(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification⁷: H04Q 7/38

(21) International Application Number: PCT/SE00/02286

(22) International Filing Date:
21 November 2000 (21.11.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/458,374   10 December 1999 (10.12.1999)   US

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(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— With international search report.

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR COMMUNICATING INFORMATION
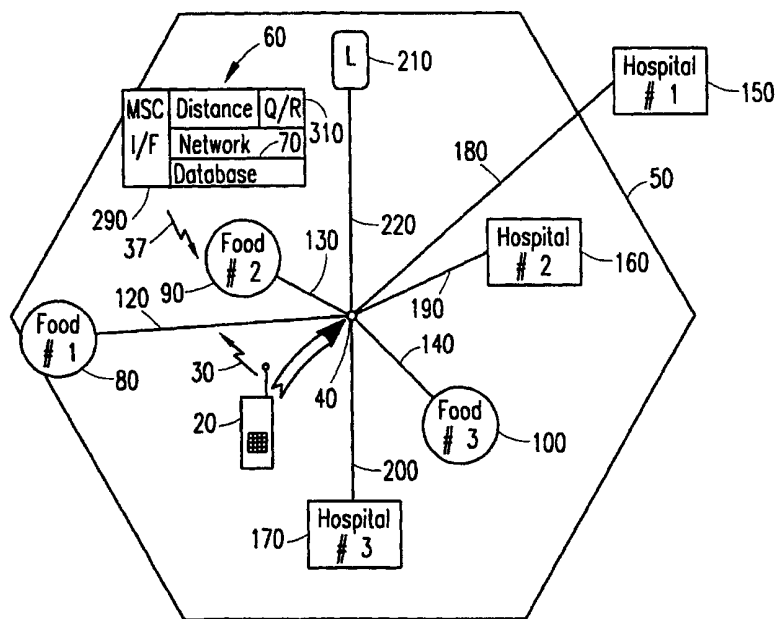
(57) Abstract: An apparatus (10) for communicating information about a provider of goods or services between a telecommunications network (60) and a mobile station (20) at an approximate physical location comprises a mobile switching center (250) including a database memory (70), and a distance determination module (300) in electronic communication with the database memory (70), the module (300) being adapted to compare the mobile station location with locations represented by physical location addresses (71, 75) stored in the database memory (70). The method comprises the steps of receiving an information segment query (30), determining the approximate location (40) of the mobile station (20), scanning the database memory (70) to provide a set of preselected information segments (72, 76) matching the query, along with a set of associated physical address locations, comparing the mobile station location (40) with the locations represented by the set of physical location addresses to provide a proximate subset of physical address locations, and transmitting a response (33), including at least one of the physical addresses in the proximate subset, to the mobile stations (20). The invention also comprises a network (60) which includes a communications interface (290), a database memory (70) communicating with the communications interface (290), and a distance determination module (300) which communicates with the database memory (70).

— *Before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments.*

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SYSTEM AND METHOD FOR COMMUNICATING INFORMATION

BACKGROUND OF THE INVENTION

This invention relates generally to systems, apparatus, and methods to enhance mobile subscriber services. More particularly, the invention relates to systems, apparatus and methods for communicating information from a telecommunications network to a mobile station subscriber based on queries received from the mobile station.

History of Related Art

The amount of world-wide business and personal travel increases on a daily basis. Therefore, the likelihood of a mobile subscriber encountering unfamiliar locales also increases. In these circumstances it is often difficult to determine which bank, hospital, gas station, etc. may be the most convenient (i.e., the closest) for use by a traveling subscriber. Even if the subscriber is fortunate enough to encounter a local resident knowledgeable with regard to destinations and directions, it is not always safe to make such inquiries in an unfamiliar neighborhood. Thus, a lot of time and energy may be unnecessarily wasted searching for local providers of goods or services.

One approach to solving this problem is to find a public telephone or business establishment which maintains a local telephone directory. However, many public phones no longer have directories attached. Further, the subscriber may need the information at a time when all of the proximate businesses are closed.

Some telecom systems provide for determining the position of a mobile subscriber, but fail to relate this position to providers of goods or services. Conversely, as noted above, there are directories and lists of service providers, but no automated system or method exists to relate the location of the mobile station subscriber to a specific local provider of needed goods or services. Some Global Positioning Satellite (GPS) systems provide directions to a specified address or location, given the geographic coordinates of the user (which requires the user to carry a GPS receiver), but such systems do not automatically relate the location of the user to the location of desired goods/service providers.

Therefore, what is needed is a system and method for communicating information to a local subscriber operating a mobile station, from a telecommunications network, based on queries posed to the network. The system and method should make use of a database memory in which is stored addresses of various providers or goods or services, along with other information, including, possibly, the directions for traveling from the location of the subscriber to the location of the desired provider. Such a system and method should not necessarily require the use of a GPS receiver, and should ideally utilize standard cellular telephone technology, including unmodified mobile stations, along with other standard components currently available within a telecommunications network.

SUMMARY OF THE INVENTION

The method of communicating information between a telecommunications network and a mobile station comprises the steps of receiving a query related to a provider of goods or services from the mobile station, determining the approximate location of the mobile station, scanning a database memory to provide entries which match information contained in the query, comparing locations represented by the addresses of the matching entries with the approximate location of the mobile station, and transmitting a response to the mobile station which includes some portion of the database memory information associated with the most proximate addresses. The database memory is used to store a plurality of physical location addresses related to various providers of goods or services, and each address is associated with a corresponding plurality of information segments, or query matching information.

During database memory scanning, an attempt is made to find providers of goods or services located proximate to the mobile station which have characteristics defined by the query, as listed in the associated information segments. For example, the physical location address may be associated with several information segments, such as the name of the business and its hours of operation. The method includes the step of comparing the determined, approximate physical location of the mobile station with the locations represented by the physical location addresses of one or more providers of goods or services stored within the database memory that

correspond to the query, and selecting one or more providers which are the shortest distance from the mobile station. It is this relationship (i.e., the physical distance between the mobile station and query-matched goods/service providers) that determines the information transmitted to the mobile station.

