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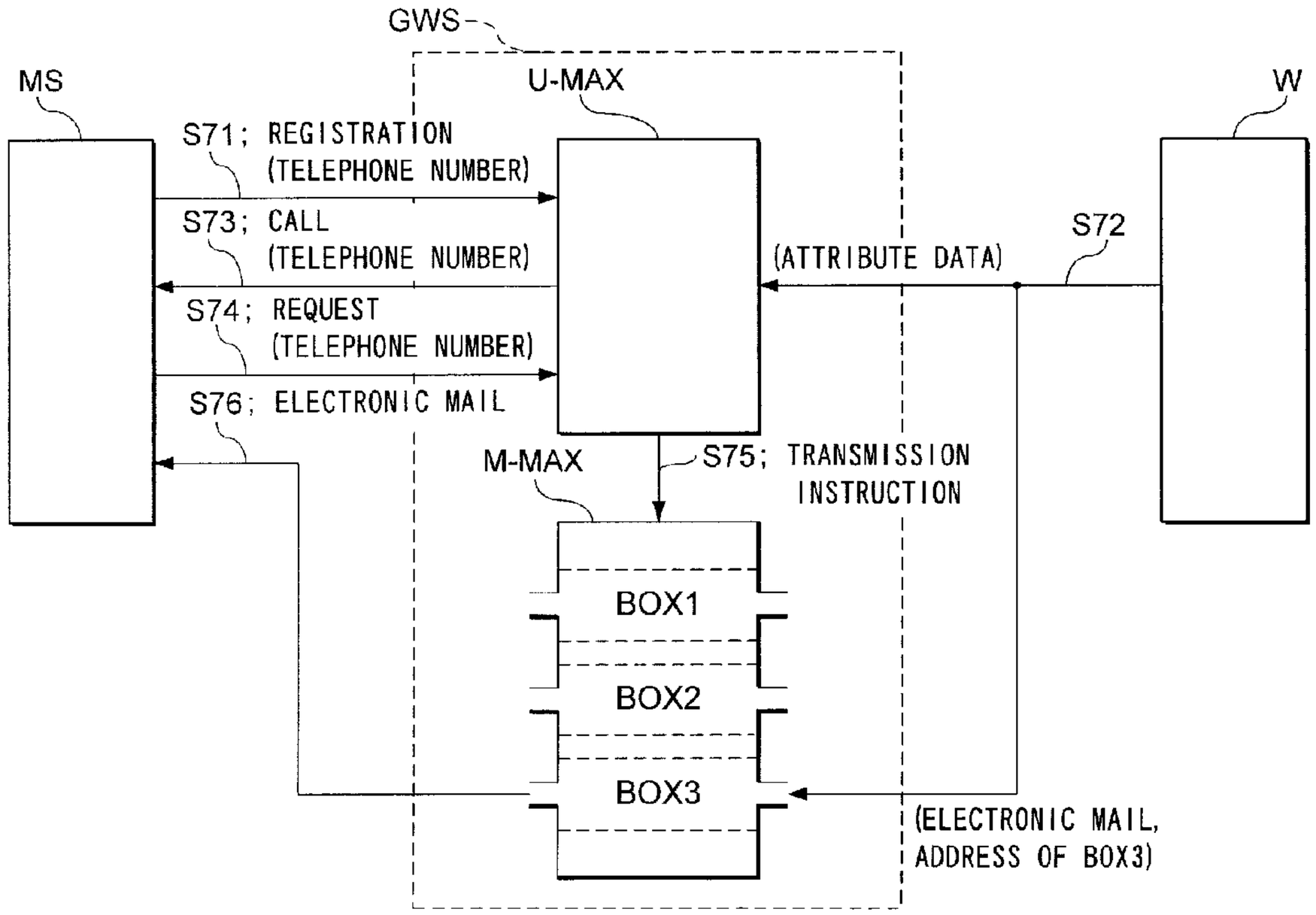

(57) Abrégé/Abstract:
The user of a mobile station which is prepared to receive information providing services from unspecified IP (Information Providers) accesses a gateway server and performs a pre-registration procedure (S71). When an IP server has information to provide to users, it constructs the information in the form of electronic mail, appends user attribute data, and sends this to the gateway server (S72). Upon receiving electronic mail with attribute data, the gateway server stores the electronic mail in a third mailbox, makes a comparison of the user attributes, and calls the mobile stations of relevant users (S73). A user who has received a call requests a download of the electronic mail from the gateway server (S74). The gateway server sends electronic mail to the mobile station which made the request (S75, S76).

