present invention, can include any of those preferences mentioned herein or an equivalent.

The plurality of session data **36** included within the plurality of client data **25** contains information relating to each of the plurality of messaging sessions **24** for which the account user **30** is currently participating, has previously participated, or plans to participate in, using the messaging client **26**. FIG. **3** illustrates a preferred embodiment of the plurality of session data **36** in accordance with the present invention. As illustrated in FIG. **3**, for each messaging session **40**, the plurality of session data **36** includes a session identifier **41**, a session priority **42**, a plurality of session preferences **43**, a plurality of session participants **44**, and a session history **45**. It will be appreciated by one of ordinary skill in the art that the plurality of session data **36**, in accordance with the present invention, can include any of the session data mentioned herein or an equivalent.

Preferably, the session identifier **41** identifies the messaging session **40** of the plurality of messaging sessions **24**. In one embodiment, the messaging session **40** is assigned the session priority **42**. The session priority **42** determines or identifies the priority of the messaging session **40** within the plurality of messaging sessions **24** for which the account user **30** is currently participating. The session priority **42** can be set manually by the account user **30** or through a predetermined algorithm in the messaging client **26** taking

directly to the power circuit **82**, the user input **88** to the user interface **64**, or alternatively automatically via the programming of the CPU **53**.

In a preferred embodiment of the present invention, the fixed network device **50** of FIG. **5** includes a fixed messaging client **84**. It will be appreciated by one of ordinary skill in the art that the fixed messaging client **84** can be the first messaging client **14**, the second messaging client **20**, or any other of the plurality of messaging clients **12** of FIG. **1**. The fixed network device **50** performs messaging functions within the fixed messaging client **84** using a plurality of messages stored in the electronic memory of the fixed network device **50**. The fixed messaging client **84** may be hard coded or programmed into the fixed network device **50** during manufacturing, may be programmed over-the-air upon customer subscription, or may be a downloadable application. It will be appreciated that other programming methods can be utilized for programming the fixed messaging client **84** into the fixed network device **50**. It will be further appreciated by one of ordinary skill in the art that the fixed messaging client **84** can be hardware circuitry within the fixed network device **50**.

Preferably the fixed messaging client **84** automatically updates a CRT **86** when a new message has been sent or received by sending a command to the display driver **59**. This allows the message to be updated while the device user is reading it without disturbing the CRT **86**. The fixed messaging client **84** uses the plurality of client data **25** stored in the electronic memory or stored in the memory storage device **58** to perform functions relating to various received and/or sent messages. It will be appreciated by one of ordinary skill in the art that fixed networked devices having software-programming capabilities may include client data that is specialized and personalized such as the plurality of user preferences **35** including display options and screens for each account user, or similarly may include the plurality of session preferences **43** for each messaging session **40**. Alternatively, fixed networked devices that do not include software-programming capabilities may include the plurality of client data **25** including the plurality of user preferences **35** that are standard, pre-defined display options and screens for the plurality of messaging sessions **24**.

The plurality of user preferences **35** of the plurality of client data **25** used by the fixed messaging client **84** further includes various alert options. In one embodiment, the fixed messaging client **84** notifies the CPU **53** to send a command to an alert circuit (not shown) when a new message is received. In another embodiment, the fixed messaging client **84** notifies the CPU **53** to send a command to the alert circuit when an unread message is to be deleted from the memory. Alternatively, no alert may be sent when a new message is received and stored in the memory. It will be appreciated by one of ordinary skill in the art that other alerting schemes are within the scope of the present invention. Further, the CPU **53**, in response to the user input **88** to the user interface **64** through to the user interface port **62**, such as a device user depressing a button or series of buttons, or in response to receipt of a message initiates an input signal to the fixed messaging client **84**. The fixed messaging client **84**, in response to the input signal, accesses a plurality of messages stored in the electronic memory for use in operation of the fixed messaging client **84**.

Preferably, the fixed messaging client **84** includes a client profile **85**. The client profile **85** includes information regarding the capabilities and limitations of the fixed messaging client **84** and also of the fixed network device **50**. For example, the client profile **85** can include indication of the media supported by the fixed messaging client **84** (e.g. audio, video), indication of which features are supported by the fixed messaging client **84**, device type, device display, device battery life, device battery capacity, device processing power, and access to alternate networks. It will be appreciated by one of ordinary skill in the art that the client profile **85** can include any of those mentioned above in any combination or an equivalent.

In accordance with the present invention, the fixed messaging client **84** includes software capability for transferring all or a portion of the plurality of client data **25** to one or more other messaging clients for use by the other messaging client to participate within one or more of the plurality of messaging sessions **24**. The fixed messaging client **84**, in accordance with the present invention, further includes software capability for receiving all or a portion of the plurality of client data **25** from at least one other messaging client to participate within one or more of the plurality of messaging sessions **24**. As illustrated in FIG. **5**, the software capability for transferring and/or the capability for receiving the plurality of client data **25** can be incorporated into the fixed messaging client **84**, or alternatively can be contained within a separate data transfer application **83**. The data transfer application **83**, for example can be a third party software add-on that is compatible with existing messaging software applications (e.g. the fixed messaging client **84**) already programmed into the fixed network device **50**. Maintaining the data transfer software on a separate data transfer application **83** minimizes incorporation timeframes and also the cost of upgrading the fixed network device **50** to include this feature.

FIG. **6** is an electronic block diagram of one embodiment of a messaging device in which a messaging client of FIG. **1** operates. Specifically, FIG. **6** illustrates a mobile device **90**. It will be appreciated by one of ordinary skill in the art that the mobile device **90** in accordance with the present invention, can be a mobile cellular telephone, a mobile radio data terminal, a mobile cellular telephone having an attached data terminal, or a two way pager, such as the "Pagewriter 2000X" manufactured by Motorola Inc. of Schaumburg, Ill. In the following description, the term "mobile device" refers to any of the messaging devices mentioned above or an equivalent.

As illustrated in FIG. **6**, the mobile device **90** includes a first antenna **92**, a second antenna **94**, a receiver **96**, a transmitter **98**, a clock **100**, a processor **102**, a device memory **104**, a device memory interconnect **105**, a device alert circuit **106**, a device display **108**, a device user interface **110** and a mobile messaging client **112**.

The first antenna **92** intercepts transmitted signals from a wireless messaging system **114**. It will be appreciated by one of ordinary skill in the art that the wireless messaging system **114**, in accordance with the present invention, can function utilizing any wireless RF channel, for example, a one or two-way pager channel, a mobile cellular telephone channel, or a mobile radio channel. Similarly, it will be appreciated by one of ordinary skill in the art that the wireless messaging system **114** can function utilizing other types of communication channels such as infrared channels. In the following description, the term "wireless messaging system" refers to any of the wireless messaging systems mentioned above or an equivalent.

The first antenna **92** is coupled to the receiver **96**, which employs conventional demodulation techniques for receiving the communication signals transmitted by the wireless messaging system **114**. Coupled to the receiver **96**, is the processor **102** utilizing conventional signal-processing tech-

niques for processing received messages. Preferably, the processor **102** is similar to the MC68328 micro-controller manufactured by Motorola, Inc. of Schaumburg, Ill. It will be appreciated by one of ordinary skill in the art that other similar processors can be utilized for the processor **102**, and that additional processors of the same or alternative type can be utilized as required to handle the processing requirements of the processor **102**. The processor **102** decodes an address in the demodulated data of the received message, compares the decoded address with one or more addresses **115** stored in an address memory **116** of the device memory **104**; and when a match is detected, proceeds to process the remaining portion of the received message.

To perform the necessary functions of the mobile device **90**, the processor **102** is coupled to the device memory **104**, which preferably includes a random access memory (RAM), a read-only memory (ROM), and an electrically erasable programmable read-only memory (EEPROM)(not shown). The device memory **104** includes the address memory **116**, a message memory **118**, and a client data memory **120**.

Once the processor **102** has processed a received message, it stores the decoded message in the message memory **118** of the device memory **104**. It will be appreciated by one of ordinary skill in the art that the message memory **118**, in accordance with the present invention, can be a voicemail box or a group of memory locations in a data storage device. In the following description, the term "message memory" refers to any of the memory means mentioned above or an equivalent. Preferably, when the received message is a message for participation in one of the plurality of messaging sessions **24**, for example the session message **46** of the messaging session **40**, the processor **102** stores the decoded message in the client data memory **120**.

In one embodiment, the mobile device **90** includes the device memory interconnect **105** for operatively connecting the memory storage device **58** to the mobile device **90**. The device memory interconnect **105** can, for example, comprise a structure for physically engaging external contacts on the memory storage device **58** so that the memory storage device **58** is directly connected to the mobile device **90**. It will be appreciated by one of ordinary skill in the art that the device memory interconnect **105** can also be a wireless connection such as an infrared, Bluetooth or radio frequency interface. When the device memory interconnect **105** is connected to the memory storage device **58**, the mobile device **90** can access a plurality of memory information such as the plurality of client data **25** from the memory storage device **58**.

The client data memory **120** includes the plurality of client data **25** as described previously in FIGS. **2** to **4**. The client data memory **120** includes a memory slot **122** for each messaging session **40** in which the mobile device **90** has subscribed. The memory slot **122**, in accordance with the present invention, includes the plurality of session data **36** as illustrated in FIG. **2**. The plurality of session messages **61** associated with the messaging session **40** is stored together in chronological order in the memory slot **122** similar to the session history **45** of FIG. **4**. The memory slot **122** is allocated a fixed amount of memory for storing associated plurality of session messages **61**. The memory slot **122** holds multiple session messages in a single message memory slot. Any session message **46** received for the messaging session **40** along with its associated session message information is appended at the end of the plurality of session messages **61** already in the memory slot **122**. If the amount of allocated memory for the memory slot **122** is exceeded, the older session messages are deleted. It will be appreciated by one of ordinary skill in the art that, in accordance with the present invention, the client data memory **120** and associated operation herein described, in accordance with the present invention, can be included in the fixed network device **50** of FIG. **5**, a cable box **136** of FIG. **7** or any other messaging device in which the messaging client **26** operates.

Upon receipt and processing of a message, the processor **102** preferably generates a command signal to the device alert circuit **106** as a notification that the message has been received and stored. The device alert circuit **106** can include a speaker (not shown) with associated speaker drive circuitry capable of playing melodies and other audible alerts, a vibrator (not shown) with associated vibrator drive circuitry capable of producing a physical vibration, or one or more LEDs (not shown) with associated LED drive circuitry capable of producing a visual alert. It will be appreciated by one of ordinary skill in the art that other similar alerting means as well as any combination of the audible, vibratory, and visual alert outputs described can be used for the device alert circuit **106**.

Upon receipt and processing of a message, the processor **102** preferably also generates a command signal to the device display **108** to generate a visual notification of the receipt and storage of the message. When the device display **108** receives the command signal from the processor **102** that the message has been received and stored in the device memory **104**, a message indication is displayed. The message indication, for example can be the activation of one of a plurality of message icons on the device display **108**. The device display **108** can be, for example, a liquid crystal display utilized to display text. It will be appreciated by one of ordinary skill in the art that other similar displays such as cathode ray tube displays can be utilized for the device display **108**.

The mobile device **90** preferably further includes the clock **100**. The clock **100** provides timing for the processor **102**. The clock **100** can include the current time for use in the operation of the mobile device **90**. The clock **100** also provides a source for timing of feature enhancements such as active and inactive periods of operation or periods of alerting.

In a preferred embodiment, the mobile device **90** includes the mobile messaging client **112**. It will be appreciated by one of ordinary skill in the art that the mobile messaging client **112** can be the first messaging client **14**, the second messaging client **20**, or any other of the plurality of messaging clients **12** of FIG. **1**. The mobile messaging client **112** performs messaging functions within the mobile device **90** using the plurality of client data **25** stored in the client data memory **120**. The mobile messaging client **112** may be hard coded or programmed into the mobile device **90** during manufacturing, may be programmed over-the-air upon customer subscription, or may be a downloadable application. It will be appreciated that other programming methods can be utilized for programming the mobile messaging client **112** into the mobile device **90**. It will be further appreciated by one of ordinary skill in the art that the mobile messaging client **112** can be hardware circuitry within the mobile device **90**. Preferably the mobile messaging client **112** automatically updates the device display **108** when a new session message has been sent or received. This allows the session history **45** to be updated while the account user **30** is reading it without disturbing the device display **108**. The mobile messaging client **112** uses the plurality of client data **25** stored in the electronic memory or stored in the memory storage device **58** to perform functions relating to various received and/or sent session messages. It will be appreciated

by one of ordinary skill in the art that mobile devices having software-programming capabilities may include specialized and personalized display options and screens for each messaging session **40**. Alternatively, mobile devices that do not include software-programming capabilities may include standard, pre-defined display options and screens for the plurality of messaging sessions **24**. In accordance with the present invention, the display options for the plurality of messaging sessions **24** in which the messaging client **26** within the mobile device **90** is participating can be included in the plurality of session preferences **43** for each messaging session **40** or alternately, the display options can be stored independently within the plurality of user preferences **35** of the plurality of client data **25**

The mobile messaging client **112** further operates using various alert options. In one embodiment, the mobile messaging client **112** notifies the processor **102** to send a command to the device alert circuit **106** when a new session message is added to the memory slot **122** of the client data memory **120** for the messaging session **40**. In another embodiment, the mobile messaging client **112** notifies the processor **102** to send a command to the device alert circuit **106** when an unread session message is to be deleted from the memory slot **122**. Alternatively, no alert may be sent when a new session message is received and stored in the client data memory **120**. It will be appreciated by one of ordinary skill in the art that other alerting schemes are within the scope of the present invention. In accordance with the present invention, the alert options for the plurality of messaging sessions **24** in which the messaging client **26** within the mobile device **90** is participating can be included in the plurality of session preferences **43** for each messaging session **40** or alternately, the alert options can be stored independently within the plurality of user preferences **35** of the plurality of client data **25**.

In accordance with the present invention, the mobile messaging client **112** includes software capability for transferring all or a portion of the plurality of client data **25** to at least one other messaging client for use by the other messaging client to participate within one or more of the plurality of messaging sessions **24**. The mobile messaging client **112**, in accordance with the present invention, further includes software capability for receiving all or a portion of the plurality of client data **25** from another messaging client to participate within one or more of the plurality of messaging sessions **24**. As illustrated in FIG. **6**, the software capability for transferring and receiving client data can be incorporated into the mobile messaging client **112** or alternatively contained within a separate data transfer application **83**. The data transfer application **83**, for example can be a third party software add-on that is compatible with existing messaging software applications (e.g. the mobile messaging client **112**) already programmed into the mobile device **90**. Maintaining the data transfer software on a separate data transfer application **83** minimizes incorporation timeframes and also the cost of upgrading a messaging device to include this feature.

Preferably, the device user interface **110** is coupled to the processor **102**. The device user interface **110** can be one or more buttons used to generate a button press, a series of button presses, a voice response from the device user, or some other similar method of manual response initiated by the device user (such as the account user **30**) of the mobile device **90**. The processor **102**, in response to the device user interface **110**, such as a device user depressing a button or series of buttons, or in response to receipt of a session message, initiates an input signal to the mobile messaging client **112**. The mobile messaging client **112**, in response to the user input signal, accesses the plurality of session messages **61** stored in the client data memory **120** for use in operation of the mobile messaging client **112**.

Preferably, the mobile messaging client **112** includes the client profile **85**. The client profile **85** includes information regarding the capabilities and limitations of the mobile messaging client **112** and also of the mobile device **90**. For example, the client profile **85** can include indication of the media supported by the mobile messaging client **112** (e.g. audio, video), indication of which features are supported by the mobile messaging client **112**, device type, device protocol usage, device display, device battery life, device battery capacity, device processing power, and access to alternate networks. It will be appreciated by one of ordinary skill in the art that the client profile **85** can include any of those mentioned above in any combination or an equivalent.

