

DESCRIPTION

Information Providing Method, Mobile Communication Network,
and Mobile Communication Terminal

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TECHNICAL FIELD

This invention relates to an information providing method
for providing information to mobile communication terminal
users via a mobile communication network; a mobile
10 communication network and a mobile communication terminal used
for the method.

BACKGROUND ART

In recent years, a cellular-type mobile communication
15 network that serves mobile communication terminals such as
mobile phones has widely spread. In such a mobile communication
network, it is necessary for the network to grasp the present
location of a mobile communication terminal in order to call
up the mobile communication terminal when receiving a call. The
20 location search of the mobile communication terminal is
performed for this purpose.

This location search is performed in units of area which
is formed by collecting a number of cells, the cells being formed
by base stations in the mobile communication network and ranging
25 from hundreds of meters to several kilometers in radius. Each
base station transmits area identification information, and
mobile communication terminal detects that it has transferred
to a different area according to changes in the area

identification information. The mobile communication terminal then sends location registration request signals to the network, and identification information of the mobile communication terminal and the area identification information of a new location are stored in the location database in the network. The network, thus, is able to grasp the present location of a mobile communication terminal at all times, and this information is utilized for calling up mobile communication terminal in receiving a call.

Recently, a variety of a non-voice use of the mobile communication network has been prevailing, and a data communication service has been suggested to provide value-added information regarding a local area where mobile communication terminals are located by utilizing the registered location related information as exemplified above.

An area in which the conventional location search is performed, however, covers a wide range of greater than 10 kilometers in radius because each area is the collection of many wireless cells; a problem lies here in that it is impossible to provide detailed location related information regarding a limited area around a particular station where a mobile communication terminal is located, given that location related information provision services are provided based on the conventional location related information.

DISCLOSURE OF INVENTION

This invention is made under the above-mentioned situation, and has an object to provide an information providing

method, a mobile communication network, and a mobile communication terminal that can provide detailed location related information to users of mobile communication terminals.

This invention, in order to solve the above-mentioned
5 problem, provides an information providing method for providing information to mobile communication terminals by dispatching information signals from base stations of the mobile communication network that serves a plurality of mobile communication terminals. The information providing method
10 comprises a step of accumulating, within the network, location related information related to wireless cells covered by a given base station, a step of broadcasting said location related information as information signals from said base station, and a step of a mobile communication terminal located within the
15 range of wireless cells covered by said base station receiving said information signals; and a mobile communication network and mobile communication terminals for carrying out the method. This invention, thus, allows to provide the detailed location related information to mobile communication terminals users.

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BRIEF DESCRIPTION OF THE DRAWINGS

Fig.1 is a block diagram showing an overall configuration of a mobile communication system according to an embodiment of the present invention.

25 Fig.2 is a block diagram showing a hardware configuration of a mobile station 10 in the embodiment.

Fig.3 is a block diagram showing a functional configuration of a gateway server 25 in the embodiment.

Fig.4A and Fig.4B are data format diagrams of an information storage 254 provided in the gateway server 25 in the embodiment.

Fig.5 is a block diagram showing a configuration of a base station control unit 22A in the embodiment.

Fig.6A and Fig.6B are data format diagrams of a memory 223A provided in the base station control unit 22A in the embodiment.

Fig.7 is a flow diagram showing an operation of information transmission of the mobile communication system in the embodiment.

Fig.8A to Fig.8C are diagrams showing examples of display images shown on the liquid crystal display of the mobile station 10 in the embodiment.

Fig.9 is a flow diagram showing an operation in updating location related information of the mobile communication system in the embodiment.

Fig.10 is a flow diagram showing an operation of updating menu information of the mobile communication system in the embodiment.

BEST MODE FOR CARRYING OUT THE INVENTION

1: Configuration

1-1: Overall Configuration of Mobile Communication System

First of all, a configuration of a whole mobile communication system will be discussed below according to an embodiment of the present invention.

Fig.1 is a block diagram showing the configuration of the

whole mobile communication system. As shown in the figure, this mobile communication system has a mobile station 10 as a mobile communication terminal, a mobile packet communication network 20, Internet 30 as a network, and IP servers 40A and 40B as server devices.

