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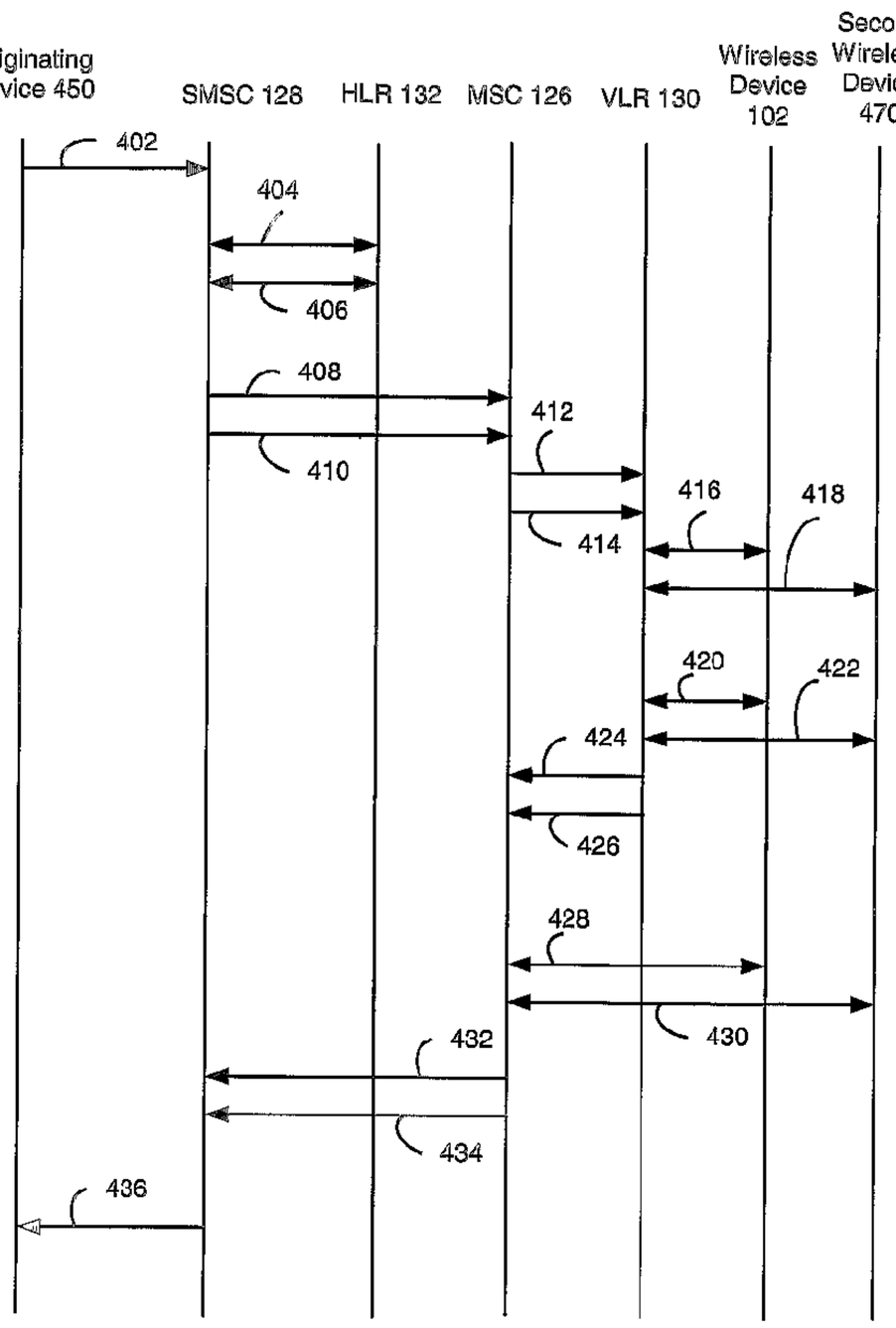
(54) Titre : PROCEDES ET APPAREIL D'ACHEMINEMENT D'UN MESSAGE A DEUX OU PLUSIEURS DISPOSITIFS DE COMMUNICATION SANS FIL ASSOCIES

(54) Title: METHODS AND APPARATUS FOR DELIVERING A MESSAGE TO TWO OR MORE ASSOCIATED WIRELESS COMMUNICATION DEVICES



(57) Abrégé/Abstract:
Methods and apparatus for use in delivering a message, such as a Short Message Service (SMS) message, simultaneously to two or more associated wireless communication devices are described. In one illustrative example, a request to deliver an SMS

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(57) Abrégé(suite)/Abstract(continued):
message to a first wireless communication device identified by a first address is received. In response to the request, the SMS message is delivered to the first wireless communication device as well as to a second wireless communication device identified by a second address different from the first address. In one preferred scenario, the first and the second wireless devices are possessed by the same end user so that SMS messages can be received regardless of which device is being used at any given moment. The method may be executed by a server in the wireless network or, alternatively, by the wireless communication device itself.

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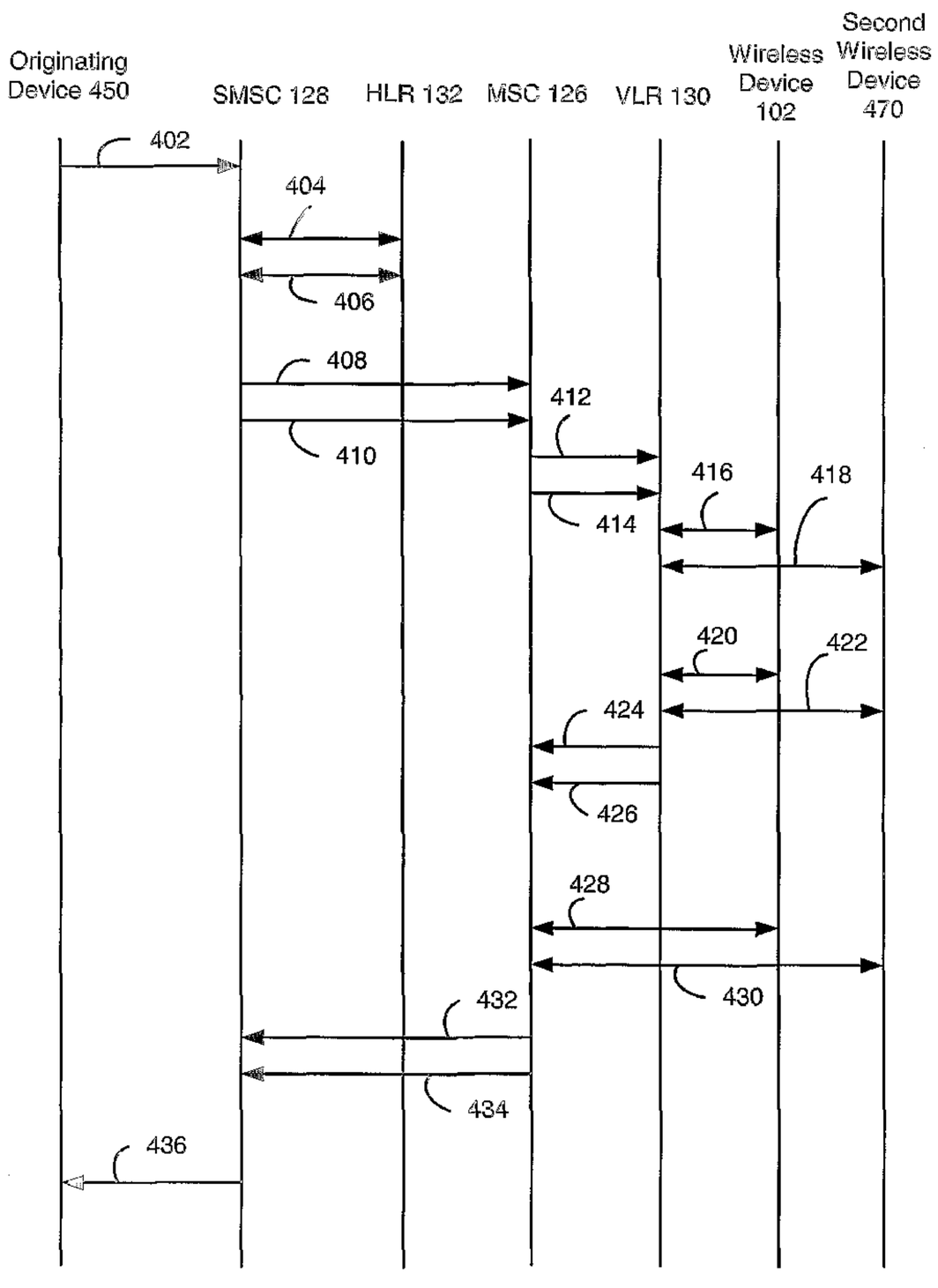
[Continued on next page]

(54) **Title:** METHODS AND APPARATUS FOR DELIVERING A MESSAGE TO TWO OR MORE ASSOCIATED WIRELESS COMMUNICATION DEVICES



(57) **Abstract:** Methods and apparatus for use in delivering a message, such as a Short Message Service (SMS) message, simultaneously to two or more associated wireless communication devices are described. In one illustrative example, a request to deliver an SMS message to a first wireless communication device identified by a first address is received. In response to the request, the SMS message is delivered to the first wireless communication device as well as to a second wireless communication device identified by a second address different from the first address. In one preferred scenario, the first and the second wireless devices are possessed by the same end user so that SMS messages can be received regardless of which device is being used at any given moment. The method may be executed by a server in the wireless network or, alternatively, by the wireless communication device itself.

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METHODS AND APPARATUS FOR DELIVERING A MESSAGE TO TWO OR MORE ASSOCIATED WIRELESS COMMUNICATION DEVICES

BACKGROUND

Field of the Technology

The present application relates generally to wireless communication networks and devices, and more particularly to Short Message Service (SMS) message delivery techniques within such networks.

Description of the Related Art

There are several different types of useful portable electronic devices on the market today. An end user may own two or more of these electronic devices, including a data communication device, a cellular telephone, a multiple-function communication device with data and voice communication capabilities, a personal digital assistant (PDA) enabled for wireless communication, or a computer incorporating an internal modem, as some examples.

Some of these devices are equipped to send and receive Short Message Service (SMS) messages. SMS messages are different from e-mail messages but are delivered in a similar fashion with use of a uniquely identifying address. For example, the address may be a Mobile Station Integrated International Service Digital Network (MSISDN) uniquely associated with a Subscriber Identity Module (SIM) that is inserted within a wireless communication device. Since each device is associated with a unique address, an end user who owns two or more of

these devices often finds it inconvenient to continually make use of only one of the devices to keep a single consistent address or point of contact with others.

Documents related to the present application include Document D1 which represents US6175743B1, Document D2 which represents WO94/09599A, Document D3 which represents EP0899918A2, and Document D4 which represents EP1096726A2. Documents D1 and D2 describe SMS messaging techniques where group messages are delivered to many unassociated wireless devices. In D1, a broadcast and filtering approach is utilized where special information is provided in SMS headers for limiting the cell broadcast of the SMS message. In D2, special "service identifier" information is provided in the messages upon delivery to identify different groups of wireless devices. In the approaches of D1 and D2, important changes are required to be made to the SMS mechanisms of all wireless devices, and no solution is provided to keep a single consistent address or point of contact with others when multiple devices are owned by the same user. In D3, ways in which to provide "alias" source addresses for the sending of e-mail are described. In D4, an e-mail based-technique is described where the e-mail "FROM" address is the same regardless of whether the sender is utilizing a PC or a mobile unit. However, D3 and D4 do not relate to the delivery of SMS or MMS messages or the use of two or more wireless communication devices by the same user. In addition, D3 and D4 do not describe an association of addresses of wireless devices with addresses of other associated wireless devices.

Accordingly, there is a resulting need for improved methods and apparatus for use in delivering SMS messages to wireless communication devices.