The physical location addresses may be stored in the database memory in a number of ways, such as street addresses, cell coordinates, map grid coordinates, geographic coordinates, global positioning system coordinates, and latitude-longitude coordinates. The information segments which are associated with each physical location address may be stored as generic business names, actual business names, physical addresses, descriptions of services, descriptions of goods, certifications, fees, days of operation, employees, and/or hours of operation, among others. The location of the mobile station may be determined according to the cell in which it is located, or according to geophysical coordinates, for example. The method may include the steps of setting up a call between the mobile station and the network, and transmitting the query, which includes an information segment to be matched, or an information selection, to the network. The information segment query may include a request to provide a physical address location corresponding to a generic business name, a description of services, or a description of goods, for example.

The invention also includes an apparatus for communicating information about a provider of goods or services between a telecommunications network and a mobile station located at an approximate physical

location. The apparatus comprises a mobile switching center operating within the network, which includes a database memory wherein a plurality of preselected physical location addresses, each associated with a corresponding plurality of associated preselected information segments, are stored, and a distance determination module in electronic communication with the database memory, the module being adapted to determine the approximate distance between the approximate physical location of the mobile station and the plurality of physical location addresses. The apparatus may also comprise a query-response module in electronic communication with the database memory to assist in the generation of a query.

The invention may also be embodied in a telecommunications network comprising a communications interface; a database memory in electronic communication with the communications interface, the database memory being used to store a plurality of preselected physical location addresses and corresponding pluralities of preselected information segments; and a distance determination module in electronic communication with the database memory, the module being adapted to determine the approximate distance between an approximate physical location of a mobile station communicating with the network and the plurality of physical location addresses. The communications interface may comprise a mobile switching center, and the network may include a query-response module in electronic communication with the database memory, as described above.

BRIEF DESCRIPTION OF THE DRAWINGS

A more complete understanding of the structure and operation of the present invention may be had by reference to the following detailed description when taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a block diagram illustrating the telecommunications network of the present invention;

Fig. 2 is a block diagram illustrating the apparatus of the present invention; and

Fig. 3 is a flow chart illustrating the method of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The scenario which best illustrates the need for and use of the present invention as a network and method can be seen in Figure 1. Here, a mobile station **20** subscriber is located at an approximate physical location **40** as defined by an absolute geophysical coordinate location (e.g., longitude - latitude), a street address, map grid coordinates, geographic coordinates, global positioning system coordinates, or a cell currently serving the mobile station location **50**.   In any event, the mobile station **20** is surrounded by various providers of goods or services, such as restaurants **80, 90, 100**, hospitals **150, 160**, and **170**, and a library **210**. Each of these facilities is located at some distance from the mobile station **20**.   For example, the restaurants **80, 90** and **100** are located at a first, second, and third distance of **120, 130**, and **140**,

respectively. Similarly, the hospitals **150, 160,** and **170** are located at a first, second and third distance of **180, 190** and **200.** Finally, the library is located at a distance of **220.**

5   If the mobile station **20** subscriber wishes to determine where the most proximate library **210** is located, there is no simple way to accomplish this task without looking at a telephone directory and a map. It may also be possible to dial a local

10   information number, but the telephone directory information provider often will typically have no idea where the mobile station **20** subscriber is located **40,** nor where the service provider, such as the library **210,** is located in relation to the

15   physical location **40** of the mobile station **20.**

In the network and method of the instant invention, the mobile station **20** subscriber may dial the directory number of an information service provider operating within the telecommunications

20   network **60** and, upon transmitting a query **30** (e.g., including the term "library" as the selected information segment), information within the database memory **70** can be retrieved and returned to the mobile station **20** subscriber which relates the

25   address location of the most proximate library **210.** Further, directions on how to travel from the location **40** of the mobile station **20** to the library **210** may also be generated and provided to the mobile station **20,** via the network query-response module

30   **310.** Other information about the library **210,** such as operating hours, can also be transmitted to the

mobile station **20** by the network and method of the present invention.

To use another example, the mobile station **20** subscriber may transmit a query **30** to the network **60** as a specific verbal question, such as "Where is the nearest hospital? My location is 1600 Main Street." In this case, the selected information segment "hospital" contained in the query **30** is extracted using voice recognition principles well known in the art. The query **30** may also be generated with the assistance of an automated menu provided by a query-response module **310** in electronic communication with the database memory **70**. For example, the mobile station **20** may be assisted in generating a query **30** based upon choices provided by the query-response module **310** for selection by the mobile station **20** subscriber. The choices may be contained in a series of data messages **37** such as, "Are you looking for entertainment? Enter 1 for theater, 2 for restaurant, and 3 for amusement park." Then, if the subscriber presses the numeral "2" at the mobile station **20** (i.e., the response "2" contained within the query being the selected information segment, i.e., the numerical equivalent to "restaurant"), the follow-up question/message **37** provided by the query-response module **310** might be, "Enter 1 for Mexican food, 2 for Chinese food, 3 for Indian food, and 4 for Fine Dining." If the answer is "Chinese" (i.e., the information segment contained in the query is "3") and the distance determination module **300** of the network **60** determines that food location #2, **90**, corresponds to the closest Chinese restaurant to the mobile station approximate location **40**, the address

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of this restaurant may be transmitted to the mobile station **20**. In this example, the query **30** may include multiple information segments, such as "entertainment = restaurant or **2**" and "type = Chinese or **3**". Similarly, if the mobile station **20** subscriber requests the address of the nearest hospital, the locations of hospitals #2, **160**, and #3 **170**, may be transmitted to the mobile station **20** subscriber for selection based upon the particular services required, or road traffic conditions.

As can be seen by the examples given above, the choices presented by the query-response module **310** to the subscriber may be in the form of data messages (e.g., using a message center), or verbal messages (e.g. using a announcement machine). In each case, the choice of information transmitted to the mobile station **20** subscriber depends upon the information stored in the database memory **70**, the location **40** of the mobile station **20** subscriber, and the distance between the approximate location **40** of the mobile station **20** and the providers of goods or services, such as the distances to the various hospitals **180**, **190**, and **200**, respectively.

Turning now to Figure 2, the apparatus **10** of the present invention can be seen. The apparatus **10** for communicating information between a telecommunications network **60** and a mobile station **20** at an approximate location **40** comprises a database memory **70** and a distance determination module **300** in electronic communication with the database memory **70**.

The telecommunications network **65** comprises elements which are commonly needed to enable

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communications with mobile station 20 subscribers, such as additional mobile stations 25, a mobile switching center 250, a base station controller 240, and a base station transceiver 230. A home location register 260 and other mobile switching centers 250 constitute additional elements which may also form a part of the telecommunications network 65.