The mobile station 10, for example, is served by the mobile packet communication network 20 and is a mobile phone capable of performing data transmission. Using this mobile station 10 enables its user to refer to various information provided from the mobile packet communication network 20. The mobile packet communication network 20 is a communication network for providing a packet communication service to a mobile station 10. This network has base stations 21A to 21F for transmitting location related information as information signals, base station control units 22A and 22B, a home memory 23, and a packet subscriber processing unit 24, a gateway server 25, and a communication cable connecting these components to one another.

The base stations 21A to 21F are spaced out at a certain distance within a mobile communication service area and perform a wireless communication with the mobile station 10 located within a wireless cell zone covered by each base station.

Each of the base station control units 22A and 22B is connected to a plurality of the base stations 21A to 21C, or 21D to 21F, and controls a communication processed by the base stations 21A to 21C, or 21D to 21F.

In addition, this base station control unit 22A, or 22B, is equipped with a memory 223A, or 223B, that stores location

related information to be delivered to each of its subordinate base stations 21A to 21C, or 21D to 21F, these information being stored corresponding to each of the base stations 21A to 21C, or 21D to 21F.

5 The base stations 21A to 21F generate information signals indicating various information delivered from the base stations control units 22A and 22B, and transmits the generated information signals to wireless cells covered by each station. The information delivered from the base station control unit
10 22A, or 22B, to the base stations 21A to 21C, or 21D to 21F, are information related with a local area where each of the base stations 21A to 21C, or 21D to 21F, is located, the information being hereinafter referred to as location related information. A service for providing those location related information to
15 a user of the mobile station 10 via the base stations 21A to 21F will be referred to as location related information providing service hereinafter.

 The home memory 23 stores various information such as subscriber information, registered location information,
20 accounting information, and authentication information registered as a database. These information are read out by a remote access from the base station control units 22A and 22B and the packet subscriber processing unit 24, and utilized for various types of control processings in the network.

25 The packet subscriber processing unit 24 receives a packet switching request from the mobile station 10, and handles the processing of relaying the above packet switching, given that the packet switching request is justified after confirming

the validity of the packet with reference to the home memory
23.

The gateway server 25 is a computer system established
at a mobile packet gateway relaying/switching center for
5 interconnecting the mobile packet communication network 20 and
other networks such as the Internet 30.

This gateway server 25, in addition to performing the
conversion of communication protocols between the mobile packet
communication network 20 and the Internet 30, performs a
10 relaying operation of various data exchanged among mobile
stations 10, or between a mobile station 10 and the IP server
40A or 40B (hereinafter referred to as among/between nodes).
The IP servers 40A and 40B each is a server system operated by
an Information Provider (IP). This system accumulates
15 location related information as data written in the Hyper Text
Markup Language (HTML), and provides the accumulated location
related information to the gateway server 25.

When contents of the accumulated location related
information are updated, this IP server 40A or 40B transmits
20 the fact that the information have been updated and contents
of the updated information as updated information to the gateway
server 25.

1-2: Configuration of Mobile Station 10

25 Fig.2 is a block diagram showing the configuration of the
mobile station 10. The mobile station 10 has a
transmitter-receiver 11 that receives information signals
transmitted as location related information and transmits

request signals requesting location related information; a controller 12 that validates the reception of information signals received at said transmitter-receiver and has a memory to store control information necessary for the validation; and
5 a user interface unit 13, and a bus 14 that interconnects the above components.

The transmitter-receiver 11 conducts wireless communications with the base stations 21A to 21F of the mobile packet communication network, or the mobile communication
10 network 20.

The user interface unit 13 is equipped with a liquid crystal display that displays various information, a keypad by which users perform various inputting operations, and a microphone and a speaker for users' calling operations.

15 The controller 12 controls each of the components of the mobile station 10, and has a CPU 121, a ROM 122, and a RAM 123.

The ROM 122 stores various control programs; the CPU 121 reads out these control programs and carries out various types of control processings. The RAM 123 is used as a work area at
20 this time.

The control programs within the ROM 122 include a document data viewing software, known as a browser, in addition to programs regarding calling functions of the mobile station 10.