SUMMARY

In one illustrative example, a method for use in delivering a message through a wireless communication network comprises the acts of receiving a request to deliver the message to a first wireless communication device identified by a first address, and, in response to the request, causing the message to be delivered to the first wireless communication device, and causing the message to be delivered to a second wireless communication device identified by a second address different from the first address.

In another illustrative example, a method for use in delivering a message through a wireless communication network comprises the acts of receiving a request to deliver a message from a first wireless communication device identified by a first address to a second wireless communication device identified by a second address, and, in response to the request, providing a message-originating address with the message that comprises a third address which identifies a third wireless communication device, and causing the message to be delivered to the second wireless communication device with the message-originating address.

According to another aspect of the invention, a mobile station, comprises a receiver, a transmitter, a user interface, and one or more processors coupled to the

receiver, the transmitter, and the user interface. The one or more processors are for use in receiving, from the user interface, a request to deliver a message to a wireless communication device, and, in response to the request, providing a message-originating address with the message that identifies a different mobile station, and causing the message to be delivered to the wireless communication device with the message-originating address.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of present invention will now be described by way of example with reference to attached figures, wherein:

FIG. 1 is a block diagram of a communication system which includes a wireless communication device for communicating in a wireless communication network;

FIG. 2 is a more detailed example of a wireless communication device for use in the wireless communication network;

FIG. 3 is a particular structure of a system for communicating with the wireless communication device;

FIG. 4 is a first flow diagram which illustrates a method for use in simultaneously delivering a Short Message Service (SMS) message to two or more associated wireless communication devices operating in the wireless communication network (mobile-terminated example);

FIG. 5 is a second flow diagram which illustrates a method for use in simultaneously delivering an SMS message to two or more associated wireless

communication devices operating in the wireless communication network (mobile-originated example);

FIG. 6 is an illustration of a visual display of a first wireless communication device which receives an SMS message; and

FIG. 7 is an illustration of a visual display of a second wireless communication device which also receives the SMS message in accordance with the techniques of the present application.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Methods and apparatus for use in delivering a message simultaneously to two or more associated wireless communication devices are described herein. The message may be delivered as a Short Message Service (SMS) message or a Multimedia Messaging Service (MMS) message, as examples. In one illustrative embodiment, a request to deliver such a message to a first wireless communication device identified by a first address is received. In response to this request, the message is delivered to the first wireless communication device as well as to a second wireless communication device identified by a second address different from the first address. In a preferred scenario, the first and the second wireless communication devices are possessed by the same end user so that SMS messages can be received regardless of which device is being used by the end user at any given moment. This method may be executed by a server in the wireless network or, alternatively, by the wireless communication device itself. In another illustrative embodiment, a request to deliver a message from a first wireless

communication device identified by a first address to a second wireless communication device identified by a second address is received. In response to this request, the message is delivered to the second wireless communication device along with a message-originating address that identifies a third wireless communication device. In a preferred scenario, the first and the third wireless communication devices are possessed by the same end user so that messages delivered therefrom can be identified from a single address regardless of which device is being used by the end user at any given moment. This method may be executed by a server in the wireless network or, alternatively, by the wireless communication device itself.

General Configuration. FIG. 1 is a block diagram of a communication system 100 which includes a wireless communication device 102 which communicates through a wireless communication network 104. Wireless communication device 102 preferably includes a visual display 112, a keyboard 114, and one or more auxiliary user interfaces (UI) 116, each of which is coupled to a controller 106. Controller 106 is also coupled to radio frequency (RF) transceiver circuitry 108 and an antenna 110.

In most modern communication devices, controller 106 is embodied as a central processing unit (CPU) which runs operating system software in a memory component (not shown). Controller 106 will normally control overall operation of wireless device 102, whereas signal processing operations associated with communication functions are typically performed in RF transceiver circuitry 108. Controller 106 interfaces with device display 112 to display received information,

stored information, user inputs, and the like. Keyboard 114, which may be a telephone type keypad or full alphanumeric keyboard, is normally provided for entering data for storage in wireless device 102, information for transmission to network 104, a telephone number to place a telephone call, commands to be executed on wireless device 102, and possibly other or different user inputs.

Wireless device 102 sends communication signals to and receives communication signals from network 104 over a wireless link via antenna 110. RF transceiver circuitry 108 performs functions similar to those of base station 120, including for example modulation/demodulation and possibly encoding/decoding and encryption/decryption. It is also contemplated that RF transceiver circuitry 108 may perform certain functions in addition to those performed by base station 120. It will be apparent to those skilled in art that RF transceiver circuitry 108 will be adapted to particular wireless network or networks in which wireless device 102 is intended to operate.

Wireless device 102 includes a battery interface 134 for receiving one or more rechargeable batteries 132. Battery 132 provides electrical power to (most if not all) electrical circuitry in wireless device 102, and battery interface 132 provides for a mechanical and electrical connection for battery 132. Battery interface 132 is coupled to a regulator 136 which regulates power for the device. When wireless device 102 is fully operational, an RF transmitter of RF transceiver circuitry 108 is typically keyed or turned on only when it is sending to network, and is otherwise turned off to conserve resources. Such intermittent operation of transmitter has a dramatic effect on power consumption of wireless device 102.

Similarly, an RF receiver of RF transceiver circuitry 108 is typically periodically turned off to conserve power until it is needed to receive signals or information (if at all) during designated time periods.

Wireless device 102 may consist of a single unit, such as a data communication device, a cellular telephone, a multiple-function communication device with data and voice communication capabilities such as a mobile telephone with data communication functionality, a personal digital assistant (PDA) enabled for wireless communication, or a computer incorporating an internal modem. Alternatively, wireless device 102 may be a multiple-module unit comprising a plurality of separate components, including but in no way limited to a computer or other device connected to a wireless modem. In particular, for example, in the wireless device block diagram of FIG. 1, RF transceiver circuitry 108 and antenna 110 may be implemented as a radio modem unit that may be inserted into a port on a laptop computer. In this case, the laptop computer would include display 112, keyboard 114, one or more auxiliary UIs 116, and controller 106 embodied as the computer's CPU. It is also contemplated that a computer or other equipment not normally capable of wireless communication may be adapted to connect to and effectively assume control of RF transceiver circuitry 108 and antenna 110 of a single-unit device such as one of those described above. Such a wireless device 102 may have a more particular implementation as described later in relation to wireless device 202 of FIG. 2.

Wireless device 102 operates using a Subscriber Identity Module (SIM) 140 which is connected to or inserted in wireless device 102 at a SIM interface 142.

SIM 140 is one type of a conventional "smart card" used to identify an end user (or subscriber) of wireless device 102 and to personalize the device, among other things. Without SIM 140, the wireless device terminal is not fully operational for communication through wireless network 104. By inserting SIM 140 into wireless device 102, an end user can have access to any and all of his/her subscribed services. In order to identify the subscriber, SIM 140 contains some user parameters such as an International Mobile Subscriber Identity (IMSI) and a Mobile Station Integrated International Service Digital Network (MSISDN). In addition, SIM 140 is typically protected by a four-digit Personal Identification Number (PIN) which is stored therein and known only by the end user. An advantage of using SIM 140 is that end users are not necessarily bound by any single physical wireless device. Typically, the only element that personalizes a wireless device terminal is a SIM card. Therefore, the user can access subscribed services using any wireless device equipped to operate with the user's SIM.

Some information stored on SIM 140 (e.g. address book and SMS messages) may be retrieved and visually displayed on display 112. Wireless device 102 has one or more software applications which are executed by controller 144 to facilitate the information stored on SIM 140 to be displayed on display 112. Controller 144 and SIM interface 142 have data and control lines 144 coupled therebetween to facilitate the transfer of the information between controller 144 and SIM interface 142 so that it may be visually displayed. An end user enters user input signals at keyboard 114, for example, and in response, controller 144 controls SIM interface 142 and SIM 140 to retrieve the information for display.

The end user may also enter user input signals at keyboard 114, for example, and, in response, controller 144 controls SIM interface 142 and SIM 140 to store information on SIM 140 for later retrieval and viewing. Preferably, the software applications executed by controller 106 include an application to retrieve and display address book information stored on SIM 140, and an application to retrieve and display SMS message information stored on SIM 140.

Wireless device 102 communicates in and through wireless communication network 104. In the embodiment of FIG. 1, wireless network 104 is a Global Systems for Mobile (GSM) and General Packet Radio Service (GPRS) network. Wireless network 104 includes a base station 120 with an associated antenna tower 118, a Mobile Switching Center (MSC) 126, a Visitor Location Register (VLR) 130, a Home Location Register (HLR) 132, and a Short Message Service Center (SM-SC) 128. MSC 126 is coupled to base station 120 and to SM-SC 128, which is in turn coupled to other network(s) 134.

Base station 120, including its associated controller and antenna tower 118, provides wireless network coverage for a particular coverage area commonly referred to as a "cell". Base station 120 transmits communication signals to and receives communication signals from wireless devices within its cell via antenna tower 118. Base station 120 normally performs such functions as modulation and possibly encoding and/or encryption of signals to be transmitted to the wireless device in accordance with particular, usually predetermined, communication protocols and parameters, under control of its controller. Base station 120 similarly demodulates and possibly decodes and decrypts, if necessary, any

communication signals received from wireless device 102 within its cell. Communication protocols and parameters may vary between different networks. For example, one network may employ a different modulation scheme and operate at different frequencies than other networks.

The wireless link shown in communication system 100 of FIG. 1 represents one or more different channels, typically different radio frequency (RF) channels, and associated protocols used between wireless network 104 and wireless device 102. Those skilled in art will appreciate that a wireless network in actual practice may include hundreds of cells, each served by a distinct base station 120 and transceiver, depending upon desired overall expanse of network coverage. All base station controllers and base stations may be connected by multiple switches and routers (not shown), controlled by multiple network controllers.

For all wireless devices 102 registered with a network operator, permanent data (such as wireless device 102 user's profile) as well as temporary data (such as wireless device's 102 current location) are stored in HLR 132. In case of a voice call to wireless device 102, HLR 132 is queried to determine the current location of wireless device 102. VLR 130 is responsible for a group of location areas and stores the data of those wireless devices that are currently in its area of responsibility. This includes parts of the permanent wireless device data that have been transmitted from HLR 132 to VLR 130 for faster access. However, VLR 130 may also assign and store local data, such as temporary identifications. Optionally, VLR 130 can be enhanced for more efficient co-ordination of GPRS

and non-GPRS services and functionality (e.g. paging for circuit-switched calls, and combined GPRS and non-GPRS location updates).

Being part of the GPRS network, a Serving GPRS Support Node (SGSN) is at the same hierarchical level as MSC 126 and keeps track of the individual locations of wireless devices. An SGSN also performs security functions and access control. Further, a Gateway GPRS Support Node (GGSN) provides interworking with external packet-switched networks and is connected with SGSNs via an IP-based GPRS backbone network. The SGSN performs authentication and cipher setting procedures based on the same algorithms, keys, and criteria as in existing GSM. For SMS transfer over GPRS, the SGSN is used in place of MSC 126.

In order to access GPRS services, wireless device 102 first makes its presence known to wireless network 104 by performing what is known as a GPRS "attach". This operation establishes a logical link between wireless device 102 and the SGSN and makes wireless device 102 available to receive, for example, pages via SGSN, notifications of incoming GPRS data, or SMS messages over GPRS. In order to send and receive GPRS data, wireless device 102 assists in activating the packet data address that it wants to use. This operation makes wireless device 102 known to the GGSN; interworking with external data networks can thereafter commence. User data may be transferred transparently between wireless device 102 and the external data networks using, for example, encapsulation and tunneling. Data packets are equipped with GPRS-specific protocol information and transferred between wireless device 102 and the GGSN.