In alternative embodiments of the invention, a query response module 310 may be present as an element of the apparatus 10. The database memory 70 may also form an integral part of a mobile switching center 250, shown as database memory 70' shown in Figure 2, or may operate independently, as database memory 70. In either case, the components elements of the database memories 70, 70' are the same.

The database memory 70 is used to store at least one physical location address 71 related to a provider of goods/services, which is in turn associated with a first plurality of preselected information segments, namely, information segment 72, information segment 73, and information segment 74 (also stored in the memory 70). As shown in Figure 2, the database memory 70 typically stores a plurality of physical location addresses, such as the first physical location address 71 and the second physical location address 75, which is in turn associated with a second plurality of preselected information segments, namely, information segment 76, and information segment 77. As noted above, the database memory 70' may be incorporated entirely within the mobile switching center 250, or the database memory 70 may exist as an entity outside

the mobile switching center **250**, as a separate intelligent network element.

The physical location addresses **71**, **75** may be conventional street addresses, cell coordinates, map grid coordinates, geographic coordinates (e.g. county, city, or state names), Global Positioning System (GPS) coordinates, and/or latitude-longitude coordinates. The preselected information segments **72**, **73**, and **74**; and **76**, and **77** associated with the addresses **71** and **75**, respectively, may include generic business names (e.g. hospital, library, police, factory, printer, employment agency, etc.), actual business names (e.g. Dan's Donuts, Minus Transmission, The Grocery Store Lounge, etc.), physical addresses (e.g., 123 Main Street, 56 West 42nd, etc.), descriptions of services (e.g. laundry, auto broker, banking, patent attorney, etc.), descriptions of goods (e.g. toys, staple foods, feed, hardware, etc.), certifications (e.g., American Bar Association, Texas Society of Professional Engineers, American Medical Association, etc.), fees (e.g. $100.00 an hour, five for $1.00, under $100,000, etc.), days of operation (e.g. Monday-Friday, etc.), employees (e.g. Charlie Brown, Linus Van Pelt, etc.), hours of operation (e.g. 8:00 a.m. - 5:00 p.m., etc.), or numerical equivalents to any of these. Such numerical equivalents may represent actual number values, or merely addresses or classifications stored in a look-up table memory. In use, the apparatus **10** operates by receiving some query information **30** from a mobile station **20** located at an approximate physical location **40**. The query information **30**, including a query information segment

31, is received in turn by the base transceiver station 230, base station controller 240, and passed on to the mobile switching center 250. The query information segment 31 is used during database memory 70 scanning operations to provide a set of matching information segments selected from all of the segments 72-74 and 76-77 stored within the database memory 70.

Assuming that segments 72 and 76 match segment 31, the distance determination module 300 will operate to compare the approximate physical location of the mobile station 40 with the locations represented by the physical addresses 71, 75 related to providers of goods or services stored in the database memory 70 to determine the proximity of the mobile station 20 to the providers located at the address 71, 75. The mobile station 20 subscriber may ask for a selected number of addresses (e.g. 1, 2, etc.), or, as an alternative, a preselected number of information segments to be returned. In any event, the query information 30, including the information segment 31, combined with the approximate location 40 of the mobile station 20 are used to select one or more of the corresponding addresses and/or information segments stored within the database memory 70 to be returned to the mobile station 20 by the mobile switching center 250.

In this embodiment of the invention, the query-response module 310 may act through a message center 280 to provide a response 33 to the mobile station 20 in the form of a character-limited message displayed on the mobile station 20 display (i.e.,

using the Short Message System (SMS)). Typically, however, the message center **280** will not be used, and a voice recording or announcement machine **270** under control of the query-response module **310** will provide audio feedback to the user of the mobile station **20** for responses to the query information **30** posed by the mobile station **20** subscriber.

The method of the present invention is illustrated in Figure 3. The method begins at step **320** and continues with optional step **330**, which includes dialing the telephone directory number of a subscriber service provider operating within the network **60**. The method continues with optional step **340**, which includes setting up the call between the mobile station and the network **60**. If a query-response module **310** is included in the invention, the method of the invention may include the step **350** of building a query **30** based upon the contents of the database memory **70** containing a plurality of preselected physical location addresses **71**, **75** and associated pluralities of preselected information segments **72-74** and **76-77**, respectively. As noted above, the preselected information segments **72-74** and **76-77** may represent actual terms, such as "police" or "hospital", as well as alphanumeric and purely numeric values which equate to significant physical quantities (such as an address, phone number, time, or price), or may be used to represent values stored in a lookup table memory (not shown). After the query **30** is formulated, the query **30** is sent to the network **60** (see Fig. 1) or the apparatus **10** (see Fig. 2) in optional step **360**. Of course, if the

first query **30** is fully-developed at the mobile station **20**, then step **350** is unnecessary to the method of the invention.

The method typically begins with step **370**, wherein an information segment query, which typically includes an information segment, is received from a mobile station **20**. The query many include many different types of information, or numerical values which can be related to information (using a look-up table memory), such as that contained within the information segments **72-74** and **76-77** stored in the database memory **70**, to include: generic business names, actual business names, physical addresses, descriptions of services, descriptions of goods, certifications, fees, days of operation, employees, hours of operation, or numerical equivalents to any of these, among others. Thus, for example, a common query might include the generic name of a business, a description of the goods or services provided by a business, or a number which is equivalent to either of these.

The method continues with determining the approximate physical location **40** of the mobile station **20** in step **380**. Step **380** may include the step **385** of determining the location of the cell **50** currently serving the mobile station **20**, or the longitude-latitude coordinates of the mobile station **20**. Other alternatives for determining the approximate location **40** of the mobile station **20** include determining the location of the mobile station in relation to a street address, map coordinates, geographic coordinates, and/or GPS coordinates.