ABSTRACT

The user of a mobile station which is prepared to receive information providing services from unspecified IP (Information Providers) accesses a gateway server and performs a pre-registration procedure (S71). When an IP server has information to provide to users, it constructs the information in the form of electronic mail, appends user attribute data, and sends this to the gateway server (S72). Upon receiving electronic mail with attribute data, the gateway server stores the electronic mail in a third mailbox, makes a comparison of the user attributes, and calls the mobile stations of relevant users (S73). A user who has received a call requests a download of the electronic mail from the gateway server (S74). The gateway server sends electronic mail to the mobile station which made the request (S75, S76).

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DESCRIPTION

PUSH-TYPE INFORMATION TRANSMISSION METHOD AND TRANSFER DEVICE THEREOF

Technical Field

The present invention relates to a push-type information transmission method which provides information from a server device to a plurality of user terminals via a network, and a transfer device thereof.

Background Art

Pull-type information transmission wherein a user accesses a server device of an information provider from a communication terminal such as a personal computer or the like to download desired information has been known conventionally in the field of information providing services which use the Internet.

Additionally, push-type information transmission wherein information is provided to the user from the server side without awaiting access by a user has been proposed in recent years.

Communication networks have become more complicated and diversified of late, so that the forms of networks in which various routers exist between the server device and the user terminal such as by interposing a gateway device between networks with different protocols have also increased.

Disclosure of the Invention

As the forms of networks continue to diversify as discussed above, various forms of information transmission services will become possible. As one example, it is possible to supplement a portion of the services involved in information transmission with a gateway unit instead of server device.

The present invention was made in view of these considerations, and has the purpose of offering a new form of push-type information transmission method and transfer device thereof, capable of supplementing a part of the services involved in information transmission between a server device and a user terminal instead of the server device.

In accordance with one aspect of the present invention there is provided in a communication network comprising an information provider server, a plurality of user terminals, and a transfer device for routing information transmission between said information provider server and said user terminals, a push-type information transmission method performed by the transfer device comprising: registering at least a network address of the information provider with the transfer device; registering at least a network address of a user terminal with the transfer device; registering the user terminal by sending information regarding the user terminal from the transfer device to the information provider server; receiving, at the transfer device, information for at least one of the plurality of user terminals and information identifying the at least one of the plurality of user terminals from said information provider server; storing, at the transfer device, said information; calling the at least one of the plurality of user terminals; and transmitting from the transfer device the stored information in response to a request from said called user terminal.

In accordance with another aspect of the present invention there is provided in a communication network comprising an information provider server, a plurality of user terminals, and a transfer device for routing information transmission between said information provider server and said user terminals, a push-type information transmission method performed by said transfer device comprising: storing identification information relating to user terminals which are to receive an information providing service offered by said information provider server; modifying the identification information relating to the user terminals; sending the modified identification information to the information provider server; receiving information for transmission and a user terminal identifier from said information provider server; storing said information for transmission; calling a relevant user terminal based on the stored identification information relating to user terminals, the modified identification information, and the user terminal identifier; and transmitting the stored information for transmission in response to a request from the called user terminal.

In accordance with yet another aspect of the present invention there is provided in a communication network comprising an information provider server, a plurality of user terminals, and a transfer device for routing information transmission between said information provider server and said user terminals, a push-type information transmission method performed by said transfer device comprising: storing user attribute data of users and network addresses of the user terminals in correspondence; receiving information supplied from said information provider server together with attribute information of users designated as desired destinations; storing said received information; comparing said stored user attribute data and the designated user attribute data, and specifying network addresses of user terminals corresponding to users having the designated

attributes; calling the specified user terminals; and sending the stored information mail in response to requests from said called user terminals.

In accordance with still yet another aspect of the present invention there is provided a transfer device for routing information transmissions between an information provider server and a plurality of user terminals for receiving the information provided by said information provider server, comprising: registering means for registering at least a network address of the information provider and at least a network address of a user terminal with the transfer device; registering means for registering the user terminal with the information provider server; receiving means for receiving information for at least one of the plurality of user terminals and information identifying the at least one of the plurality of user terminals supplied from said information provider server; storage means for storing the received information; calling means for calling the at least one of the plurality of user terminals; and sending means for sending the stored information in response to a request from said called user terminal.