When the transmitter-receiver 11 receives data in a form
25 of HTML transmitted from the base stations 21A to 21F, the CPU 121 reads out the mentioned browser from ROM 122 and carries it out so that the received data can be displayed on the liquid crystal display.

In order to receive this location related information providing service, a user of the mobile station 10 needs to contract in advance with a common carrier for subscribing this service. The mobile station 10 owned by a user who has made
5 this contract stores control information for validating the reception of information signals sent from the base stations 21A to 21F.

These control information are such information as identification code information for distinguishing a mobile
10 station 10 allowed to receive the location related information service (a mobile station 10 owned by a user who has made the service subscription contract) from a mobile station 10 not allowed to receive the service (a mobile station 10 owned by a user without the service subscription contract); or key
15 information for interpreting information signals received by the mobile station 10. These control information are stored in the mobile station 10 by inputting the information into the mobile station 10 at the store of a communication carrier, alternatively by transmitting to the mobile station 10 from the
20 mobile packet communication network by a wireless communication.

1-3: Configuration of the Gateway Server 25

A configuration of the gateway server 25 will be discussed
25 below.

Fig.3 is a block diagram showing a functional configuration of the gateway server 25. As shown in the figure, the gateway server 25 has an interface unit 251, a subscriber

information manager 252, an information storage or a memory 254, and a bus 255 interconnecting these components.

The interface unit 251 functions as an interface among networks, such as performing protocol conversions between the mobile packet communication network 20 and the Internet 30. To illustrate, the interface unit 251 performs an inter-conversion of protocols between a given transmission protocol used in the mobile packet communication network 20 and a TCP/IP (Transmission Control Protocol / Internet Protocol), which is a transmission protocol of the Internet 30.

The subscriber information manager 252 stores and manages subscriber information acquired by referring to the home memory 23 mentioned above.

The data delivery manager 253 performs a relaying operation and a delivering operation of data exchanged among nodes. For example, the data delivery manager 253 receives location related information and/or updated information sent from the IP server 40A or 40B, and delivers the location related information acquired from the information storage 254 described below, to the base station control units 22A and 22B.

The information storage 254 has two data files: a menu information file and a location related information file.

Fig.4A and Fig.4B show data formats for the menu information file and the location related information file provided in the data storage 254.

Menu information stored in the menu information file are information indicating menu items of location related information. For example, those information include such

information as restaurants, gas stations, museums, and movie theaters, as shown in the figures.

Common carriers update, as required, the menu information by adding new menu items, modifying or deleting the existing
5 menu items in the menu information file.

On the other hand, location related information stored in the location related information file are information subordinated to the above-mentioned menu information. Those information include such information as names of restaurants,
10 their location, phone number, products, and holidays, as shown in the figures.

These location related information are stored corresponding to the base stations 21A to 21F located in each area. For example, the figures show that the restaurants A and
15 B are located in an area where the base station A is located.

There is also a case, as shown in the figures, that each set of location related information is stored corresponding to a group of base stations consisting of a plurality of the base stations 21, the base station 21B and 21C, instead of each set
20 of location related information being stored corresponding to a single base station 21.

Further, location related information do not necessarily correspond to all the base stations 21A to 21F as no location related information are shown for the base station D in the
25 figures.

These location related information are information provided from the IP server 40A or 40B and updated based on the updated information from the IP server 40A or 40B, as described

before.

When the menu information or location related information in the information storage 254 are updated, the data delivery manager 253 is to transmit a notification message that includes
5 the fact that menu information or location related information have been updated and the updated information to the base stations control units 22A and/or 22B that store the updated information. The base stations control units 22A and/or 22B, upon receiving this notification message, is to update
10 information within memories 223A and/or 223B based on the contents of the message.

1-4: Configuration of the base station control units 22A and 22B

15 A configuration of the base station control units 22A and 22B will be discussed below.

Fig.5 is a block diagram showing a configuration of the base station control unit 22A. As shown in the figure, this base station control unit 22A comprises a controller 221A, a
20 signal generator 222A, a memory 223A, and a transmitter-receiver 224A.