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The method of the present invention continues with step **390**, wherein the database memory **70** is scanned to provide a set of preselected information segments (e.g., **72** and **76**) matching the information segment within the query **30**. The method continues with step **400**, wherein a set of preselected physical location addresses (i.e., **71** and **75**) associated with the set of preselected information segments found in step **390** are retrieved from the database memory **70**. The determined approximate physical location **40** of the mobile station **20** (provided by steps **380**, **385**) is then compared with locations represented by the physical location addresses **71**, **75** to determine the physical distance of the mobile station **20** from the addresses, and provide a proximate subset of preselected physical location addresses. For example, it may be that the business located at physical location address **71** is found to be within five miles of the mobile station **20**, whereas the business located at physical location address **75** is more than ten miles from mobile station **20**. The comparison of locations to determine a physical distance may include the step of determining a linear surface (of the earth) distance, which is equal to the physical distance between the approximate physical location **40** of the mobile station and the locations represented by the physical addresses **71** and **75** stored within the database memory **70**. Normally, the query information **30** will be such that the address **71** (or addresses) requiring the least amount of travel from the location of the mobile station **20** will be transmitted to the mobile station (see step **420**). However, the method may also

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include searching within the database memory **70** for information segments **72-74** and **76-77** associated with physical location addresses representing locations that are within a predetermined distance from the approximate physical location **40** of the mobile station **20**, as shown in step **415**. That is, a "window" around the mobile station may be drawn (e.g., the cell **50**), and addresses within that imaginary window **50** can be supplied to the mobile station.

Finally, the corresponding information stored within the database memory **70**, such as the most proximate address **71** corresponding to the selected information segment **31** sent as part of the query **30** (e.g. segment **72**), is transmitted to the mobile station **20** in step **420**. Of course, multiple queries **30**, shown in step **370**, may be posed to the telecommunications network **60**, and multiple corresponding information segments may be transmitted to the mobile station in step **420**. The method ends at step **430**.

Turning now to Figures 1, 2, and 3, a concrete example of the network **60**, apparatus **10**, and method of operation for the present invention will be given. One possible scenario involves the arrival of a mobile station **20** subscriber in an unfamiliar city. After renting a car at the airport, the subscriber travels to a business meeting. On the way, an automobile accident occurs and the subscriber, who is a medical doctor, encounters the accident scene. The subscriber realizes that medical care must be supplied immediately to one of the accident victims,

or she will die. There is no time to wait for police or ambulance escort to arrive.

The subscriber sets up a call between the mobile station **20** and the telecommunications network **60** by accessing the communications interface **290**. Once the call is answered by the serving mobile switching center **250**, the process of generating the query **30** begins.

As noted previously, building the query **30** may be accomplished using a series of voice menu questions or data messages **37** to the mobile station **20**. For example, the system **10** may announce, using an announcement machine **270**, "Enter 1 for emergency services, enter 2 for entertainment, enter 3 for retail, enter 4 for transportation, and enter 5 for other." After entering "1", the machine **270** may announce "Enter 1 for police, enter 2 for hospital, enter 3 for ambulance, and enter 4 for other." After "2" is entered, the query **30**, including desired information segments, can be transmitted by the mobile station **20**. Thus, the query may contain more than one information segment (in this case, the query **30** includes multiple segments "1" and "2"), and may be transmitted from the mobile station after enough selected information segments are provided to provide useful information from the database, or the mobile station may submit information as a query **30** containing a single information segment (i.e., a first query **30** including a selected information segment "1", and a second query **30** including a selected information segment "2") separately.

After the information segment query 30 is received, determining the physical location 40 of the mobile station 20 is accomplished. In the simplest situation, the approximate physical location 40 of the mobile station 20 will be determined by noting the physical location of the cell 50 which is currently serving the mobile station 20. More sophisticated examples of such determination may include triangulation within the cell, arcuation, signal strength measurements, signal timing measurements or, possibly, initiating a query 37 from the query-response module 310 to the mobile station 20, requesting a specific verbal description of the closest street name and/or address. Given this example, it is readily understood that the process of sending query information 30 from the mobile station may also be accomplished by voice recognition of the audio signal provided by the mobile station 20 subscriber in answer to queries 37 from an announcement machine 270. Further, instead of an announcement machine 270, the query process may be handled using a message center 280. In this instance, the query process may be conducted using a menu displayed on the display of the mobile station 20, which prompts for keypad 22 entries by the mobile station 20 subscriber. Using the SMS, directions can also be displayed on the mobile station 20 to direct the subscriber to the nearest hospital location 160. All of the announcements noted above may be displayed in visual form using the SMS residing in the message center 280. In any event, after the query 30 is generated and received,

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the approximate location **40** of the mobile station **20** will be determined by the distance determination module **300**.

The approximate location **40** of the mobile station **20** and the information indicating that the location of the nearest hospital **150**, **160**, **170** has now been acquired. The database memory **70** is then searched to locate matching preselected information segments associated with the query information. In this case, the information segments **72**, and **76** may contain the term "hospital". The database memory **70** is also searched to provide a set of preselected physical location addresses associated with the matching information segments for hospitals, such as for hospital #2, **160**, which may be stored in the database memory **70** as physical location address **71**, and hospital #3, **170**, which may be stored as physical location address **75** in the database memory **70**. The associated information segments **73** and **77** may contain the telephone numbers of the hospitals **160** and **170**.

Using the distance determination module **300**, which may be a hardware circuit or a software program module, the set of preselected physical location addresses are equated to some type of absolute coordinates, such as a map grid, or latitude/longitude coordinates, and the physical distance **190**, **200** between the mobile station **20** and the hospitals **160**, **170**, is determined. In this case, it will be found that the physical distance **190** to the hospital **160** from the approximate location **40** is less than the physical distance **200** to the

hospital **170**. Thus, proximate subset of preselected physical location addresses in this case comprises only address **71**.

At this point, the address **71** corresponding to the corresponding matching information segment **37**, i.e., information segment **72** can be transmitted to the mobile station **20**, along with the address for the hospital, contained in information segment **73**. Further, a series of directions from the nearest major thoroughfare can also be transmitted to the mobile station **20**, generated by the query-response module **310**. Such information will be most useful if the approximate location **40** of the mobile station is known to within a distance of several blocks, so that the directions can be fairly specific.

A specific example of the method for communicating information about a provider of goods or services to a mobile station, using the concept of an information segment "class" to more precisely define a subset of providers of goods or services, may comprise the steps of receiving an information segment query related to a provider of restaurant services, including a selected information segment for the class of "restaurant"; determining the approximate location of the mobile station; scanning the database memory where a plurality of preselected physical location addresses and corresponding pluralities of preselected information segments are stored (including the information segment for the class of "restaurant"), to provide a set of preselected information segments selected from the pluralities of information segments stored in the database memory which matching the class of

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"restaurant". The method continues with retrieving a set of preselected physical location addresses associated with the set of preselected information segments for the class of "restaurant" from the database memory; comparing the approximate physical location of the mobile station with the set of preselected physical location addresses to provide a proximate subset of preselected physical location addresses for restaurants which are proximate to the mobile station; and transmitting a response to the mobile station which includes at least the most proximate of the preselected physical location addresses within the proximate subset of preselected physical location addresses for restaurants which are proximate to the mobile station. Instead of restaurants, the example may of course include classes for safety or health service providers, such that the preselected information segment would be for the class of "hospital", "ambulance", "police", "fire", etc.