SMS makes use of SM-SC 128 which acts as a store-and-forward system for relaying short messages. Messages are stored in the network until the destination device becomes available, so a user can receive or transmit an SMS message at any time, whether a voice call is in progress or not. SM-SC 128 may be integrated with a Gateway MSC For Short Message Service (SMS-GMSC) and an Interworking MSC for Short Message Service (SMS-IWMSC), as would be the case shown in FIG. 1. An SMS-GMSC is a function for receiving a short message from an SM-SC, interrogating an HLR for routing information and SMS info, and delivering the short message for the recipient MS. An SMS-IWMSC is a function for receiving a short message from within the network and submitting it to the recipient SM-SC. Other messages which may be delivered are Multimedia Messaging Service (MMS) messages. The above configuration is preferably provided in substantial accordance with 3rd Generation Partnership Project, Technical Specification 03.40, V6.2.0, 2001-12 (Release 1997) (3GPP TS 03.40).

As apparent from the above, the wireless network includes fixed network components including RF transceivers, amplifiers, base station controllers, network servers, and servers connected to network. Those skilled in art will appreciate that a wireless network may be connected to other systems, possibly including other networks, not explicitly shown in FIG. 1. A network will normally be transmitting at very least some sort of paging and system information on an ongoing basis, even if there is no actual packet data exchanged. Although the network consists of many parts, these parts all work together to result in certain behaviours at the wireless link.

Preferred Wireless Communication Device. FIG. 2 is a detailed block diagram of a preferred wireless communication device 202. Wireless device 202 is preferably a two-way communication device having at least voice and data communication capabilities, including the capability to communicate with other computer systems. Depending on the functionality provided by wireless device 202, it may be referred to as a data messaging device, a two-way pager, a cellular telephone with data messaging capabilities, a wireless Internet appliance, or a data communication device (with or without telephony capabilities). Wireless device 202 may be a mobile station, as it is in the preferred embodiment.

If wireless device 202 is enabled for two-way communication, it will normally incorporate a communication subsystem 211, which includes a receiver 212, a transmitter 214, and associated components, such as one or more (preferably embedded or internal) antenna elements 216 and 218, local oscillators (LOs) 213, and a processing module such as a digital signal processor (DSP) 220. Communication subsystem 211 is analogous to RF transceiver circuitry 108 and antenna 110 shown in FIG. 1. As will be apparent to those skilled in field of communications, particular design of communication subsystem 211 depends on the communication network in which wireless device 202 is intended to operate.

Network access requirements will also vary depending upon type of network utilized. In GPRS networks, for example, network access is associated with a subscriber or user of wireless device 202. A GPRS device therefore operates in conjunction with a Subscriber Identity Module, commonly referred to as a "SIM" card 256, in order to operate on the GPRS network. Without such a

SIM card 256, a GPRS device will not be fully functional. Local or non-network communication functions (if any) may be operable, but wireless device 610 will be unable to carry out any functions involving communications over the network. SIM 256 includes those features described in relation to FIG. 1.

Wireless device 202 may send and receive communication signals over the network after required network registration or activation procedures have been completed. Signals received by antenna 216 through the network are input to receiver 212, which may perform such common receiver functions as signal amplification, frequency down conversion, filtering, channel selection, and like, and in example shown in FIG. 2, analog-to-digital (A/D) conversion. A/D conversion of a received signal allows more complex communication functions such as demodulation and decoding to be performed in DSP 220. In a similar manner, signals to be transmitted are processed, including modulation and encoding, for example, by DSP 220. These DSP-processed signals are input to transmitter 214 for digital-to-analog (D/A) conversion, frequency up conversion, filtering, amplification and transmission over communication network via antenna 218. DSP 220 not only processes communication signals, but also provides for receiver and transmitter control. For example, the gains applied to communication signals in receiver 212 and transmitter 214 may be adaptively controlled through automatic gain control algorithms implemented in DSP 220.

Wireless device 202 includes a microprocessor 238 (which is one implementation of controller 106 of FIG. 1) which controls overall operation of wireless device 202. Communication functions, including at least data and voice

communications, are performed through communication subsystem 211. Microprocessor 238 also interacts with additional device subsystems such as a display 222, a flash memory 224, a random access memory (RAM) 226, auxiliary input/output (I/O) subsystems 228, a serial port 230, a keyboard 232, a speaker 234, a microphone 236, a short-range communications subsystem 240, and any other device subsystems generally designated at 242. Data and control lines 260 extend between SIM interface 254 and microprocessor 238 for communicating data therebetween and for control. Some of the subsystems shown in FIG. 2 perform communication-related functions, whereas other subsystems may provide "resident" or on-device functions. Notably, some subsystems, such as keyboard 232 and display 222, for example, may be used for both communication-related functions, such as entering a text message for transmission over a communication network, and device-resident functions such as a calculator or task list. Operating system software used by microprocessor 238 is preferably stored in a persistent store such as flash memory 224, which may alternatively be a read-only memory (ROM), a battery backed-up RAM, or similar storage element (not shown). Those skilled in the art will appreciate that the operating system, specific device applications, or parts thereof, may be temporarily loaded into a volatile store such as RAM 226.

Microprocessor 238, in addition to its operating system functions, preferably enables execution of software applications on wireless device 202. A predetermined set of applications which control basic device operations, including at least data and voice communication applications (such as a network

re-establishment scheme), will normally be installed on wireless device 202 during its manufacture. A preferred application that may be loaded onto wireless device 202 may be a personal information manager (PIM) application having the ability to organize and manage data items relating to user such as, but not limited to, e-mail, calendar events, voice mails, appointments, and task items. Naturally, one or more memory stores are available on wireless device 202 and SIM 256 to facilitate storage of PIM data items and other information.

The PIM application preferably has the ability to send and receive data items via the wireless network. In a preferred embodiment, PIM data items are seamlessly integrated, synchronized, and updated via the wireless network, with the wireless device user's corresponding data items stored and/or associated with a host computer system thereby creating a mirrored host computer on wireless device 202 with respect to such items. This is especially advantageous where the host computer system is the wireless device user's office computer system. Additional applications may also be loaded onto wireless device 202 through network, an auxiliary I/O subsystem 228, serial port 230, short-range communications subsystem 240, or any other suitable subsystem 242, and installed by a user in RAM 226 or preferably a non-volatile store for execution by microprocessor 238. Such flexibility in application installation increases the functionality of wireless device 202 and may provide enhanced on-device functions, communication-related functions, or both. For example, secure communication applications may enable electronic commerce functions and other such financial transactions to be performed using wireless device 202.

In a data communication mode, data such as an SMS message will be processed by communication subsystem 211 and input to microprocessor 238. Microprocessor 238 will preferably further process the signal for output to display 222 or alternatively to auxiliary I/O device 228. A user of wireless device 202 may also compose data items, such as SMS messages, using keyboard 232 in conjunction with display 222 and possibly auxiliary I/O device 228. Keyboard 232 is preferably a complete alphanumeric keyboard and/or telephone-type keypad. These composed items may be transmitted over a communication network through communication subsystem 211.

For voice communications, the overall operation of wireless device 202 is substantially similar, except that the received signals would be output to speaker 234 and signals for transmission would be generated by microphone 236. Alternative voice or audio I/O subsystems, such as a voice message recording subsystem, may also be implemented on wireless device 202. Although voice or audio signal output is preferably accomplished primarily through speaker 234, display 222 may also be used to provide an indication of the identity of a calling party, duration of a voice call, or other voice call related information, as some examples.

Serial port 230 in FIG. 2 is normally implemented in a personal digital assistant (PDA)-type communication device for which synchronization with a user's desktop computer is a desirable, albeit optional, component. Serial port 230 enables a user to set preferences through an external device or software application and extends the capabilities of wireless device 202 by providing for

information or software downloads to wireless device 202 other than through a wireless communication network. The alternate download path may, for example, be used to load an encryption key onto wireless device 202 through a direct and thus reliable and trusted connection to thereby provide secure device communication.

Short-range communications subsystem 240 of FIG. 2 is an additional optional component which provides for communication between wireless device 202 and different systems or devices, which need not necessarily be similar devices. For example, subsystem 240 may include an infrared device and associated circuits and components, a Bluetooth™ communication module, or an 802.11 communication module, to provide for communication with similarly-enabled systems and devices. Bluetooth™ is a registered trademark of Bluetooth SIG, Inc. Those skilled in the art will appreciate that "Bluetooth" and "802.11" refer to sets of specifications, available from the Institute of Electrical and Electronics Engineers (IEEE), relating to wireless personal area networks and wireless local area networks, respectively.

Wireless device 202 also includes a battery interface (such as that described in relation to FIG. 1) for receiving one or more rechargeable batteries. Such a battery provides electrical power to most if not all electrical circuitry in wireless device 202, and the battery interface provides for a mechanical and electrical connection for it. The battery interface is coupled to a regulator which regulates power to all of the circuitry.

Preferred Network Configuration. FIG. 3 shows a particular system structure for communicating with a wireless communication device. In particular, FIG. 3 shows basic components of an IP-based wireless data network, such as a GPRS network. A wireless device 100 communicates with a wireless packet data network 145, and may also be capable of communicating with a wireless voice network (not shown). The voice network may be associated with IP-based wireless network 145 similar to, for example, GSM and GPRS networks, or alternatively may be a completely separate network. The GPRS IP-based data network is unique in that it is effectively an overlay on the GSM voice network. As such, GPRS components will either extend existing GSM components, such as base stations 320, or require additional components to be added, such as an advanced Gateway GPRS Service Node (GGSN) as a network entry point 305.

As shown in FIG. 3, a gateway 140 may be coupled to an internal or external address resolution component 335 and one or more network entry points 305. Data packets are transmitted from gateway 140, which is source of information to be transmitted to wireless device 100, through network 145 by setting up a wireless network tunnel 325 from gateway 140 to wireless device 100. In order to create this wireless tunnel 325, a unique network address is associated with wireless device 100. In an IP-based wireless network, however, network addresses are typically not permanently assigned to a particular wireless device 100 but instead are dynamically allocated on an as-needed basis. It is thus preferable for wireless device 100 to acquire a network address and for gateway 140 to determine this address so as to establish wireless tunnel 325.

Network entry point 305 is generally used to multiplex and demultiplex amongst many gateways, corporate servers, and bulk connections such as the Internet, for example. There are normally very few of these network entry points 305, since they are also intended to centralize externally available wireless network services. Network entry points 305 often use some form of an address resolution component 335 that assists in address assignment and lookup between gateways and wireless devices. In this example, address resolution component 335 is shown as a dynamic host configuration protocol (DHCP) as one method for providing an address resolution mechanism.

A central internal component of wireless data network 345 is a network router 315. Normally, network routers 315 are proprietary to the particular network, but they could alternatively be constructed from standard commercially available hardware. The purpose of network routers 315 is to centralize thousands of base stations 320 normally implemented in a relatively large network into a central location for a long-haul connection back to network entry point 305. In some networks there may be multiple tiers of network routers 315 and cases where there are master and slave network routers 315, but in all such cases the functions are similar. Often network router 315 will access a name server 307, in this case shown as a dynamic name server (DNS) 307 as used in the Internet, to look up destinations for routing data messages. Base stations 320, as described above, provide wireless links to wireless devices such as wireless device 100.

Wireless network tunnels such as a wireless tunnel 325 are opened across wireless network 345 in order to allocate necessary memory, routing, and address resources to deliver IP packets. In GPRS, such tunnels 325 are established as part of what are referred to as "PDP contexts" (i.e. data sessions). To open wireless tunnel 325, wireless device 100 must use a specific technique associated with wireless network 345. The step of opening such a wireless tunnel 325 may require wireless device 100 to indicate the domain, or network entry point 305 with which it wishes to open wireless tunnel 325. In this example, the tunnel first reaches network router 315 which uses name server 307 to determine which network entry point 305 matches the domain provided. Multiple wireless tunnels can be opened from one wireless device 100 for redundancy, or to access different gateways and services on the network. Once the domain name is found, the tunnel is then extended to network entry point 305 and necessary resources are allocated at each of the nodes along the way. Network entry point 305 then uses the address resolution (or DHCP 335) component to allocate an IP address for wireless device 100. When an IP address has been allocated to wireless device 100 and communicated to gateway 140, information can then be forwarded from gateway 140 to wireless device 100.

