

## SPECIALIZED CALL ROUTING METHOD AND APPARATUS FOR A CELLULAR COMMUNICATION SYSTEM

### FIELD OF THE INVENTION

The present invention relates generally to cellular communication systems and, more specifically, to cellular communication systems in which emergency communication services may be requested by users of the communication system.

### BACKGROUND OF THE INVENTION

The need for requesting emergency services is a common one in communication systems. Commonly-known, standard emergency numbers are helpful to eliminate caller confusion during emergency situations. When a user dials the standard emergency number (e.g., 911 in the United States), the telephone switch receiving the emergency call makes a decision as to where to route that call. In prior art terrestrial telephone systems, the routing decision is based on the location of the fixed instrument from which the call is made. This location may be determined from the phone number of the fixed instrument. After a call is routed to an emergency service center which handles the call, an emergency service center operator may be presented with the street address at which the fixed instrument is located. One problem with this system is that a user in an unfamiliar country may not know the proper standard emergency telephone number for that country. Further, the user may not speak the language of the operator.

In prior-art cellular systems, a subscriber unit user makes an emergency call request to an operator responsible for the area serviced by the cellular switch (i.e., a "service provider"). The operator must ask the caller to provide his or her location, and the call is then transferred to the proper emergency service center based on the given location.

Besides the drawbacks to fixed-station emergency response systems, a further drawback to this system is that the caller must provide location information which the caller may not know. Thus, a cellular system user traveling in an unfamiliar city or country is likely to have difficulty obtaining emergency services.

In a global satellite cellular communication system, other problems may arise. First, many areas of the world have no emergency response systems or governments may not be willing to pay the costs of emergency calls. A global cellular system user may need to resort to emergency services supplied by the service provider. Finally, a single switch may serve multiple continents, rendering an approach in which a single emergency service center handles all emergency calls unworkable.

What is needed is a method and apparatus for determining emergency call routing in a terrestrially-based or a satellite-based cellular communication system. Further needed is an emergency call routing method and apparatus in which a cellular subscriber does not need to provide location information in an unfamiliar language. What is further needed is a method and apparatus for determining emergency call routing in which the subscriber may use the standard emergency number for the subscriber's own country no matter where the subscriber is located.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a terrestrially-based cellular communication system which may incorporate the method and apparatus of the present invention;

FIG. 2 illustrates a satellite-based cellular communication system which may incorporate the method and apparatus of the present invention;

FIG. 3 illustrates an apparatus for requesting an emergency call in accordance with a preferred embodiment of the present invention;

FIG. 4 illustrates a remote communication unit in accordance with a preferred embodiment of the present invention;

FIG. 5 illustrates an apparatus for handling an emergency service request in accordance with a preferred embodiment of the present invention;

FIG. 6 illustrates a gateway in accordance with a preferred embodiment of the present invention;

FIG. 7 shows a method for a communication system to establish an emergency call in accordance with a preferred embodiment to the present invention; and

FIG. 8 illustrates a method for a subscriber unit to establish an emergency call in accordance with a preferred embodiment of the present invention.

### DETAILED DESCRIPTION OF THE DRAWINGS

The present invention provides a method and apparatus for emergency call routing in a terrestrially-based or satellite-based cellular communication system, wherein users (or "subscribers") may use a standard emergency number of their own country and are not required to provide location information. Basically, after a subscriber sends an emergency service request, an emergency service center is selected for routing the call. The selection is based on the location of the subscriber unit, the identity of the service provider with which the subscriber is enrolled, and any restrictions imposed by geopolitical or other entities.

The description refers to emergency call routing, however, the invention may apply to routing any type of "specialized" call where predefined telephone numbers are used as would be obvious to one of skill in the art based on the description. Therefore, "specialized call" may be substituted for "emergency call" in the description. Similarly, "specialized service request" may be substituted for "emergency service request", etc. Further, where the term "telephone number" is used, it is interchangeable with the term "communication number", indicating that a device receiving a service request need not be a telephone. Some other device may receive a service request, such as a computer or an answering machine, for example.

As used herein, a "subscriber unit" is a communication device used by a cellular communication system user. For example, a subscriber unit may be a hand-held portable cellular telephone, a pager, or a one-directional communication device. A subscriber unit may also be referred to herein as a "remote communication unit". An "emergency service center" (ESC) is defined as an entity which responds to emergency service requests. In a particular location, one or more ESCs may be available to respond to any particular emergency service request. An "ESC telephone number" is defined herein as an actual telephone number of an ESC. A "user-selected emergency number" is defined herein as the standard emergency number known to the user. A "gateway" is defined herein as an equipment facility capable of directly or indirectly communicating with a subscriber unit. For