The transmitter **98** is coupled to the processor **102** and is responsive to commands from the processor **102**. When the transmitter **98** receives a command from the processor **102**, the transmitter **98** sends a signal via the second antenna **94** to the wireless messaging system **114**.

In an alternative embodiment (not shown), the mobile device **90** includes one antenna performing the functionality of the first antenna **92** and the second antenna **94**. Further, the mobile device **90** alternatively includes a transceiver circuit performing the functionality of the receiver **96** and the transmitter **98**. It will be appreciated by one of ordinary skill in the art that other similar electronic block diagrams of the same or alternate type can be utilized for the mobile device **90** to handle the requirements of the mobile device **90**.

The mobile device **90** can be changed from an active state to an inactive state or from an inactive state to an active state through a user input to the power circuit **134**. The power circuit **134** can be operated manually via the user input to the power circuit **134**, the user input to the user interface **110**, or alternatively automatically via the programming of the processor **102**.

FIG. **7** is an electronic block diagram of one embodiment of a messaging device in which a messaging client of FIG. **1** operates. Specifically, FIG. **7** illustrates an interactive broadcast receiver such as the cable box **136**. The cable box **136** preferably allows network operators to deploy a wide range of interactive television broadcast services and applications on their networks. Further the cable box **136** preferably offers cable operators a combined, all-in-one, hardware and software solution for deploying interactive television services on their networks, thereby creating the ability for real time electronic message communication using television sets and networks.

As illustrated in FIG. **7**, the cable box **136** preferably includes a controller **138** for controlling the operation of the cable box **136**. Preferably, the controller **138** is similar to the MC68328 micro-controller manufactured by Motorola, Inc. of Schaumburg, Ill. It will be appreciated by one of ordinary skill in the art that other similar processors can be utilized for the controller **138**, and that additional processors of the same or alternative type can be utilized as required to handle the processing requirements of the controller **138**. Preferably, the controller **138** is programmed to function with the cable messaging client **140**. The cable messaging client **140**, in accordance with the present invention, operates similarly to the fixed messaging client **84** of FIG. **5** and the mobile messaging client **112** of FIG. **6** as described above. It will be appreciated by one of ordinary skill in the art that the cable messaging client **140** illustrated in FIG. **7** can be the first

messaging client **14**, the second messaging client **20**, or any other of the plurality of messaging clients **12** of FIG. **1**.

In accordance with the present invention, the cable messaging client **140** includes software capability for transferring all or a portion of the plurality of client data **25** to at least one other messaging client for use by the other messaging client to participate within one or more of the plurality of messaging sessions **24**. The cable messaging client **140** further includes software capability for receiving all or a portion of the plurality of client data **25** from another messaging client to participate within one or more of the plurality of messaging sessions **24**. As illustrated in FIG. **7**, the software capability for transferring and receiving client data can be incorporated into the cable messaging client **140** or alternatively contained within a separate data transfer application **83**. The data transfer application **83**, for example can be a third party software add-on that is compatible with existing messaging software applications (e.g. the cable messaging client **140**) already programmed into the cable box **136**. Maintaining the data transfer software on a separate data transfer application **83** minimizes incorporation timeframes and also the cost of upgrading a device to include this feature.

Preferably, the cable messaging client **140** includes the client profile **85**. The client profile **85** includes information regarding the capabilities and limitations of the cable messaging client **140** and of the cable box **136**. For example, the client profile **85** can include indication of the media supported by the cable messaging client **140** (e.g. audio, video), indication of which features are supported by the cable messaging client **140**, device type, device protocol usage, device display, device battery life, device battery capacity, device processing power, and access to alternate networks. It will be appreciated by one of ordinary skill in the art that the client profile **85** can include any of those mentioned above in any combination or an equivalent.

The cable box **136** further includes an up/down converter **142** coupled to the controller **138** for communicating with a cable headend. To perform the necessary functions of the cable box **136**, the controller **138** is further coupled to a cable box memory **144**, which preferably includes a cable box random access memory (RAM) **146**, a cable box read-only memory (ROM) **148**, and an electrically erasable programmable read-only memory (EEPROM) (not shown). The cable box memory **144** of the cable box **136** preferably includes the client data memory **120** as previously described and illustrated in FIG. **6**.

In one embodiment, the cable box **136** includes a cable box memory interconnect **149** for operatively connecting the memory storage device **58** to the cable box **136**. The cable box memory interconnect **149** can, for example, comprise a structure for physically engaging external contacts on the memory storage device **58** so that the memory storage device **58** is directly connected to the cable box **136**. It will be appreciated by one of ordinary skill in the art that the cable box memory interconnect **149** can also be a wireless connection such as an infrared, Bluetooth or radio frequency interface. When cable box memory interconnect **149** is connected to the memory storage device **58**, the cable box **136** can access a plurality of memory information such as the plurality of client data **25** from the memory storage device **58**.

Further coupled to the controller **138** is a first cable box I/O **150** for driving a remote control transceiver **152** and further for driving a radio frequency transceiver **154** connected to a cable box antenna **156**. A second cable box I/O **158** for inputs from a user input via a cable box user interface **160** is further coupled to the controller **138**. Also coupled to the controller **138** are an audio driver **162** and a radio frequency/video driver **164** for communicating with a television **166**.

The cable box **136** can be changed from an active state to an inactive state or from an inactive state to an active state through a user input to the cable box power circuit **168**. The cable box power circuit **168** can be operated manually via the user input to the cable box power circuit **168**, the user input to the cable box user interface **160** or alternatively automatically via the programming of the controller **138**.

FIG. **8** is an electronic block diagram of an alternate embodiment of a messaging communication system **170** in accordance with the present invention. The messaging communication system **170** includes the plurality of messaging clients **12** and a message server **172**.

The message server **172** manages the communication of a plurality of electronic messages among the plurality of messaging clients **12**, facilitating substantially real time communication among the plurality of messaging clients **12** within the messaging communication system **170**. The message server **172** provides numerous services to manage the plurality of messaging sessions **24**. The message server **172** also offers various options to the plurality of session participants **44** to reduce cost or enhance the features of the plurality of messaging sessions **24**.

Each messaging client **26** of the plurality of messaging clients **12** such as the first messaging client **14** and the second messaging client **20** includes client software to interface within the messaging communication system **10**. It will be appreciated by one of ordinary skill in the art that in accordance with the present invention, the interface capabilities of the client software can also be designed into client hardware of a messaging client. Each mess aging client **26** of the plurality of messaging clients **12** further includes the client identifier **27**. For example, the first messaging client **14** includes the first client identifier **15** and the second messaging client **20** includes the second client identifier **21**. The client identifier **27** of the messaging client **26** is a unique identification within the messaging communication system **170** for providing individualized messages to be directed to a particular messaging client. For example, the client identifier **27** can be an address of the mobile device **90** or an IP address and number of the port of the fixed network device **50**. To communicate within the messaging communication system **170**, the messaging client **26** establishes the communication connection **28** via the message server **172**. For example, the first messaging client **14** establishes the first communication connection **16** via the message server **172** for communication within at least one of the plurality of messaging sessions **24**. Similarly, the second messaging client **20** establishes the second communication connection **22** via the message server **172** for communication within at least one of the plurality of messaging sessions **24**. It will be appreciated by one of ordinary skill in the art that the communication connection **28**, the first communication connection **16**, and the second communication connection **22** can be a physical connection, or alternatively can be a logical connection where the act of connecting and disconnecting is a logical one. Each of the plurality of messaging clients **14** belongs to the account user **30**. The account user **30** is an individual who uses one or more of the plurality of messaging clients **12** to communicate with other account users within the plurality of messaging sessions **24**. It will be appreciated by one of ordinary skill in the art that the account user **30** can communicate using one or more of the plurality of messaging clients **12**. For example, the first

account user **29** can establish communication within the plurality of messaging sessions **24** using the first messaging client **14**, and, in accordance with the present invention, also using the second messaging client **20**.

Each messaging client **26** preferably includes the plurality of client data **25**. The plurality of client data **25** includes data associated with the messaging client **26** and data associated with each messaging session for which the messaging client **26** is currently participating, has participated in, or plans to participate in. The first messaging client **14** includes the first client data **17** and the second messaging client **20** includes the second client data **23**.

The message server **172** includes a server processor **174** and a server memory **176**. The server processor **174** utilizes conventional signal processing techniques for processing received electronic messages. Preferably, the server processor **174** is similar to the MC68328 micro-controller manufactured by Motorola, Inc. of Schaumburg, Ill. It will be appreciated that other similar processors can be utilized for the server processor **174**, and that additional processors of the same or alternative type can be added as required to handle the processing requirements of the server processor **174**.

To perform the necessary functions of the message server **172**, the server processor **174** is coupled to the server memory **176**, which preferably includes a random access memory (RAM), a read-only memory (ROM), an electrically erasable programmable read-only memory (EEPROM), and/or a magnetic storage memory (for example a hard drive). The server memory **174** preferably includes a messaging sessions data memory **178**, a messaging clients data memory **180**, and a server data memory **182**. The messaging sessions data memory **178** stores the plurality of session data for all messaging sessions for which the message server **172** is managing. The plurality of session data stored for each messaging session for which the message server **172** is managing is similar to the plurality of session data **36** as illustrated in FIGS. **3** and **4** and described previously. The messaging clients data memory **178** stores the plurality of client data **25** for each of the messaging clients **26** that have established the communication connection **28** with the message server **172**. For example, the plurality of client data **25** can include the type of device being utilized by each messaging client **26**, the account user **30** utilizing each messaging client **26**, the plurality of user preferences **35** for each messaging client **26**, and the messaging sessions for which each messaging client **26** is participating. It will be appreciated by one of ordinary skill in the art that the messaging client data memory **178** can store any of the plurality of client data **25** mentioned herein or an equivalent. The server memory **176** further includes the server data memory **182**. The server data memory **182** preferably includes a server identifier **184** for the message server **172**. The server identifier **184** can be, for example, a unique selective call address in the wireless messaging system **114**. Alternatively, the server identifier **184** can be an IP address, or an IP address and associated number of the port assigned to the message server **172** of the wired messaging system **89**. It will be appreciated by one of ordinary skill in the art that the server identifier **184** can be one mentioned herein or an equivalent. The server identifier **184** enables the communication between the plurality of messaging clients **12** and the message server **172** using the communication connections such as the communication connection **28**, the first communication connection **16**, and the second communication connection **22**. The server data memory **182** also preferably includes a server profile **186**. The server profile **186** includes information regarding the capabilities of the message server **176**. For example, the server profile **186** can include server processing power, server client capability, server messaging session capability, and server access to secondary networks. It will be appreciated by one of ordinary skill in the art that the server profile **186** can include any of those mentioned above in any combination or an equivalent.

FIG. **9** is an electronic block diagram of one embodiment of the messaging communication system **10**, **170** of FIGS. **1** and **8** respectively. Specifically, FIG. **9** illustrates an embodiment of the present invention in which the messaging communication system **10**, **170** is the wireless messaging system **114** of FIG. **6**.

The wireless messaging system **114**, as illustrated in FIG. **9** includes a message input device for initiating messages into the wireless messaging system **114**. The message input device can be, for example, a telephone **204**, a computer **206**, a desktop messaging unit **208**, or the message server **172** connected through a conventional public switched telephone network (PSTN) **210** through a plurality of telephone links **212** to a wireless system controller **214**. The telephone links **212**, for example, can be a plurality of twisted wire pairs, a fiber optic cable, or a multiplexed trunk line.

The wireless system controller **214** is coupled to and oversees the operation of at least one radio frequency (RF) transmitter **216** and at least one radio frequency (RF) receiver **218** through one or more communication links **220**. The communication links **220** typically are twisted pair telephone wires, and additionally can include radio frequency (RF), microwave, or other communication links. The RF transmitter **216** and the RF receiver **218** typically are used with message store and forward stations that encode and decode inbound and outbound messages into formats that are compatible with landline message switched computers and personal radio addressing requirements, such as cellular messages, short messaging service, or paging protocols. The wireless system controller **214** can also function to encode and decode wireless messages that are transmitted to or received by the RF transmitter **216** or the RF receiver **218**. Telephony signals are typically transmitted to and received from the wireless system controller **214** by telephone sets such as the telephone **204** or a mobile device. The wireless system controller **214** encodes and schedules outbound messages such as a downlink message **222**. The wireless system controller **214** then transmits the encoded outbound messages through the RF transmitter **216** via a transmit antenna **224** to a plurality of mobile devices **226** such as the mobile device **90** of FIG. **6** on at least one outbound radio frequency (RF) channel **234**. The plurality of mobile devices **226**, for example, includes a first mobile device **228**, a second mobile device **230**, and a third mobile device **232** each communicating through a wireless connection such as the outbound RF channel **234** and an inbound RF channel **240**. The downlink message **222** can be, for example, a data message or a voice call such as the session message **46**. Similarly, the wireless system controller **214** receives and decodes inbound messages such as an uplink message **236** received by the RF receiver **218** via a receive antenna **238** on at least one inbound radio frequency (RF) channel **240** from one of the plurality of mobile devices **226**. The uplink message **236** can be, for example, a data message, a reply to a data message, a response message based on at least one data message, a voice call, or a reply to a voice call, such as the session message **46**.

Each of the plurality of mobile devices **226** assigned for use in the wireless messaging system **114** has an address or

identity assigned thereto which is a unique selective call address in the wireless messaging system **114**. For example, the first mobile device **228** has a first address **242**, the second mobile device **230** has a second address **244**, and the third mobile device **232** has a third address **246**. It will be appreciated by one of ordinary skill in the art that other mobile devices assigned for use in the wireless messaging system **114** have an address assigned thereto which is a unique selective call address in the wireless messaging system **114**. The address enables the transmission of the downlink message **222** from the wireless system controller **214** only to the mobile device having the address, and identifies the messages and responses received at the wireless system controller **214** from the mobile device with the address. In one embodiment, each of the plurality of mobile devices **226** also has a pin number assigned thereto, the pin number being associated with a telephone number within the PSTN **210**. A list of the assigned addresses and correlated telephone numbers for each of the plurality of mobile devices **226** is stored in the wireless system controller **214** in the form of a subscriber database **248**.

Preferably, at least one messaging client operates within a mobile device. For example, as illustrated in FIG. **9**, the first messaging client **14** operates within the first mobile device **228** and the second messaging client **20** operates within the second mobile device **230**. Similarly, a plurality of messaging clients can operate within the same mobile device. For example, a third messaging client **250** and a fourth messaging client **252** operate within the third mobile device **232**. It will be appreciated by one of ordinary skill in the art that, in accordance with the present invention, a mobile device can include no messaging client, one messaging client, or a plurality of messaging clients.

In one embodiment of the present invention, the message server **172** is coupled to the wireless system controller **214** of the wireless messaging system **114**. The message server **172** provides a means for real time electronic message communication with the plurality of mobile devices **226**. The message server **172**, for example, receives a request and can in response to such receipt, sends a response, both via the wireless system controller **214**. The wireless system controller **214** then routes the response to the requesting device which may be a message input device, such as the telephone **204**, the computer **206**, or the desktop messaging unit **208**, or alternatively may be an individual or one of the plurality of mobile devices **226**. In the following description, the term requester refers to any of the requesting devices mentioned above or an equivalent.

Preferably, the message server **172** includes a server address **254**, which is a unique selective call address in the wireless messaging system **114**. The server address **254** enables the transmission, via the inbound RF channel **240**, to the message server **172** of various real time electronic communication messages such as conversation service requests, subscription requests, conversation messages, availability settings, and other information. The message server **172** similarly sends real time electronic communication messages such as sending an availability setting or the forwarding of a session message to the plurality of mobile devices **226** via the outbound RF channel **234**. Furthermore, the message server **172** can also have a pin number assigned thereto, the pin number being associated with a telephone number within the PSTN **210**. The server address **254** and correlated telephone number is stored in the in the subscriber database **248** of the wireless system controller **214**.

