

example, a gateway may be a cellular switch which directly or indirectly connects a subscriber unit to a terrestrial telephone network.

FIG. 1 illustrates a terrestrially-based cellular communication system which may incorporate the method and apparatus of the present invention. Subscriber unit 100 communicates with gateway 102 over link 104. Link 104 represents a radio frequency (RF) communication path. In an alternate embodiment, link 104 may be an optical communication path. Gateway 102 is a cellular switch which links subscriber unit 100 to a terrestrial telephone network or to another communication network (e.g., to a satellite communication network). Gateway 102 may perform system control functions. Gateway 102 may also connect to another control center which performs system control functions.

FIG. 2 illustrates a satellite-based cellular communication system which may incorporate the method and apparatus of the present invention. Subscriber unit 110 communicates with gateway 112 through satellite 114 or a satellite network (not shown). Subscriber unit 110 communicates with satellite 114 over link 116. Satellite 114 communicates with gateway 112 or link 118.

A subscriber unit's "home gateway" is defined herein as a gateway containing information relevant to that particular subscriber unit. A "visited gateway" is a gateway other than a subscriber unit's home gateway. For example, a user living in the Chicago area may have a home gateway within that area. When the user travels to another area (e.g., a foreign country) the user must communicate with a visited gateway.

According to the method and apparatus of the present invention, a user's location may be roughly determined based on which cell the subscriber unit is located in at a particular time. Alternatively, a user's location may be determined based on geolocation information. As defined herein, a "location area code" (LAC) is a code number which identifies a particular location area (i.e., an area of a relatively small size having known boundaries). The present invention associates each LAC with an emergency service center if the country within which the LAC is located provides emergency services. A service provider may independently provide emergency services.

FIG. 3 illustrates an apparatus for requesting an emergency call in accordance with a preferred embodiment of the present invention. Apparatus 120 contains emergency call request detection means 122, message generation means 124, transmitting means 126, receiving means 128, and call setup means 130. Emergency call request detection means 122 accepts a request by a user for emergency service. For example, emergency call request detection means 122 may be a key pad capable of receiving a dialed number or a single button which, when pressed, indicates an emergency situation. Emergency call request detection means 122 is coupled to message generation means 124. Message generations means 124 creates an emergency service request message to be transmitted to a gateway. Message generation means 124 is coupled to transmitting means 126 which is used to transmit the emergency service request message.

Receiving means 128 is capable of receiving transmitted messages and is coupled to call setup means 130. Call setup means 130 evaluates access approved or denied messages transmitted to the apparatus to determine an ESC telephone number. Call setup means 130 then desirably begins to establish communication with that ESC. Transmitting means 126 and receiving means 128 may be, for example, one or more RF antennas. Alternatively, transmitting means 126 and receiving means 128 may be optical devices.

FIG. 4 illustrates a subscriber unit (or remote communication unit) in accordance with a preferred embodiment of the present invention. Subscriber unit 140 comprises keypad 142 processor 144 memory device 146, and transmitting and receiving device 148. Keypad 142 is an interface capable of receiving a request for emergency service from a user. Keypad 142 may be a conventional 10 digit keypad, or may be another indicator which, when pressed or set, indicates an emergency situation. Keypad 142 is coupled to processor 144. Processor 144 detects a request for emergency call and generates an emergency call request message. Processor 144 is coupled to memory device 146 which desirably contains information necessary for detecting an emergency call request and generating an emergency call request message. Processor 144 is coupled transmitting and receiving device 148 which is used to transmit the emergency call request message.

FIG. 5 illustrates an apparatus for handling an emergency service request in accordance with a preferred embodiment of the present invention. Emergency service unit 160 comprises receiving means 162, access decision means 164, data storage means 166, message generation means 168, and transmitting means 170. Receiving means 162 is coupled to access decision means 164. When an emergency call request is received by receiving means 162, access decision means 164 determines which ESC, if any, is appropriate for the particular subscriber unit which transmitted the emergency service request. Access decision means 164 is coupled to data storage means 166. Data storage means 166 contains information which access decision means 164 uses in its determination of the appropriate ESC. Access decision means 164 is coupled to message generation means 168 which creates an access approved or an access denied message. Message generation means 168 is coupled to transmitting means 170 which is used to transmit the access approved or access denied message. Transmitting means 170 and receiving means 162 may be, for example, one or more RF antennas. Alternatively, transmitting means 170 and receiving means 162 may be optical devices.

FIG. 6 illustrates a gateway in accordance with a preferred embodiment of the present invention. Gateway 180 comprises a transmitting and receiving device 182 a processor 184 and a memory device 186. Transmitting and receiving device 182 is coupled to processor 184. When an emergency service request is received by transmitting and receiving device 182, processor 184 determines the appropriate ESC for the particular subscriber unit sending the emergency service request. Processor 184 then generates an access approved or an access denied message. Processor 184 is coupled to memory device 186 which contains information used in the access decision.

FIG. 7 shows a method for a communication system to establish (or "set up") an emergency call in accordance with a preferred embodiment to the present invention. The emergency call setup process begins in step 190 by performing the initiate emergency call step 192. In the initiate emergency call step 192, a user dials an emergency number or sets or presses an indicator which indicates to the subscriber unit that there is an emergency situation. In a preferred embodiment, a user-selected emergency number has been preprogrammed into the memory of this subscriber unit. When this user-selected emergency number has been dialed or an emergency request button has been pressed, the subscriber unit creates and transmits an emergency service request message.

A gateway receives the emergency service request message in step 194. In a preferred embodiment, the gateway is