Another specific example might include the steps of receiving an information segment query related to a provider of grocery store goods, including a selected information segment for the class of "grocery"; determining the approximate location of the mobile station; scanning the database memory where a plurality of preselected physical location addresses and corresponding pluralities of preselected information segments are stored (including the information segment for the class of "grocery"), to provide a set of preselected information segments selected from the pluralities of information segments stored in the database memory

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which matching the class of "grocery". The method continues with retrieving a set of preselected physical location addresses associated with the set of preselected information segments for the class of "grocery" from the database memory; comparing the approximate physical location of the mobile station with the set of preselected physical location addresses to provide a proximate subset of preselected physical location addresses for grocery store goods providers which are proximate to the mobile station; and transmitting a response to the mobile station which includes at least the most proximate of the preselected physical location addresses within the proximate subset of preselected physical location addresses for grocery stores which are proximate to the mobile station. The example may of course include other providers of goods, such that the preselected information segment would be for the class of "hardware", "gasoline", "oil", etc.

Although the invention has been described with reference to specific embodiments, this description is not meant to be construed in a limited sense. The various modifications of the disclosed embodiments, as well as alternative embodiments of the invention, will become apparent to persons skilled in the art upon reference to the description of the invention. It is, therefore, contemplated that the appended claims will cover such modifications that fall within the scope of the invention, or their equivalents.

CLAIMS

What is claimed is:

1   1. A method of communicating information about
2 a provider of goods or services to a mobile station,
3 comprising the steps of:

4   receiving an information segment query related
5 to the provider of goods or services, the information
6 segment query including a selected information
7 segment;

8   determining an approximate location of the
9 mobile station;

10   scanning a database memory in which is stored a
11 plurality of preselected physical location addresses,
12 wherein at least one of the plurality of preselected
13 physical location addresses is related to the
14 provider of goods or services and wherein each one
15 of said preselected physical location addresses is
16 associated with a corresponding plurality of
17 preselected information segments, to provide a set of
18 preselected information segments selected from the
19 pluralities of information segments stored in the
20 database memory and matching the selected information
21 segment;

22   retrieving a set of preselected physical
23 location addresses associated with the set of
24 preselected information segments from the database
25 memory;

26   comparing the approximate physical location of
27 the mobile station with the set of preselected
28 physical location addresses to provide a proximate
29 subset of preselected physical location addresses;
30 and

23

31   transmitting a response to the mobile station
32   which includes at least one of the preselected
33   physical location addresses within the proximate
34   subset of preselected physical location addresses.

1   2.   The method of Claim 1 wherein the plurality
2   of physical location addresses may be selected from
3   a group consisting of: street addresses, cell
4   coordinates,   map   grid   coordinates,   geographic
5   coordinates, global positioning system coordinates,
6   and latitude-longitude coordinates.

1   3.   The method of Claim 1 wherein the plurality
2   of preselected information segments may be selected
3   from a group consisting of: generic business names,
4   actual   business   names,   physical   addresses,
5   descriptions of services, descriptions of goods,
6   certifications, fees, days of operation, employees,
7   and hours of operation.

1   4.   The method of Claim 1 comprising the steps
2   of:
3   setting up a call between the mobile station and
4   the telecommunications network; and
5   transmitting the information segment query from
6   the mobile station to the telecommunications network.

1   5.   The   method   of   Claim   1   wherein   the
2   information segment query includes a request to
3   provide a physical address location corresponding to
4   a generic business name.

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1   6.   The   method   of   Claim   1   wherein   the
2   information   segment   query   includes   a   request   to
3   provide   a   physical   address   location   corresponding   to
4   a   description   of   services.

1   7.   The   method   of   Claim   1   wherein   the
2   information   segment   query   includes   a   request   to
3   provide   a   physical   address   location   corresponding   to
4   a   description   of   goods.

1   8.   The   method   of   Claim   1   wherein   the   step   of
2   determining   an   approximate   location   of   the   mobile
3   station   includes   the   step   of   determining   a   location
4   of   a   cell   currently   serving   the   mobile   station.

1   9.   The   method   of   Claim   1   wherein   the   step   of
2   determining   an   approximate   location   of   the   mobile
3   station   includes   the   step   of   determining   a   set   of
4   approximate   latitude-longitude   coordinates   of   the
5   mobile   station.

1   10.   The   method   of   Claim   1   wherein   the   step   of
2   comparing   the   approximate   physical   location   of   the
3   mobile   station   with   the   set   of   preselected   physical
4   location   addresses   includes   the   step   of   determining
5   a   linear   surface   physical   distance   between   the
6   approximate   physical   location   of   the   mobile   station
7   and   each   one   of   the   preselected   physical   location
8   addresses   contained   within   the   set   of   preselected
9   physical   location   addresses.

1   11.   The method of Claim 1 wherein the proximate
2   subset of preselected physical location addresses
3   includes a selected number of preselected physical
4   location addresses which are within a predetermined
5   distance from the approximate physical location of
6   the mobile station.

1   12.   An apparatus for communicating information
2   about a provider of goods or services to a mobile
3   station located at an approximate physical location,
4   comprising:

5   a mobile switching center operating within a
6   telecommunications network, the mobile switching
7   center including a database memory in which is stored
8   a   plurality   of   preselected   physical   location
9   addresses, wherein at least one of the plurality of
10   preselected physical location addresses is related to
11   the provider of goods or services and wherein each
12   one of the preselected physical location addresses is
13   associated   with   a   corresponding   plurality   of
14   preselected information segments; and

15   a distance determination module in electronic
16   communication with the database memory, the module
17   being adapted to determine the approximate distance
18   between   the   approximate   physical   location   of   the
19   mobile station and the plurality of physical location
20   addresses.

1   13.   The apparatus of Claim 12 wherein the
2   plurality of preselected physical location addresses
3   may be selected from a group consisting of: street

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4   addresses, cell coordinates, map grid coordinates,
5   geographic coordinates, global positioning system
6   coordinates, and latitude-longitude coordinates.