The coupling of the message server **172** to the wireless messaging system **114** enhances the operation of the wireless messaging system **114** by adding intelligence for multiple mobile devices to communicate in substantially real time. The message server **114** interactively manages the messaging traffic associated with the plurality of messaging sessions **24** in an efficient manner.

FIG. **10** is an electronic block diagram of one embodiment of the messaging communication system **10**, **170** of FIGS. **1** and **8** respectively. Specifically, FIG. **10** illustrates an embodiment of the present invention in which the messaging communication system **10**, **170** is the wired messaging system **89** of FIG. **5**. The wired messaging system **89**, for example, can include a LAN **256** (local area network), a WAN **258** (wide area network), or a combination of LAN **256** and WAN **258** networks. It will be appreciated that while only a single LAN **256** and a single WAN **258** are shown, multiple LAN **256** networks and/or WAN **258** networks can be interconnected in a manner well known to one of ordinary skill in the art for the transfer of electronic communication such as electronic mail (email), and real time electronic messaging (i.e.: instant messaging and chat messaging) including the plurality of session messages **61**.

The general function and operation of the LAN **256** is one of allowing spatially co-located computers which are typically located within a room, building or campus of buildings to communicate with each other and/or share common resources on a computer network in a manner well known to one of ordinary skill in the art. The spatially co-located computers are represented pictorially in FIG. **10** as a plurality of messaging devices, such as the fixed network device **50** of FIG. **5**, three of which are shown by example. (a first network device **260**, a second network device **262**, and a third network device **264**) Each of the plurality of messaging devices communicates using a network connection **265**. Preferably, at least one messaging client operates within a network device. For example, as illustrated in FIG. **10**, the first messaging client **14** operates within the first network device **260** and the second messaging client **20** operates within the second network device **262**. Similarly, a plurality of messaging clients can operate within the same network device. For example, the third messaging client **250** and the fourth messaging client **252** operate within the third network device **264**. It will be appreciated by one of ordinary skill in the art that, in accordance with the present invention, a network device can include no messaging client, one messaging client, or a plurality of messaging clients.

Typical resources shared on the LAN **256** through a LAN server **266** are files on a file server, printers on a print server, and electronic message (email) services on an email server. The LAN **256** uses a physical network such as ARCNET, Ethernet, Token-ring, Local Talk or other network media to connect the computers, which represent wired network nodes into the network. The LAN **256** can employ any one of a number of networking protocols, such as TCP/IP (Transmission Control Protocol/Internet Protocol), AppleTalk™, IPX/SPX (Inter-Packet Exchange/Sequential Packet Exchange), Net BIOS (Network Basic Input Output System) or any other packet structures to enable the communication between E-mail clients and the E-mail server. In the following description, the term "local area network" refers to a network utilizing any of the networking protocols mentioned above or an equivalent. The LAN **256** can also use routers (not shown) to subnet the LAN **256** organizationally or physically. In this context, the definition of the LAN **256** as described herein refers to a geographic locality of computers and the type of wired media used to interconnect the computers for communication.

wireless messaging devices, a plurality of wired messaging devices, a plurality of networked devices, or any combination thereof.

FIG. **13** is a flowchart illustrating the operation of the messaging communication system **10,170** in accordance with the present invention. Beginning with Step **296**, the first messaging client **14** establishes the first communication connection **16** for communication within at least one of the plurality of messaging sessions **24** within the messaging communication system **10,170**. For example, when the first messaging client **14** operates within the fixed network device **50**, the first messaging client **14** accesses the appropriate network and notifies the messaging communication system **10,170** of its connection information (i.e.: IP address and number of the port assigned to the first messaging client **14**). Next, in Step **298**, the process determines whether or not an authentication is required. It will be appreciated by one of ordinary skill in the art that an authentication can be required of the first messaging client **14**, of the first account user **29** utilizing the first messaging client **14**, or of the messaging device in which the first messaging client **14** operates, or an equivalent. In Step **300**, when an authentication is required in Step **298**, a first authentication is performed. The first authentication of Step **300** checks that the first account user **29** or alternatively the first messaging client **14** is authorized to establish the first communication connection **16** and/or authorized to participate within one or more of the plurality of messaging sessions **24**. Next, in Step **302**, when the first authentication of Step **300** is completed, and also when the authentication is not required in Step **298**, the first messaging client **14** operates using the first communication connection **16** and accumulates the plurality of session data **36** for each messaging session **40** for which the first messaging client **14** is participating. In accordance with the present invention, the plurality of session data **36** can include the session identifier **41**, the session priority **42**, the session preferences **43**, the session participants **44**, or the session history **45**. It will be appreciated by one of ordinary skill in the art that the plurality of session data **36** can include any of the items mentioned herein or an equivalent. Next, in Step **304**, the process determines whether a data transfer is required or requested. A data transfer, in accordance with the present invention, is the capability for a first account user **29** to change communication means within the messaging communication system **10, 170** from the first messaging client **14** to the second messaging client **20**. For example, when the first account user **29** establishes the first communication connection **16** using the fixed network device **50** and thereafter needs to become mobile, the first account user **29** can transfer the first client data **17** including the plurality of session data **36** accumulated for the first communication connection **16** to the second messaging client **20** which for example can operate on the mobile device **90**. When no data transfer is required or requested in Step **304**, the first communication connection **16** is maintained in Step **302**, whereby the first messaging client **14** continues to accumulate the plurality of session data **36** for each messaging session **40** for which the first messaging client **14** participates. In Step **306**, when a data transfer is required or requested in Step **304**, the process determines if it is necessary to verify the second messaging client **20** prior to transferring the first client data **17** including the plurality of session data **36** to the second messaging client **20**. When verification of the second messaging client **20** is required, the second messaging client **20** is verified in step **308**. For example, the first messaging client **14** and the second messaging client **20** can both be pre-configured with a private value and the first messaging client **14** can exchange messages with the second messaging client **20** that verify that the second messaging client **20** has the correct private value. Next, in Step **310**, after the second messaging client **20** is verified in Step **308** or when no verification is required in Step **306**, the first client data **17** including the plurality of session data **36** is transferred from the first messaging client **14** to the second messaging client **20**. It will be appreciated by one of ordinary skill in the art that a portion of the first client data **17** can alternatively be transferred in Step **310**. It will further be appreciated by one of ordinary skill in the art that the transfer of the first client data **17** can be accomplished using a direct connection between the first messaging client **14** and the second messaging client **20** or a connection through the message server **172**, both either via a network connection, a wireless connection such as through the wireless communication system **114**, a Bluetooth connection, or IRDA connection, a wired connection such as through the wired communication system **89**, a network connection separate from the wireless communication system, an RS-232 connection or the broadcast messaging system **274**, or an equivalent.

Next, in Step **312**, the process determines whether or not the second communication connection **22** has already been established. For example, the second messaging client **20** can establish the second communication connection **22** independently from the establishment of the first communication connection **16** by the first messaging client **14**. The second messaging client **20** can establish the second communication connection **22** but not yet be participating in a messaging session. Alternatively, the second messaging client **20** can independently be participating in one or more messaging session of the plurality of messaging session **24** which can be the same or different messaging sessions from the ones that the first messaging client **14** is participating. In Step **314**, when no second communication connection **22** has been established for the second messaging client **20**, the process determines whether or not the authentication key **33** is required. In Step **316**, when the authentication key **33** is required in Step **314**, the first messaging client **14** transfers the authentication key **33** to the second messaging client **20**. It will be appreciated by one of ordinary skill in the art that the second messaging client **20** can include a plurality of authentication keys and that in step **316** the first messaging client **14** can send an indicator of which of the plurality of authentication keys should be used. It will be appreciated by one of ordinary skill in the art that an authentication key can be required of the second messaging client **20**, of the first account user **29**, or any other account user **30** utilizing the second messaging client **20**, or of the particular messaging device in which the second messaging client **20** operates, or an equivalent. It will further be appreciated by one of ordinary skill in the art that the transfer of the authentication key **33** can be accomplished using a direct connection between the first messaging client **14** and the second messaging client **20** or a connection through the message server **172**, both either via a network connection, a wireless connection such as through the wireless communication system **114**, a Bluetooth connection, or IRDA connection, a wired connection such as through the wired communication system **89**, a network connection separate from the wireless communication system, an RS-232 connection or the broadcast messaging system **274**, or an equivalent. Next, in Step **318**, when no authentication key is required in Step **314** or after the transfer of the authentication key in Step **316**, the second communication connection **22** is established. The second messaging client **20** establishes the second commu-

a plurality of response messages. Further, although the interaction of two account users and two messaging clients is illustrated by way of example in FIG. **20**, it will be appreciated by one of ordinary skill in the art that the messaging session **40** can include a plurality of messaging clients and an associated plurality of account users. Further, it will be appreciated by one of ordinary skill in the art that the session message **394** can be sent directly from the first messaging client **14** to the messaging client **26**; and similarly the response message **398** can be sent directly from the messaging client **26** to the first messaging client **14**, without the interface of the message server **170**, in accordance with the present invention.

According to the present invention, an account user can choose to initiate a data transfer. As illustrated in FIG. **20**, the first account user **29** via the first messaging client **14** sends a transfer request signal **402** including at least a portion of the first client data **17** such as the plurality of session data **36** currently contained on the first account user's first messaging client **14** to the message server **172**. The transfer request signal **402** preferably also includes a request to the message server **172** to transfer at least a portion of the first client data **17** including the plurality of session data **36** to a new messaging client such as the second messaging client **20**. For example, the first messaging client **14** can be a fixed personal computer such as the fixed network device **50** in the office of the first account user **29**. The first account user **29** has the need to become mobile. The second messaging client **20** can be a cellular telephone such as the mobile device **90**. The first account user **29**, according to the present invention, can pass the current messaging session from his/her personal computer to his/her cellular telephone with no loss of communication or of session data. Similarly, the transfer request signal **402** can include a request for the message server **172** to pass the plurality of session data **36** for more than one messaging session. In response to receiving the transfer request signal **402**, the message server **172** determines whether the second messaging client **20** is currently connected onto the message server **172**. (not shown) For example, the message server **172** determines whether the second messaging client **20** has established the second communication connection **22**. When the second messaging client **20** is not currently connected with the message server **172**, the message server **172** stores the plurality of session data **36** and/or the first client data **17** if so requested until the second messaging client **20** is connected. (not shown) When the second messaging client **20** is connected to the message server **172**, the message server **172** sends the data signal **404** including the plurality of session data **36** and/or any portion of the first client data **17** received from the first messaging client **14** within the transfer request signal **404** to the second messaging client **20**. The second messaging client **20** stores the plurality of session data **36** and/or the portion of the first client data **17** in memory and displays the session history **45** for access and use by the first account user **29** on the display of the messaging device in which the second messaging client **20** operates. It will be appreciated by one of ordinary skill in the art that the data signal **404** can include the plurality of session data **36** for one messaging session or for a plurality of messaging sessions, or can include the first client data **17** or the client data portion **18** of the first client data **17** for the first messaging client **14**. Similarly the messaging device in which the second messaging client **20** operates can store one messaging session or a plurality of messaging sessions, the first client data **17** or the client data portion **18** of the first client data **17** in its memory in response to receiving the data signal **404**. Preferably, in response to receiving the data signal **404**, the second messaging client **20** sends an acknowledgement signal **406** to the message server **172**. The message server **172** also preferably sends a transfer acknowledgement signal **410** to the first account user's first messaging client **14**. The messaging session **40** seamlessly continues between the first account user **29** and the second account user through the second messaging client **20** and the messaging client **26** as illustrated by the plurality of session messages **412** to **422**. The messaging session **40** continues seamlessly without the second account user being necessarily aware of the transfer of the first client data from the first account user's first messaging client **14** to his/her second messaging client **20**. It will be appreciated by one of ordinary skill in the art that although only a second account user is shown in FIG. **20** by way of example, the messaging session **40** can continue seamlessly between a plurality of account users and associated plurality of messaging clients.

Preferably, the first messaging client **14** is disconnected from the messaging session **40** upon completion of the data transfer. (not shown) It will be appreciated by one of ordinary skill in the art that the first messaging client **14** can be automatically disconnected from the messaging session **40** or alternatively the first messaging client **14** can be disconnected manually by the first account user **29**. Similarly, it will be appreciated by one of ordinary skill in the art the first messaging client **14** can continue to be active in the messaging session **40** along with the second messaging client **20**. (not shown)

FIG. **21** is a signaling flow diagram illustrating the interaction between the elements of the messaging communication system **10**,**170**, according to the present invention. Specifically, FIG. **21** illustrates the interaction between the first messaging client **14**, the second messaging client **20**, the messaging client **26**, and the message server **172**, according to the present invention. In accordance with the present invention, as illustrated in FIG. **21**, a second account user, such as the account user **30**, logs onto the messaging client **26** and sends a notification signal **388** to the message server **172**. For example, the messaging client **26** establishes the communication connection **28**. The notification signal **388** for example, includes the connection information (i.e.: IP address and number of the port assigned to the messaging client) of the messaging client **26**. Preferably, the notification signal **388** further includes the second account identifier of the second account user. Similarly, the first account user **29** logs onto the first messaging client **14** and sends a notification signal **386** to the message server **172**. For example, the first messaging client **14** establishes the first communication connection **16**. The notification signal **386** for example, includes the connection information (i.e.: IP address and number of the port assigned to the messaging client) of the first messaging client **14**. Preferably, the notification signal **386** also includes the first account identifier of the first account user **29**. It will be appreciated by one of ordinary skill in the art that alternatively, the notification signals **386** and **388** can be sent directly to one or more of the plurality of messaging clients **12**. In response to receiving the notification signal **386** from the messaging client **26**, and receiving the notification signal **388** from the first messaging client **14**, the message server **172** sends a client availability signal **390** to the messaging client **26**. The client availability signal **390** informs the second account user via the messaging client **26** that the first account user **29** is available for real time electronic communications such as participation in one or more messaging sessions. Similarly, in response to receiving the notification signal **386** from the

EXHIBIT 20

US005784001A

United States Patent [19]

Deluca et al.

[11] Patent Number: 5,784,001

[45] Date of Patent: Jul. 21, 1998

[54] **METHOD AND APPARATUS FOR PRESENTING GRAPHIC MESSAGES IN A DATA COMMUNICATION RECEIVER**

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[73] Assignee: **Motorola, Inc.**, Schaumburg, Ill.

[21] Appl. No.: **898,640**

[22] Filed: **Jul. 21, 1997**

Related U.S. Application Data

[63] Continuation of Ser. No. 560,604, Nov. 20, 1995, abandoned.

[51] **Int. Cl.**[6] **G08B 5/22**

[52] **U.S. Cl.** **340/825.44**; 345/133

[58] **Field of Search** 340/825.44; 345/133, 345/122

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2 206 718	1/1989	United Kingdom	H04B 5/04
9103885	3/1991	WIPO	455/154

Primary Examiner—Brian Zimmerman
Assistant Examiner—Edward Merz

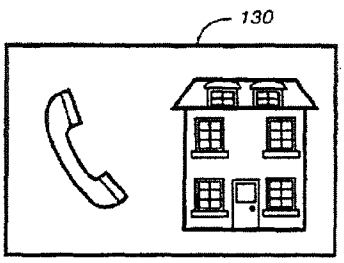
[57] **ABSTRACT**

A data communication receiver (**100**) includes a receiver (**110**) for receiving a message including at least one code, a database (**155**) for storing codes and image data associated with the codes, and a presentation element (**150**) for locating the at least one code in the database (**155**). The presentation element (**150**) then retrieves the image data associated with the at least one code. The image data associated with the at least one code is representative of at least one image. The data communication receiver (**100**) also includes a display (**130**) coupled to the presentation element (**150**) for presenting the at least one image as a graphic message.