Wireless tunnel 325 typically has a limited life, depending on wireless device's 100 coverage profile and activity. Wireless network 145 will tear down wireless tunnel 325 after a certain period of inactivity or out-of-coverage period, in order to recapture resources held by this wireless tunnel 325 for other users. The main reason for this is to reclaim the IP address temporarily reserved for

wireless device 100 when wireless tunnel 325 was first opened. Once the IP address is lost and wireless tunnel 325 is torn down, gateway 140 loses all ability to initiate IP data packets to wireless device 100, whether over Transmission Control Protocol (TCP) or over User Datagram Protocol (UDP).

In this application, an "IP-based wireless network" (one specific type of wireless communication network) may include but is not limited to: (1) a Code Division Multiple Access (CDMA) network that has been developed and operated by Qualcomm; (2) a General Packet Radio Service (GPRS) network for use in conjunction with Global System for Mobile Communications (GSM) network both developed by standards committee of European Conference of Postal and Telecommunications Administrations (CEPT); and (3) future third-generation (3G) networks like Enhanced Data rates for GSM Evolution (EDGE) and Universal Mobile Telecommunications System (UMTS). It is to be understood that although particular IP-based wireless networks have been described, the communication re-establishment schemes of the present application could be utilized in any suitable type of wireless packet data network.

The infrastructure shown and described in relation to FIG. 3 may be representative of each one of a number of different communication networks which are provided and available in the same geographic region. One of these communication networks will be selected by the wireless device, either in an automatic or manual fashion, for communications.

SMS Message Delivery Techniques. FIG. 4 is a flow diagram which describes a method for use in delivering a message (e.g. an SMS message)

simultaneously to two or more associated wireless communication devices. Such a method may be employed in connection with components shown and described above in relation to FIGs. 1-3. FIG. 4 relates particularly to a method involving the two or more wireless devices which receive the message (i.e. mobile-terminated message).

In general, the method of FIG. 4 involves receiving a request to deliver an SMS message to a first wireless communication device identified by a first address. In response to the request, the SMS message is delivered to the first wireless communication device as well as to a second wireless communication device identified by a second address different from the first address. In a preferred scenario, the first and the second wireless devices are possessed by the same end user so that messages can be received without fail regardless of which device is being used at any given moment. This method may be executed by a server in the wireless network or, alternatively, by the wireless communication device itself.

Initially, an end user of an originating wireless device 450 uses a keyboard (or other user interface device) to navigate through a menu of features displayed on the visual display. The end user finds and selects an "SMS message sending feature" provided by originating device 450, composes the SMS message, and depresses a button to send the SMS message to a wireless device (e.g. wireless device 102) which is identified by a first address (e.g. a first MSISDN). This causes the SMS message to be sent from originating device 450 to SM-SC 128 (step

402), which is identified by its own phone number stored at originating device 450.

In response to receiving this message, SM-SC 128 interrogates HLR 132 and receives routing information for wireless device 102 associated with the first address as is conventional (step 404). However, SM-SC 128 also identifies a second address (e.g. a second MSISDN) of a second wireless device 470 which is associated with wireless device 102. This may be performed, for example, by issuing a query to a database to retrieve the additional address or addresses. Once the additional second address is identified, SM-SC 128 interrogates HLR 132 to receive routing information for second wireless device 470 having this second address (step 406).

SM-SC 128 then sends the short message to MSC 126 with use of a forward short message operation (e.g. "forwardShortMessage") for wireless device 102 (step 408). In addition, SM-SC 128 sends the same short message to MSC 126 with use of the forward short message operation for second wireless device 470 (step 410). MSC 126 retrieves subscriber information for wireless device 102 from VLR 130, using an optional authentication procedure (step 412). Similarly, MSC 126 retrieves subscriber information for second wireless device 470 from VLR 130 (step 414).

MSC 126 then transfers the short message to wireless device 102 by issuing a page (step 416), performing authentication (step 420), receiving acknowledgement (step 424), and transferring the message (step 428). Similarly, MSC 126 transfers the same short message to second wireless device 470 by

issuing a page (step 418), performing authentication (step 422), receiving acknowledgement (step 426), and transferring the message (step 430). To further illustrate, FIGs. 6 and 7 show examples of visual displays 602 and 702 corresponding to wireless device 102 and second wireless device 470, respectively, displaying the SMS message. As illustrated in FIG. 6, an SMS message 604 is delivered to wireless device 102 and may be shown in its visual display 602; similarly, SMS message 604 is delivered to second wireless device 470 and may be shown in its visual display 702, as illustrated in FIG. 7.

Returning back to FIG. 4, MSC 126 may then return to SM-SC 128 the outcome of the forward short message operation for wireless device 102. Similarly, MSC 126 may return to SM-SC 128 the outcome of the operation for second wireless device 470. Assuming both message transfers are successful, SM-SC 128 returns a status report indicating delivery of the short message to the originating wireless device.

As apparent from FIG. 4, the same short message is simultaneously delivered to two different wireless devices which may be owned and/or possessed by the same user. The method described in relation to FIG. 4 assumes that wireless device 102 and second wireless device 470 are each operating on the same network having the same MSC 126; however they may be on different networks or use different MSCs. Further, although each step outlined in FIG. 4 is illustrated as being performed simultaneously "in step" with the other, they do not need to be performed so closely in time together. What matters is that the short message gets delivered to both wireless devices substantially at the same

time (e.g. within a few minutes from each other). Finally, although two wireless devices are described as having the same message delivered to them, more than two wireless devices may be involved.

Although the additional functionality of the present application is described as being associated with SM-SC 128 of FIG. 4, the sending of the short message to two different device addresses may be alternatively employed in wireless device 102. For example, although the end user of originating device 450 may depress the button on the device only once to submit the short message, this may cause originating device 450 to send the short message to both wireless device 102 and second wireless device 470 (i.e. sequentially send two messages to two different addresses). In this particular embodiment, SM-SC 128 operates in a conventional fashion.

FIG. 5 is another flow diagram which describes another method for use in delivering a message (e.g. an SMS message) simultaneously to two or more associated wireless communication devices. Such a method may be employed in connection with components shown and described above in relation to FIGs. 1-3. FIG. 5 relates particularly to a method involving the wireless device which sends or originates (i.e. mobile-originated message).

In general, the method of FIG. 5 involves receiving a request to deliver a message from a first wireless communication device identified by a first address to a second wireless communication device identified by a second address. In response to this request, the message is delivered to the second wireless communication device along with a message-originating address that identifies a

third wireless communication device. In a preferred scenario, the first and the third wireless communication devices are possessed by the same end user so that messages delivered therefrom can be identified from a single address regardless of which device is being used by the end user at any given moment. This method may be executed by a server in the wireless network or, alternatively, by the wireless communication device itself.

Initially, an originating wireless device 102 is powered on and registers with the wireless network (step 502). An end user of originating wireless device 102 uses a keyboard (or other user interface device) to navigate through a menu of features displayed on the visual display. The end user finds and selects an "SMS message sending feature" provided by originating wireless device 102, composes the SMS message, and depresses a button to send the SMS message to a wireless device (e.g. a short message entity or SME in FIG. 5). This causes the SMS message to be sent from originating device 450 to MSC 126 (step 504). In response, MSC 126 interrogates VLR 130 to verify that the message transfer does not violate the supplementary services invoked or restrictions imposed (step 506). Next, MSC 126 sends the short message to SM-SC 128 using the forward short message operation (e.g. "forwardShortMessage") (step 508). In response, SM-SC 128 delivers the short message to the SME (step 510) with an optional acknowledgement (step 512). SM-SC 128 acknowledges to MSC 126 a successful outcome of the forward short message operation (step 514). Finally, MSC 126 returns to wireless device 102 the outcome of the operation (step 516).

The method of FIG. 5 of the present application differs from conventional methods in that the SMS message is sent with a message-originating address (e.g. an MSISDN) that is different from the address normally used to identify wireless device 102. In particular, the message-originating address sent with the SMS message is the address of a wireless communication device that is associated with wireless device 102. In a preferred scenario, the message-originating address may be that of another different wireless device that is owned and/or possessed by the same end user. In this way, short messages from the same end user appear to be sent by the same device/user.

The special addressing technique of FIG. 5 may be employed at a server in the wireless network (e.g. SM-SC 128) or, alternatively, by the wireless communication device itself (e.g. originating wireless device 102). For example, SM-SC 128 may receive the short message from wireless device 102, subsequently identify the alternative address associated with it and accordingly change the message-originating address (prior to step 510). A query to a database may be used to retrieve this alternative address associated with the original address of wireless device 102.

As another example, wireless device 102 may itself automatically insert the alternate address (different from its normal address) prior to sending the short message to MSC 126 (prior to step 504). Preferably, the procedure to modify the originating address is subject to an appropriate security mechanism to prevent misuse (e.g. "spoofing"). For example, one such method may involve inserting the SIM from the other wireless communication device into wireless device 102

temporarily, so that a certificate or other authority can be granted to allow wireless device 102 to temporarily use the MSISDN from the other device (e.g. for a predetermined time period or a predetermined number of messages).

The above techniques described in relation to FIGs. 4 and 5 are preferably provided in accordance with 3rd Generation Partnership Project, Technical Specification 03.40, V6.2.0, 2001-12 (Release 1997) (3GPP TS 03.40), having suitable modifications made as desired.

Thus, methods and apparatus for use in delivering a message simultaneously to two or more associated wireless communication devices have been described. The message may be delivered as a Short Message Service (SMS) message or a Multimedia Messaging Service (MMS) message, as examples. In one illustrative embodiment, a request to deliver such a message to a first wireless communication device identified by a first address is received. In response to this request, the message is delivered to the first wireless communication device as well as to a second wireless communication device identified by a second address different from the first address. In a preferred scenario, the first and the second wireless communication devices are possessed by the same end user so that messages can be received without fail regardless of which device is being used by the end user at any given moment. In another illustrative embodiment, a request to deliver a message from a first wireless communication device identified by a first address to a second wireless communication device identified by a second address is received. In response to this request, the message is delivered to the second wireless communication device along with a message-originating address

that identifies a third wireless communication device. In a preferred scenario, the first and the third wireless communication devices are possessed by the same end user so that messages delivered therefrom can be identified from a single address regardless of which device is being used by the end user at any given moment. This method may be executed by a server in the wireless network or, alternatively, by the wireless communication device itself.

The above-described embodiments of invention are intended to be examples only. Alterations, modifications, and variations may be effected to particular embodiments by those of skill in art without departing from scope of invention, which is defined solely by claims appended hereto.

CLAIMS:

1. A method for use in delivering a short message to at least two wireless communication devices which operate in a wireless communication network, the method comprising:

maintaining, at a message server, a stored association between a first address of a first wireless communication device and a second address of a second wireless communication device;

receiving, at the message server, a request to deliver the short message to the first address of the first wireless communication device; and

in response to receiving the request:

sending, from the message server, the short message to the first address for delivery, via the wireless communication network, to the first wireless communication device operating in the wireless communication network;

identifying, at the message server, the second address of the second wireless communication device through the stored association with the first address; and

additionally sending, from the message server, the short message to the second address for delivery, via the wireless communication network, to the second wireless communication device operating in the wireless communication network, so that the short message is delivered to both the first and the second wireless communication devices in response to receiving the request.

2. The method of claim 1, wherein the request is received via a user request through a user interface of a message-originating wireless communication device.

3. The method of claim 1, wherein the message server is part of a Short Message Service Center in the wireless communication network.