In accordance with still yet another aspect of the present invention there is provided a transfer device for routing information transmissions between an information provider server and a plurality of user terminals for receiving the information provided by said information provider server, comprising: memory for pre-recording identification information relating to a user terminal which is to receive an information providing service offered by said information provider sever; modification means for modifying the identification information relating to the user terminals; sending means for sending the modified identification information to the information provider server; receiving means for receiving information for transmission and a user terminal identifier from said information provider server; storage means for storing the received information; calling

means for calling relevant user terminals based on the identification information relating to the pre-recorded user terminal, the modified identification information, and the user terminal identifier; and sending means for sending said stored information in response to a request from said called user terminal.

In accordance with still yet another aspect of the present invention there is provided a transfer device for routing information transmissions between an information provider server and a plurality of user terminals for receiving the information provided by said information provider server, comprising: memory for recording user attribute information and a network address of the user terminal in correspondence with each other with respect to users; receiving means for receiving from said information provider server information supplied together with attribute information of users designated as desired destinations; storage means for storing the received information; specifying means for comparing the recorded user attribute information with the designated user attribute information, and specifying network addresses of user terminals which correspond to users having the designated attributes; calling means for calling the specified user terminals; and sending means for sending said stored information in response to requests from the called user terminals.

In accordance with still yet another aspect of the present invention there is provided in a communication network comprising a plurality of information provider servers, a plurality of user terminals, and a transfer device for routing information transmission between said information provider servers and said user terminals, a push-type information transmission method performed by said transfer device comprising: receiving, from an information provider server, push-type information for transmitting to at least one user terminal; determining whether the information provider server is

registered with the transfer device; and rejecting the push-type information if the information provider is not registered with the transfer device.

In accordance with still yet another aspect of the present invention there is provided in a communication network comprising a plurality of information provider servers, a plurality of user terminals, and a transfer device for routing information transmission between said information provider servers and said user terminals, a push-type information transmission method comprising: registering the user terminals with the transfer device; registering the user terminals with the information provider servers by sending information regarding the user terminals from the transfer device to the information provider servers; registering the information provider servers with the transfer device; receiving push-type information at the transfer device from an information provider server; and determining, by the transfer device, which user terminals to send the push-type information based on the registration of the user terminals and the information provider servers.

In accordance with still yet another aspect of the present invention there is provided in a communication network comprising an information provider server, a plurality of user terminals, and a transfer device for routing information transmission between said information provider server and said user terminals, a push-type information transmission method performed by said transfer device comprising: storing user terminal information; receiving, from the information provider server, information to transmit to at least one of the user terminals and a user terminal identifier for identifying the at least one of the user terminals, wherein the user terminal identifier is other than a network address of a user terminal; storing the transmitted information; determining at least one user terminal to send the information to transmit based on the user terminal

identifier and the user terminal information; and sending the transmitted information to the determined user terminal.

In accordance with still yet another aspect of the present invention there is provided a transfer device for routing information transmission from an information provider server to a plurality of user terminals, the transfer device comprising: programming code in said transfer device for: receiving, from an information provider server, push-type information for transmitting to at least one user terminal; determining whether the information provider server is registered with the transfer device; and rejecting the push-type information if the information provider is not registered with the transfer device.

In accordance with still yet another aspect of the present invention there is provided a transfer device for routing information from an information provider server to a plurality of user terminals, the transfer device comprising: a database; an information managing portion for storing registration information from the user terminals and the information provider server in the database, for registering the user terminals with the information provider server, and for determining which user terminal to transmit information to based on the stored registration information from the user terminals and the information provider server; an electronic mail managing portion comprising at least one mailbox for storing the information to be transmitted; and a bus for connecting the information managing portion and the electronic mail managing portion.

In accordance with still yet another aspect of the present invention there is provided an information provider server in an Internet sending information to a plurality of user terminals in a mobile telephone network via a transfer device acting as a gateway, the information provider server comprising: registration means for registering user

management numbers of the user terminals with the information provider server, the user management numbers being received from the transfer device and having a one-to-one correspondence with telephone numbers of the user terminals; and providing means for providing information services to the user terminals via the transfer device in response to requests from registered user terminals.