6 Claims, 8 Drawing Sheets

CODE	IMAGE
#01	TELEPHONE
#02	HOUSE
#03	OFFICE
#04	FAMILY
#05	TRAIN
#06	PERSON RUNNING
#07	COFFEE MUG
#08	CLOCK FOLLOWED BY TIME
#09	FOOD PLATTER

155



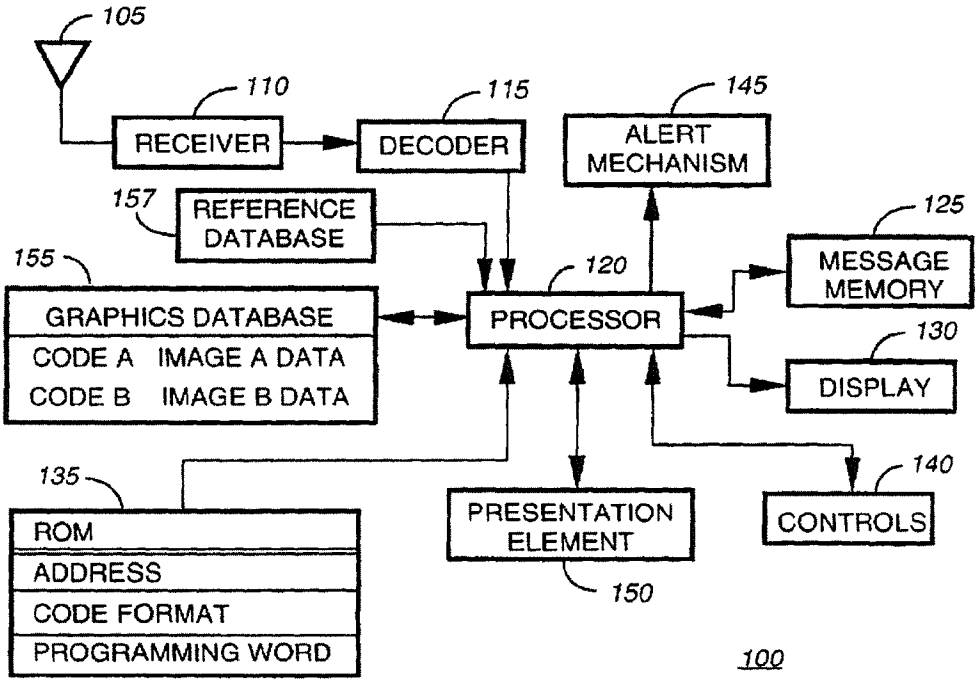


FIG. 1

CODE	IMAGE
#01	TELEPHONE
#02	HOUSE
#03	OFFICE
#04	FAMILY
#05	TRAIN
#06	PERSON RUNNING
#07	COFFEE MUG
#08	CLOCK FOLLOWED BY TIME
#09	FOOD PLATTER

155

FIG. 2

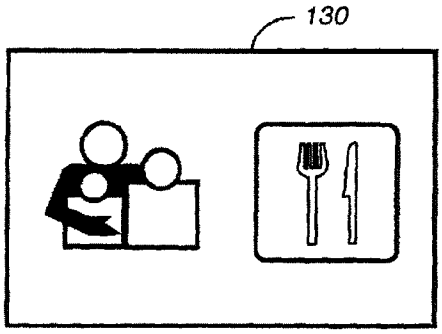


FIG. 3

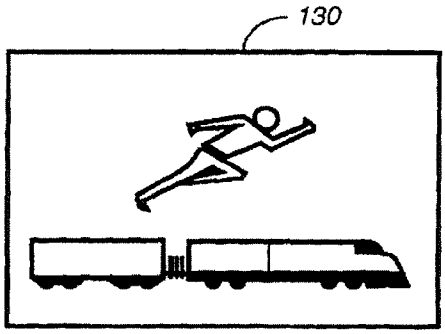


FIG. 6

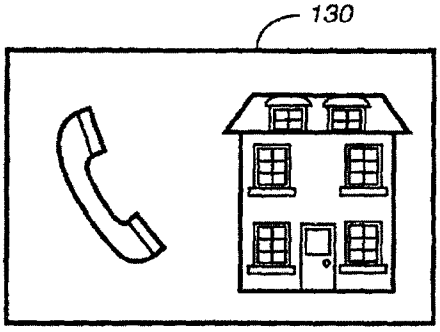


FIG. 4

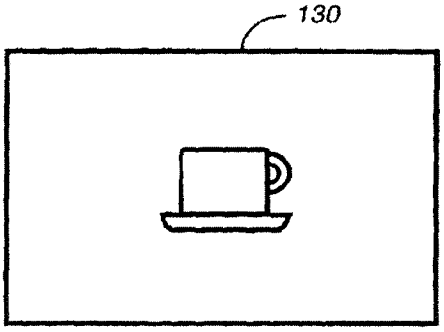


FIG. 7

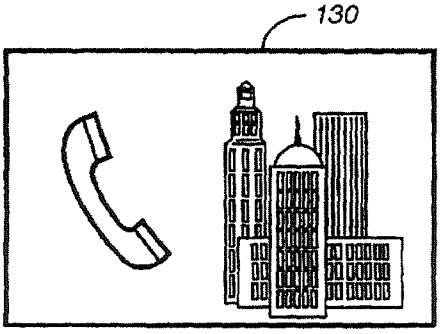


FIG. 5

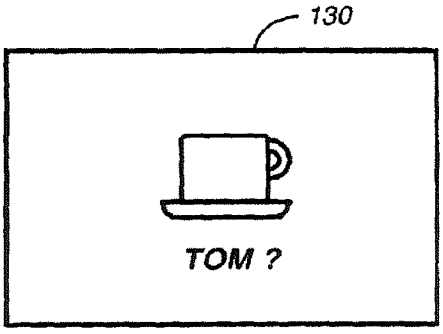


FIG. 8

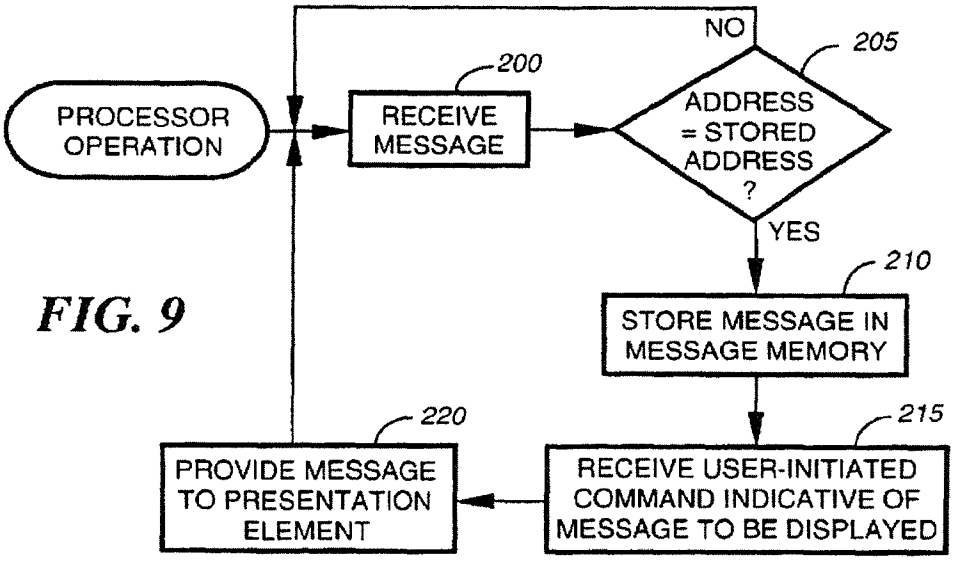

PROCESSOR OPERATION
200
RECEIVE MESSAGE
205
ADDRESS = STORED ADDRESS ?
NO
YES
210
STORE MESSAGE IN MESSAGE MEMORY
215
RECEIVE USER-INITIATED COMMAND INDICATIVE OF MESSAGE TO BE DISPLAYED
220
PROVIDE MESSAGE TO PRESENTATION ELEMENT

FIG. 9

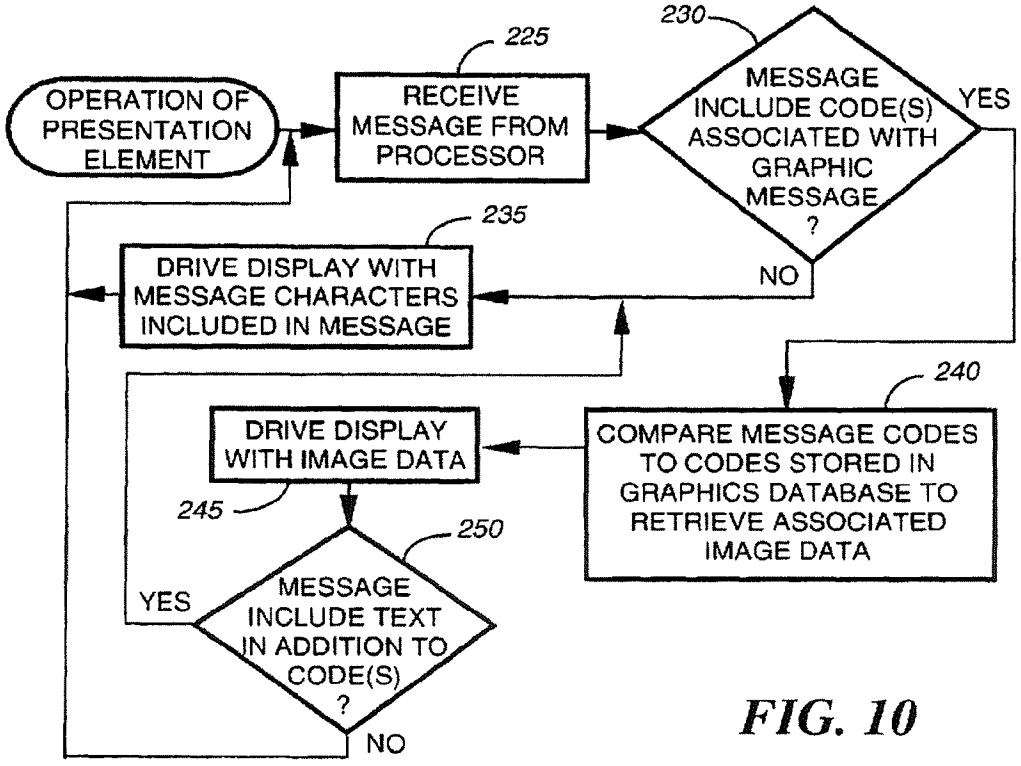

OPERATION OF PRESENTATION ELEMENT
225
RECEIVE MESSAGE FROM PROCESSOR
230
MESSAGE INCLUDE CODE(S) ASSOCIATED WITH GRAPHIC MESSAGE ?
YES
NO
235
DRIVE DISPLAY WITH MESSAGE CHARACTERS INCLUDED IN MESSAGE
240
COMPARE MESSAGE CODES TO CODES STORED IN GRAPHICS DATABASE TO RETRIEVE ASSOCIATED IMAGE DATA
DRIVE DISPLAY WITH IMAGE DATA
245
250
MESSAGE INCLUDE TEXT IN ADDITION TO CODE(S) ?
YES
NO

FIG. 10

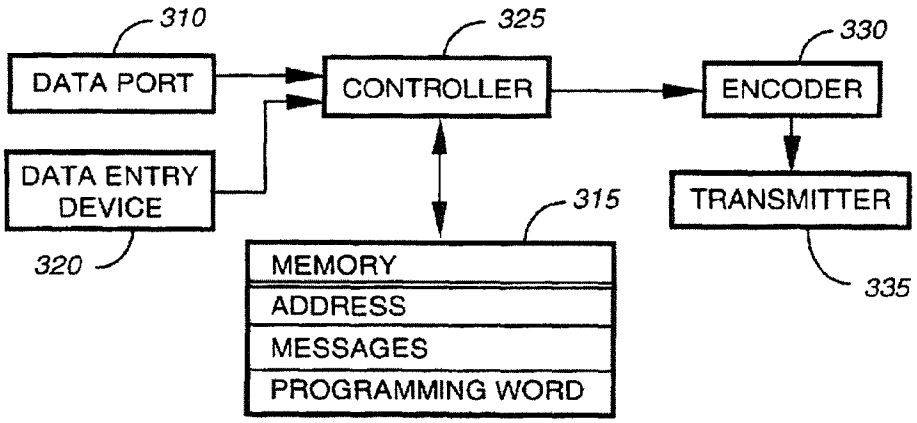

310
325
330
DATA PORT
CONTROLLER
ENCODER
DATA ENTRY DEVICE
TRANSMITTER
315
320
335
MEMORY
ADDRESS
MESSAGES
PROGRAMMING WORD
305

FIG. 11

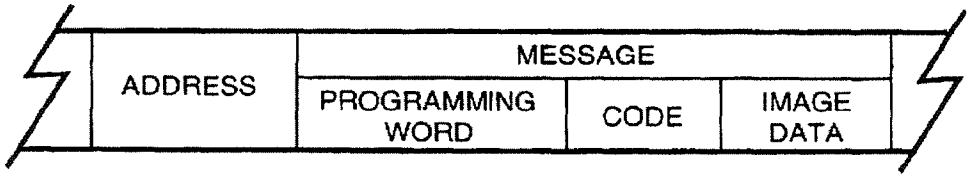

ADDRESS
MESSAGE
PROGRAMMING WORD
CODE
IMAGE DATA

FIG. 12

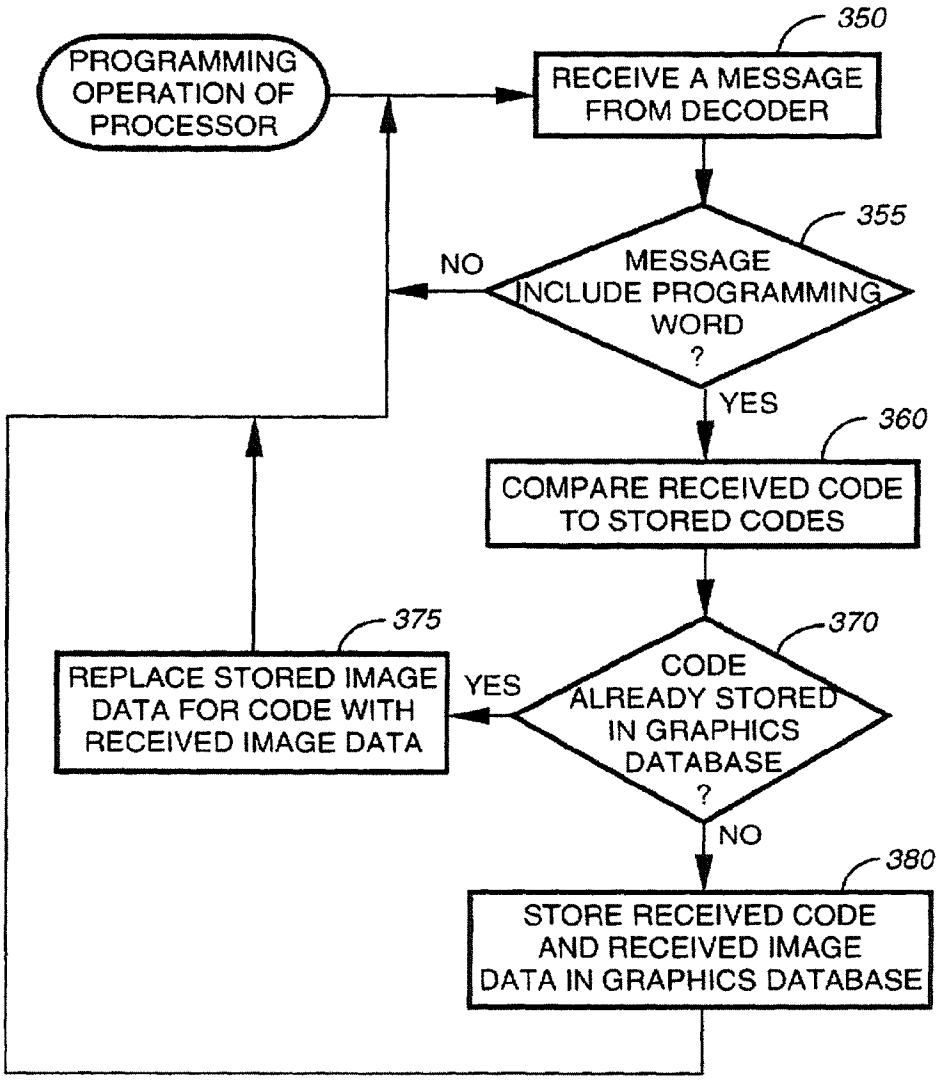

PROGRAMMING OPERATION OF PROCESSOR
350
RECEIVE A MESSAGE FROM DECODER
355
MESSAGE INCLUDE PROGRAMMING WORD ?
NO
YES
360
COMPARE RECEIVED CODE TO STORED CODES
370
CODE ALREADY STORED IN GRAPHICS DATABASE ?
YES
375
REPLACE STORED IMAGE DATA FOR CODE WITH RECEIVED IMAGE DATA
NO
380
STORE RECEIVED CODE AND RECEIVED IMAGE DATA IN GRAPHICS DATABASE