4. The method of claim 1, wherein the first address comprises a first Mobile Station Integrated Services Digital Network (MSISDN) address which identifies the first wireless

communication device and the second address comprises a second MSISDN which identifies the second wireless communication device.

5. The method of claim 1, wherein the short message comprises one of a Short Message Service (SMS) message and a Multimedia Messaging Service (MMS) message.

6. The method of claim 1, wherein the short message is for display at both the first and the second wireless communication devices.

7. The method of claim 1, wherein the acts of the method are performed for each one of a plurality of wireless communication devices in the wireless communication network.

8. The method of claim 1, further comprising:

interrogating a Home Location Register to identify routing information for the first wireless communication device identified by the first address; and

interrogating the Home Location Register to identify routing information for the second wireless communication device identified by the second address.

9. The method of claim 1, wherein the first and the second wireless communication devices are possessed by the same user.

10. The method of claim 1, further compromising:

causing a query to be issued to a database for identifying the second address.

11. The method of claim 1, further compromising:

wherein the act of sending the short message to the first address comprises the further act of sending the short message to a mobile switching center using a first forward short message operation; and

wherein the act of sending the short message to the second address comprises the further act of sending the short message to a mobile switching center using a second forward short message operation.

12. The method of claim 1, further compromising:

receiving, via the wireless communication network, routing information for the first wireless communication device; and

receiving, via the wireless communication network, routing information for the second wireless communication device.

13. The method of claim 1, which is performed by computer instructions stored in a computer readable medium and executable by a processor of the message server.

14. A communication system, comprising:

a wireless communication network;

a first wireless communication device operative in the wireless communication network;

a second wireless communication device operative in the wireless communication network;

a message server of the wireless communication network; and

the message server being adapted to deliver a short message to the first and the second wireless communication devices through the wireless communication network by maintaining a stored association between a first address of the first wireless communication device and a second address of the second wireless communication device;

receiving a request to deliver the short message to the first address; and

in response to the request: sending the short message to the first address for delivery, via the wireless communication network, to the first wireless communication device operating in the wireless communication network;

identifying the second address of the second wireless communication device through the stored association with the first address; and

additionally sending the short message to the second address for delivery, via the wireless communication network, to the second wireless communication device operating in the wireless communication network, so that the short message is delivered to both the first and the second wireless communication devices in response to the request.

15. The communication system of claim 14, wherein the request is received via a user request through a user interface of a message-originating wireless communication device.

16. The communication system of claim 14, wherein the message server is part of a Short Message Service Center in the wireless communication network.

17. The communication system of claim 14, wherein the first address comprises a first Mobile Station Integrated Services Digital Network (MSISDN) address which identifies the first wireless communication device and the second address comprises a second MSISDN which identifies the second wireless communication device.

18. The communication system of claim 14, wherein the short message comprises one of a Short Message Service (SMS) message and a Multimedia Messaging Service (MMS) message.

19. The communication system of claim 14, further comprising:

interrogating a Home Location Register to identify routing information for the first wireless communication device identified by the first address; and

interrogating the Home Location Register to identify routing information for the second wireless communication device identified by the second address.

20. The communication system of claim 14, further compromising: causing a query to be issued to a database for a identifying the second address.

21. The communication system of claim 14, further comprising:

wherein the act of sending the short message to the first address comprises the further act of sending the short message to a mobile switching center using a first forward short message operation; and

wherein the act of sending the short message to the second address comprises the further act of sending the short message to a mobile switching center using a second forward short message operation.

22. A message server which is adapted to deliver a short message to two or more wireless communication devices through a wireless communication network by maintaining a stored association between a first address of a first wireless communication device and a second address of a second wireless communication device;

receiving a request to deliver the short message to the first address of the first wireless communication device; and

in response to the request:

sending the short message to the first address for delivery, via the wireless communication network, to the first wireless communication device operating in the wireless communication network;

identifying the second address of the second wireless communication device through the stored association with the first address; and

additionally sending the short message to the second address for delivery, via the wireless communication network, to the second wireless communication device operating in the wireless communication network, so that the short message is delivered to both the first and the second wireless communication devices in response to the request.

23. The message server of claim 22, wherein the request is received via a user request through a user interface of a message-originating wireless communication device.

24. The message server of claim 22, which is part of a Short Message Service Center.

25. The message server of claim 22, wherein the first address comprises a first Mobile Station Integrated Services Digital Network (MSISDN) address which identifies the first wireless communication device and the second address comprises a second MSISDN which identifies the second wireless communication device.

26. The message server of claim 22, wherein the short message comprises one of a Short Message Service (SMS) message and a Multimedia Messaging Service (MMS) message.

27. The message server of claim 22, wherein the short message is for display at both the first and the second wireless communication devices.

28. The message server of claim 22, wherein the acts of the method are performed for each one of a plurality of wireless communication devices in the wireless communication network.

29. The message server of claim 22, which is further adapted for:

interrogating a Home Location Register to identify routing information for the first wireless communication device identified by the first address; and

interrogating the Home Location Register to identify routing information for the second wireless communication device identified by the second address.

30. The message server of claim 22, wherein the first and the second wireless communication devices are possessed by the same user.

31. The message server of claim 22, which is further adapted for: causing a query to be issued to a database for a identifying the second address.

32. The message server of claim 22, further comprising:

wherein the act of sending the short message to the first address comprises the further act of sending the short message to a mobile switching center using a first forward short message operation; and

wherein the act of sending the short message the second address comprises the further act of sending the short message to a mobile switching center using a second forward short message operation.

33. The message server of claim 22, which is further adapted for:

receiving, via the wireless communication network, routing information for the first wireless communication device; and

receiving, via the wireless communication network, routing information for the second wireless communication device.

34. A method for use in delivering a short message to at least two wireless communication devices which operate in a wireless communication network comprising the acts of:

receiving, at a message server, a request to deliver the short message to a first wireless communication device identified by a first address in the wireless communication network;

performing, at the message server, the following acts in response to the request: causing the short message to be sent from the message server for delivery, via the wireless communication network, to the first wireless communication device of the wireless communication network identified by the first address;

causing a query issued to a database for identifying a second address of a second wireless communication device through an association with the first address; and

causing the short message to be sent again from the message server for delivery, via the wireless communication network, to the second wireless communication device of the wireless communication network identified by the second address.

35. The method of claim 34, wherein the request comprises a user request through a user interface of a message-originating wireless communication device.

36. The method of claim 34, wherein the message server is part of a Short Message Service Center in the wireless communication network.

37. The method of claim 34, wherein the first address comprises a first Mobile Station Integrated Services Digital Network (MSISDN) address which identifies the first wireless communication device and the second address comprises a second MSISDN which identifies the second wireless communication device.

38. The method of claim 34, wherein the short message comprises one of a Short Message Service (SMS) message and a Multimedia Messaging Service (MMS) message.

39. The method of claim 34, wherein the short message is for display at both the first and the second wireless communication devices.

40. The method of claim 34, wherein the acts of the method are performed for each one of a plurality of wireless communication devices in the wireless communication network.

41. The method of claim 34, further comprising:

interrogating a Home Location Register to identify routing information for the first wireless communication device identified by the first address; and

interrogating the Home Location Register to identify routing information for the second wireless communication device identified by the second address.

42. The method of claim 34, wherein the first and the second wireless communication devices are possessed by the same user.

43. The method of claim 34, wherein the wireless communication network comprises a cellular network.

44. The method of claim 34, wherein the second address is not part of the first address.

45. A mobile station, comprising:

a receiver; a transmitter; a user interface;

one or more processors coupled to the receiver, the transmitter, and the user interface; and

the one or more processors for:

storing an association between a first address of a first wireless communication device and a second address of a second wireless communication device;

receiving, from the user interface, a request to deliver a short message to the first wireless communication device identified by the first address in a wireless communication network;

and in response to receiving the request:

causing the short message to be sent from the mobile station, via the transmitter, to the wireless communication network for delivery to the first wireless communication device of the wireless communication network using the first address;

identifying a the second address of a the second wireless communication device from the stored association with the first address;

and causing the short message to be sent again from the mobile station, via the transmitter, to the wireless communication network for additional delivery to the second wireless communication device of the wireless communication network using the second address.

46. The mobile station of claim 45, wherein the first address comprises a first Mobile Station Integrated Services Digital Network (MSISDN) address which identifies the first wireless communication device and the second address comprises a second MSISDN which identifies the second wireless communication device.

47. The mobile station of claim 45, wherein first and the second wireless communication devices are possessed by the same user.

48. A message server which is adapted to deliver a short message to two or more wireless communication devices through a wireless communication network by receiving a request to deliver the short message to a first wireless communication device identified by a first address in the wireless communication network;

and in response to the request:

causing the short message to be sent from the message server for delivery, via the wireless communication network, to the first wireless communication device of the wireless communication network using the first address;

causing a query to be issued to a database for identifying a second address of a second wireless communication device through an association with the first address; and

causing the short message to be sent from the message server again, for delivery, via the wireless communication network, to the second wireless communication device of the wireless communication network using the second address.

49. The message server of claim 48, wherein the message server is part of a Short Message Service Center in the wireless communication network.

50. The message server of claim 48, wherein the first address comprises a first Mobile Station Integrated Services Digital Network (MSISDN) address which identifies the first wireless communication device and the second address comprises a second MSISDN which identifies the second wireless communication device.

51. The message server of claim 48, which is further adapted to perform the recited acts for each one of a plurality of wireless communication devices in the wireless communication network.

52. A method for use by a message service center in delivering a short message to at least two wireless communication devices operative in a wireless communication network comprising the acts of:

maintaining access, at the message service center, to a stored association between a first address of a first wireless communication device and a second address of a second wireless communication device;

receiving, at the message service center, a request to deliver the short message to the first wireless communication device identified by the first address in the wireless communication network;

performing, at the message service center, the following acts in response to receiving the short message:

causing the short message to be sent from the message service center, via the wireless communication network, for delivery to and display at the first wireless communication device identified by the first address;

identifying the second address of the second wireless communication device from the stored association with the first address; and

causing the short message to be sent from the message service center again, via the wireless communication network, for delivery to and display at the second wireless communication device identified by the second address.

53. The method of claim 52, wherein the wireless communication network comprises a cellular network.

54. The method of claim 52, wherein the short message comprises one of a Short Message Service (SMS) message and a Multimedia Messaging Service (MMS) message.

55. A message server which is adapted to deliver a short message to at least two wireless communication devices operative in a wireless communication network by maintaining access, at the message server, to a stored association between a first address of a first wireless communication device and a second address of a second wireless communication device;

receiving a request to deliver the short message to the first wireless communication device identified by the first address in the wireless communication network;

performing the following acts in response to receiving the request:

causing the short message to be sent from the message server, via the wireless communication network, for delivery to and display at the first wireless communication device identified by the first address;

identifying the second address of the second wireless communication device from the stored association with the first address; and

causing the short message to be sent from the message server again, via the wireless communication network, for delivery to and display at the second wireless communication device identified by the second address.

56. The message server of claim 55, wherein the first address comprises a first Mobile Station Integrated Services Digital Network (MSISDN) address which identifies the first wireless communication device and the third address comprises a third MSISDN which identifies the third wireless communication device.

57. The message center of claim 55, wherein the short message comprises one of a Short Message Service (SMS) message and a Multimedia Messaging Service (MMS) message.

58. The message server of claim 55, which is further adapted to perform the recited acts for each one of a plurality of wireless communication devices in the wireless communication network.

59. The message server of claim 55, wherein the first and the third wireless communication devices are possessed by the same user.

60. The message server of claim 55, which is part of a Short Message Service Center in the wireless communication network.

61. A method for transmitting short messages from in a short message-originating wireless communication device, the method comprising the acts of:

receiving, via a user interface of the short message-originating device, a request to deliver a short message to a first address;

in response to receiving the request, the originating wireless communication device automatically accessing a memory to determine a second address that is associated in the memory with the first address;

transmitting the short message for delivery to a first device using the first address; and

additionally transmitting the short message for delivery to a second device using the second address.