In accordance with still yet another aspect of the present invention there is provided an information provider server in an Internet sending information to a plurality of user terminals in a mobile telephone network via a transfer device, the information provider server comprising: identifying means for identifying a set of attributes with respect to users of the user terminals for purposes of providing information services; and providing means for providing information to the user terminals by forwarding to the transfer device the information with the identified set of attributes so that the transfer device specifies addresses of the user terminals corresponding to users having the identified set of attributes.

In accordance with still yet another aspect of the present invention there is provided mobile terminal device for receiving information from an information provider server via a transfer device, the mobile terminal device comprising: requesting means for requesting registration of the user terminal at the transfer device and the information provider device, the registration at the transfer device comprising registering a telephone number of the user terminal and the registration at the information provider server comprising registering a user management number of the user terminal, the user management number having a one-to-one correspondence with the telephone number; and receiving means for receiving information, the information provider server sending the information and the user management number to the transfer device, the transfer

device selecting the telephone number corresponding to the user management number and sending the information to the receiving means.

In accordance with still yet another aspect of the present invention there is provided mobile terminal device for receiving information from an information provider server via a transfer device, the mobile terminal device comprising: requesting means for requesting registration of the user terminal at the transfer device, the registration at the transfer device comprising registering attributes of a user of the user terminal and a telephone number of the user terminal; and receiving means for receiving information, the information provider server sending the information and designated attributes to the transfer device, the transfer device sending the information to the receiving means if the designated attributes match at least some of the registered attributes.

Brief Description of the Drawings

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

Fig. 2 is a data format diagram showing the contents of a subscriber database according to the same embodiment.

Fig. 3 is a block diagram showing the structure of a gateway server according to the same embodiment.

Fig. 4 is a sequence diagram showing the basic operations of pull-type information transmission according to the same embodiment.

Fig. 5 is a sequence diagram showing the basic operations of push-type information transmission according to the same embodiment.

Fig. 6 is a conceptual diagram showing a first embodiment of the services according to the same push-type information transmission.

Fig. 7 is a conceptual diagram showing a second embodiment of the services according to the same push-type information transmission.

Fig. 8 is a flow chart showing a billing procedure for the case of the same pull-

type information transmission.

Fig. 9 is a flow chart showing a billing procedure for the case of the same push-type information transmission.

Fig. 10 is a screen transition diagram for explaining a variant of the present invention.

Best Modes for Carrying Out the Invention

Herebelow, an embodiment of the present invention shall be explained with reference to the drawings. This embodiment is structured as a system wherein the present invention is applied to a mobile packet communication network. The present invention is not restricted to the following embodiment, and various modifications are possible within the range of the technical concept thereof.

A: Structure of Embodiment

(1) Overall Structure of System

Fig. 1 is a block diagram showing an embodiment of the present invention.

In the drawing, MS denotes a mobile station which receives packet communication services from a mobile packet communication network MPN. This mobile station MS is connected not only to the mobile packet communication network MPN shown in the drawing, but also to a mobile telephone network which is not shown, and is therefore capable of receiving mobile telephone services as well. The mobile station MS comprises an voice input-output portion for a user to perform voice communications, a radio portion for performing radio communications with a base station BS, an information display portion comprising a liquid crystal panel or the like

and an operating portion where information input operations such as number input and character input are performed, and also has an internal microcomputer for controlling these parts. Additionally, the mobile station MS has software (i.e. a browser) for browsing HTML (Hyper Text Markup Language) document data (hereinafter referred to as HTML data), and displays an interactive screen for the user based on HTML data supplied from an information provider (hereinafter abbreviated to IP) via a mobile packet communication network.

Additionally, the mobile packet communication network MPN comprises a base station BS, a packet processing module PS, a gateway server GWS, a subscriber database UDB, a billing system BILL and a communication line for connecting these elements.

The base stations BS are positioned at predetermined intervals obtained by dividing the ground into ranges of e.g. a radius of 500 m, and perform radio communications with mobile stations MS visiting the radio zones formed thereby.