FIG. 13

KEY WORD	IMAGE
CALL, PHONE	TELEPHONE
COFFEE, DRINK	COFFEE MUG
LUNCH, DINNER	PLATTER
SEND, MAIL	ENVELOPE

500

FIG. 14

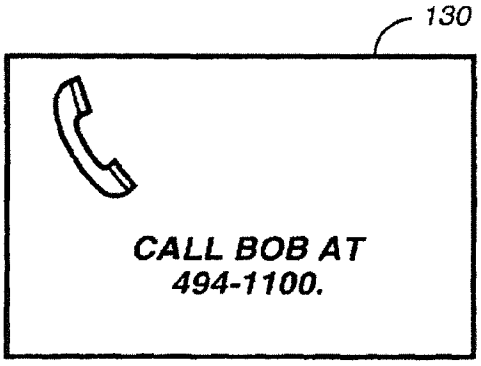


FIG. 15

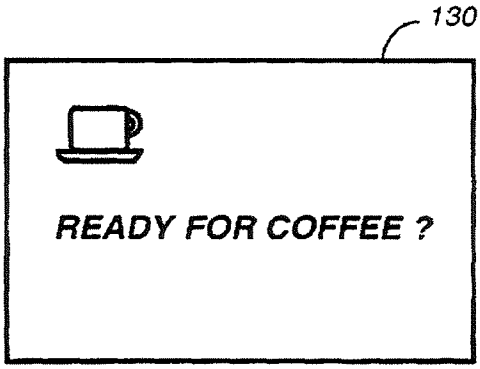


FIG. 16

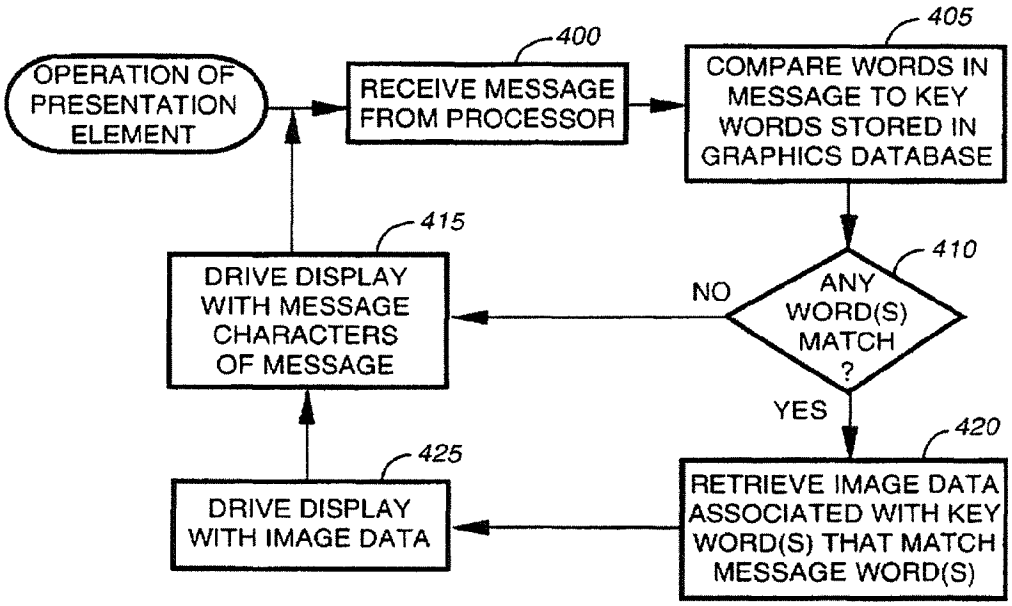

OPERATION OF PRESENTATION ELEMENT
400
RECEIVE MESSAGE FROM PROCESSOR
405
COMPARE WORDS IN MESSAGE TO KEY WORDS STORED IN GRAPHICS DATABASE
410
ANY WORD(S) MATCH ?
NO
YES
415
DRIVE DISPLAY WITH MESSAGE CHARACTERS OF MESSAGE
420
RETRIEVE IMAGE DATA ASSOCIATED WITH KEY WORD(S) THAT MATCH MESSAGE WORD(S)
425
DRIVE DISPLAY WITH IMAGE DATA

FIG. 17

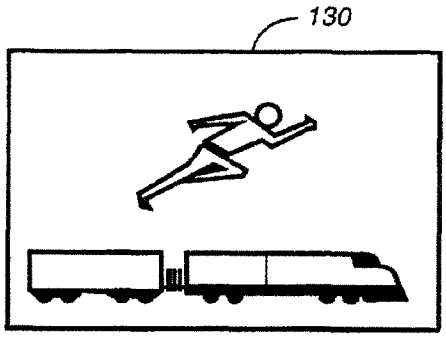


FIG. 18

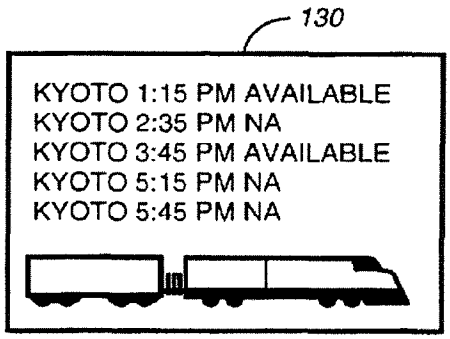


FIG. 19

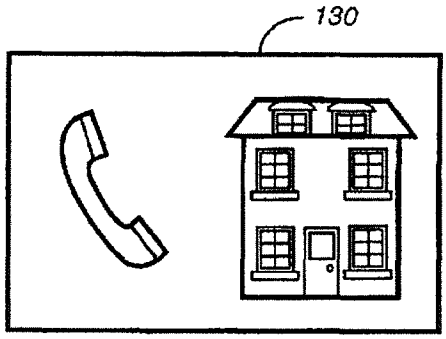


FIG. 20

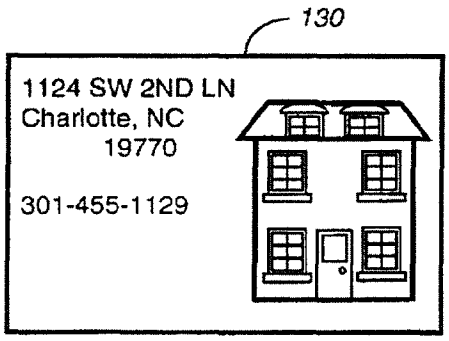


FIG. 21

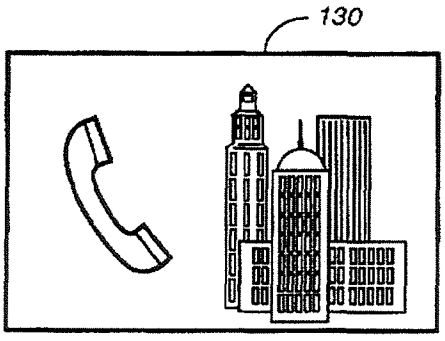


FIG. 22

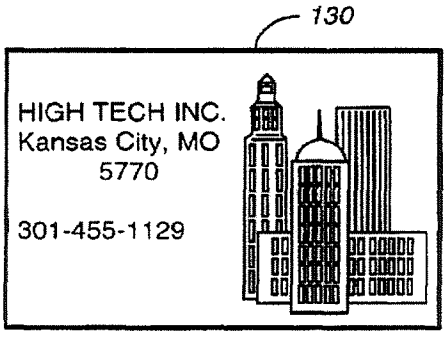


FIG. 23

METHOD AND APPARATUS FOR PRESENTING GRAPHIC MESSAGES IN A DATA COMMUNICATION RECEIVER

This is a continuation of application Ser. No. 08/560,604, filed Nov. 20, 1995 now abandoned.

FIELD OF THE INVENTION

This invention relates in general to data communication receivers having displays, and more specifically to data communication receivers that can display images.

BACKGROUND OF THE INVENTION

Selective call messages are generally originated by a person who wishes to contact the user of a data communication receiver. A message is usually provided to a paging terminal, then transmitted as a radio signal to the receiver. Once the data communication receiver has decoded and stored a message, message reception is announced to the user by, for example, an alert such as an audible tone or predetermined icon. For instance, some prior art devices include a standby display that presents a single, triangular icon for each stored message such that the user can determine the number of messages stored in the receiver. Data communication receivers employ predetermined icons to provide other information, e.g., low battery or out-of-range status, as well.

However, text, rather than icons, is conventionally utilized to present the actual content of received messages to a user of a data communication receiver. Data communication receivers that receive alphanumeric messages and the systems in which they are registered therefore usually are language-specific. As a result, a user who speaks a particular language is unable to understand received messages if he roams into a system in which messages are transmitted in a different language.

Thus, what is needed is a method and apparatus for providing selective call messages that are not language-specific.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an electrical block diagram of a data communication receiver for presenting information in accordance with the present invention.

FIG. **2** is an example of codes and image data stored in a graphics database included in the data communication receiver of FIG. **1** in accordance with the present invention.

FIGS. **3–8** are illustrations depicting the presentation of graphic messages on a display of the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **9** is a flowchart depicting an operation of a processor included in the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **10** is a flowchart depicting an operation of a presentation element included in the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **11** is an electrical block diagram of a terminal for providing information to the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **12** is a signal diagram depicting an example of a programming message transmitted by the terminal of FIG. **11** to the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **13** is a flowchart depicting a programming operation of the processor of the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **14** is an example of key words and image data stored in the graphics database in accordance with the present invention.

FIGS. **15** and **16** are illustrations of supplemental graphic messages provided with text on the display of the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **17** is a flowchart depicting another operation of the presentation element included in the data communication receiver of FIG. **1** in accordance with the present invention.

FIGS. **18–23** are illustrations further depicting the presentation of graphic messages on a display of the data communication receiver of FIG. **1** in accordance with the present invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

FIG. **1** is an electrical block diagram of a data communication receiver **100**, such as a pager, that includes an antenna **105** for receiving a radio signal and a receiver **110** for demodulating the radio signal. A decoder **115** coupled to the receiver **110** recovers information, such as selective call messages and addresses, included in the demodulated signal. The data communication receiver **100** further includes a processor **120** for processing the recovered information and for determining whether an address in the signal is equivalent to a pager address preferably stored in a memory, such as a read only memory (ROM) **135**. A matching address indicates that the message is intended for reception by the data communication receiver **100**. The ROM **135** preferably also stores a code format and a programming word, as will be discussed in greater detail below. A message memory **125** is further included in the data communication receiver **100** for storing the received messages intended for reception by the data communication receiver **100**. Controls **140** are coupled to the processor **120** for inputting user-initiated commands, such as a display command, and a display **130**, such as a liquid crystal display, is coupled to the processor **120** for presenting information to the user. An alert mechanism **145** announces reception of a message to the user by generating an audible, vibratory, or visual alert.

According to the present invention, a presentation element **150** processes each received message to determine whether the message is to be presented graphically, i.e., whether the message comprises a "graphics message," the meaning of which is conveyed pictorially. Preferably, the data communication receiver **100** is able to receive both conventional alphanumeric messages and graphics messages, which are indicated by predetermined codes included in received messages.

By way of example, predetermined characters commonly found on conventional telephone receivers can be used to designate selected codes representative of predetermined graphic images. A message originator can therefore press the buttons associated with the codes to provide graphics information to a selective call terminal, which transmits the codes as a radio signal. When at least one predetermined code is recognized by the data communication receiver **100**, a graphics message comprising one or more graphic images is presented to the user of the receiver **100**. According to the present invention, the graphic message conveys, in pictures, a universally understood meaning to the user of the data communication receiver **100**. The presentation element **150** is preferably implemented in firmware stored in the ROM **135**. However, hardware capable of performing equivalent operations can alternatively be used to implement the presentation element **150**.

The graphic images available for presenting graphic messages are preferably stored by the data communication receiver **100** in, for example, a graphics database **155**. According to the present invention, the graphics database **155** stores a predetermined list of codes, i.e., one or more predetermined characters or a pattern of bits. Each code is associated with image data stored in the database **155**. The codes and image data associated therewith can be programmed into the receiver **110** by means such as the controls **140**, downloading through a data port (not shown), or over-the-air programming through use of the stored programming word. Therefore, additional codes and image data can be conveniently added to the graphics database **155** as the need for new graphic images arises. Other information to be displayed can be stored in a reference database **157** with cross-references to numeric information, as will be explained in greater detail below.

FIG. **2** is an example of entries in the graphics database **155**. As shown, codes recognized by the receiver **100** as indicative of graphic messages begin with the "#" character, which is followed by two numeric characters. In this format, up to one-hundred codes, each associated with image data, could be programmed into the database **155**. It will be appreciated, though, that any combination of any number of characters could be utilized to designate graphic messages, as long as the message originator is aware of the codes and the data communication receiver **100** can recognize the codes.

As shown, each code is associated with image data representative of a particular image. For example, code "#01" is associated with image data that represents the image of a telephone. "#02" is associated with a house, while "#03" is associated with an office. According to the present invention, reception of a display command for a received message including any of the stored codes will result in the presentation of the associated image or images on the display **130**.

Referring next to FIGS. **3–8**, illustrations of different graphic messages on the display **130** are shown. FIG. **3**, for instance, illustrates the presentation of the graphic message "DINNER WITH FAMILY" in response to reception of the codes "#09#04." FIGS. **4** and **5** depict graphic messages indicating that the user should "CALL HOME" and "CALL THE OFFICE," respectively. In FIG. **5**, reception of a display command for a message comprising the codes "#06#05" results in display of a graphic message that indicates "I AM GOING TO THE TRAIN." The graphic message of FIG. **7**, associated with the code "#07," is understood to mean "LET'S GET COFFEE" OR "LET'S GET A DRINK."

FIG. **8** illustrates the combination of both a graphic message and a text message including, for example, alphanumeric characters. Reception of a display command for a message comprising the characters of "#07TOM?" or "TOM?#07" results in the presentation of the image associated with the code "#07" as well as the presentation of any additional alphanumeric or numeric characters included in the message. As a result, graphic messages which need clarification can conveniently be supplemented by additional textual information presented substantially coincident with the graphic messages. For example, the user of a data communication receiver **100** may usually take a coffee break with his friend Bob. So, the display of a coffee mug with nothing more might indicate to the user that Bob is ready for coffee. When Tom wants to get coffee, he may therefore need to include additional information, such as his name, to avoid confusion.