62. The method of claim 61, wherein the short message is transmitted via a wireless communication network.

63. The method of claim 61, wherein the first address is an address of a wireless communication device and the second address is an address of an additional wireless communication device.

64. The method of claim 61, wherein the first address comprises a first number in a first removable memory card and the second address comprises a second number in a second removable memory card.

65. The method of claim 61, wherein the first address comprises a first Mobile Station Integrated Services Digital Network (MSISDN) and the second address comprises a second MSISDN.

66. The method of claim 61, wherein the short message comprises one of a Short Message Service (SMS) message and a Multimedia Messaging Service (MMS) message.

67. The method of claim 61, wherein the request to deliver the short message via the user interface is made in response a depression of a button to send the short message.

68. The method of claim 61, wherein the request to deliver the short message via the user interface is made in response to a depression of a button, only once, to send the short message.

69. The method of claim 61, wherein the short message-originating wireless communication device comprises a mobile station which is operative with a wireless communication network which is a cellular telecommunications network.

70. A communication device, comprising:

a controller;

a radio frequency (RF) receiver;

an RF transmitter;

a user interface;

memory;

the controller being coupled to the RF receiver, the RF transmitter, the user interface, and the memory;

the memory for storing an address in association with an additional address;

the controller being adapted to:

receive, via the user interface, a request to deliver a short message to the address;

performing the following acts in response to receiving the request:

automatically accessing the memory to identify the additional address associated with the address;

causing the short message to be transmitted, via the RF transmitter, to the address; and

causing the short message to be additionally transmitted, via the RF transmitter, to the additional address.

71. The communication device of claim 70, wherein the controller is adapted to cause the short message to be transmitted via a wireless communication network.

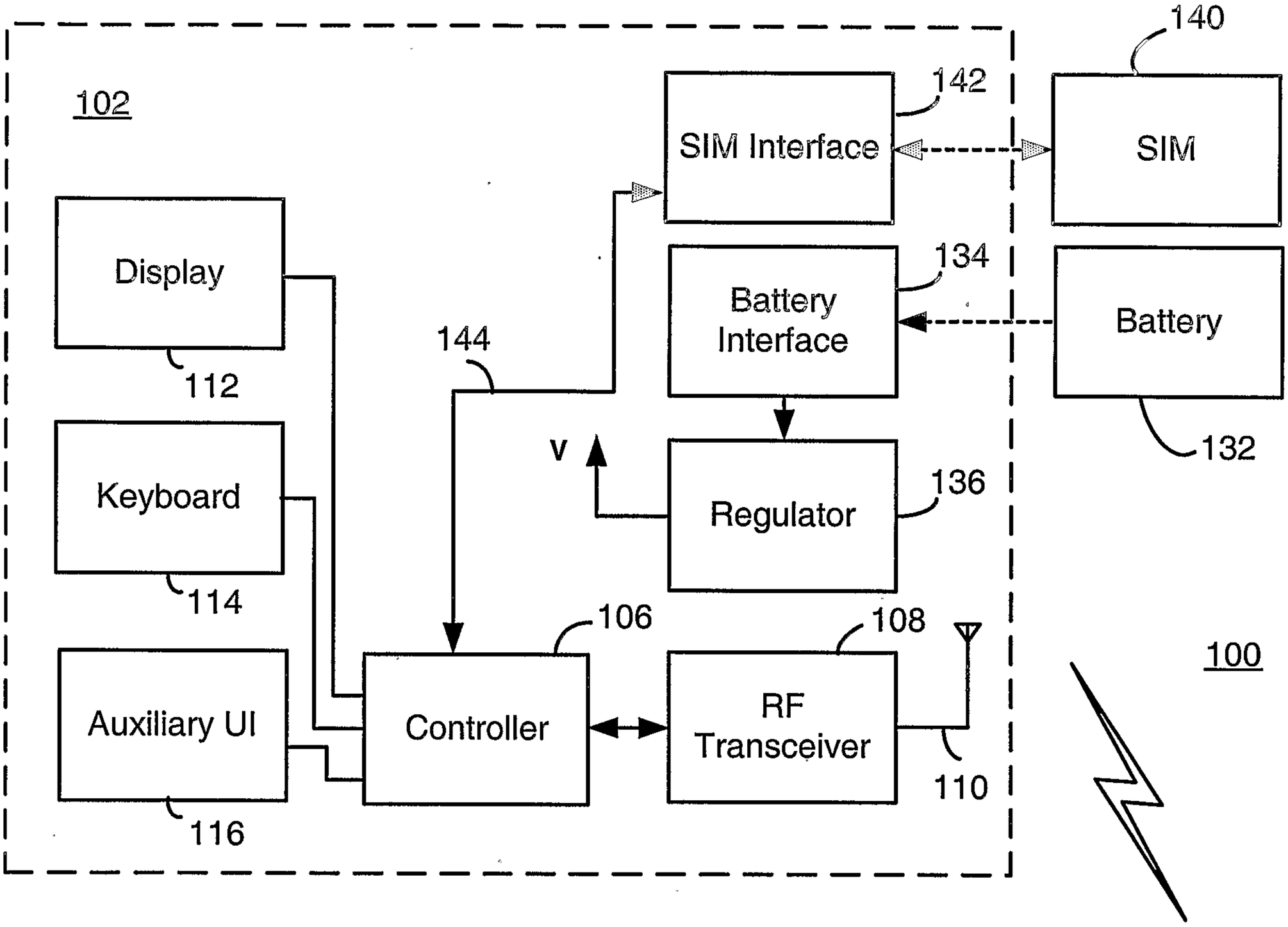
72. The communication device of claim 70, wherein the address is an address of a wireless communication device and the additional address is an address of an additional wireless communication device.

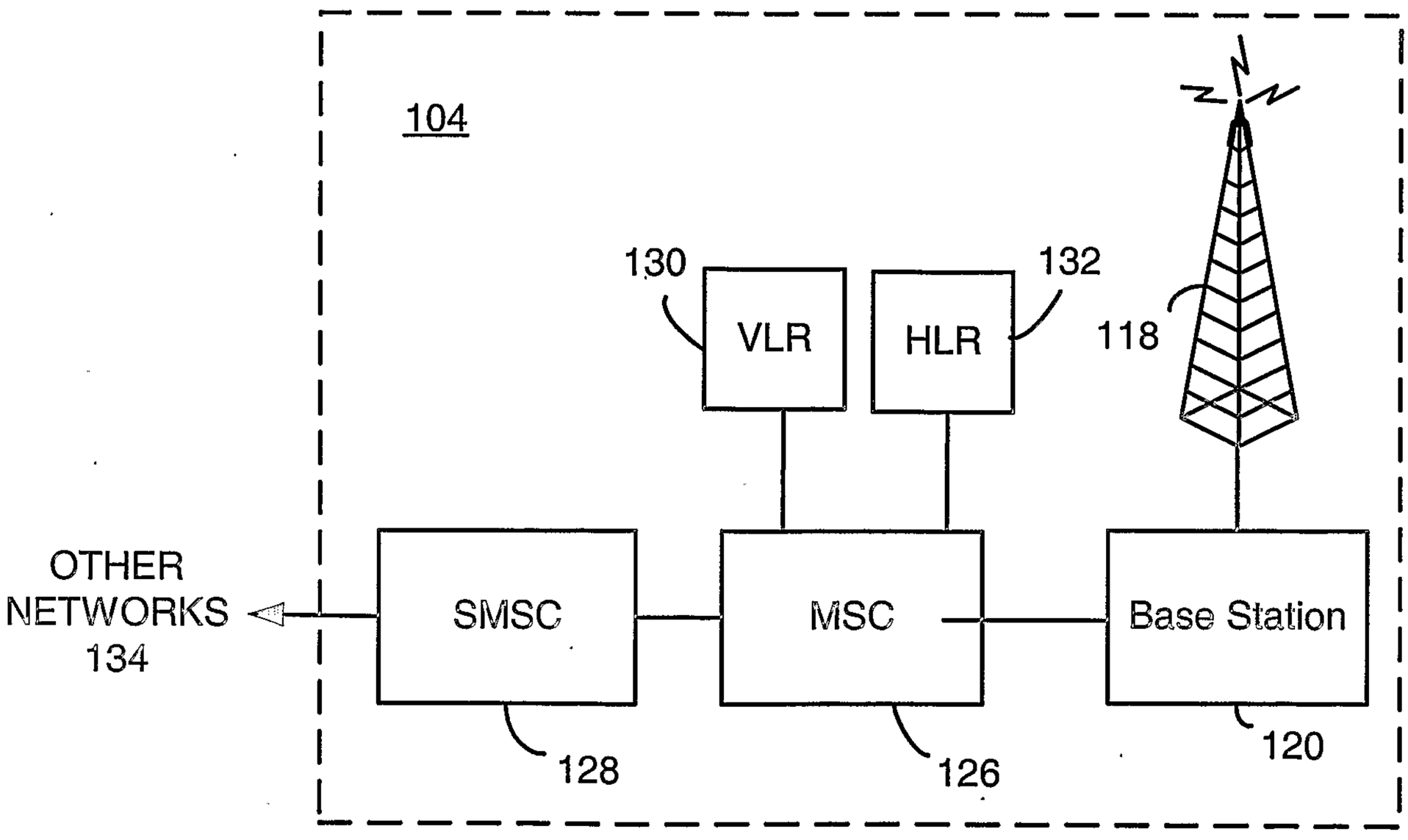
73. The communication device of claim 71, wherein the address comprises a first number in a first removable memory card and the additional address comprises a second number in a second removable memory card.

74. The communication device of claim 70, wherein the first address comprises a first Mobile Station Integrated Services Digital Network (MSISDN) and the additional second address comprises a second MSISDN.

75. The communication device of claim 70, wherein the short message comprises one of a Short Message Service (SMS) message and a Multimedia Messaging Service (MMS) message.

FIG. 1


102
Display
112
Keyboard
114
Auxiliary UI
116
SIM Interface
142
140
SIM
Battery Interface
134
Battery
132
144
V
Regulator
136
106
Controller
108
RF Transceiver
110
100