The packet processing module PS is a computer system provided in a packet switching center accommodating a plurality of base stations BS, which receives packet switching requests from the mobile stations MS (packet switching service registration to be explained below), and performs the switching of packets in the mobile packet communication network.

The gateway server GWS is a computer system provided in a mobile packet gateway switching center for interconnecting the mobile packet communication network MPN with other networks such as the Internet INET, which converts communication protocols which differ between the networks. Specifically, conversions are made between the transmission protocol for mobile packet communications networks used by

the mobile packet communication network MPN and the TCP/IP used in other networks such as the Internet INET. Additionally, the gateway server GWS works in cooperation with the IP server W, the subscriber database UDB and the billing system BILL to perform control relating to the various applications, such as information providing services and billing procedures for information transmission.

The subscriber database UDB stores a subscriber registration information file composed of information relating to subscribers of the mobile packet communication network MPN and an IP registration information file composed of registration information of the IP (Information Provider). Fig. 2 is a data format diagram showing an example of the content of this subscriber database UDB. As shown in the drawing, the subscriber registration information file contains attribute data indicating the attributes of each subscriber such as the telephone number of the mobile station MS, name, sex, birthdate and address for each subscriber (i.e. the user of the mobile station MS) in the mobile packet communication network MPN. Additionally, the IP registration information file contains the company name and the absolute address on the network (e.g. in the case of the Internet, the URL (Uniform Resource Locator) which specifies the information resources on the WWW (World Wide Web); herebelow, the absolute network address in the present embodiment shall be referred to as the URL), information indicating whether the type of billing is IP billing or not, and information indicating whether the type of billing depends on the amount or is fixed-rate, for each IP which is contracted to receive gateway services with the company which runs this mobile packet communication network MPN. Here, IP billing refers to billing for information transmissions service which is performed not with respect to the user who received the transmission service, but with respect to the information provider. On the

other hand, billing with respect to the user shall hereinafter be referred to as user billing.

The billing system BILL calculates the fees for the providing of services based on service history information supplied from the gateway server, and issues a bill to the user or the IP. While billing types include user billing and IP billing as well as amount-dependent and fixed-rate, the billing system BILL performs billing in accordance with each billing type.

The IP server W is a server system run by the IP, which sends information to be provided to the users over a network in an HTML data format. The IP server W can be connected to the gateway server GWS via an exclusive line or the Internet INET, can be provided inside the gateway server GWS which is provided by the owner of the mobile packet communication network MPN (hereafter referred to as an IP server W-MAX).

(2) Structure of Gateway Server

Next, the structure of the gateway server GWS shall be explained. Fig. 3 is a block diagram showing the structure of a gateway server GWS. In the drawing, the gateway server GWS comprises a system control portion I-MAX, a user information managing portion U-MAX, a billing managing portion P-MAX, an electronic mail managing portion M-MAX, an IP server W-MAX and a bus BUS for connecting these parts.

The system control portion I-MAX controls the various portions of the gateway server GWS, and functions as an interface between networks such as by performing protocol conversion between the mobile packet communication network MPN and other networks such as the Internet INET.

The user information managing portion U-MAX stores and manages subscriber registration information and IP registration information obtained by referencing the

subscriber database UDB, as well as the correspondence between telephone numbers of the mobile stations and user management numbers (to be explained below) and the access histories of users to the IP server W (for example, the number of accesses to each IP server). Additionally, the user information managing portion U-MAX performs conversions between the telephone numbers and user management number, collation of telephone numbers and comparison of attribute data based on the above stored information.

The billing managing portion P-MAX records and manages information necessary for billing with respect to the information transmission services, and supplies this information to the billing system BILL. Specifically, it stores the fact that an electronic mail has been received from the IP server W as history information, calculates the number of packets to be exchanged when transmitting the electronic mail to the user, and stores this calculated value. Additionally, the billing managing portion P-Max references the content of the subscriber database UDB transferred to the user information managing portion U-MAX, in order to determine whether or not the billing type for each IP is IP billing, and whether or not it is amount-dependent, then requests billing to the billing system BILL based on the billing type.

The electronic mail managing portion M-MAX mediates the exchange of electronic mail between mobile station MS users, between mobile station MS users and users of other networks such as the Internet INET, or between the mobile station MS users and the IP server W. This electronic mail managing portion M-MAX is provided with mailboxes for storing the electronic mails to be transferred for each user or for each IP server W. There are three types of mailboxes in accordance with the type of mail service, and these being distinguished by the addresses of their mailboxes (mail

addresses).

