

APPARATUS FOR COMMUNICATION OF CHAT MESSAGES AND METHOD THEREFOR

Background of the Invention

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Field of the Invention

This invention relates in general to wireless communication systems and in particular to real time communication among a plurality of wireless communication
10 devices within a wireless communication system.

Description of the Related Art

Historically, wireless communication devices, such as pagers, have had the
15 ability to receive a message sent from a wireless communication system, and perform standard functions in response to the message receipt such as storing the message, displaying the message, or alerting the user of receipt of the message. The messages are typically a numeric message such as a phone number, or an alphanumeric message containing one unique piece of information such as
20 "meeting in my office at 6:00pm." The user is alerted of receipt of a new message by an audible alert or a vibratory alert. The display of many wireless communication devices includes a message indicator for each message it has received and stored in memory.

Today's wireless communication devices are no longer restricted to these
25 standard functions. For example, two-way pagers optimize productivity in a portable package. Two-way pagers function as regular full-text pagers, communicate wirelessly with other pagers, and send and receive e-mail. In many two-way pagers, the combination of an easy to use graphic user interface (GUI), QWERTY keyboard, software programmability, application interface, address
30 book, customizable menu, PC connectivity, and large memory make them ideal for enhanced functionality.

Two-way paging protocols are optimized for one-to-one messaging. Utilizing two-way paging protocols, a first wireless communication device can send

a message to another wireless communication device; and the recipient of the message can reply to the sender. The first wireless communication device can also send the same message to a plurality of wireless communication devices; and receive individual replies from each device. In this manner, real time
5 communication between two wireless communication devices is achieved.

One drawback of the current two-way paging systems is the inability to send the complete recipient list to every wireless communication device receiving the same message when a message is sent to a plurality of wireless communication devices. This leads to difficulty for an individual recipient to reply
10 to not only the original sender but also all other recipients of the message.

A second drawback of the current two-way paging systems when a message is sent to a plurality of wireless communication devices is that even if a person did know the people to reply to the system would have to send an individual page to each of them. For example, when a message is sent to five
15 other wireless communication devices, five individual messages must be encoded and sent over the air. Optionally, a temporary news service address could be set up by the infrastructure, but this would take additional time to page each wireless communication device; and add it to the news service group before sending out the message.

20 Chat functions are very popular on the Internet. Chat functions allow the simultaneous access to a message or set of messages by multiple users, with each user capable of inputting a message or set of messages to the chat. The message is related to the devices (typically computers) of the other users who have chosen to participate in that chat. Then the other users can respond with
25 their own messages, which are likewise relayed to all the devices. In this manner, chat functions offer real time conversations between users.

The sophisticated design of wireless communication devices today makes them ideal for wireless communication of chat conversations. However, the drawbacks as described previously of current two-way paging protocols and
30 systems make it burdensome to implement a chat conversation with three or more wireless communication devices.

What is needed is a method and apparatus in which a plurality of wireless communication devices can communicate efficiently and in substantially real time

with all other wireless communication devices within a particular group to implement chat functions wirelessly.

Brief Description of the Several Views of the Drawings

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FIG. 1 is an electronic block diagram of a wireless communication system;

FIG. 2 is a flowchart illustrating communication of chat requests and responses within the wireless communication system of FIG. 1;

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FIG. 3 is an electronic block diagram of a chat server for use within the wireless communication system of FIG. 1;

FIGs. 4 through 7 are flowcharts illustrating various embodiments of the operation of the chat server of FIG. 3 in accordance with the present invention;

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FIG. 8 is an electronic block diagram of a wireless communication device for use within the wireless communication system of FIG. 1;

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FIG. 9 is an illustration of the chat memory included within the wireless communication device of FIG. 8;

FIGs. 10 and 11 are embodiments of a protocol for communicating a chat message to the wireless communication device of FIG. 3; and

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FIGs. 12 through 16 are flowcharts illustrating various embodiments of the operation of the wireless communication device of FIG. 8 in accordance with the present invention.

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Detailed Description of the Invention

Referring to FIG. 1, an electronic block diagram of a wireless communication system 10 is shown. The wireless communication system 10 comprises a

message input device, such as a telephone **12**, a computer **14**, or a desktop messaging unit **16**, connected through a conventional public switched telephone network (PSTN) **18** through a plurality of telephone links **20** to a system controller **22**. The telephone links **20** may be a plurality of twisted wire pairs, a fiber optic cable, or a multiplexed trunk line.

The system controller **22** is coupled to and oversees the operation of at least one radio frequency (RF) transmitter **26** and at least one radio frequency (RF) receiver **28** through one or more communication links **24**. The communication links **24** typically are twisted pair telephone wires, and additionally can include radio frequency (RF), microwave, or high quality audio communication links. The radio frequency transmitter **26** and the radio frequency receiver **28**, which typically are used in message store and forward stations that encode and decode inbound and outbound messages into formats that are compatible with landline message switch computers and personal radio addressing requirements, such as cellular message protocols. The system controller **22** can also function to encode and decode wireless messages that are transmitted to or received by the radio frequency transmitter **26** or the radio frequency receiver **28**. Telephony signals are typically transmitted to and received from the system controller **22** by telephone sets such as the telephone **12** or the wireless communication device **36**. The system controller **22** encodes and schedules outbound messages such as a downlink message **34**, for transmission by the radio frequency transmitter **26** via a transmit antenna **30** to at least one wireless communication device **36** on at least one outbound radio frequency (RF) channel **32**. As illustrated in FIG. 1, the wireless communication device **36** may be, for example, a cellular telephone or a two-way pager. The downlink message **34** may be, for example, a data message. Similarly, the system controller **22** receives and decodes inbound messages such as an uplink message **44** received by the radio frequency receiver **28** via a receive antenna **40** on at least one inbound RF channel **42** from the wireless communication device **36**. The uplink message **44** may be, for example, a data message or a reply to a data message.

It will be appreciated that the wireless communication system **10**, in accordance with the present invention, may function utilizing any wireless RF channel, for example, a one or two way pager channel, a mobile cellular channel,

or a mobile radio channel. Similarly, it will be appreciated that the wireless communication system **10** may function utilizing other types of channels such as infrared channels. In the following description, the term wireless communication system refers to any of the wireless communication systems mentioned above or
5 an equivalent.

Similarly, it will be appreciated that the wireless communication device **36**, in accordance with the present invention, may be a mobile cellular telephone, a mobile radio data terminal, a mobile cellular telephone having an attached data terminal, or a two way pager. In the following description, the term "wireless
10 communication device" refers to any of the devices mentioned above or an equivalent.