The controller 221A controls throughout this base station control unit.

The signal generator 222A generates the information
25 stored in the memory 223A into the signal receivable by the mobile station 10.

The transmitter-receiver 224A transmits and receives information exchanged with the base stations 21A to 21C

controlled by the base station control unit 22A and information exchanged with the gateway server 25 via the packet subscriber processing unit 24.

Also, the transmitter-receiver 224A distributes the
5 above information signals generated by the signal generator 222A to its subordinate base stations 21A to 21C.

Next, the memory 223A will be discussed. Fig.6A and Fig.6B show a memory configuration of the memory 223A. As shown in the figures, the memory 223A stores menu information, and
10 location related information corresponding to the base stations 21A to 21C controlled by the base station control unit 22A.

The menu information stored in this memory 223A are identical information to the menu information stored in the gateway server 25 mentioned above. Location related
15 information stored in this memory 223A are the location related information corresponding merely to the base stations 21A to 21C among the above-mentioned location related information stored in the gateway server 25.

The menu information and location related information in
20 this memory 223 are updated according to the update notification from the gateway server 25 as mentioned before.

The base station control unit 22B has the same configuration as that of the base station control unit 22A explained above, and the location related information stored
25 in the memory 223B include location related information corresponding only to the base stations 21D to 21F.

2: Operation

The operation of the present embodiment having the above configuration will be discussed below in the following two cases: one case where information are sent to the mobile station 10 from the base stations 21A to 21F; and the other case where
5 contents of the information stored in the memory 223A, or 223B, of the base station control unit 22A, or 22B are updated.

2-1: Operation for Information Transmission

First of all, an operation in transmitting various
10 information from any one of the base stations 21A to 21F to a mobile station 10 will be discussed, with reference to Fig.7 and Fig.8A to Fig.8C.

Fig.7 is a flow diagram showing operations of the base station 21A and the mobile station 10 in transmitting
15 information; the Fig.8A to 8C are screen images shown on the liquid crystal display of the mobile station 10 during the information transmission.

The base station control unit 22A broadcasts information signals indicating menu information and location related
20 information at all times without specifying the destination (step Sa1).

The mobile station 10 located in a wireless cell zone of the base station 21A receives information signals transmitted from the base station 21A (step Sa3).

25 The mobile station 10, upon receiving the signals from the base station 21A, determines as to whether it is possible to receive the location related information indicated in the received information signals (step Sa5). The determination

depends on whether the control information for validating
receptions of information signals are stored in advance within
the mobile station. If the control information is stored, it
is determined that the reception of the signals is allowed; if
5 not stored, it is determined that the reception is not allowed.

If the result of the determination at this step Sa5 is
negative (in other words, if it is not allowed to receive the
location related information), the mobile station 10 abandons
the received location related information and the process in
10 the figure ends.

On the other hand, if the result of the determination at
this step Sa5 is positive (in other words, if it is allowed to
receive the location related information), the mobile station
10 outputs ringing melodies from its speaker indicating that
15 the location related information have been received, shows a
message asking its user whether to display the received location
related information, and awaits its user for inputting the
response to the message (step Sa7).

The display image shown on the liquid crystal display of
20 the mobile station 10 at this step is indicated in Fig.8A.

Following the input from the user, the mobile station 10
determines whether to display the received location related
information based on the input contents(step Sa9).

If the result of the determination at step Sa9 is negative,
25 in other words, if the location related information should not
be displayed, the process in the figure ends.

On the other hand, if the result of the step Sa9 turns
out positive, in other words, if the location related

information should be displayed, the mobile station 10 first interprets the received information signals and displays menu information, and awaits until the user makes a menu selection (Sa11).

5 A screen image shown at this stage on the liquid crystal display of the mobile station 10 is shown in the Fig.8B.

Following the input of the selected menu by the user, the mobile station 10 displays the location related information corresponding to the input contents(step Sa13), and the
10 processing ends.

A screen image shown on the crystal liquid display of the mobile station 10 in the case of restaurants information being selected by the user at this stage, for example, is shown in the Fig.8C.

15

2-2: Operation for Information Update

Next, an operation in updating information will be described in one case of updating location related information and in the other case of updating menu information.