104
130
VLR
HLR
132
118
OTHER NETWORKS
134
SMSC
MSC
Base Station
128
126
120

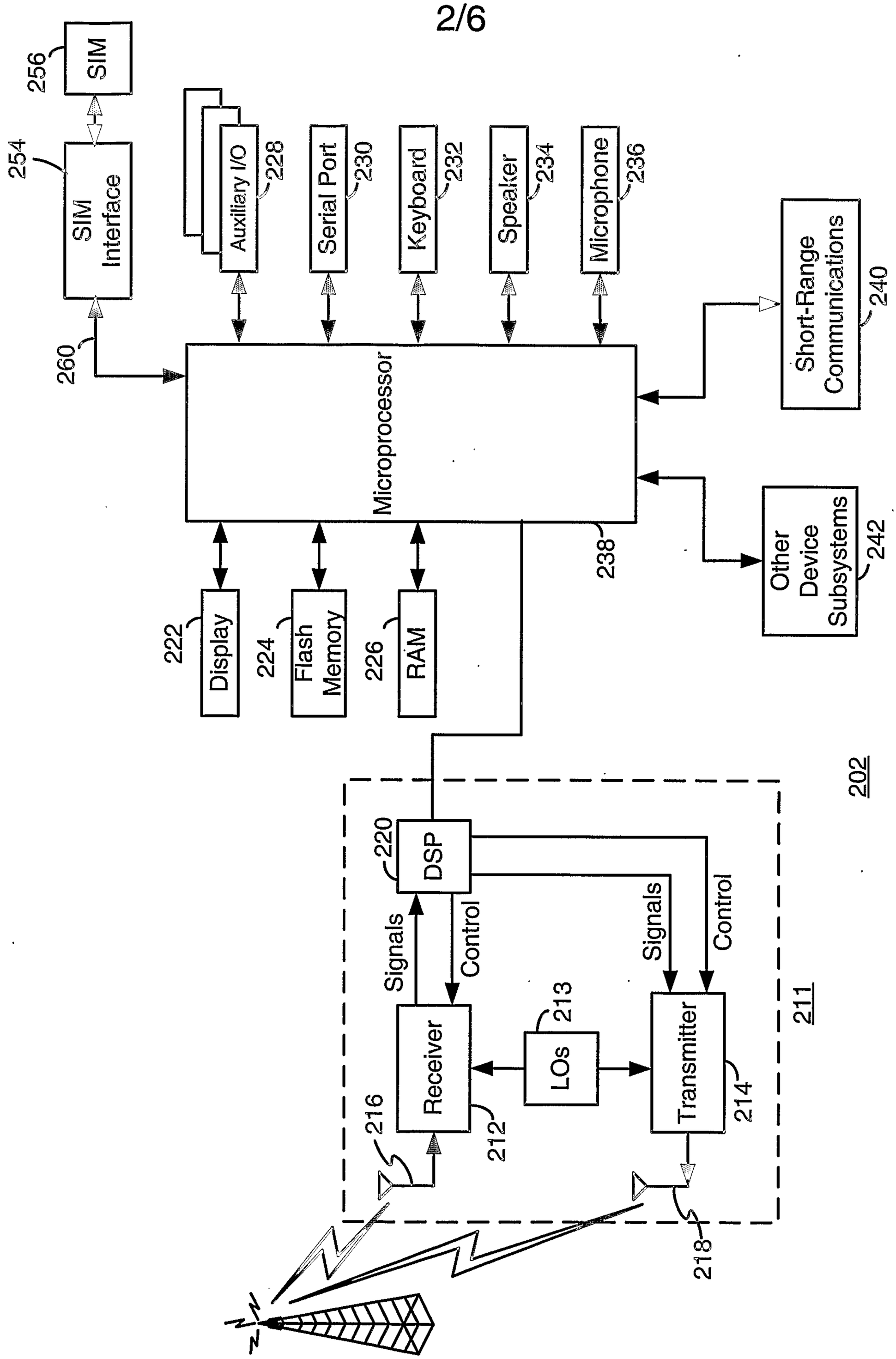

SIM
256
SIM Interface
254
260
Auxiliary I/O
228
Serial Port
230
Keyboard
232
Speaker
234
Microphone
236
Short-Range Communications
240
Microprocessor
238
Other Device Subsystems
242
Display
222
Flash Memory
224
RAM
226
202
DSP
220
Signals
Control
Signals
Control
Receiver
216
LOs
213
Transmitter
214
212
218
211

FIG. 2

FIG. 3

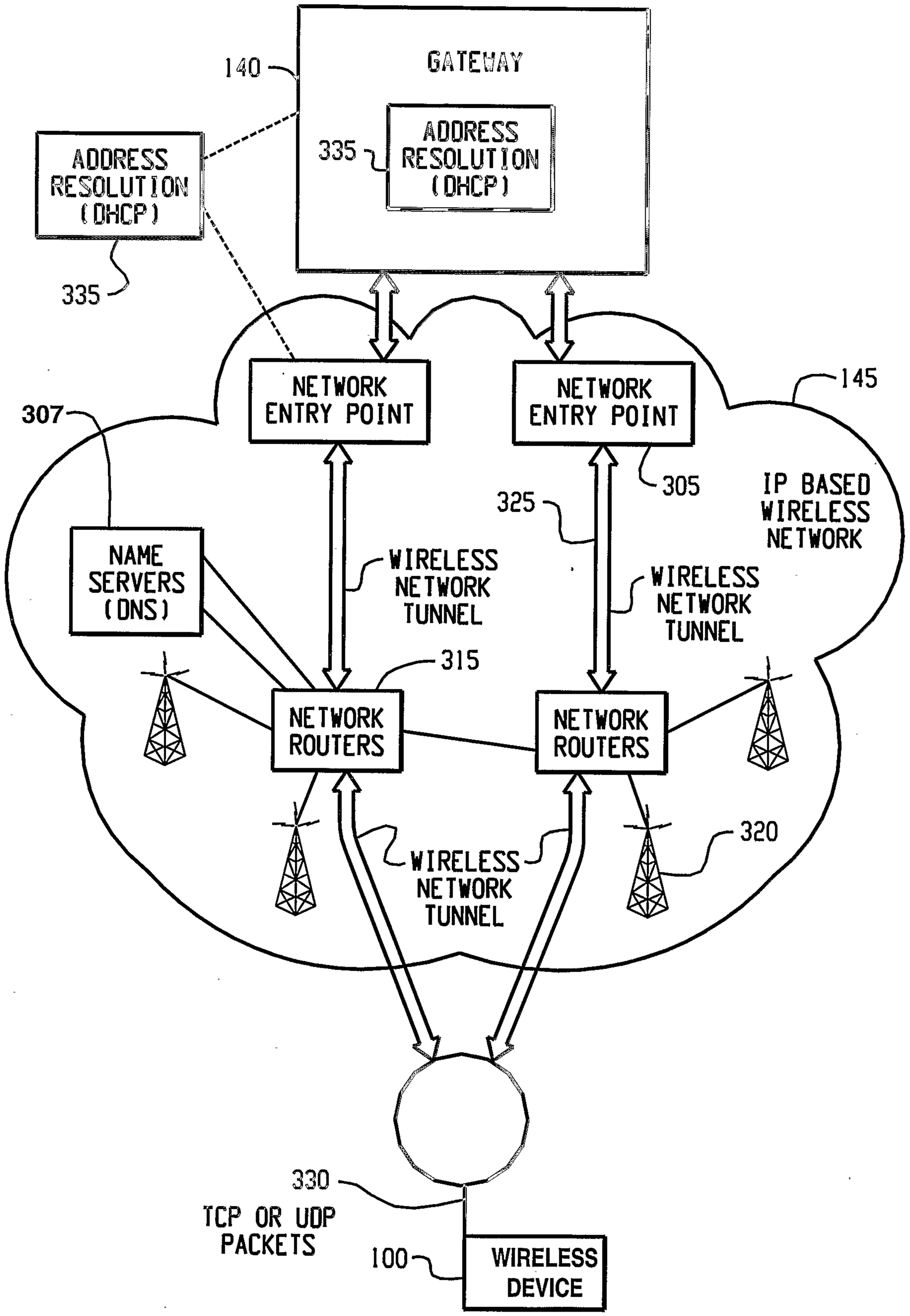
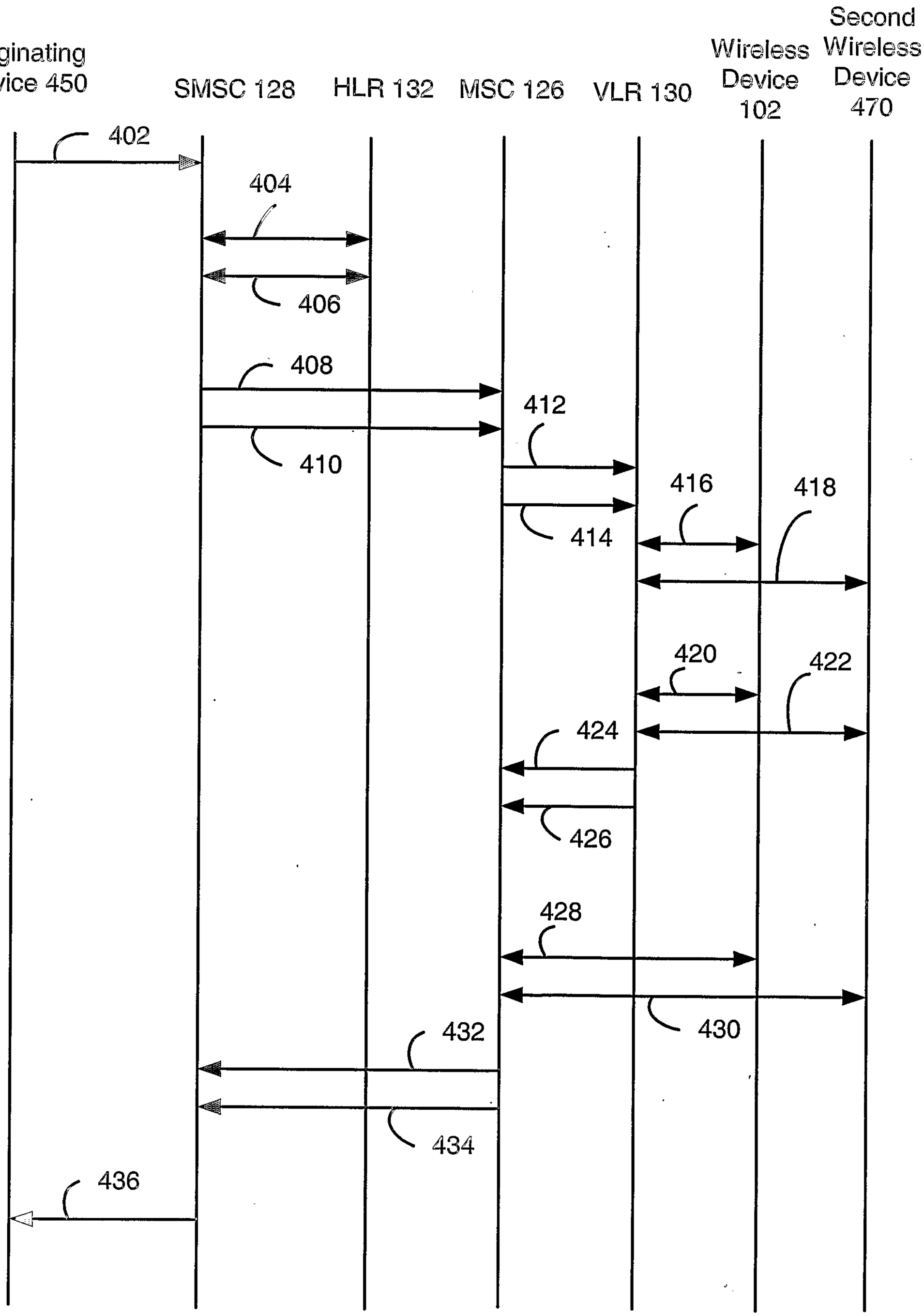

GATEWAY
140
ADDRESS RESOLUTION (DHCP)
335
ADDRESS RESOLUTION (DHCP)
335
NETWORK ENTRY POINT
NETWORK ENTRY POINT
145
307
305
325
IP BASED WIRELESS NETWORK
NAME SERVERS (DNS)
WIRELESS NETWORK TUNNEL
WIRELESS NETWORK TUNNEL
315
NETWORK ROUTERS
NETWORK ROUTERS
320
WIRELESS NETWORK TUNNEL
330
TCP OR UDP PACKETS
100
WIRELESS DEVICE