Each wireless communication device **36** assigned for use in the wireless communication system **10** has an address **38** assigned thereto which is a unique selective call address in the wireless communication system **10**. The address **38**
15 enables the transmission of the downlink message **34** from the system controller **22** only to the wireless communication device **36** having that address **38**, and identifies the messages and responses received at the system controller **22** from the wireless communication device **36**. In one embodiment, each wireless communication device **36** also has a pin number assigned thereto, the pin number
20 being associated with a telephone number within the PSTN **18**. A list of the assigned addresses and correlated telephone numbers for each wireless communication device **36** is stored in the system controller **22** in the form of a subscriber database **46**.

In a preferred embodiment of the present invention, the wireless
25 communication system **10** includes a chat server **48** coupled to the system controller **22** via a server interface **52**. The chat server **48** manages the communication of a plurality of chat discussions, facilitating substantially real time communication among a plurality of wireless communication devices within the wireless communication system **10**. The chat server **48** provides numerous
30 services to manage the chat discussions. The chat server **48** also offers various options to the participants to reduce cost or enhance the features of the chat discussion.

The chat server **48** receives a chat request **54** and in response to such receipt, sends a chat response **56**. In one embodiment, the chat request **54** is communicated to the chat server **48** via the server interface **52** from the system controller **22** and the chat response **56** is communicated via the server interface **52** to the system controller **22**. The system controller **22** then routes the chat response **56** to the requesting device which may be a message input device, such as the telephone **12**, the computer **14**, or the desktop messaging unit **16**, or alternatively may be an individual or a wireless communication device **36**. In the following description, the term requester refers to any of the requesting devices mentioned above or an equivalent.

Preferably, the chat server **48** includes a chat server address **50**, which is a unique selective call address in the wireless communication system **10**. The chat server address **50** enables the transmission, via the inbound RF channel **42**, to the chat server **48** of the chat request **54** such as chat service requests, subscription requests, and other information requests from a chat requester which may be an individual or the wireless communication device **36**. In response to the chat request **54**, the chat server **48** sends the chat response **56**, to the requester via the outbound RF channel **32**. The chat response **56** may be sent alternatively through the system controller **22** via the server interface **52**. Furthermore, the chat server **48** also has a pin number assigned thereto, the pin number being associated with a telephone number within the PSTN **18**. The chat server address **50** and correlated telephone number is stored in the subscriber database **46** of the system controller **22**.

The addition of the chat server **48** to the wireless communication system **10** enhances the operation of the wireless communication system **10** by adding intelligence for multiple wireless communication devices to communicate in substantially real time. The chat server **48** interactively manages the traffic associated with a plurality of chat discussions in an efficient manner.

FIG. 2 is a flow chart illustrating the communication of the chat request **54** and the chat response **56** within the wireless communication system **10**. In Step **58**, the chat server **48** is in standby operation. In Step **60**, the chat server **48** queries whether a chat request **54** has been received. If no chat request **54** has been received, the chat server **48** returns to the standby operation of Step **58**. If a

chat request **54** has been received, the chat server **48** processes the chat request **54** and compiles the chat response **56**. In Step **62**, the chat server **48** determines whether a wireless chat response has been requested. In Step **64**, if a wireless chat response has not been requested, the chat server **48** communicates the chat response **56** to the system controller **22** via the server interface **52**. If a wireless chat response has been requested, the chat server **48** communicates the chat response **56** via the outbound RF channel **32** to the requester. In Step **66**, the chat response **56** is communicated to the requester. Upon communicating the chat response **56** to the requester, the chat server returns to standby operation, Step **58**.

FIG. **3** is an electronic block diagram of a preferred embodiment of the chat server **48** for use within the wireless communication system **10**. The chat server **48** includes a chat server processor **68**, a chat server memory **70**, a chat server monitor **72**, a first chat server antenna **74**, a chat server receiver **76**, a second chat server antenna **78**, and a chat server transmitter **80**.

The first chat server antenna **74** intercepts transmitted signals such as the chat request **54** from the wireless communication system **10** received via the inbound RF channel **42**. The first chat server antenna **74** is coupled to the chat server receiver **76** which employs conventional demodulation techniques for receiving the communication signals transmitted by the wireless communication system **10** such as the chat request **54**.

Coupled to the chat server receiver **76**, is the chat server processor **68**, utilizing conventional signal processing techniques for processing received chat requests. Preferably, the chat server processor **68** is similar to the MC68328 micro-controller manufactured by Motorola, Inc. of Schaumburg, Illinois. It will be appreciated that other similar processors can be utilized for the chat server processor **68**, and that additional processors of the same or alternative type can be added as required to handle the processing requirements of the chat server processor **68**. The chat server processor **68** receives the chat request **54** from the chat server receiver **76** and processes that request to generate the chat response **56**.

To perform the necessary functions of the chat server **48**, the chat server processor **68** is coupled to the chat server memory **70**, which preferably includes a

random access memory (RAM), a read-only memory (ROM), and an electrically erasable programmable read-only memory (EEPROM). The chat server memory **70** preferably stores at least one chat topic **82**. The chat topic **82** may be for example a private chat group within a business or social group, a current
5 newsworthy topic, a political viewpoint, a particular sport, or any other topic of interest to a group of individuals. In the following description, the term chat topic refers to any of the chat topics mentioned above or an equivalent. A chat user **84** identification and a user profile **85** for that chat user **84** subscribing to the chat topic **82** is stored along with the chat topic **82** in the chat server memory **70**. The
10 user profile **85** includes, for example, billing information, favorite topics, associates, group lists, age, obscenity rating, and optional services. The chat server **48** sends a chat notification when a new chat corresponding to the user profile **85** is initiated.

The chat server transmitter **80** is coupled to the chat server processor **68** and
15 is responsive to commands from the chat server processor **68**. When the chat server transmitter **80** receives a command from the chat server processor **68**, the chat server transmitter **80** sends the chat response **56** via the second chat server antenna **78** to the wireless communication system **10**. The chat server transmitter **80** preferably monitors traffic on the outbound RF channel **32**. If the
20 outbound RF channel **32** is busy, the chat server transmitter **80** collects and buffers the chat responses for a period of time and then communicates them as one chat message. This allows efficient use of the outbound RF channel **32**. If there is little or no traffic on the outbound RF channel **32**, the chat server transmitter **80** sends the chat response **56** individually upon receipt of a command
25 from the chat server processor **68**.