20 2-2-1: Operation in Updating Location Related Information

The operation in updating location related information stored in the memory 223A/223B of the base stations control unit 22A/22B will be discussed. Fig.9 is a flow diagram showing the operation in updating location related information in the
25 memory 223A of the base station control unit 22A.

First of all, either IP server 40A or 40B updates the location related information stored in itself. It is supposed here that the IP server 40A performs this operation.

The IP server 40A, which has updated the location related information, transmits data including the fact of location related information being updated and data of updated location related information to the gateway server 25 (step Sb1). This data of updated information includes only the parts different from the unupdated data for the sake of reducing the traffic. Hereinafter, the term "the data of updated location related information" indicates the data similar to the data explained above. Likewise, the same term in the menu information in Fig. 9, which will mentioned later indicates such data.

The gateway server 25 receives the updated information from the IP server 40A (step Sb3). The gateway server 25 then interprets the received updated information and updates the location related information stored in the information storage 254 (step Sb5).

When the updating processing is completed, the gateway server 25 transmits a notification of the update completion to the IP server 40A, from which the update information is transmitted (step Sb7).

The IP server 40A receives the notification of the update completion and confirms that the updating of location related information has been processed (step Sb9).

Next, the gateway server 25 transmits the fact that the location related information have been updated and the updated location related information as an update notification to the base station control unit 22A corresponding to the updated location related information (step Sb11).

The base station control unit 22A receives the update

notification from the gateway server 25 (step Sb13) and subsequently updates the location related information stored in the memory 223A according to the update notification (step Sb15).

5 The base station control unit 22A that has updated the location related information transmits the notification of the update completion to the gateway server 25 (step Sb17).

 The gateway server 25 then receives the notification of the update completion from the base station control unit 22A
10 (step Sb19) and confirms the completion of the update; thus, the process shown in the figure ends.

2-2-2: Operation in Updating Menu Information

 Next, an operation in updating menu information stored
15 in the memory 223A/223B of the base station control unit 22A/22B will be described below.

 Fig.10 is a flow diagram showing the operation in updating the menu information stored in the memory 223A.

 In the operation shown in the figure, the common carrier
20 first updates menu information stored in the gateway server 25.

 The gateway server 25 transmits the fact of menu information being updated and the updated menu information as an update notification to the base station control unit 22A or 22B (step Sc1).

25 The base station control unit 22A or 22B receives the update notification (step Sc3) and updates the menu information stored in each memory 223A or 223B according to the update notification (step Sc5).

The base station control unit 22A or 22B transmits the notification of the update completion to the gateway server 25 (step Sc7).

5 The gateway server 25 then receives the notification of the update completion (step Sc9), and confirms that the updating of the menu information is completed; thus, the processing shown in the figure ends.

According to the embodiment described so far, each base station 21A to 21F transmits the information signals
10 corresponding to its location, and a mobile station 10 located in a wireless cell zone of the base stations 21A to 21F can acquire information corresponding to its own location because using the above-mentioned control information allows the mobile station 10 to receive the information signals.

15

3: Modifications

3-1: Embodiment of the Mobile Station 10

3-1-1: Operation in Validating the Information Signals in the Mobile Station 10

20 In the embodiment mentioned above, the mobile station 10 stores the control information used to validate the reception of the information signals; it is possible further to include another control information, in information signals, that are different from the above control information.

25 To illustrate, the mobile station 10 allowed to receive the location related information providing service stores first control information for validating the reception of the information signals, and the information signals sent from the

base stations 21A to 21F include second control information for validating the reception of the information signals. The reception of the information signals are validated here only when the mobile station that stores the first control
5 information receives the information signals including the second control information.

Further, while the mobile station 10 can receive all the location related information in the above-mentioned embodiment, it is not so limited but is possible to receive or not to receive
10 only particular types of location related information; for example, only restaurants information.

To be concrete, the mobile station 10 stores third control information, control information indicating the types of receivable location related information. On the other hand,
15 fourth control information, control information indicating types of location related information, are included in headers of packet signals sent from the base stations 21A to 21F. Then, the mobile station 10 can refer to the fourth control information included in the headers of the packet information
20 signals that have been received from the base stations 21A to 21F, and abandon information signals other than the types of location related information designated by the third control information, which have been stored in the mobile station 10 itself after receiving the signals.