(i) A first mailbox BOX1 is a conventional mailbox wherein the electronic mail transferred between users is stored at mail addresses assigned for each user.

(ii) Next, a second mailbox BOX2 is a mailbox for storing electronic mail transmitted from the IP to specific users for the purposes of providing information or the like. Here, a specific user is a user who has already completed registration procedures with respect to the IP. This second mailbox BOX2 is used in a first type of service due to push-type information transmission to be described below.

(iii) Next, a third mailbox BOX3, as with the second mailbox BOX2, is a mailbox for storing electronic mail transmitted from the IP to a user for the purposes of providing information. It differs from the second mailbox BOX2 in that instead of storing electronic mail provided to users which have been pre-registered in the IP, it stores electronic mail provided to users having attributes (attributes such as sex, age, address, etc.) designated by the IP. This third mailbox BOX3 is used in a second type of service due to push-type information transmission to be described below.

The IP server W-MAX is a server system provided by the company owning the mobile packet communication network MPN. This IP server W-MAX, like the other IP server W, performs services such as providing information to the users.

B. Operations of the Embodiment

Next, operations of the embodiment having the above-described structure shall be explained.

First, information transmission shall be explained, followed by an explanation of the billing procedures.

B-1. Information Transmission

With regard to the information transmission according to the present embodiment, there is pull-type information transmission in which the user of a mobile station MS receives information transmissions by accessing the IP server W, and push-type information transmission in which information transmission is performed from the IP server W side to specified or non-specified users without waiting for user access. Herebelow, the explanation shall be given separately for these types.

(1) Pull-type Information Transmission

Fig. 4 is a sequence showing a basic operation for pull-type information transmission.

As shown in the drawing, the mobile station MS performs a packet switching service registration in cooperation with the packet processing module PS (step S1). The packet switching service registration is a preliminary registration procedure for enabling packet switching in a mobile packet communication network MPS. When this packet switching service registration is completed, the mobile station MS sends a line connection request signal to the mobile packet communication network MPS (step S2). This line connection request signal is sent through the packet processing module PS to the gateway server GWS (step S3). If a line connection is possible, then the gateway server GWS sends a line connection response signal through the packet processing module PS back to the mobile station MS (steps S4, S5). As a result, packet switching becomes possible between the mobile station MS and the gateway server GWS.

Next, the mobile station MS sends a connection request signal designating the URL of a desired IP server W (step S6). This connection request signal is routed

through the packet processing module PS and sent to the gateway server GWS (step S7). The gateway server GWS receives the connection request signal, and establishes a link with the IP server W of the designated URL (step S8).

When a link has been established with the gateway server GWS in this way, the IP server W sends HTML data which has been prepared beforehand to the mobile station MS (step S9). This HTML data is routed through the gateway server GWS and transferred to the packet processing module PS (step S10). Furthermore, at the packet processing module PS, the received HTML data is transferred to the mobile station MS (step S11).

The operations of the above steps S6-S11 are repeatedly performed in accordance with the amount of all of the data to be transmitted from the IP server W to the mobile station MS. At this time, the mobile station MS interprets sequentially transmitted HTML data by means of the browser and displays the received information at the information display portion.

When the data transmission to the mobile station MS has been completed, the mobile station MS sends an acknowledgement signal (step S12). The packet processing module PS transfers this acknowledgement signal to the gateway server GWS so as to make a delivery notification (step S13). When the IP server W completes the data transmission to the mobile station MS, the link between the gateway server GWS and the IP server W is released (step S14).

Additionally, when there is a data delivery notification from the mobile station MS to the gateway server GWS, the gateway server GWS performs a billing procedure with respect to the information transmission. The billing procedure performed at this time shall be described in detail below.

(2) Push-type Information Transmission

First, the basic operations of the push-type information transmission shall be explained, followed by explanations of two types of services due to push-type information transmission.

(i) Basic Operations of Push-type Information Transmission

Fig. 5 is a sequence diagram illustrating the basic operations of push-type information transmission.