The chat server processor **68** is coupled to the chat server monitor **72**. The chat server monitor **72** performs various functions relating to the chat discussions. The chat server monitor **72** is preferably programmed with a set of rules regarding chat topics and substance of chat discussions. The chat server monitor **72**, for
30 example, may delete chat discussion substance containing obscenity. The chat server monitor **72** may also disallow the creation of a new chat topic containing obscenity. The chat server monitor **72** preferably also tracks traffic from a particular requester or group for billing purposes. Various billing methods are

supported for the various types of chats. A flat rate per month, for example, may be charged to allow the user to pick a certain number of public chat topics to subscribe to continuously or as desired. Alternatively, hourly charges or per character charges may be applied to private chat topics. The hourly charge also
 5 may be applied to specialty public chat topics. A specialty public chat topic is one active for a short time based on some special event or related topic. One skilled in the art will recognize that any of the billing methods mentioned above or an equivalent are supported by the chat server 48 in accordance with the present invention.

10 FIG. 4 is a flowchart illustrating the operation of the chat server 48 in accordance with the present invention. FIG. 4 illustrates the operation of creation of a new private chat topic. A private chat topic is one available only to a specific identified group of subscribers. In Step 58, the chat server 48 is in standby operation. In Step 86, the chat server 48 queries whether a request for a new
 15 chat topic has been received. When no request for a new chat topic has been received, the chat server 48 returns to the standby operation of Step 58. When a request for a new chat topic has been received, in Step 88 the chat server 48 determines if a subscriber list is included in the request. The subscriber list is a list of users the requester wishes to include in the chat group for the requested
 20 private chat topic. In Step 90, if no subscriber list is included in the request for a chat topic, the chat server 48 sends a request for the subscriber list to the requester; and then returns to standby operation in Step 58. In Step 92, when a subscriber list is included in the request for a chat topic, the chat server 48 creates the new chat topic. Next, in Step 94, the chat server 48 sends a start up message
 25 to each user in the subscriber list. The start up message creates an inbox with the new chat topic on the subscriber's device. The subscriber's device preferably is the wireless communication device 36. Next, in Step 96, the chat server 48 sends an introduction message including information about the new chat topic such as the originator and the other subscribers. In Step 98, the new chat topic is
 30 active and the subscribers maintain their chat discussion. The chat server 48 then returns to the standby state of Step 58.

FIG. 5 is a flowchart illustrating the further detail of the operation of the chat server 48. In Step 100, the chat server 48 creates a new chat topic. The chat

topic **82** is stored in the chat server memory **70** as previously described in FIG. 3. Next, in Step **102**, the chat server **48** determines whether a guaranteed delivery option is associated with the chat topic **82**. In Step **104**, when there is no guaranteed delivery option, the chat server **48** assigns a group address to the chat topic **82**; and next in Step **106** programs the subscriber devices associated with the subscriber list for the new chat topic with the assigned group address. The programming preferably is done wirelessly by the chat response **56** sent over the outbound RF channel **32** to the subscribers' wireless communication devices. Alternatively, the programming of the group address may be accomplished via the system controller **22** or via a programming fixture. Those skilled in the art will recognize that any of the programming methods mentioned above or an equivalent are supported by the present invention. Next, in Step **108**, the chat server programs a new chat inbox in each of the subscribers' devices for the new chat. This programming may be accomplished as part of the same message programming the group address or as a separate message after the group address is programmed. In Step **96**, the chat server **48** then sends an introduction message to the group address, which is received by all the subscribers whose devices were programmed with that group address. Next, in Step **98**, the chat discussion activates for the new chat topic.

In summary, the use of a group address for the private chat as described above is an efficient use of airtime. The various chat messages are only sent as one message to a plurality of users.

Referring back to Step **102**, when the guaranteed delivery option is chosen, in Step **110**, the chat server **48** stores each chat user **84** on the subscriber list and the address **38** of the chat user's device along with the chat topic **82** in the chat server memory **70**. Next, in Step **111**, the chat server **48** checks whether the first subscriber on the subscriber list is an active account. In Step **113**, when the subscriber is not an active account, the chat server **48** checks for the end of the subscriber list. In Step **117**, when the end of the subscriber list has been reached, the process ends. When the end of the subscriber list has not been reached, in Step **115**, the chat server **48** increments a counter and next, returns to Step **111** to check the active status of that subscriber account. When the subscriber account is active, in Step **112**, the chat server **48** programs a new inbox for the

new chat topic individually for each chat user **84** by sending a programming page to the individual address of each wireless communication device for each user on the subscriber list. Next, in Step **114**, the chat server **48** sends an introduction message to each individual address for each individual chat user of the subscriber list. The introduction message informs the user that the chat has been formed and acts as an invitation to the user to join the chat. Next, in Step **98**, the chat discussion activates for the new chat topic.

The process described above and depicted in FIG. **5** offers the user two choices. The guaranteed delivery option compensates for the wireless environment being inherently error prone and noisy (ie: subject to interference). The non- guaranteed delivery option provides a less expensive, more efficient channel utilization option for both the service provider and the user.

FIG. **6** is a flowchart illustrating the further operation of the chat server **48** in accordance with the present invention. The operation of FIG. **6** specifically relates to public chat topics residing on the chat server **48** and available to all requesting subscribers. In Step **58**, the chat server **48** is in standby operation. In Step **116**, the chat server **48** queries whether a request for a chat list has been received. When no request for a chat list has been received, the chat server **48** returns to the standby operation of Step **58**. When a request for a chat list has been received, in Step **118** the chat server **48** sends a list of active chats to the requester. Next, in Step **120**, the chat server **48** queries whether a topic subscription request has been received from a subscriber. When no subscribe topic request has been received, the chat server **48** returns to the standby operation of Step **58**. In Step **111**, when a topic subscription request has been received, the chat server **48** checks whether the subscriber account is active. When the subscriber account is not active, the process ends. When the subscriber account is active, In Step **122**, the chat server **48** adds the user to the subscriber list for the requested topic. Next, in Step **124**, the chat server **48** determines whether the requested topic includes a guaranteed delivery option. In Step **126**, when no guaranteed delivery option is associated with the requested topic, the chat server **48** sends a programming message to the wireless communication device of the requester to program the group address of the requested topic. In Step **128**, when a guaranteed delivery option is included in the

requested topic, the chat server **48** adds the address for the requester user to the list of addresses associated with the chat topic requested. In Step **130**, after the address is added to the list of addresses, or after the group address is programmed when there is a guaranteed delivery option, the chat server **48** sends
5 a programming message to program a new inbox into the wireless communication device for the requested topic. Next, in Step **132**, the chat server **48** queries for a user acknowledgement receipt from the requester. When no user acknowledgement has been received, the chat server **48** continues to query for a user acknowledgement. In Step **134**, when the chat server **48** has received the
10 user acknowledgement, the requesting user is activated in the requested chat topic. The chat server **48** then returns to the standby operation of Step **58**.

In summary, when a user desires to chat, the chat server provides the user a list of active chat topics and gives the user the option to choose which chat to subscribe to and also the quality of service for that chat. In one embodiment, the
15 service provider predefines the quality of service.