There may be circumstances, however, in which the receiver **100** is capable of receiving only numeric information or the message originator can only send numeric information. In such a case, the originator, e.g., Tom, can send a code as well as his telephone number. The message could then comprise "#073331111" or "3331111#07." The codes, as mentioned, are preferably in one or more predetermined formats recognized by the receiver **100**, so the receiver **100** will still recognize "#07" as the code indicative of the coffee mug. Additionally, the receiver **100** can then look up the remainder of the message in the reference database **157** to determine which other display information should be displayed along with the coffee mug icon. When "3331111" is located in the reference database **157**, the display information corresponding thereto is displayed with the coffee mug. For example, display information associated with the telephone number "3331111" could result in presentation of the name "TOM" with the coffee mug image. When the number is not found in the reference database **157**, the number itself is preferably displayed with the coffee mug icon. In this manner, alphanumeric information can be displayed or conveyed (through the displayed telephone number) even though only numeric information is sent and received.

FIG. **9** is a flowchart of an operation of the processor **120**. At step **200**, the processor **120** receives a message. When, at step **205**, the received address is equivalent to the receiver address stored in the ROM **135** (FIG. **1**), the message is stored, at step **210**, in the message memory **125**. When, at step **215**, a user-initiated display command is received for the message, the message is provided to the presentation element **150**, at step **220**.

Referring next to FIG. **10**, an operation of the presentation element **150** in accordance with the present invention is depicted. When, at step **225**, a message is received from the processor **120**, the presentation element **150** determines, at step **230**, whether the message includes at least one code associated with a graphic message. As mentioned, the codes associated with graphic messages are preferably in a predetermined format, such as a predetermined character, e.g., "#", followed by specific number of numerals. Therefore, the presentation element **150** can recognize a code associated with a graphic message by determining, with reference to the code format stored in the ROM **135**, whether any characters included in the message are arranged in the predetermined code format. When the message does not include a code associated with a graphic message, the message is displayed, at step **235**, in a conventional manner. In other words, the display **130** (FIG. **1**) is driven with signals to generate the message characters on the display **130**.

When, on the other hand, the message does include one or more codes associated with a graphic message, the presentation element **150** compares, at step **240**, each code included in the message to the entries in the graphics database **155** (FIG. **1**). When a code in the message is determined to be equivalent to a code in the database **155**, the image data associated with the matching code is retrieved and used, at step **245**, to drive the display **130**, thereby presenting the image to the user. When, at step **250**, the message includes text in addition to the graphic message code or codes, the additional text is also presented, at step **235**.

In accordance with the present invention, the data communication receiver **100** can present the content of received messages to a user by displaying a graphic image or a sequence of graphic images. The graphic images can fully

replace a text message so that a universally understood message is presented pictorially to a user. As a result, a user of the receiver **100** can understand a presented message regardless of his language. The presentation of a telephone image and an office image, for example, is likely to be understood as "CALL THE OFFICE" regardless of the language of the user. In this manner, a sequence of two or more graphic images can be easily combined to convey messages to any user. An advantage of the present invention, therefore, is that a person who roams into a geographic region in which a different language is spoken can still receive messages that are easily understood. Also, persons who speak one language can advantageously receive and understand messages that are originated by speakers of different languages.

FIG. **11** is an electrical block diagram of a terminal **305** included in a communication system for transmitting information to the data communication receiver **100**. The terminal **305** preferably includes a data port **310**, such as a telephone interface, for receiving messages from message originators and a memory **315** for storing the messages until transmission. The memory **315** also stores addresses associated with data communication receivers, including the data communication receiver **100**, that receive messages within the communication system and, when over-the-air programming of data communication receivers is desired, a programming word indicative of programming information. A data entry device **320**, such as a keyboard, data port, or modem, provides user inputs so that an operator can update the addresses of the data communication receivers, add subscribers, or program data communication receivers.

A controller **325** coupled to the data port **310**, the data entry device **320**, and the memory **315** controls the operation of the terminal **305**. The terminal **305** further comprises an encoder **330** for encoding messages and addresses using a communication protocol such as the conventional FLEX™ protocol and a transmitter **335** for transmitting the encoded information as a radio signal.

According to the present invention, the codes and the images used by the data communication receiver **100** in forming graphic messages can be programmed to update images or to provide additional images. Programming can be accomplished by direct entry of information by the controls **140** (FIG. **1**) of the data communication receiver **100**, by over-the-air programming, or by any other means for providing information to the data communication receiver **100**.

FIG. **12** is a signal diagram of a radio signal which can be transmitted by the terminal **305** to the data communication receiver **100** for programming new or enhanced images. As shown, the radio signal comprises the address of data communication receiver **100** followed by a programming message, which includes the predetermined programming word stored both by the terminal **305** and the data communication receiver **100**. The programming word, which indicates to the data communication receiver **100** that the information appended to the word is to be utilized for programming the graphic database **155**, preferably includes a predetermined character or sequence of characters. The message also includes a code, either existing or new, followed by image data to be written into the graphics database **155**. Therefore, as graphics technology results in higher resolution graphics that are more easily understood, new image data can be provided to the data communication receiver **100**.

FIG. **13** is a flowchart depicting a programming operation of the processor **120** (FIG. **1**) according to the present invention. When, at step **350**, a message is received by the processor **120** from the decoder **115**, the processor **120** determines, at step **355**, whether the message includes the programming word indicative of over-the-air programming. When the programming word is located, the received code is compared, at step **360**, with codes stored in the graphics database **155**. When, at step **370**, the received code already exists in the database **155**, the received image data overwrites the image data already stored in the graphics database **155**, at step **375**. When the received code is not found in the graphics database **155**, the processor **120** stores, at step **380**, both the received code and the received image data in the database **155**. Although over-the-air programming is not the exclusive method for programming the data communication receiver **100**, such a method provides for convenient dissemination of programming information without requiring that each user bring his or her data communication receiver into a service center for individual reprogramming.

FIG. **14** is an example of entries in a graphics database **500** in accordance with an alternate embodiment of the present invention. According to the alternate embodiment of the present invention, the data communication receiver **100** recognizes key words in conventional messages then, when the messages are displayed, images associated with the key words are displayed as well to supplement the message. For example, key words such as "CALL" and "PHONE" can be associated with the image of a telephone. Therefore, when a message includes the words "CALL" or "PHONE", the message would be displayed as text along with a supplemental image of a telephone, as shown in the illustration of FIG. **15**. FIG. **16** illustrates the display of the text message "READY FOR COFFEE?" along with a supplemental image of a coffee mug. According to the alternate embodiment of the present invention, the presence of the key word "COFFEE" in the received message triggers the display of the coffee mug image.

Referring next to FIG. **17**, a flowchart depicts an operation of the presentation element **150** according to the alternate embodiment of the present invention. At step **400**, the presentation element **150** receives a message from the processor **120** and then, at step **405**, compares the words of the message with the key words stored in the graphics database **500**. When, at step **410**, no words match, the message is displayed, at step **415**, in a conventional manner. When one or more message words are equivalent to key words in the graphics database **500**, the image data associated with the key word or words is retrieved, at step **420**, from the database **500**. Thereafter, at steps **415**, **425**, the display **130** is driven to display both the message text and the supplemental image.

According to an alternate embodiment of the present invention, the graphics database **155** (FIG. **1**) additionally stores database information about the different graphic images that can be displayed. This information augments universally-understood graphic messages and can be accessed via selection of a displayed image by the user. For example, the user could select a displayed image by touchpad technology, i.e., by touching the image on the display **130**, or by operating controls **140** to move a cursor to highlight a displayed image. Examples of information that can be displayed are shown in FIGS. **18–23**.

In FIG. **18**, the "person running" icon and the "train" icon are displayed to indicate that a particular person is traveling by train or to a train. When the user selects the train icon, such as by touch, database information associated with the train icon is retrieved from the graphics database **155** and provided to the display **130**. Referring to FIG. **19**, such

information could, for example, comprise information such as a train schedule. When the receiver **100** (FIG. 1) comprises a clock (not shown), the schedule could be displayed only for future times so that space on the display **130** is not wasted by presenting past information that may be only of minimal use to the person reading the display **130**. FIG. **20** depicts the display of the graphic message "CALL HOME," which is conveyed by universally-understood images of a telephone and a house. FIG. **21** shows an example of information that can be displayed when the house icon is selected by the user. When the user touches the house, database information such as the address of the house and the telephone number can be retrieved from the graphics database **155** and displayed to remind the user of important information.

FIGS. **22** and **23** show the use of other information in addition to that provided by the graphic message. In FIG. **22**, the graphic message "CALL THE OFFICE" or "CALL WORK" is presented solely by graphic images. When the user touches the office, or otherwise selects the office image, information about the office is presented. Such information can include, for example, the address and telephone number associated with the office.

Preferably, stored information, such as that in the graphics database **155**, can be programmed into the data communication receiver **100** in a number of ways. For example, information could be entered via the controls **140** or via a data port (not shown) coupled to the processor **120**. Alternatively, programming information could be provided to the data communication receiver **100** over the air for reception by the receiver **110**. When information is programmed over the air, the user need not suffer the inconvenience of having to take the data communication receiver **100** into a service shop. Instead, information can be frequently updated without ever disturbing the user.

In summary, the data communication receiver as described above receives messages then, in response to predetermined information included in the received messages, displays graphic messages to the user to convey an easily understood, universal message. According to the present invention, this can be done by transmitting predetermined codes to the data communication receiver. Codes in a received message are looked up in a graphics memory to retrieve image data associated with the codes, then an image or a sequence of images is advantageously presented on a display to convey a universally understood message. For example, two images, e.g., a telephone and a house, can be displayed together on the screen to convey the message "CALL HOME." This message will be understood regardless of the language spoken by the user of the data communication receiver. Alternatively, if a text message is desired, the text message can be displayed along with a supplemental image that reinforces the message.

Also, other important information associated with the images forming the graphic messages can be conveniently stored and selectively presented to the user. This additional information could comprise, for example, train schedules associated with a train image, a description of a cafeteria menu associated with a food platter image, an address associated with an office image, etc. The user can easily access this information by selecting the icon, such as by touching the screen or highlighting the icon with a cursor.

It will be appreciated by now that there has been provided a method and apparatus for providing universal messages that can be understood regardless of languages spoken by the user of a data communication receiver.

What is claimed is:

1. A method for displaying messages in a data communication receiver, the method comprising the steps of:

receiving an alphanumeric message;

receiving a programming message that includes a key word and image data;

storing the key word and the image data in the database;

referencing a database to determine whether at least one word included in the alphanumeric message matches at least one key word included in the database, wherein the at least one key word is associated with image data that is representative of at least one image;

presenting, when the alphanumeric message includes at least one word that matches at least one key word located in the database, the at least one image as a graphic message that is accompanied by the alphanumeric message on a display; and

presenting, when the alphanumeric message does not include at least one word that matches at least one key word located in the database, the alphanumeric message without an accompanying graphic message on the display.

2. The method of claim **1**, wherein the step of receiving the programming message comprises the step of:

receiving the programming message as a radio signal.

3. The method of claim **1**, wherein the step of receiving the programming message comprises the step of:

receiving the programming message through use of controls on the data communication receiver.

4. A data communication receiver for presenting information, the data communication receiver comprising:

a receiver for receiving an alphanumeric message including at least one word;

a database for storing key words and image data associated with the key words;

a presentation element coupled to the receiver and the database for determining whether at least one word included in the alphanumeric message matches at least one key word included in the database, wherein the image data associated with the at least one key word is representative of at least one image;

a display coupled to the presentation element for presenting, when the at least one word matches at least one key word, the at least one image as a graphic message accompanied by the alphanumeric message, and for presenting, when the at least one word does not match at least one key word; the alphanumeric message without an accompanying graphic message;

controls coupled to the processor for providing user-initiated commands thereto, wherein presentation of the alphanumeric message and any accompanying graphic message occurs in response to reception of a display command; and

programming means coupled to the processor and to the database for programming the database, the programming means further comprising:

the receiver for receiving a programming message including a key word and image data;

a memory for storing a programming word; and

storing means for storing the key word and the image data in the database in response to determining that the programming message includes the programming word.

5. A data communication receiver for presenting information, the data communication receiver comprising:

a receiver for receiving an alphanumeric message including at least one word;

a database for storing key words and image data associated with the key words;

a presentation element coupled to the receiver and the database for determining whether at least one word included in the alphanumeric message matches at least one key word included in the database, wherein the image data associated with the at least one key word is representative of at least one image;

a display coupled to the presentation element for presenting, when the at least one word matches at least one key word, the at least one image as a graphic message accompanied by the alphanumeric message, and for presenting, when the at least one word does not match at least one key word, the alphanumeric message without an accompanying graphic message;

controls coupled to the processor for providing user-initiated commands thereto, wherein presentation of the alphanumeric message and any accompanying graphic message occurs in response to reception of a display command; and

programming means coupled to the processor and to the database for programming the database, the programming means further comprising:

controls for receiving a programming message comprising a key word and image data; and

storing means for storing the key word and the image data in the database.

6. A data communication receiver for presenting information, the data communication receiver comprising:

a receiver for receiving a message;

a decoder coupled to the receiver for decoding the message to recover one or more alphanumeric words therefrom;

a memory coupled to the decoder for storing the message;

a database coupled to the decoder for storing a plurality of key words and image data associated therewith, the image data representative of images;

a presentation element coupled to the database for determining whether at least one alphanumeric word included in the message matches at least one key word included in the database; and

a display coupled to the presentation element for presenting, when at least one alphanumeric word matches at least one key word, a corresponding image as a graphic message accompanied by the message, and for presenting, when at least one alphanumeric word does not match at least one key word, the message unaccompanied by any graphic messages.

* * * * *

EXHIBIT 21

US005784001A

United States Patent [19]

Deluca et al.

[11] Patent Number: 5,784,001

[45] Date of Patent: Jul. 21, 1998

[54] **METHOD AND APPARATUS FOR PRESENTING GRAPHIC MESSAGES IN A DATA COMMUNICATION RECEIVER**

[75] Inventors: **Joan Deluca**, Boca Raton; **Douglas Kraul**, Parkland; **Charles Edward Batey, Jr.**, Lake Worth, all of Fla.

[73] Assignee: **Motorola, Inc.**, Schaumburg, Ill.

[21] Appl. No.: **898,640**

[22] Filed: **Jul. 21, 1997**

Related U.S. Application Data

[63] Continuation of Ser. No. 560,604, Nov. 20, 1995, abandoned.

[51] **Int. Cl.**[6] **G08B 5/22**

[52] **U.S. Cl.** **340/825.44**; 345/133

[58] **Field of Search** 340/825.44; 345/133, 345/122

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9103885	3/1991	WIPO	455/154

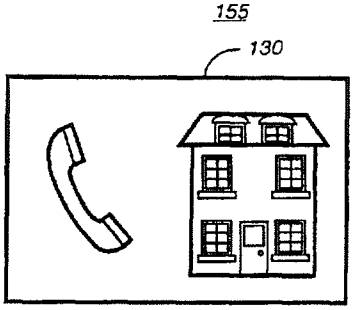
Primary Examiner—Brian Zimmerman
Assistant Examiner—Edward Merz

[57] **ABSTRACT**

A data communication receiver (**100**) includes a receiver (**110**) for receiving a message including at least one code, a database (**155**) for storing codes and image data associated with the codes, and a presentation element (**150**) for locating the at least one code in the database (**155**). The presentation element (**150**) then retrieves the image data associated with the at least one code. The image data associated with the at least one code is representative of at least one image. The data communication receiver (**100**) also includes a display (**130**) coupled to the presentation element (**150**) for presenting the at least one image as a graphic message.