25 Furthermore, it is also possible for the mobile station 10 not to receive particular kinds of information, employing the similar method to the above. This method is beneficial in preventing minors from receiving location related information

that are adult-rated.

3-1-2: Embodiment of Information Display in the Mobile Station 10

5 In the above-mentioned embodiment, the mobile station 10 is to show the received information on the liquid crystal display, but it is not limited to that mode of display. For example, it can be a voice presentation using the speaker of the mobile station 10 when showing the contents of the received
10 information.

3-1-3: Embodiment of the Mobile Station 10

 In the above-mentioned embodiment, the mobile station 10 such as a mobile phone is to be used, but it is not limited thereto.
15 It also can be any mobile communication terminal such as a Personal Digital Assistants (PDA) without calling functions, if such terminal being equipped with a function for performing wireless communications between it and the base station 21 of the mobile communication network.

20

3-2: Embodiment of Base Stations 21A to 21F and Base Station Control Units 22A and 22B

3-2-1: Timing of the Information Transmission

 In the above-mentioned embodiment the base station
25 control units 22A and 22B are to transmit location related information at all times via the base stations 21A to 21F, but it is not necessarily in this way.

 For example, the base station control units 22A and 22B

can be equipped with a timer so as to transmit location related information via the base stations 21A to 21F at intervals according to the timer.

Also, when requested from a particular unit within the mobile communication network, for example, the gateway server 25, the base station control units 22A and 22B can transmit the location related information via base stations 21A to 21F in response to the request.

Also, when a request for information transmission is sent from a given unit outside the mobile communication network, for example, IP server 40A or 40B, to the gateway server 25, and a request for information transmission is subsequently made from the gateway server 25 to the base station control units 22A and 22B, it is possible to transmit location related information via base stations 21A to 21F in response to that request.

In another variation, the base station control units 22A and 22B can transmit location related information when requested from the mobile station 10.

For instance, a predetermined operation by the user causes the mobile station 10 to transmit the information request signals first. The information request signals include the above-mentioned control signals stored in the mobile station 10.

Subsequently, the request signals are received by one of the base stations 21A to 21F where the mobile station 10 is located. Supposing that the base station 21A receives the request signal, the base station 21A transmits the received

request signals to the base station control unit 22A in this case.

The base station control unit 22A confirms that the received request signals include the above-mentioned control
5 signals, reads out location related information from the memory 223, and transmits information signals via its subordinate base stations 21A to 21C.

The mobile station 10 located within the wireless cell zone of the base station 21A receives and interprets the
10 information signals sent from the base station 21A, and displays the location related information.

3-2-2: Embodiment of the Device that Sends Information Signals

In the above-mentioned embodiment, signals indicating
15 location related information are transmitted from the base stations 21A to 21F, but it is not limited thereto. The signals can be transmitted from a given device either by a wire or wirelessly connected to the mobile packet communication.

The given device, for instance, can be an information
20 signal transmission device established exclusively for this information providing service.

3-3: Embodiment of Role Allocated to the Base Station Control Units 22A and 22B, and the Gateway Server 25

25 In the above-mentioned embodiment, the base station control unit 22AB, or 22, is equipped with the memory 223A, or 223B; location related information stored therein are transmitted via the base stations 21A to 21C, or 21D to 21F.

However, it is not so limited but is sufficient to have storage means such as the memory 223A or 223B placed in a particular unit that can be communicated with the base station control unit 22A or 22B.

5 For example, the home memory 23 shown in Fig.1 can be equipped with the storage means; a switching center (not shown) of communication lines can be equipped with the storage means; or each of the base stations 21A to 21F can be equipped with the storage means.

10 Also, only the gateway server 25 may have storage means (the information storage 254, mentioned before), instead of the base stations control unit 22A or 22B having storage means such as the memory 223A or 223B. In this case, the gateway server 25 transmits an information transmission instruction with the
15 said location related information to the base stations 21A to 21F corresponding to location related information stored by the storage means (the information storage 254), and the base stations 21A to 21F transmit the location related information in response to the received transmission instruction.