1   14. The apparatus of Claim 12 wherein the
2   plurality of preselected information segments may be
3   selected from a group consisting of: generic
4   business names, actual business names, physical
5   addresses, descriptions of services, descriptions of
6   goods, certifications, fees, days of operation,
7   employees, and hours of operation.

1   15. A   telecommunications   network   for
2   communicating information about a provider of goods
3   or services to a mobile station comprising:

4   a   communications   interface   adapted   to
5   communicate with the mobile station;

6   a database memory in electronic communication
7   with the communications interface, the database
8   memory including a plurality of preselected physical
9   location addresses, wherein each one of the
10   preselected physical location addresses is associated
11   with a corresponding plurality of preselected
12   information segments, and wherein at least one of the
13   preselected physical location addresses is related to
14   the provider of goods or services; and

15   a distance determination module in electronic
16   communication with the database memory, the module
17   being adapted to determine the approximate distance
18   between an approximate physical location of a mobile
19   station communicating with the network and the
20   plurality of physical location addresses.

1   16.   The   network   of   Claim   15   wherein   the
2   communications interface comprises a mobile switching
3   center.

1   17.   The   network   of   Claim   15   comprising   a
2   distance   determination   module   in   electronic
3   communication with the database memory.

1   18.   The network of Claim 15 comprising a query-
2   response module in electronic communication with the
3   database memory.

1   19.   The   network   of   Claim   15   wherein   the
2   plurality of preselected physical location addresses
3   may be selected from a group consisting of: street
4   addresses,   cell   coordinates,   map   grid   coordinates,
5   geographic   coordinates,   global   positioning   system
6   coordinates, and latitude-longitude coordinates.

1   20.   The   network   of   Claim   15,   wherein   the
2   plurality of preselected information segments may be
3   selected   from   a   group   consisting   of: generic
4   business   names,   actual   business   names,   physical
5   addresses, descriptions of services, descriptions of
6   goods,   certifications,   fees,   days   of   operation,
7   employees, and hours of operation.

1   21.   A method of communicating information about
2   a provider of goods or services to a mobile station,
3   comprising the steps of:

4   receiving an information segment query related to a
5   provider of restaurant services, the information
6   segment query including a selected information
7   segment for a class of restaurant;

8   determining an approximate location of the
9   mobile station;

10 scanning a database memory in which is stored a
11 plurality of preselected physical location addresses,
12 and wherein each one of said preselected physical
13 location addresses is associated with a corresponding
14 plurality of preselected information segments
15 including the information segment for the class of
16 restaurant, to provide a set of preselected
17 information segments selected from the pluralities of
18 information segments stored in the database memory
19 and matching the selected information segment for the
20 class of restaurant;

21 retrieving a set of preselected physical
22 location addresses associated with the set of
23 preselected information segments from the database
24 memory;

25 comparing the approximate physical location of
26 the mobile station with the set of preselected
27 physical location addresses to provide a proximate
28 subset of preselected physical location addresses for
29 restaurants which are proximate to the mobile
30 station; and

31 transmitting a response to the mobile station
32 which includes at least the most proximate of the
33 preselected physical location addresses within the
34 proximate subset of preselected physical location

29

35   addresses for restaurants which are proximate to the
36   mobile station.

1   22. A method of communicating information about
2   a provider of goods or services to a mobile station,
3   comprising the steps of:

4   receiving an information segment query related
5   to a provider of hospital services, the information
6   segment query including a selected information
7   segment for a class of hospital;

8   determining an approximate location of the
9   mobile station;

10   scanning a database memory in which is stored a
11   plurality of preselected physical location addresses,
12   and wherein each one of said preselected physical
13   location addresses is associated with a corresponding
14   plurality of preselected information segments
15   including the information segment for the class of
16   hospital, to provide a set of preselected information
17   segments selected from the pluralities of information
18   segments stored in the database memory and matching
19   the selected information segment for the class of
20   hospital;

21   retrieving   a   set   of   preselected   physical
22   location addresses associated with the set of
23   preselected information segments from the database
24   memory;

25   comparing the approximate physical location of
26   the mobile station with the set of preselected
27   physical location addresses to provide a proximate
28   subset of preselected physical location addresses for

29   hospitals which are proximate to the mobile station;
30   and

31   transmitting a response to the mobile station
32   which includes at least the most proximate of the
33   preselected physical location addresses within the
34   proximate subset of preselected physical location
35   addresses for hospitals which are proximate to the
36   mobile station.

1   23. A method of communicating information about
2   a provider of goods or services to a mobile station,
3   comprising the steps of:

4   receiving an information segment query related
5   to a provider of grocery goods, the information
6   segment query including a selected information
7   segment for a class of grocery;

8   determining an approximate location of the
9   mobile station;

10   scanning a database memory in which is stored a
11   plurality of preselected physical location addresses,
12   and wherein each one of said preselected physical
13   location addresses is associated with a corresponding
14   plurality of preselected information segments
15   including the information segment for the class of
16   grocery, to provide a set of preselected information
17   segments selected from the pluralities of information
18   segments stored in the database memory and matching
19   the selected information segment for the class of
20   grocery;

21   retrieving a set of preselected physical
22   location addresses associated with the set of

23   preselected information segments from the database
24   memory;

25   comparing the approximate physical location of
26   the mobile station with the set of preselected
27   physical location addresses to provide a proximate
28   subset of preselected physical location addresses for
29   grocery stores which are proximate to the mobile
30   station; and