6 Claims, 8 Drawing Sheets

CODE	IMAGE
#01	TELEPHONE
#02	HOUSE
#03	OFFICE
#04	FAMILY
#05	TRAIN
#06	PERSON RUNNING
#07	COFFEE MUG
#08	CLOCK FOLLOWED BY TIME
#09	FOOD PLATTER



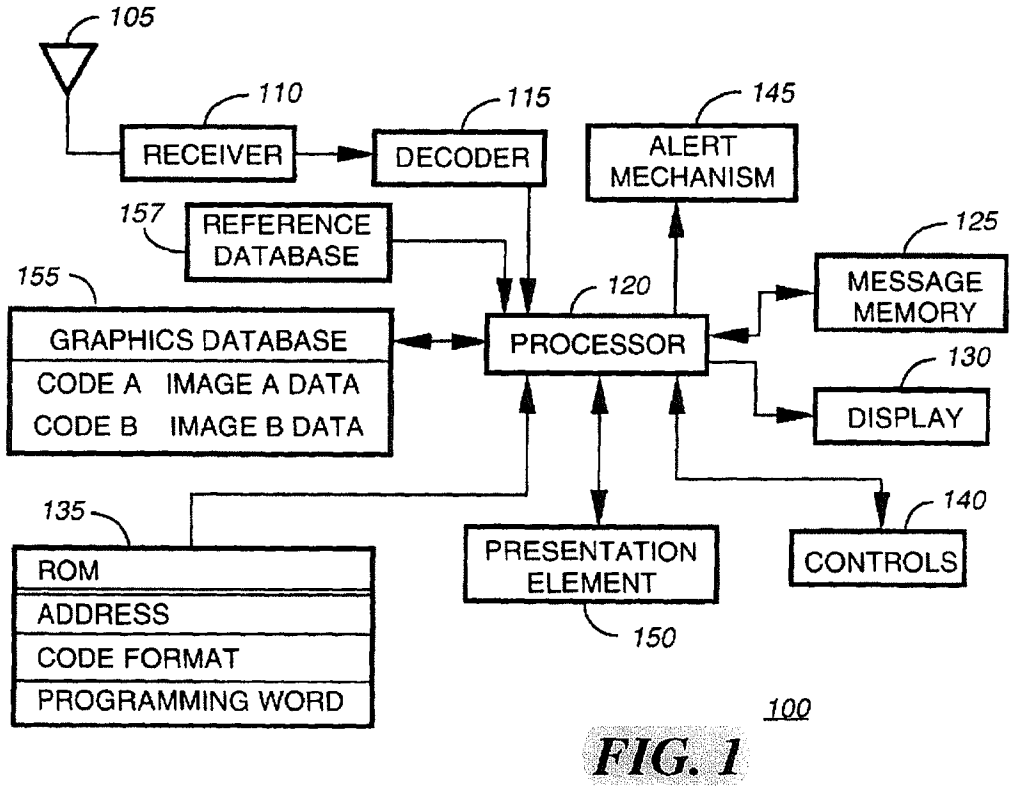


FIG. 1

CODE	IMAGE
#01	TELEPHONE
#02	HOUSE
#03	OFFICE
#04	FAMILY
#05	TRAIN
#06	PERSON RUNNING
#07	COFFEE MUG
#08	CLOCK FOLLOWED BY TIME
#09	FOOD PLATTER

155

FIG. 2

METHOD AND APPARATUS FOR PRESENTING GRAPHIC MESSAGES IN A DATA COMMUNICATION RECEIVER

This is a continuation of application Ser. No. 08/560,604, filed Nov. 20, 1995 now abandoned.

FIELD OF THE INVENTION

This invention relates in general to data communication receivers having displays, and more specifically to data communication receivers that can display images.

BACKGROUND OF THE INVENTION

Selective call messages are generally originated by a person who wishes to contact the user of a data communication receiver. A message is usually provided to a paging terminal, then transmitted as a radio signal to the receiver. Once the data communication receiver has decoded and stored a message, message reception is announced to the user by, for example, an alert such as an audible tone or predetermined icon. For instance, some prior art devices include a standby display that presents a single, triangular icon for each stored message such that the user can determine the number of messages stored in the receiver. Data communication receivers employ predetermined icons to provide other information, e.g., low battery or out-of-range status, as well.

However, text, rather than icons, is conventionally utilized to present the actual content of received messages to a user of a data communication receiver. Data communication receivers that receive alphanumeric messages and the systems in which they are registered therefore usually are language-specific. As a result, a user who speaks a particular language is unable to understand received messages if he roams into a system in which messages are transmitted in a different language.

Thus, what is needed is a method and apparatus for providing selective call messages that are not language-specific.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an electrical block diagram of a data communication receiver for presenting information in accordance with the present invention.

FIG. **2** is an example of codes and image data stored in a graphics database included in the data communication receiver of FIG. **1** in accordance with the present invention.

FIGS. **3–8** are illustrations depicting the presentation of graphic messages on a display of the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **9** is a flowchart depicting an operation of a processor included in the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **10** is a flowchart depicting an operation of a presentation element included in the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **11** is an electrical block diagram of a terminal for providing information to the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **12** is a signal diagram depicting an example of a programming message transmitted by the terminal of FIG. **11** to the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **13** is a flowchart depicting a programming operation of the processor of the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **14** is an example of key words and image data stored in the graphics database in accordance with the present invention.

FIGS. **15** and **16** are illustrations of supplemental graphic messages provided with text on the display of the data communication receiver of FIG. **1** in accordance with the present invention.

FIG. **17** is a flowchart depicting another operation of the presentation element included in the data communication receiver of FIG. **1** in accordance with the present invention.

FIGS. **18–23** are illustrations further depicting the presentation of graphic messages on a display of the data communication receiver of FIG. **1** in accordance with the present invention.

DESCRIPTION OF A PREFERRED EMBODIMENT

FIG. **1** is an electrical block diagram of a data communication receiver **100**, such as a pager, that includes an antenna **105** for receiving a radio signal and a receiver **110** for demodulating the radio signal. A decoder **115** coupled to the receiver **110** recovers information, such as selective call messages and addresses, included in the demodulated signal. The data communication receiver **100** further includes a processor **120** for processing the recovered information and for determining whether an address in the signal is equivalent to a pager address preferably stored in a memory, such as a read only memory (ROM) **135**. A matching address indicates that the message is intended for reception by the data communication receiver **100**. The ROM **135** preferably also stores a code format and a programming word, as will be discussed in greater detail below. A message memory **125** is further included in the data communication receiver **100** for storing the received messages intended for reception by the data communication receiver **100**. Controls **140** are coupled to the processor **120** for inputting user-initiated commands, such as a display command, and a display **130**, such as a liquid crystal display, is coupled to the processor **120** for presenting information to the user. An alert mechanism **145** announces reception of a message to the user by generating an audible, vibratory, or visual alert.

According to the present invention, a presentation element **150** processes each received message to determine whether the message is to be presented graphically, i.e., whether the message comprises a "graphics message," the meaning of which is conveyed pictorially. Preferably, the data communication receiver **100** is able to receive both conventional alphanumeric messages and graphics messages, which are indicated by predetermined codes included in received messages.

By way of example, predetermined characters commonly found on conventional telephone receivers can be used to designate selected codes representative of predetermined graphic images. A message originator can therefore press the buttons associated with the codes to provide graphics information to a selective call terminal, which transmits the codes as a radio signal. When at least one predetermined code is recognized by the data communication receiver **100**, a graphics message comprising one or more graphic images is presented to the user of the receiver **100**. According to the present invention, the graphic message conveys, in pictures, a universally understood meaning to the user of the data communication receiver **100**. The presentation element **150** is preferably implemented in firmware stored in the ROM **135**. However, hardware capable of performing equivalent operations can alternatively be used to implement the presentation element **150**.

The graphic images available for presenting graphic messages are preferably stored by the data communication receiver **100** in, for example, a graphics database **155**. According to the present invention, the graphics database **155** stores a predetermined list of codes, i.e., one or more predetermined characters or a pattern of bits. Each code is associated with image data stored in the database **155**. The codes and image data associated therewith can be programmed into the receiver **110** by means such as the controls **140**, downloading through a data port (not shown), or over-the-air programming through use of the stored programming word. Therefore, additional codes and image data can be conveniently added to the graphics database **155** as the need for new graphic images arises. Other information to be displayed can be stored in a reference database **157** with cross-references to numeric information, as will be explained in greater detail below.

FIG. **2** is an example of entries in the graphics database **155**. As shown, codes recognized by the receiver **100** as indicative of graphic messages begin with the "#" character, which is followed by two numeric characters. In this format, up to one-hundred codes, each associated with image data, could be programmed into the database **155**. It will be appreciated, though, that any combination of any number of characters could be utilized to designate graphic messages, as long as the message originator is aware of the codes and the data communication receiver **100** can recognize the codes.

As shown, each code is associated with image data representative of a particular image. For example, code "#01" is associated with image data that represents the image of a telephone. "#02" is associated with a house, while "#03" is associated with an office. According to the present invention, reception of a display command for a received message including any of the stored codes will result in the presentation of the associated image or images on the display **130**.

Referring next to FIGS. **3–8**, illustrations of different graphic messages on the display **130** are shown. FIG. **3**, for instance, illustrates the presentation of the graphic message "DINNER WITH FAMILY" in response to reception of the codes "#09#04." FIGS. **4** and **5** depict graphic messages indicating that the user should "CALL HOME" and "CALL THE OFFICE," respectively. In FIG. **5**, reception of a display command for a message comprising the codes "#06#05" results in display of a graphic message that indicates "I AM GOING TO THE TRAIN." The graphic message of FIG. **7**, associated with the code "#07," is understood to mean "LET'S GET COFFEE" OR "LET'S GET A DRINK."

FIG. **8** illustrates the combination of both a graphic message and a text message including, for example, alphanumeric characters. Reception of a display command for a message comprising the characters of "#07TOM?" or "TOM?#07" results in the presentation of the image associated with the code "#07" as well as the presentation of any additional alphanumeric or numeric characters included in the message. As a result, graphic messages which need clarification can conveniently be supplemented by additional textual information presented substantially coincident with the graphic messages. For example, the user of a data communication receiver **100** may usually take a coffee break with his friend Bob. So, the display of a coffee mug with nothing more might indicate to the user that Bob is ready for coffee. When Tom wants to get coffee, he may therefore need to include additional information, such as his name, to avoid confusion.

There may be circumstances, however, in which the receiver **100** is capable of receiving only numeric information or the message originator can only send numeric information. In such a case, the originator, e.g., Tom, can send a code as well as his telephone number. The message could then comprise "#07333 1111" or "3331111#07." The codes, as mentioned, are preferably in one or more predetermined formats recognized by the receiver **100**, so the receiver **100** will still recognize "#07" as the code indicative of the coffee mug. Additionally, the receiver **100** can then look up the remainder of the message in the reference database **157** to determine which other display information should be displayed along with the coffee mug icon. When "3331111" is located in the reference database **157**, the display information corresponding thereto is displayed with the coffee mug. For example, display information associated with the telephone number "3331111" could result in presentation of the name "TOM" with the coffee mug image. When the number is not found in the reference database **157**, the number itself is preferably displayed with the coffee mug icon. In this manner, alphanumeric information can be displayed or conveyed (through the displayed telephone number) even though only numeric information is sent and received.

FIG. **9** is a flowchart of an operation of the processor **120**. At step **200**, the processor **120** receives a message. When, at step **205**, the received address is equivalent to the receiver address stored in the ROM **135** (FIG. **1**), the message is stored, at step **210**, in the message memory **125**. When, at step **215**, a user-initiated display command is received for the message, the message is provided to the presentation element **150**, at step **220**.

Referring next to FIG. **10**, an operation of the presentation element **150** in accordance with the present invention is depicted. When, at step **225**, a message is received from the processor **120**, the presentation element **150** determines, at step **230**, whether the message includes at least one code associated with a graphic message. As mentioned, the codes associated with graphic messages are preferably in a predetermined format, such as a predetermined character, e.g., "#", followed by specific number of numerals. Therefore, the presentation element **150** can recognize a code associated with a graphic message by determining, with reference to the code format stored in the ROM **135**, whether any characters included in the message are arranged in the predetermined code format. When the message does not include a code associated with a graphic message, the message is displayed, at step **235**, in a conventional manner. In other words, the display **130** (FIG. **1**) is driven with signals to generate the message characters on the display **130**.

When, on the other hand, the message does include one or more codes associated with a graphic message, the presentation element **150** compares, at step **240**, each code included in the message to the entries in the graphics database **155** (FIG. **1**). When a code in the message is determined to be equivalent to a code in the database **155**, the image data associated with the matching code is retrieved and used, at step **245**, to drive the display **130**, thereby presenting the image to the user. When, at step **250**, the message includes text in addition to the graphic message code or codes, the additional text is also presented, at step **235**.

In accordance with the present invention, the data communication receiver **100** can present the content of received messages to a user by displaying a graphic image or a sequence of graphic images. The graphic images can fully

EXHIBIT 22

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United States Patent [19]

Deluca et al.

[11] Patent Number: 5,784,001

[45] Date of Patent: Jul. 21, 1998

[54] **METHOD AND APPARATUS FOR PRESENTING GRAPHIC MESSAGES IN A DATA COMMUNICATION RECEIVER**

[75] Inventors: **Joan Deluca**, Boca Raton; **Douglas Kraul**, Parkland; **Charles Edward Batey, Jr.**, Lake Worth, all of Fla.

[73] Assignee: **Motorola, Inc.**, Schaumburg, Ill.

[21] Appl. No.: **898,640**

[22] Filed: **Jul. 21, 1997**

Related U.S. Application Data

[63] Continuation of Ser. No. 560,604, Nov. 20, 1995, abandoned.

[51] **Int. Cl.**[6] **G08B 5/22**

[52] **U.S. Cl.** **340/825.44**; 345/133

[58] **Field of Search** 340/825.44; 345/133, 345/122

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Primary Examiner—Brian Zimmerman
Assistant Examiner—Edward Merz

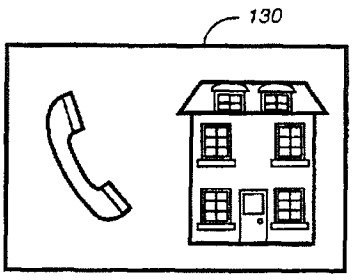
[57] **ABSTRACT**

A data communication receiver (**100**) includes a receiver (**110**) for receiving a message including at least one code, a database (**155**) for storing codes and image data associated with the codes, and a presentation element (**150**) for locating the at least one code in the database (**155**). The presentation element (**150**) then retrieves the image data associated with the at least one code. The image data associated with the at least one code is representative of at least one image. The data communication receiver (**100**) also includes a display (**130**) coupled to the presentation element (**150**) for presenting the at least one image as a graphic message.