FIG. 7 is a flowchart illustrating an alternative operation of the chat server **48** in accordance with the present invention. In Step **58**, the chat server **48** is in standby operation. In Step **116**, the chat server **48** queries whether a request for a chat list has been received. When no request for a chat list has been received,
20 the chat server **48** returns to the standby operation of Step **58**. When a request for a chat list has been received, in Step **111**, the chat server **48** checks whether the subscriber account is active. When the subscriber account is not active, the process returns to the standby operation of Step **58**. When the subscriber account is active, in Step **136** the chat server **48** sends a list of active chats along
25 with the group address for each active chat to the requester. In Step **138**, the process queries whether the user has selected one or more active chat topics. When the user has not selected an active chat topic, the chat server **48** returns to the standby operation with no change to the chats. When the user selects a chat topic, in Step **140**, the user's device adds the group address and an inbox for that
30 chat topic. Next, in Step **134**, the user is now part of the chat and the chat server **48** returns to the standby operation of Step **58**.

The operation of FIG. 7 illustrates a method for giving the user more control over chat activities. One example in which this is preferable is free chat services such as those with attached advertisements.

FIG. 8 is an electronic block diagram of a preferred embodiment of the wireless communication device **36** for use within the wireless communication system **10**. The wireless communication device **36** includes a first device antenna **142**, a second device antenna **144**, a device receiver **146**, a device transmitter **148**, a device processor **150**, a device memory **152**, an alert circuit **154**, a display **156**, a user interface **158**, and a chat application **160**.

The first device antenna **142** intercepts transmitted signals from the wireless communication system **10**. The first device antenna **142** is coupled to the device receiver **146** which employs conventional demodulation techniques for receiving the communication signals transmitted by the wireless communication system **10** such as the downlink message **34**.

Coupled to the device receiver **146**, is a device processor **150** utilizing conventional signal processing techniques for processing received messages. Preferably, the device processor **150** is similar to the MC68328 micro-controller manufactured by Motorola, Inc. of Schaumburg, Illinois. It will be appreciated that other similar processors can be utilized for the device processor **150**, and that additional processors of the same or alternative type can be added as required to handle the processing requirements of the device processor **150**.

The device processor **150** decodes an address in the demodulated data of the received downlink message **34**, compares the decoded address with one or more addresses such as the address **38** stored in an address memory **162** of the device memory **152**; and when a match is detected, proceeds to process the remaining portion of the received signal.

Preferably, the device processor **150** includes a memory manager **164**. The memory manager **164** determines if the address of the decoded downlink message **34** is a chat address or a standard messaging address.

To perform the necessary functions of the wireless communication device **36**, the device processor **150** is coupled to the device memory **152**, which preferably includes a random access memory (RAM), a read-only memory (ROM), and an electrically erasable programmable read-only memory (EEPROM). The

device memory **152** includes the address memory **162**, a message memory **166**, and a chat memory **168**. Once the device processor **150** has processed the downlink message **34**, it stores the downlink message **34** in the chat memory **168** if the address is a chat address and in the message memory **166** otherwise.

5 FIG. **9** is an illustration of the chat memory **168**. The chat memory **168** includes a chat memory slot **174** for the chat topic **82** in which the wireless communication device **36** has subscribed. A plurality of chat messages **170** associated with the chat topic **82** is stored together in chronological order in the chat memory slot **174**. The chat memory slot **174** is allocated a fixed amount of
10 memory for storing associated plurality of chat messages **170**. The chat memory slot **174** holds multiple chat messages in a single message slot. Any chat message received for the chat topic **82** is appended at the end of the plurality of chat messages **170** already in the chat memory slot **174**. If the amount of allocated memory for the chat memory slot **174** is exceeded, the older chat
15 messages are deleted. The chat memory slot **174** for the chat topic **82** preferably includes one or more chat preferences **175**. The chat preferences **175** define the options chosen by the user for the chat topic **82**. The chat preferences **175** may be, for example, an alert option such as alert on receipt of a new chat message or no alert on receipt of a new chat message, guaranteed or non-guaranteed
20 delivery, timeout setting for participation in the chat, and number of chat messages to retain in history and display. In one embodiment, the chat preferences **175** includes a subscription timer **177**. The subscription timer **177** is a preset time period upon which the wireless communication device **36** is active within the chat topic **82**. One skilled in the art will recognize that the chat
25 preferences **175** may be any of those mentioned above or an equivalent. The chat preferences **175** in one embodiment are set by the chat server **48** when the chat topic is activated. Alternatively, the chat preferences **175** are manually set by the user interface **158**. A default set of chat preferences **175** typically is included either in the chat application **160** or the device processor **150** to enhance the
30 efficiency of managing the chat topics.

Referring back to FIG. **8**, the device processor **150** sends a command to the alert circuit **154** to notify a user that the downlink message **34** has been received and stored. The alert circuit **154** 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 skilled 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 alert circuit **154**.

Upon receipt of the downlink message **34**, the device processor **150** preferably also sends a command to the display **156** to generate a visual notification of the receipt and storage of the downlink message **34**. When the display **156** receives the command from the device processor **150** that the downlink message **34** has been received and stored in the device memory **152**, an indication is displayed. The display **156** can be, for example, a full or partial starburst liquid crystal display utilized to display text. It will be appreciated that other similar displays such as dot matrix displays can be utilized for the display **156**.

In a preferred embodiment, the wireless communication device **36** includes the chat application **160**. The wireless communication device **36** performs chat functions within the chat application **160** using a plurality of chat messages **170** stored in the chat memory **168**. The chat application **160** may be hard coded or programmed into the wireless communication device **36** 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 chat application **160** into the wireless communication device **36**.

Preferably the chat application **160** automatically updates the display **156** when a new chat message has been received. This allows the message to be updated while the user is reading it without disturbing the display **156**. One skilled in the art will recognize that wireless communication devices having software-programming capabilities may include specialized and personalized display options and screens for each chat topic. Alternatively, wireless communication devices that do not include software-programming capabilities may include standard, pre-defined display options and screens for chat topics.

The chat application **160** further includes various alert options. In one embodiment, the chat application **160** notifies the device processor **150** to send a command to the alert circuit **154** when a new chat message is added to the chat memory slot **174**. In another embodiment, the chat application **160** notifies the
5 device processor **150** to send a command to the alert circuit **154** when an unread chat message is to be deleted from the chat memory slot **174**. Alternatively, no alert may be sent when a new chat message is received and stored in the chat memory **168**. Those skilled in the art will appreciate that other alerting schemes are within the scope of the present invention.