20 Thus, there is no need to establish a memory 223A or 223B for each of the base station control units 22A and 22B. Also, in updating information, the gateway server 25 only has to update location related information stored in itself.

25 3-4: Embodiment of Information Transmitted from the Base Stations 21A to 21F

3-4-1: An Originating Unit of Location Related Information

In the above-mentioned embodiment, location related

information originates from the IP server 40A and 40B, and the location related information stored within the network are updated according to the update information from the IP server 40A and 40B, but it is not necessarily in this way.

5 For example, location related information can originate from a given server established in the mobile packet communication network by a common carrier, and the update information can be transmitted from this server to the base station control units 22A and 22B.

10

3-4-2:Types of Location Related Information

In the above-mentioned embodiment, location related information are mainly shop information such as restaurants, but it is not limited to such types of information.

15 For example, the information can be on time tables of train stations or bus stops of an area where the mobile station 10 is located, and also can be news or weather forecast of the area.

20 3-4-3: An Originating Unit and Embodiment of Menu Information

In the above-mentioned embodiment, menu information are information common to all the base station control units 22A and 22B, but it is not necessarily in this way. For example, the information can be common to a plurality of base station
25 control units 22, or can be unique information for each base station control unit 22.

It is also possible for the mobile station 10 to store menu information in advance.

Furthermore, it is not necessary to have menu information. That is, the base station control units 22A and 22B can transmit only location related information at all times via base stations 21A to 21F, and the mobile station 10 can display the received
5 location related information as they are.

3-5: Embodiment in Connection of IP Server 40

In the above-mentioned embodiment, the IP servers 40A and 40B are connected to the gateway server 25 via the Internet 30,
10 but it is not limited to such a mode of connection.

For example, the IP servers 40A and 40B can be connected to the gateway server 25 via private lines, or can be placed inside the gateway server 25.

15 3-6: Description Language of Data

In the above-mentioned embodiment, data exchanged among the IP servers 40A and 40B, the gateway server 25, and the mobile station 10 are written in a form of HTML, but it is not limited thereto. It is possible to use other description languages such
20 as Extensible Markup Language(XML).

CLAIMS

1. An information providing method for providing information to a mobile communication terminal by transmitting information signals from base stations of a mobile communication network that serves a plurality of mobile communication terminals, comprising:

accumulating, within said mobile communication network, location-related information on a location covered by a base station;

providing control information comprising identification code information for distinguishing a mobile communication terminal allowed to receive said location-related information; and

broadcasting said location-related information as information signals from said base station.

2. An information providing method for providing information to a mobile communication terminal served by a mobile communication network, comprising:

accumulating in a storage device location-related information on a location;

providing control information comprising identification code information for distinguishing a mobile communication terminal allowed to receive said location-related information;

broadcasting, from a wireless communication device covering said location, said location-related information stored in said storage device as information signals; and

receiving, at a mobile communication terminal within said location, said location-related information broadcast from said wireless communication device.

3. An information providing method according to Claim 1 or 2, wherein said location-related information is continuously broadcast.

4. An information providing method according to Claim 1 or 2, wherein said location-related information is intermittently broadcast.

5. An information providing method according to Claim 1 or 2, wherein said information signal is received by a particular mobile communication terminal.

6. An information providing method according to claim 5, wherein said particular mobile communication terminal stores said control information for validating reception of said information signals.

7. An information providing method according to claim 1 or 2, further comprising:

storing in a mobile communication terminal first control information for validating the reception of said information signals; and

adding second control information to the location-related information transmitted from said base stations or from said wireless communication device, the second control information being used to validate reception of the information signals of the location related information; and

wherein reception of the information signals is validated only when the mobile communication terminal that stores said first control information receives the information signals of the location related information to which said second control information has been added.

8. An information providing method according to claim 1 or 2, wherein the location-related information relating to a location is accumulated in a server device connected to said mobile communication network, and said information signals of the location related information are transmitted from said base station or said wireless communication device in response to a transmission request from said server device.