6 Claims, 8 Drawing Sheets

CODE	IMAGE
#01	TELEPHONE
#02	HOUSE
#03	OFFICE
#04	FAMILY
#05	TRAIN
#06	PERSON RUNNING
#07	COFFEE MUG
#08	CLOCK FOLLOWED BY TIME
#09	FOOD PLATTER

155



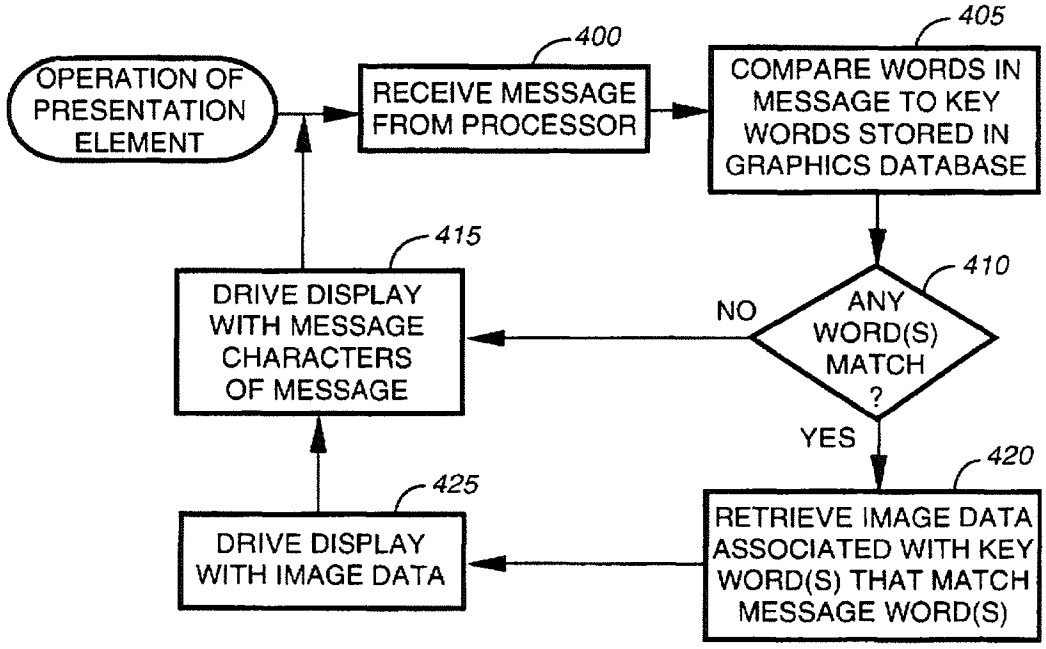

OPERATION OF PRESENTATION ELEMENT
400
RECEIVE MESSAGE FROM PROCESSOR
405
COMPARE WORDS IN MESSAGE TO KEY WORDS STORED IN GRAPHICS DATABASE
410
ANY WORD(S) MATCH ?
NO
YES
415
DRIVE DISPLAY WITH MESSAGE CHARACTERS OF MESSAGE
420
RETRIEVE IMAGE DATA ASSOCIATED WITH KEY WORD(S) THAT MATCH MESSAGE WORD(S)
425
DRIVE DISPLAY WITH IMAGE DATA

FIG. 17

The graphic images available for presenting graphic messages are preferably stored by the data communication receiver **100** in, for example, a graphics database **155**. According to the present invention, the graphics database **155** stores a predetermined list of codes, i.e., one or more predetermined characters or a pattern of bits. Each code is associated with image data stored in the database **155**. The codes and image data associated therewith can be programmed into the receiver **110** by means such as the controls **140**, downloading through a data port (not shown), or over-the-air programming through use of the stored programming word. Therefore, additional codes and image data can be conveniently added to the graphics database **155** as the need for new graphic images arises. Other information to be displayed can be stored in a reference database **157** with cross-references to numeric information, as will be explained in greater detail below.

FIG. **2** is an example of entries in the graphics database **155**. As shown, codes recognized by the receiver **100** as indicative of graphic messages begin with the "#" character, which is followed by two numeric characters. In this format, up to one-hundred codes, each associated with image data, could be programmed into the database **155**. It will be appreciated, though, that any combination of any number of characters could be utilized to designate graphic messages, as long as the message originator is aware of the codes and the data communication receiver **100** can recognize the codes.

As shown, each code is associated with image data representative of a particular image. For example, code "#01" is associated with image data that represents the image of a telephone. "#02" is associated with a house, while "#03" is associated with an office. According to the present invention, reception of a display command for a received message including any of the stored codes will result in the presentation of the associated image or images on the display **130**.

Referring next to FIGS. **3–8**, illustrations of different graphic messages on the display **130** are shown. FIG. **3**, for instance, illustrates the presentation of the graphic message "DINNER WITH FAMILY" in response to reception of the codes "#09#04." FIGS. **4** and **5** depict graphic messages indicating that the user should "CALL HOME" and "CALL THE OFFICE," respectively. In FIG. **5**, reception of a display command for a message comprising the codes "#06#05" results in display of a graphic message that indicates "I AM GOING TO THE TRAIN." The graphic message of FIG. **7**, associated with the code "#07," is understood to mean "LET'S GET COFFEE" OR "LET'S GET A DRINK."

FIG. **8** illustrates the combination of both a graphic message and a text message including, for example, alphanumeric characters. Reception of a display command for a message comprising the characters of "#07TOM?" or "TOM?#07" results in the presentation of the image associated with the code "#07" as well as the presentation of any additional alphanumeric or numeric characters included in the message. As a result, graphic messages which need clarification can conveniently be supplemented by additional textual information presented substantially coincident with the graphic messages. For example, the user of a data communication receiver **100** may usually take a coffee break with his friend Bob. So, the display of a coffee mug with nothing more might indicate to the user that Bob is ready for coffee. When Tom wants to get coffee, he may therefore need to include additional information, such as his name, to avoid confusion.

There may be circumstances, however, in which the receiver **100** is capable of receiving only numeric information or the message originator can only send numeric information. In such a case, the originator, e.g., Tom, can send a code as well as his telephone number. The message could then comprise "#073331111" or "3331111#07." The codes, as mentioned, are preferably in one or more predetermined formats recognized by the receiver **100**, so the receiver **100** will still recognize "#07" as the code indicative of the coffee mug. Additionally, the receiver **100** can then look up the remainder of the message in the reference database **157** to determine which other display information should be displayed along with the coffee mug icon. When "3331111" is located in the reference database **157**, the display information corresponding thereto is displayed with the coffee mug. For example, display information associated with the telephone number "3331111" could result in presentation of the name "TOM" with the coffee mug image. When the number is not found in the reference database **157**, the number itself is preferably displayed with the coffee mug icon. In this manner, alphanumeric information can be displayed or conveyed (through the displayed telephone number) even though only numeric information is sent and received.

FIG. **9** is a flowchart of an operation of the processor **120**. At step **200**, the processor **120** receives a message. When, at step **205**, the received address is equivalent to the receiver address stored in the ROM **135** (FIG. **1**), the message is stored, at step **210**, in the message memory **125**. When, at step **215**, a user-initiated display command is received for the message, the message is provided to the presentation element **150**, at step **220**.

Referring next to FIG. **10**, an operation of the presentation element **150** in accordance with the present invention is depicted. When, at step **225**, a message is received from the processor **120**, the presentation element **150** determines, at step **230**, whether the message includes at least one code associated with a graphic message. As mentioned, the codes associated with graphic messages are preferably in a predetermined format, such as a predetermined character, e.g., "#", followed by specific number of numerals. Therefore, the presentation element **150** can recognize a code associated with a graphic message by determining, with reference to the code format stored in the ROM **135**, whether any characters included in the message are arranged in the predetermined code format. When the message does not include a code associated with a graphic message, the message is displayed, at step **235**, in a conventional manner. In other words, the display **130** (FIG. **1**) is driven with signals to generate the message characters on the display **130**.

When, on the other hand, the message does include one or more codes associated with a graphic message, the presentation element **150** compares, at step **240**, each code included in the message to the entries in the graphics database **155** (FIG. **1**). When a code in the message is determined to be equivalent to a code in the database **155**, the image data associated with the matching code is retrieved and used, at step **245**, to drive the display **130**, thereby presenting the image to the user. When, at step **250**, the message includes text in addition to the graphic message code or codes, the additional text is also presented, at step **235**.

In accordance with the present invention, the data communication receiver **100** can present the content of received messages to a user by displaying a graphic image or a sequence of graphic images. The graphic images can fully

replace a text message so that a universally understood message is presented pictorially to a user. As a result, a user of the receiver **100** can understand a presented message regardless of his language. The presentation of a telephone image and an office image, for example, is likely to be understood as "CALL THE OFFICE" regardless of the language of the user. In this manner, a sequence of two or more graphic images can be easily combined to convey messages to any user. An advantage of the present invention, therefore, is that a person who roams into a geographic region in which a different language is spoken can still receive messages that are easily understood. Also, persons who speak one language can advantageously receive and understand messages that are originated by speakers of different languages.

FIG. **11** is an electrical block diagram of a terminal **305** included in a communication system for transmitting information to the data communication receiver **100**. The terminal **305** preferably includes a data port **310**, such as a telephone interface, for receiving messages from message originators and a memory **315** for storing the messages until transmission. The memory **315** also stores addresses associated with data communication receivers, including the data communication receiver **100**, that receive messages within the communication system and, when over-the-air programming of data communication receivers is desired, a programming word indicative of programming information. A data entry device **320**, such as a keyboard, data port, or modem, provides user inputs so that an operator can update the addresses of the data communication receivers, add subscribers, or program data communication receivers.

A controller **325** coupled to the data port **310**, the data entry device **320**, and the memory **315** controls the operation of the terminal **305**. The terminal **305** further comprises an encoder **330** for encoding messages and addresses using a communication protocol such as the conventional FLEX™ protocol and a transmitter **335** for transmitting the encoded information as a radio signal.

According to the present invention, the codes and the images used by the data communication receiver **100** in forming graphic messages can be programmed to update images or to provide additional images. Programming can be accomplished by direct entry of information by the controls **140** (FIG. **1**) of the data communication receiver **100**, by over-the-air programming, or by any other means for providing information to the data communication receiver **100**.

FIG. **12** is a signal diagram of a radio signal which can be transmitted by the terminal **305** to the data communication receiver **100** for programming new or enhanced images. As shown, the radio signal comprises the address of data communication receiver **100** followed by a programming message, which includes the predetermined programming word stored both by the terminal **305** and the data communication receiver **100**. The programming word, which indicates to the data communication receiver **100** that the information appended to the word is to be utilized for programming the graphic database **155**, preferably includes a predetermined character or sequence of characters. The message also includes a code, either existing or new, followed by image data to be written into the graphics database **155**. Therefore, as graphics technology results in higher resolution graphics that are more easily understood, new image data can be provided to the data communication receiver **100**.

FIG. **13** is a flowchart depicting a programming operation of the processor **120** (FIG. **1**) according to the present invention. When, at step **350**, a message is received by the processor **120** from the decoder **115**, the processor **120** determines, at step **355**, whether the message includes the programming word indicative of over-the-air programming. When the programming word is located, the received code is compared, at step **360**, with codes stored in the graphics database **155**. When, at step **370**, the received code already exists in the database **155**, the received image data overwrites the image data already stored in the graphics database **155**, at step **375**. When the received code is not found in the graphics database **155**, the processor **120** stores, at step **380**, both the received code and the received image data in the database **155**. Although over-the-air programming is not the exclusive method for programming the data communication receiver **100**, such a method provides for convenient dissemination of programming information without requiring that each user bring his or her data communication receiver into a service center for individual reprogramming.

FIG. **14** is an example of entries in a graphics database **500** in accordance with an alternate embodiment of the present invention. According to the alternate embodiment of the present invention, the data communication receiver **100** recognizes key words in conventional messages then, when the messages are displayed, images associated with the key words are displayed as well to supplement the message. For example, key words such as "CALL" and "PHONE" can be associated with the image of a telephone. Therefore, when a message includes the words "CALL" or "PHONE", the message would be displayed as text along with a supplemental image of a telephone, as shown in the illustration of FIG. **15**. FIG. **16** illustrates the display of the text message "READY FOR COFFEE?" along with a supplemental image of a coffee mug. According to the alternate embodiment of the present invention, the presence of the key word "COFFEE" in the received message triggers the display of the coffee mug image.

Referring next to FIG. **17**, a flowchart depicts an operation of the presentation element **150** according to the alternate embodiment of the present invention. At step **400**, the presentation element **150** receives a message from the processor **120** and then, at step **405**, compares the words of the message with the key words stored in the graphics database **500**. When, at step **410**, no words match, the message is displayed, at step **415**, in a conventional manner. When one or more message words are equivalent to key words in the graphics database **500**, the image data associated with the key word or words is retrieved, at step **420**, from the database **500**. Thereafter, at steps **415**, **425**, the display **130** is driven to display both the message text and the supplemental image.

According to an alternate embodiment of the present invention, the graphics database **155** (FIG. **1**) additionally stores database information about the different graphic images that can be displayed. This information augments universally-understood graphic messages and can be accessed via selection of a displayed image by the user. For example, the user could select a displayed image by touchpad technology, i.e., by touching the image on the display **130**, or by operating controls **140** to move a cursor to highlight a displayed image. Examples of information that can be displayed are shown in FIGS. **18–23**.

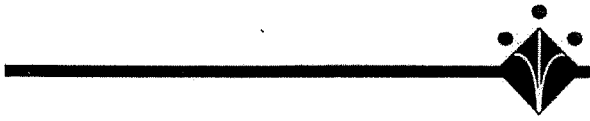
In FIG. **18**, the "person running" icon and the "train" icon are displayed to indicate that a particular person is traveling by train or to a train. When the user selects the train icon, such as by touch, database information associated with the train icon is retrieved from the graphics database **155** and provided to the display **130**. Referring to FIG. **19**, such

EXHIBIT 23

MICROSOFT PRESS

COMPUTER DICTIONARY

SECOND EDITION



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and the codes used to represent them, including not only letters but digits, punctuation marks, and other characters such as the dollar sign. The International Alphabet Number 5, for example, is represented by a 7-bit code similar to ASCII that has been standardized by the CCITT and the ISO for use in data transmission. *See also* ASCII, CCITT, character set, EBCDIC, extended ASCII, ISO.

alphabetic Having to do only with the letters in an alphabet.

alpha channel The high-order 8 bits of the 32 bits that define a pixel in some 24-bit graphics adapters. The alpha channel is used by some software to manipulate the 24 remaining bits that collectively represent each pixel's color information (8 bits for red, 8 bits for blue, and 8 bits for green) for such tasks as changing the pixel's color or masking the pixel.

Alpha chip *See* DECchip 21064.

alphageometric In computer graphics, particularly videotex and teletext systems, a display method that includes codes for alphanumeric characters as well as geometric primitives (shapes, such as horizontal and vertical lines, corners, and so on) that can be used to draw on-screen graphics. *See also* alphamosaic.

alphamosaic In computer graphics, particularly videotex and teletext systems, a display method that includes codes for alphanumeric characters and creates graphics on the screen as rectangular arrangements of elements, each element being a piece of the mosaic. *See also* alphageometric.

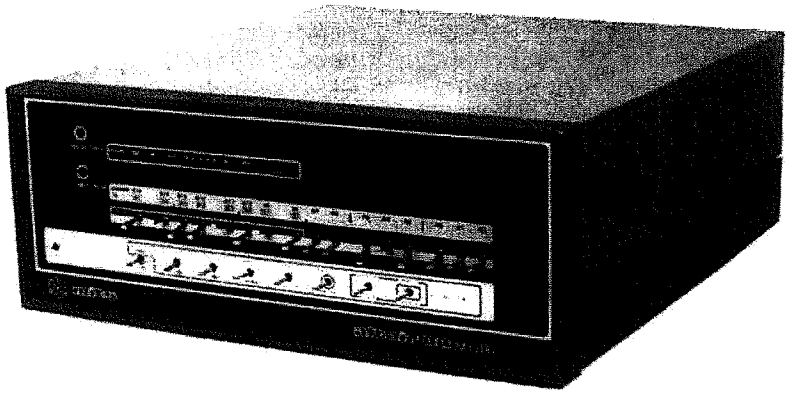
alphanumeric Comprising both letters and digits, sometimes also including control characters, space characters, and other special characters. *See also* ASCII, character set, EBCDIC.

alphanumeric display terminal A terminal capable of displaying characters (letters, numbers, and symbols) but not graphics.

alphanumeric mode *See* text mode.

alphanumeric sort A method of sorting similar to an alphabetic sort but that takes into account numbers, punctuation marks, and special characters. Typically, the order is as follows: punctuation marks, numbers, alphabetic characters (with the set of capital letters falling before the set of lowercase letters), any other characters in the set being sorted. The specific order for sorting often varies from application to application and from country to country.

Altair 8800 A small computer introduced in 1975 by Micro Instrumentation Telemetry Systems of New Mexico. See the illustrations. Sold primarily in kit form, the Altair was based on the 8-bit Intel 8080 microprocessor, had 256 bytes of random access memory, received input through a bank of switches on the front panel, and displayed output



Altair 8800.