10 Preferably, the user interface **158** is coupled to the device processor **150**, as shown in FIG. **8**. The device processor **150**, in response to the user interface **158**, such as a user depressing a button or series of buttons, or in response to receipt of a chat response **56** from the chat server **48**, initiates an input signal **172** to the chat application **160**. The chat application **160**, in response to the input
15 signal **172**, accesses the plurality of chat messages **170** stored in the chat memory **168** for use in operation of the chat application **160**.

The device transmitter **148** is coupled to the device processor **150** and is responsive to commands from the device processor **150**. When the device transmitter **148** receives a command from the device processor **150**, the device
20 transmitter **148** sends a signal via the second device antenna **144** to the wireless communication system **10**.

FIG. **10** illustrates one embodiment of a protocol **176** for communicating a chat message to the wireless communication device **36**. This protocol **176** is embedded within the downlink message **34** sent to the wireless communication
25 device **36**. The protocol **176** includes the address **38**, a chat topic **82**, and a chat message **180**. The address **38** is typically a group address used by all subscribers to the identified chat topic **82** in the case of non-guaranteed delivery or is an individual assigned address for that single wireless communication device **36** in the case of guaranteed delivery. In the embodiment of FIG. **10**, the chat topic **82**
30 identifies to the device processor **150** that the downlink message **34** contains the chat message **180** and also the chat topic **82** for which the chat message **180** relates.

FIG. 11 illustrates an alternative embodiment of a protocol for communicating a chat message to the wireless communication device 36. This protocol 176 is embedded within a downlink message 34 sent to the wireless communication device 36. The protocol 176 includes a chat address 178, a topic code 182 and the chat message 180. In the embodiment of FIG. 11, the chat address 178 identifies to the device processor 150 that the downlink message 34 contains the chat message 180. The chat address 178 is a group address used by all subscribers to that chat topic in the case of non-guaranteed delivery or is an individual assigned address for that single wireless communication device 36 in the case of guaranteed delivery. The topic code 182 then identifies to the device processor 150 the chat topic 82 for which the chat message 180 is associated with. Using one chat address for all chat topics is useful for pagers with limited address capacity.

FIG. 12 is a flowchart illustrating one embodiment of the subscription to a new chat topic by the wireless communication device 36. In the embodiment of FIG. 12, the wireless communication device 36 is subscribing to a public chat topic. In Step 184, the wireless communication device 36 requests a list of active chats from the chat server 48. In one embodiment the request for the list of active chats is sent from the wireless communication device 36 as the chat request 54 via the inbound RF channel 42 directly to the chat server 48 when the chat server 48 includes the chat server address 50. In an alternative embodiment, the request for the list of active chats is sent from the wireless communication device 36 as the uplink message 44 to the system controller 22 via the receive antenna 40. In response to receipt of the uplink message 44, the system controller 22 communicates the chat request 54 to the chat server 48 via the server interface 52. In another embodiment, the requester sends the request for the list of active chats from an input device such as the telephone 12, computer 14, or desktop messaging unit 16. The request is sent through the PSTN 18 to the system controller 22. In response to receipt of the request from the PSTN 18, the system controller 22 communicates the chat request 54 to the chat server 48 via the server interface 52. It will be appreciated that the wireless communication system 10, in accordance with the present invention, may utilize any of the above methods for the request for the list of active chats or an equivalent.

Next, in Step **186** of FIG. **12**, the wireless communication device **36** queries for receipt of the list of active chats from the chat server **48**. When no list of active chats has been received, the wireless communication device **36** continues to periodically check for receipt. In one embodiment, the chat server **48** sends the
5 list of active chats in the form of the chat response **56** directly to the wireless communication device **36** via the outbound RF channel **32**. In an alternative embodiment, the chat server **48** sends the chat response **56** including the list of active chats to the system controller **22** via the server interface **52**. In response to receipt of the chat response **56** from the chat server **48**, the system controller **22**
10 sends the downlink message **34** including the list of active chats to the wireless communication device **36**. In Step **188**, when the wireless communication device **36** receives the list of active chats, the device processor **150** of the wireless communication device **36** then queries for the selection of a chat topic. Preferably, the chat topic is selected when the user interface **158** sends a command to the
15 device processor **150** which, in response to the command from the user interface **158**, sends the input signal **172** to the chat application **160** notifying the chat application **160** of the selected topic. When no chat topic is selected, the process ends. In Step **190**, when a new chat topic is selected, the device processor **150** of the wireless communication device **36** next determines whether the system is
20 configured for system subscription of the selected chat topic.

In Step **192**, when there is no system subscription, the device processor **150** sends the input signal **172** to the chat application **160** to initiate manual subscription. In Step **194**, the chat application **160** verifies with the user that a new chat topic is desired. Preferably, the verification is done using the user
25 interface **158**. In Step **196**, the chat application **160** then programs the chat memory **168** to include a new chat message slot for the new chat topic. In Step **198**, a counter is incremented by one and the process returns to Step **194** to continue checking for further selected new chat topics.

In Step **200**, when there is a system subscription option activated, the
30 wireless communication device **36** sends a request to subscribe to the chat server **48**. In one embodiment the request to subscribe is sent from the wireless communication device **36** as the chat request **54** via the inbound RF channel **42**

directly to the chat server **48** when the chat server **48** includes the chat server address **50**. In an alternative embodiment, the request to subscribe is sent from the wireless communication device **36** as the uplink message **44** to the system controller **22** via the receive antenna **40**. In response to receipt of the uplink message **44**, the system controller **22** communicates the chat request **54** to the chat server **48** via the server interface **52**. In another embodiment, the requester sends the request to subscribe from an input device such as the telephone **12**, computer **14**, or desktop messaging unit **16**. The request is sent through the PSTN **18** to the system controller **22**. In response to receipt of the request from the PSTN **18**, the system controller **22** communicates the chat request **54** to the chat server **48** via the server interface **52**. It will be appreciated that the wireless communication system **10**, in accordance with the present invention, may utilize any of the above methods for the request to subscribe or an equivalent.

Next, in Step **202** of FIG. **12**, the wireless communication device **36** queries for receipt of a programming message from the chat server **48**. When no programming message has been received, the wireless communication device **36** continues to periodically check for receipt. In one embodiment, the chat server **48** sends the programming message in the form of the chat response **56** directly to the wireless communication device **36** via the outbound RF channel **32**. In an alternative embodiment, the chat server **48** sends the chat response **56** including the programming message to the system controller **22** via the server interface **52**. In response to receipt of the chat response **56** from the chat server **48**, the system controller **22** sends the downlink message **34** including the programming message to the wireless communication device **36**. In Step **204**, when the programming message is received, the new chat topic is added to the chat memory **168**. In Step **206**, the counter is then incremented by one and the device processor **150** returns to Step **188** and continues to query for selection of another chat topic.