FIG. 4


Originating Device 450
SMSC 128
HLR 132
MSC 126
VLR 130
Wireless Device 102
Second Wireless Device 470
402
404
406
408
410
412
414
416
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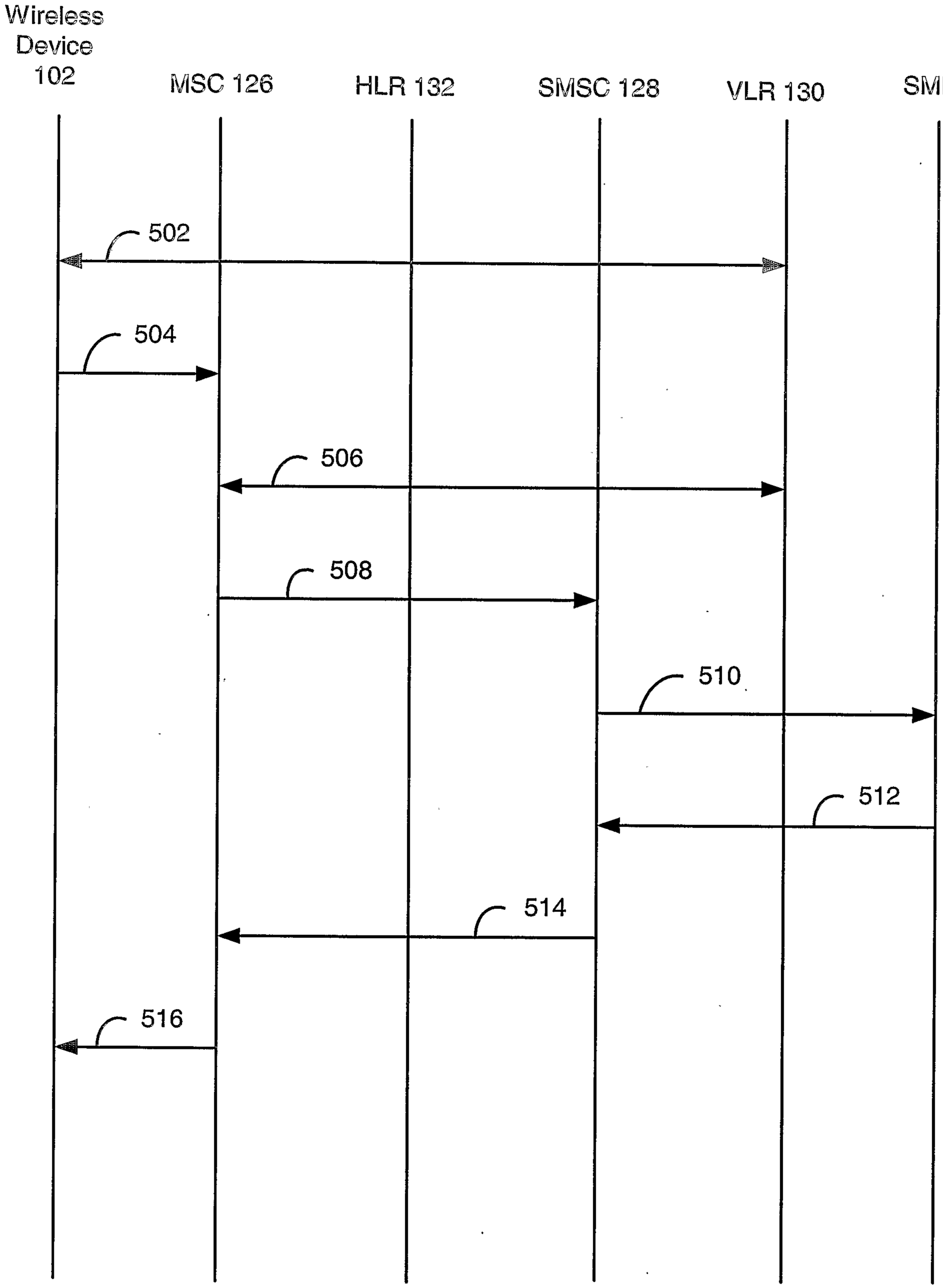
430
432
434
436

FIG. 5


Wireless Device 102
MSC 126
HLR 132
SMSC 128
VLR 130
SME
502
504
506
508
510
512
514
516

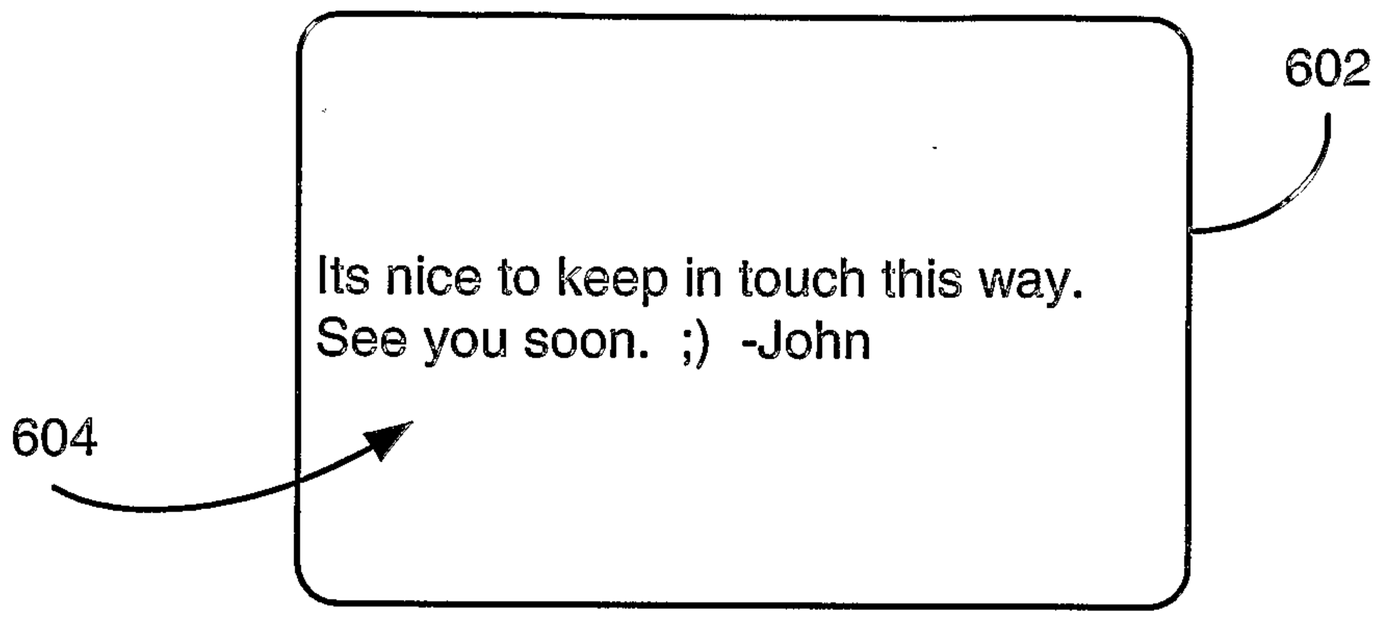

602
Its nice to keep in touch this way.
See you soon. ;) -John
604

FIG. 6

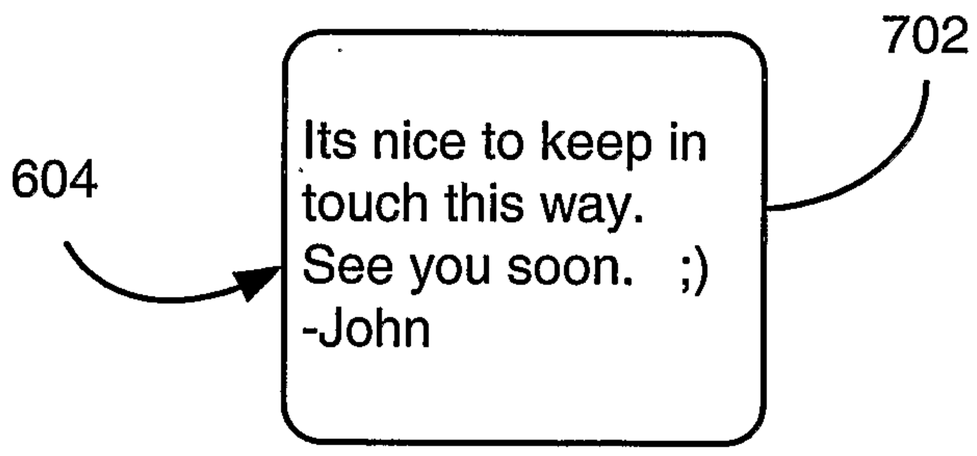
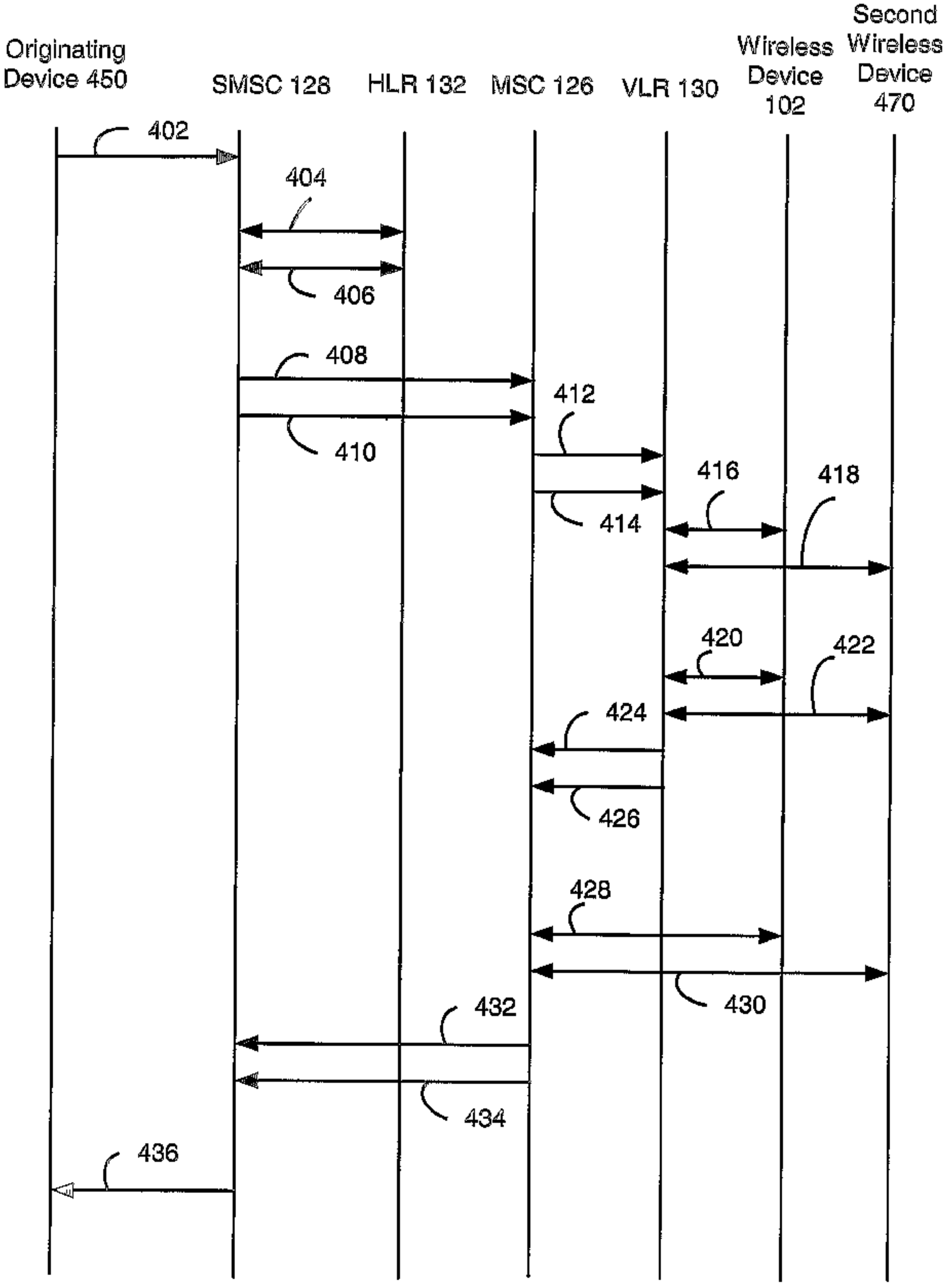

702
604
Its nice to keep in touch this way.
See you soon. ;)
-John

FIG. 7


Originating Device 450
SMSC 128
HLR 132
MSC 126
VLR 130
Wireless Device 102
Second Wireless Device 470
402
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436