31   transmitting a response to the mobile station
32   which includes at least the most proximate of the
33   preselected physical location addresses within the
34   proximate subset of preselected physical location
35   addresses for grocery stores which are proximate to
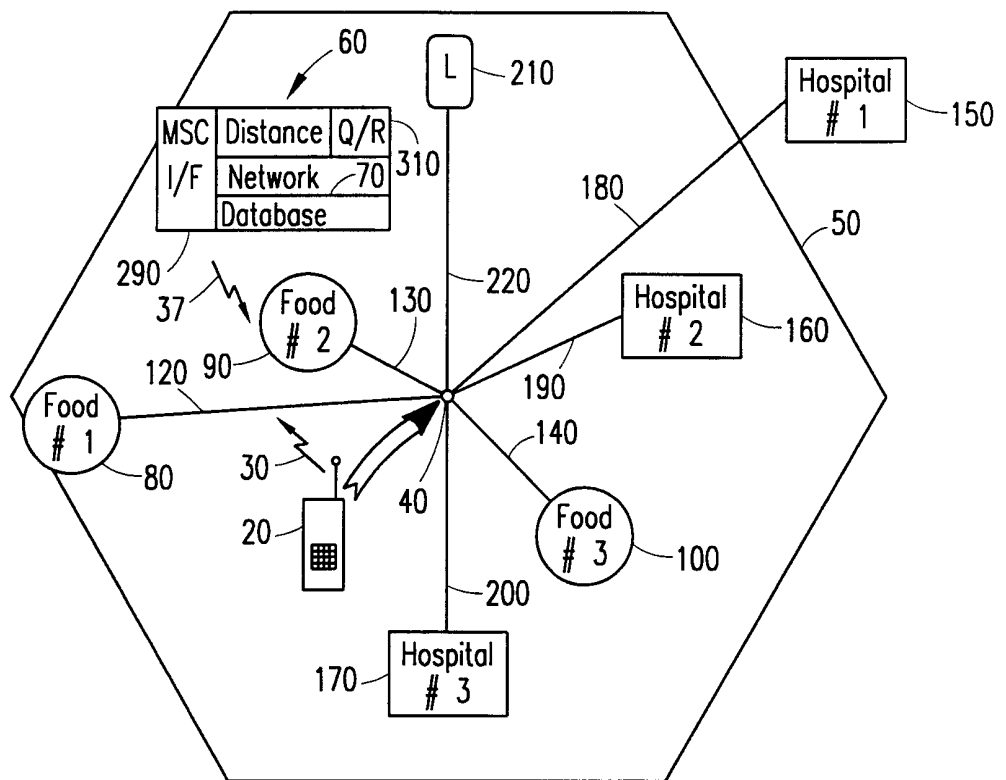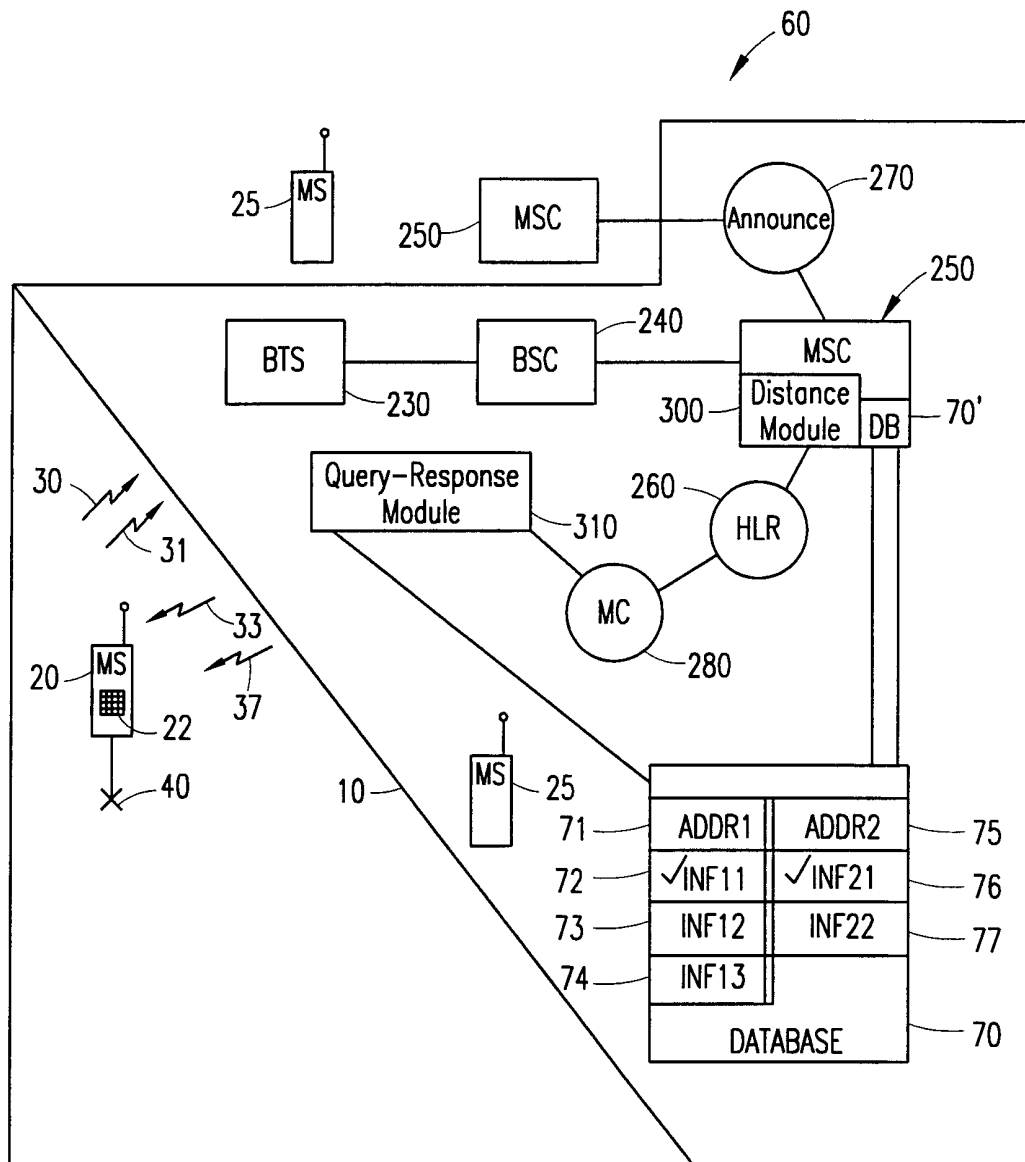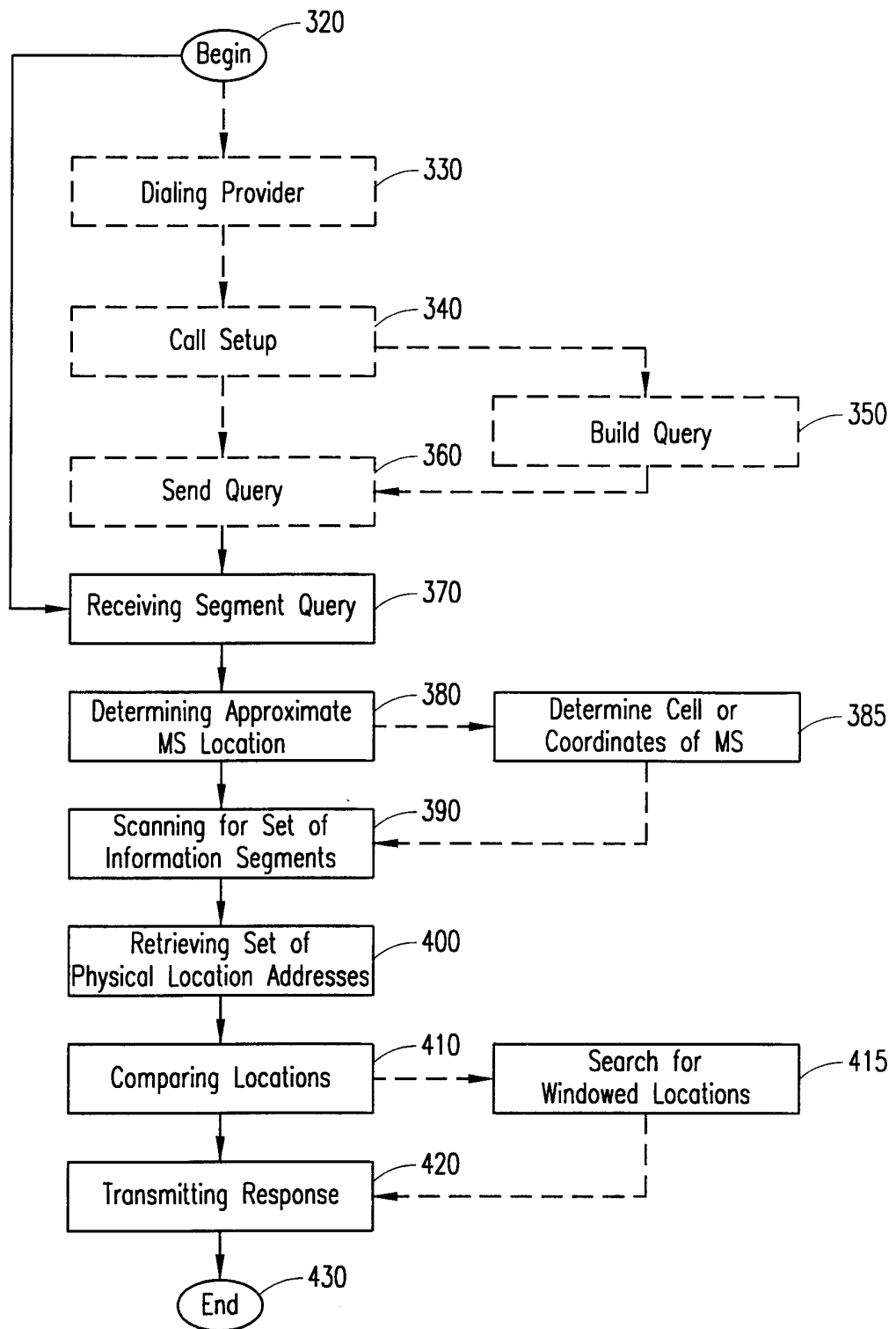36   the mobile station.