In summary, the wireless communication device receives a list of active chat topics from the chat server and chooses to subscribe. Subscription may be accomplished either through a request to the system and subsequent programming or via the user interface by manually subscribing.

FIG. **13** is a flowchart illustrating an alternative embodiment of the subscription to a new chat topic by the wireless communication device **36**. In the

embodiment of FIG. 13, the wireless communication device 36 is being added as a subscriber to a private chat topic. In Step 208, the wireless communication device 36 is in the standby operation. In Step 210, the wireless communication device 36 queries for receipt of a new chat programming message. When no chat programming message has been received, the wireless communication device 36 returns to the standby operation of Step 208. In Step 210, when a chat programming message is received, the chat address 178 for the chat topic 82 is added to the chat memory 168 in Step 212. Next, in Step 214, the chat memory slot 174 is created in the chat memory 168 corresponding to the chat topic 82. In Step 216, a new chat inbox is created corresponding to the chat topic 82. Next, in Step 218, the wireless communication device 36 sends an acknowledge message to the chat server 48. In one embodiment the acknowledge message is sent from the wireless communication device 36 as the chat request 54 via the inbound RF channel 42 directly to the chat server 48 when the chat server 48 includes the chat server address 50. In an alternative embodiment, the acknowledge message is sent from the wireless communication device 36 as the uplink message 44 to the system controller 22 via the receive antenna 40. In response to receipt of the uplink message 44, the system controller 22 communicates the chat request 54 to the chat server 48 via the server interface 52. In another embodiment, the requester sends the acknowledge message from an input device such as the telephone 12, computer 14, or desktop messaging unit 16. The request is sent through the PSTN 18 to the system controller 22. In response to receipt of the request from the PSTN 18, the system controller 22 communicates the chat request 54 to the chat server 48 via the server interface 52. It will be appreciated that the wireless communication system 10, in accordance with the present invention, may utilize any of the above methods for the acknowledge message or an equivalent.

FIG. 14 is a flowchart illustrating the removal of a subscription to a chat topic by the wireless communication device 36. In Step 220, the wireless communication device 36 is active as a chat topic subscriber. In Step 222, the wireless communication device 36 queries for the presence of a subscription timer for the chat topic. A subscription timer is a preset time period upon which the

wireless communication device **36** is active within the chat. It is typically set at the time of subscription. The subscription timer in one embodiment is set by the user at the time of subscription by sending a subscribe topic time limit request to the chat server **48** at the time of subscription. Alternatively, the chat server **48** sets the subscription timer at the time of subscription per the service options associated with the chat topic **82**. In Step **224**, when a subscription timer is present, the wireless communication device **36** determines if the subscription timer has timed out. In Step **226**, when the subscription timer has timed out, the wireless communication device **36** is unsubscribed from the chat topic **82**. To unsubscribe from the chat topic **82**, the device processor **150**, in response to the time out of the subscription timer, sends the input signal **172** to the chat application **160**. The chat application **160**, in response to the input signal **172**, removes the chat topic **82** including the chat address **178** from the chat memory **168** and deletes any chat inbox on the display **156** for the chat topic **82**.

In Step **228**, when the subscription timer has not timed out, or when there is no subscription timer, the wireless communication device **36** queries for a user chat topic removal request. In one embodiment, the chat topic removal request is initiated by the user interface **158** sending a removal command to the device processor **150**. When there is no chat topic removal request, the wireless communication device **36** continues to be active in the chat, returning to Step **220**. In Step **230**, when there is a chat topic removal request, the wireless communication device **36** next checks for a system removal option. The system removal option gives the chat server **48** the responsibility to remove the wireless communication device **36** from the chat. In Step **232**, when there is no system removal option, a manual removal is initiated. In Step **234**, the chat topic **82** is deleted from the wireless communication device **36** and the device is unsubscribed in Step **226**. Unsubscribing includes removing the chat topic inbox and deleting the chat messages from the chat memory. Preferably, to accomplish the unsubscribing, the user interface **158** sends a command to the device processor **150** to remove the chat topic **82**. The device processor **150** in response to the command from the user interface **158** sends the input signal **172** to the chat application **160**. The chat application **160**, in response to the input signal **172**, removes the chat topic **82** including the chat address **178** and the chat memory

slot **174** from the chat memory **168** and deletes the chat inbox on the display **156** for the chat topic **82**.

In Step **236**, when there is a system removal option, the wireless communication device **36** sends a removal request to the chat server **48**. In one embodiment the removal request is sent from the wireless communication device **36** as the chat request **54** via the inbound RF channel **42** directly to the chat server **48** when the chat server **48** includes the chat server address **50**. In an alternative embodiment, the removal request is sent from the wireless communication device **36** as the uplink message **44** to the system controller **22** via the receive antenna **40**. In response to receipt of the uplink message **44**, the system controller **22** communicates the chat request **54** to the chat server **48** via the server interface **52**. In another embodiment, the requester sends the removal request from an input device such as the telephone **12**, computer **14**, or desktop messaging unit **16**. The request is sent through the PSTN **18** to the system controller **22**. In response to receipt of the request from the PSTN **18**, the system controller **22** communicates the chat request **54** to the chat server **48** via the server interface **52**. It will be appreciated that the wireless communication system **10**, in accordance with the present invention, may utilize any of the above methods for the removal request message or an equivalent. Next, in Step **238**, the chat server **48** determines whether there is a group address associated with the chat topic or whether the chat topic is managed by individual addresses. In Step **240**, when there is not a group address, the chat server **48** removes the address **38** for the wireless communication device **36** from the list of chat users associated with the chat topic **82** in the chat server memory **70** of the chat server **48** and the device is unsubscribed in Step **226**. In Step **242**, when there is no group address, the wireless communication device **36** remains active in the chat awaiting receipt of a removal message from the chat server **48**. When no removal message has been received, the wireless communication device **36** continues to periodically check for receipt. In one embodiment, the chat server **48** sends the removal message in the form of the chat response **56** directly to the wireless communication device **36** via the outbound RF channel **32**. In an alternative embodiment, the chat server **48** sends the chat response **56** including the removal

message to the system controller **22** via the server interface **52**. In response to receipt of the chat response **56** from the chat server **48**, the system controller **22** sends the downlink message **34** including the removal message to the wireless communication device **36**. In Step **226**, when the removal message is received,

5 the wireless communication device **36** is unsubscribed from the chat topic **82**. To unsubscribe from the chat topic **82**, the device processor **150**, in response to the time out of the subscription timer, sends the input signal **172** to the chat application **160**. The chat application **160**, in response to the input signal **172**, removes the chat topic **82** including the chat address **178** from the chat memory

10 **168** and deletes any chat inbox on the display **156** for the chat topic **82**.