9. An information providing method according to claim 1 or 2, further comprising:

- storing in a mobile communication terminal control information for validating a request for said location-related information;

- transmitting a request signal requesting said location-related information along with said control information from said mobile communication terminal to said mobile communication network; and

- transmitting said location-related information as information signals from said base station or said wireless communication device in a case of receiving the request signal to which said control information has been added.

10. An information providing method according to claim 1 or 2, wherein said mobile communication terminal is a mobile phone used for conducting wireless communication.

11. A mobile communication network serving a plurality of mobile communication terminals and providing information to mobile communication terminals by transmitting information signals from base stations, comprising:

- a memory for storing location-related information on a location covered by a base station;

- control information providing means for providing control information comprising identification code information for distinguishing a mobile

communication terminal allowed to receive said location-related information;
and

information signal transmission means for broadcasting said location-related information as information signals from said base station.

12. A mobile communication network according to claim 11,

wherein first control information for validating reception of said information signals is stored in a mobile communication terminal; and

wherein said information signal transmission means transmits said location-related information after adding second control information for validating reception of information signals of the location-related information, whereby reception of the information signals is validated only when the mobile communication terminal storing said first control information receives information signals to which said second control signals has been added.

13. A mobile communication network according to Claim 11 or 12,

wherein third control information is stored in a mobile communication terminal, said third control information designating a type of location-related information that can be received by said mobile communication terminal; and
wherein said information signal transmission means transmits said location-related information after adding fourth control information for identifying a type of said location-related information, whereby reception of said information signals is validated on the basis of said third control information and said fourth control information.

14. A mobile communication network according to claim 11, further comprising information update means for updating contents of said location-related information stored in said memory.

15. A mobile communication network according to claim 11,
wherein said mobile communication terminal is a mobile phone used for
conducting wireless communication.

16. A mobile communication terminal served by a mobile communication
network, and used for conducting wireless communication with base stations of
the mobile communication network, comprising:

information signal receiving means for receiving information signals of
location-related information on a location covered by a base station, the
information signals being transmitted from the base station;

a memory for storing control information for validating reception of the
information signals, said control information comprising identification code
information for distinguishing a mobile communication terminal allowed to
receive said location-related information; and

information signal validating means for validating reception of said
information signals on the basis of said stored control information.

17. A mobile communication terminal served by a mobile communication
network, and used for conducting wireless communication with base stations of
the mobile communication network, comprising:

a memory for storing first control information sent from said base
station for validating reception of information signals of location-related
information on a location covered by the base station;

information signal receiving for receiving said information signals to
which second control information for validating reception of the information
signals has been added; and

information signal validating means for validating reception of said
information signals on the basis of said stored first control information and said
received second control information.

18. A mobile communication terminal according to claim 17, wherein:

said memory further stores third control information designating a type of location-related information on a location covered by a base station, said location-related information being transmitted from said base station; and

in a case where fourth control information has been added to said information signals for identifying a type of said location-related information, said information signal validating means validates reception of said information signals on the basis of said stored control information, said stored third information, and said received fourth information.

19. A mobile communication terminal served by a mobile communication network, and used for conducting wireless communication with base stations of the mobile communication network, comprising:

a memory for storing control information for validating a request for location-related information on a location covered by a base station, said control information comprising identification code information for distinguishing a mobile communication terminal allowed to receive said location-related information;

request signal transmission means for transmitting a request signal requesting location-related information to said mobile communication network; and

information signal receiving means for receiving information signals transmitted as the location-related information from said base station in response to said transmitted request signal.

20. A mobile communication terminal according to any one of claims 16 to 19, wherein said mobile communication terminal is a mobile phone used for conducting wireless communication.

21. An information management device for managing information to be transmitted from a wireless communication device to a mobile communication terminal within a location covered by said wireless communication device, said information management device being connected to said wireless communication device, comprising:

a memory for accumulating location-related information on a location;

control information providing means for providing control information comprising identification code information for distinguishing a mobile communication terminal allowed to receive said location-related information; and

means for transmitting, to a wireless communication device covering said location, said accumulated location-related information, said location-related information being broadcast as information signals from said wireless communication device.