FIG. 1

FIG. 2

3/3

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                    ┌─── 320
                ( Begin )
                     │
         ┌ ─ ─ ─│─ ─ ─ ─ ┐ ── 330
         │   Dialing  Provider   │
         └ ─ ─ ─│─ ─ ─ ─ ┘
                     │
         ┌ ─ ─ ─│─ ─ ─ ─ ┐ ── 340
         │    Call  Setup    │ ─ ─ ─ ─ ─ ─ ┐
         └ ─ ─ ─│─ ─ ─ ─ ┘                  │
                     │              ┌ ─ ─ ─ ─│─ ─ ─ ┐ ── 350
                     │              │   Build  Query   │
         ┌ ─ ─ ─│─ ─ ─ ─ ┐ ── 360  └ ─ ─ ─ ─│─ ─ ─ ┘
         │   Send  Query   │◄─ ─ ─ ─ ─ ─ ─ ┘
         └ ─ ─ ─│─ ─ ─ ─ ┘
                     │
         ┌─────────┴─────────┐ ── 370
         │  Receiving Segment Query │
         └─────────┬─────────┘
                     │
    ┌─────────────┴───────┐ ── 380   ┌──────────────────┐ ── 385
    │ Determining Approximate │ ─ ─ ─ ─►│  Determine Cell  or  │
    │     MS  Location      │          │ Coordinates of MS  │
    └─────────────┬───────┘          └──────────────────┘
                     │                               │
    ┌─────────────┴───────┐ ── 390                  │
    │   Scanning  for  Set of │◄─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
    │  Information  Segments │
    └─────────────┬───────┘
                     │
    ┌─────────────┴───────┐ ── 400
    │   Retrieving  Set of    │
    │ Physical Location Addresses│
    └─────────────┬───────┘
                     │
    ┌─────────────┴───────┐ ── 410   ┌──────────────────┐ ── 415
    │   Comparing  Locations  │ ─ ─ ─ ─►│     Search  for      │
    └─────────────┬───────┘          │  Windowed  Locations │
                     │                  └──────────────────┘
    ┌─────────────┴───────┐ ── 420                  │
    │   Transmitting  Response │◄─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ┘
    └─────────────┬───────┘
                     │
                ( End ) ── 430
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FIG. 3

1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 00/02286

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04Q 7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9911078 A1 (TELEFONAKTIEBOLAGET LM ERICSSON(PUBL)), 4 March 1999 (04.03.99), page 2, line 28 - page 4, line 10, abstract	1-23
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X	US 5579535 A (ORLEN ET AL.), 26 November 1996 (26.11.96), column 1, line 49 - column 2, line 7; column 5, line 29 - line 49, figure 3	1-23
	--	

☐ Further documents are listed in the continuation of Box C.   ☒ See patent family annex.

Date of the actual completion of the international search	Date of mailing of the international search report
25 April 2001	18.05.2001
Name and mailing address of the International Searching Authority European Patent Office P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel(+31-70)340-2040, Tx 31 651 epo nl, Fax(+31-70)340-3016	Authorized officer Oskar Philgren /OGU Telephone No.

Form PCT/ISA/210 (second sheet) (July 1998)

	International application No.
02/04/01	PCT/SE 00/02286

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