In summary, when a subscription timer times out, a user requests to be removed from a chat discussion, or an equivalent event occurs which indicates removal of the user from the chat, all associated chat resources are shut down and memory freed up for other uses.

15 FIG. **15** is a flowchart illustrating the operation of the wireless communication device **36** when active in one or more chat discussions. In FIG. **15**, the protocol of FIG. **10** is utilized for communication of the chat message **180**. In Step **208**, the wireless communication device **36** is in the standby operation. In Step **244**, the device processor **150** queries for receipt of a message such as the downlink

20 message **34**. When no message is received, the wireless communication device **36** returns to the standby operation of Step **208**. In Step **246**, when there is a message, the device processor **150** checks for a match between the address **38** of the received message and addresses stored in the address memory **162**. When there is not an address match, the wireless communication device **36**

25 returns to the standby operation of Step **208**. In Step **248**, when there is an address match, the device processor **150** determines whether the message includes the chat address **178**. In Step **250**, when the received message does not contain the chat address **178**, the memory manager **164** of the device processor **150** processes the message as a standard wireless message by first storing the

30 message in the message memory **166**. Next, in Step **252**, the device processor **150** sends a command to the alert circuit **154** to notify a user that the message has been received and stored. The notification may be playing melodies and other audible alerts, a physical vibration, or a visual alert. It will be appreciated by one

skilled in the art that other notifications or any combination of the audible, vibratory, and visual alerts described can be used for the notification. Next, in Step 254, the device processor 150 sends a command to the display 156 to generate a visual notification of the receipt and storage of the message. When the display 156 receives the command from the device processor 150 that the message has been received and stored in the message memory 166, an indication is displayed. The wireless communication device 36 thereafter returns to the standby operation of Step 208.

In Step 256, when the received message includes the chat address 178, the device processor 150 compares the chat address 178 to the chat address of the first chat topic N. In Step 258, when the chat address 178 does not match the chat address of the first chat topic N, a counter is incremented to $N = N + 1$. Next, in Step 260, the device processor 150 determines whether there is an Nth chat topic stored in the chat memory 168. When there is no Nth chat topic, the wireless communication device 36 returns to the standby operation of Step 208. When there is an Nth chat topic, the process returns to Step 256 and the device processor 150 compares the chat address 178 to the chat address of the chat topic N. In Step 262, when the chat address 178 matches the chat address of the Nth chat topic, the device processor 150 determines whether the message includes the chat message 180. When the received message does not contain the chat message 180, the wireless communication device 36 returns to the standby operation of Step 208. In Step 264, when the message includes the chat message 180, the memory manager 164 of the device processor 150 determines whether the memory allocation for the Nth chat topic has been exceeded. In Step 266, when the memory allocation has been exceeded, the memory manager 164 deletes the older pages until the memory limit is no longer exceeded. Preferably, the memory manager 164 is programmed with a buffer limit, which is added to the memory limit to determine how much to delete. The buffer limit facilitates allowance of enough memory for the storage of the newly received chat messages. In Step 268, after the old pages have been deleted, or when the memory allocation is not exceeded, the new chat message is added to the chat messages 170 for the Nth chat topic. Next, in Step 270, the device processor 150 determines whether the chat topic includes the option of alerting upon receipt of a

new chat message. This determination preferably includes communication with the chat application **160**, which stores the options for the chat topics. When the alerting option is included for the chat topic, in Step **252** the device processor **150** sends a command to the alert circuit **154** to notify the user that the chat message

5 has been received and stored. In Step **272**, when there is no alert option for receiving new chat messages, or after the alert command has been sent, the device processor **150** determines whether a visual display update option has been chosen for the chat topic N. In Step **254**, when there is a visual display automatic update the device processor **150** updates the display to show the new chat

10 message. Preferably the new chat message is appended to the bottom of the displayed chat topic messages. Next, when the display has been updated, or when there is no display update option, the wireless communication device **36** returns to the standby operation of Step **208**.

FIG. **16** is a flowchart illustrating an alternative embodiment of the operation

15 of the wireless communication device **36** when active in one or more chat discussions. In FIG. **16**, the protocol of FIG. **11** is utilized for communication of the chat message **180**. In Step **208**, the wireless communication device **36** is in the standby operation. In Step **244**, the device processor **150** queries for receipt of a message such as the downlink message **34**. When no message is received,

20 the wireless communication device **36** returns to the standby operation of Step **208**. In Step **246**, when there is a message, the device processor **150** checks for a match between the address **38** of the received message and addresses stored in the address memory **162**. When there is not an address match, the wireless communication device **36** returns to the standby operation of Step **208**. In Step

25 **248**, when there is an address match, the device processor **150** determines whether the message includes the chat address **178**. In Step **250**, when the received message does not contain the chat address **178**, the memory manager **164** of the device processor **150** processes the message as a standard wireless message by first storing the message in the message memory **166**. Next, in Step

30 **252**, the device processor **150** sends a command to the alert circuit **154** to notify a user that the message has been received and stored. The notification may be playing melodies and other audible alerts, a physical vibration, or a visual alert. It will be appreciated by those skilled in the art that other notifications or any

combination of the audible, vibratory, and visual alerts described can be used for the notification. Next, in Step **254**, the device processor **150** sends a command to the display **156** to generate a visual notification of the receipt and storage of the message. When the display **156** receives the command from the device processor **150** that the message has been received and stored in the message memory **166**,
5 an indication is displayed. The wireless communication device **36** thereafter returns to the standby operation of Step **208**.

In Step **274**, when the received message includes the chat address **178**, the device processor **150** determines whether the received message includes the
10 topic code **182**. When there is no topic code **182**, the process goes to Step **250** and proceeds through Steps **250**, **252**, and **254** as previously described. In Step **276**, when there is a topic code, the device processor **150** compares the topic code **182** to the topic code of the first chat topic N. In Step **278**, when the topic code **182** does not match the topic code of the first chat topic N, a counter is
15 incremented to $N = N + 1$. Next, in Step **280**, the device processor **150** determines whether there is an Nth chat topic stored in the chat memory **168**. When there is no Nth chat topic, the wireless communication device **36** returns to the standby operation of Step **208**. When there is an Nth chat topic, the process returns to Step **276** and the device processor **150** compares the topic code **182** to the topic
20 code of the chat topic N. The process then continues to Step **262** and thereafter as described previously.

The present invention as described above facilitates the management of a plurality of chat discussions among a plurality of chat users using wireless communication systems. Wireless attributes, for example the mobility wireless
25 offers to the chat user, not found in Internet and other wired chat approaches have not been utilized in the past due to special needs of the wireless systems. The present invention as described compensates for the requirements of wireless communication systems such as cost per character, limited bandwidth, and channel throughput while taking full advantage of the attributes that wireless
30 brings to chat discussions.

Although the invention has been described in terms of preferred embodiments, it will be obvious to those skilled in the art that various alterations and modifications may be made without departing from the invention.

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Accordingly, it is intended that all such alterations and modifications be considered as within the spirit and scope of the invention as defined by the appended claims.

5 What is claimed is:

CLAIMS

1. A wireless communication system, including a plurality of wireless communication devices, for communicating a plurality of messages between the plurality of wireless communication devices, the wireless communication system comprising:
- 5 a chat server for managing the plurality of messages including at least one chat request and at least one chat response, wherein each of the plurality of messages comprises:
- 10 an address for identifying one or more of the plurality of wireless communication devices for which the message is directed,
- a topic code for identifying an associated chat topic when the address comprises a chat address, and
- 15 a chat message associated with the chat topic when the address comprises the chat address;
- at least one radio frequency receiver coupled to the chat server for receiving the chat request from the plurality of wireless communication devices and communicating the chat request to the chat server; and
- 20 at least one radio frequency transmitter coupled to the chat server for receiving the chat response from the chat server and transmitting the chat response to the plurality of wireless communication devices.

2. In a wireless communication system for communicating a plurality of messages between a plurality of wireless communication devices, a chat server for managing the plurality of messages, the chat server comprising:

5 a chat server receiver for receiving a chat request, wherein the chat request comprises:

a chat server address for identifying the chat server within the wireless communication system,

10 a topic code for identifying the associated chat topic when the chat server address is a chat address, and

a chat request message associated with the chat topic when the chat server address is a chat address;

15 a chat server processor coupled to the chat server receiver for processing the chat request and generating a chat response, wherein the chat response comprises:

an address for identifying one or more of the plurality of wireless communication devices for which the chat response is directed, wherein the address comprises the chat address,

20 the topic code for identifying the associated chat topic, and the chat response message;

a chat server transmitter coupled to the chat server processor for transmitting the chat response; and

25 a chat server memory for storing the plurality of chat messages, wherein the chat server memory includes at least one chat topic for storing the plurality of chat messages.

3. The chat server for managing a plurality of chat messages as recited in Claim 2 wherein the chat topic includes one or more chat users and the chat memory stores the chat users for the chat topic and the chat messages for the chat topic.

30

4. In a chat server within a wireless communication system having a plurality of chat users, wherein each chat user comprises a wireless communication device, a method for creating a chat topic including:

5 receiving a chat request, wherein the chat request comprises:

a chat server address for uniquely identifying the chat server within the wireless communication system,

the chat topic for identifying that this is a chat message and the associated chat topic, and

10 at least one chat user;

storing the chat topic;

storing the chat user; and

activating the chat user by transmitting a chat response to the wireless communication device belonging to the chat user, wherein the chat response

15 comprises:

an address for identifying the wireless communication device belonging to the chat user,

a chat topic for identifying that this is a chat message and the associated chat topic, and

20 the chat response message.

5. A wireless communication device within a wireless communication system for communicating a plurality of messages, the wireless communication device comprising:
- 5 a device receiver for receiving the plurality of messages, wherein each of the plurality of messages comprises:
- an address,
 - a chat topic when the address comprises a chat address, and
 - the chat message when the address comprises the chat address;
- 10 a device processor coupled to the device receiver for processing the plurality of messages, wherein the processing of each of the plurality of messages comprises:
- matching the address with one or more addresses stored in an address memory,
 - 15 determining if the address is a chat address,
 - matching the chat topic to a stored chat topic in a chat memory when the address is a chat address, and
 - storing the chat message in the chat memory;
- 20 a device transmitter coupled to the device processor for sending the plurality of messages;
- the chat memory for storing chat messages, wherein the chat memory includes a chat memory slot for a chat topic wherein a plurality of chat messages associated with the chat topic are stored; and
 - 25 a chat application for managing the chat messages stored in the chat memory.

6. In a wireless communication device, a method for participating within a chat topic including:

5 sending a request for active chat topics to a chat server, wherein the request is sent from the wireless communication device to the chat server via an inbound radio frequency channel, and further wherein the request for chat topics comprises:

10 a chat server address for identifying the chat server,
an address for identifying the wireless communication device, and
a chat request;

receiving a chat response from the chat server, wherein the chat response is received from the chat server by the wireless communication device via an outbound radio frequency channel, and further wherein the chat response comprises:

15 the address, and
the active chat topics, wherein each of the active chat topics includes a chat address for identifying the chat topic;

20 selecting at least one of the active chat topics;
storing the chat address for the selected at least one of the active chat topics;

sending a request for chat removal from the wireless communication device to the chat server; and

deleting the address of the wireless communication device from the chat server.

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7. In a wireless communication device having an address memory and a chat memory, a method for processing a chat message, the method comprising:
- 5 receiving a message from a wireless communication system including an address, and the chat message;
 - matching the address with one or more addresses stored in the address memory;
 - determining if the address is a chat address;
 - 10 matching the chat address to a chat topic stored in the chat memory when the address is determined to be a chat address;
 - storing the chat message in a chat memory slot associated with the chat topic in the chat memory, wherein the chat memory slot includes a plurality of chat messages associated with the chat topic, and further wherein the chat message is appended to the end of the plurality of chat messages;
 - 15 identifying one or more operations to be performed using one or more chat preferences associated with the chat memory slot; and
 - performing the one or more identified operations.

8. In a wireless communication device having an address memory and a chat memory, a method for processing a chat message, the method comprising:

5 receiving a message from a wireless communication system including an address, a topic code, and the chat message;

matching the address with one or more addresses stored in the address memory;

determining if the address is a chat address;

10 matching the chat address to one or more chat addresses stored in the chat memory when the address is determined to be a chat address;

matching the topic code to a chat topic stored in the chat memory;

15 storing the chat message in a chat memory slot associated with the chat topic in the chat memory, wherein the chat memory slot includes a plurality of chat messages associated with the chat topic, and further wherein the chat message is appended to the end of the plurality of chat messages;

identifying one or more operations to be performed using one or more chat preferences associated with the chat memory slot; and

performing the one or more identified operations.

**APPARATUS FOR COMMUNICATION OF CHAT MESSAGES AND METHOD
THEREFOR**

5

Abstract of the Disclosure

10 A wireless communication system (10) includes a system controller (22), at
least one radio frequency transmitter (26), at least one radio frequency receiver
(28), at least one transmit antenna (30), at least one receive antenna (40), a chat
server (48) and a plurality of wireless communication devices (36). The chat
server (48) manages the communication of a plurality of chat discussions,
facilitating substantially real time communication among the plurality of wireless
15 communication devices (36) within the wireless communication system (10).