In the drawing, an IP server W first sends information to be provided to users to the gateway server GWS in the form of electronic mail (step S21). When the gateway server GWS receives the electronic mail, it stores this in the designated mailbox and sends a communication start notification signal to the packet processing module PS (step S22). This communication start notification signal includes information designating the destination address of the electronic mail. When the packet processing module PS receives this communication start notification signal, it calls the mobile station MS corresponding to the destination address included in the signal (step S23).

When the user of the mobile station MS performs a specified operation on the mobile station MS in response to the call, the same sequence as the above-described steps S1-S5 (shown in Fig.4) is performed, and it enters a state of being capable of packet switching with the gateway server GWS (steps S24-S28). Next, the gateway server GWS sends a reception notification signal including the address information of the mailbox in which the electronic mail is stored to the packet processing module PS (step S29). Furthermore, the packet processing module PS sends the received reception notification signal to the mobile station MS (step S30).

Upon receiving the above-described reception notification signal, the mobile station MS sends a connection request signal designating the address of the mailbox included in the reception notification signal to the packet processing module PS (step S31). This connection request signal is transferred through the packet processing module PS to the gateway server GWS (step S32). Upon receiving the connection request signal, the gateway server GWS sends a connection acnowledgement signal to the packet processing module PS (step S33). The packet processing module PS sends the received connection acnowledgement signal to the mobile station MS (step S34).

Next, the gateway server GWS reads the electronic mail received from the IP server W from the mailbox whose address is designated in the connection request signal, and transfers the electronic mail to the packet processing module PS (step S35). Upon receiving the electronic mail, the packet processing module PS sends this mail to the mobile station MS which issued the connection request (step S36).

The operations of the above steps S31-S36 are repeatedly performed in accordance with the amount of data in the electronic mail to be transmitted from the IP server W to the mobile station MS.

When the mobile station MS has received the electronic mail in this way, a delivery notification is sent to the gateway server GWS in the same manner as in steps S12 and S13 shown in Fig.4 (steps S37, S38), and the push-type information transmission is completed.

Additionally, if there is a data delivery notification from the mobile station MS to the gateway server GWS, then the gateway server GWS performs a billing procedure with respect to the information transmission. The billing procedure performed at this time shall be described in detail below.

(ii) First Type of Service by means of Push-type Information Transmission

In the present embodiment, there are two types of services by means of push-type information transmission. A first type shall now be described.

The first type is a service of transmitting electronic mail from the IP server for the purpose of providing certain information to users who have completed a registration procedure with the IP beforehand, wherein the electronic mail is stored in the second mailbox BOX2, and the electronic mail is transmitted in response to a user request after the user has been called.

Fig. 6 is a conceptual diagram for explaining the first type. In this drawing, a user who desires services such as information provision of a specific IP operates a mobile station MS to access the network, and performs preliminary registration procedures with respect to the IP server (step S61). With this access, the subscriber number of the user (i.e. the telephone number of the mobile station MS) is transferred to the gateway server GWS. The gateway server GWS converts the received subscriber number into a user management number which is user identity information having a one-to-one correspondence with the telephone number in the user information managing portion U-MAX in order to avoid the telephone number being sent outside the packet communication network MPN. This user management number is sent from the gateway server GWS to the IP server W, and is stored in the IP server W as user registration information (step S62).

Then, if the IP server W has information to be provided to a registered user, the IP server W arranges the information as transmission data in the form of electronic mail, appends to the electronic mail the address of the second mailbox BOX2 and the user management number of the registered user to which the information is to be provided,

and sends the mail to the gateway server GWS (step S63).

When the gateway server GWS receives the electronic mail from the IP server W, it stores the mail in the second mailbox BOX2 of the electronic mail managing portion M-MAX, and converts the designated user management number to the corresponding telephone number in the user information managing portion U-MAX, and calls the mobile station MS of that telephone number (step S64).

If the user of the mobile station MS who has received this call desires to receive the information provided by the IP server, the user operates the mobile station MS to access the gateway server GWS and requests a download of the electronic mail (step S65). The download request signal sent to the gateway server GWS at this time contains the telephone number of the mobile station MS which is the source of the request. The gateway server GWS compares the telephone number of the mobile station MS from which the request signal is originated and the telephone number corresponding to the user management number designated by the IP server W at the time of reception of the electronic mail in the user information managing portion U-MAX, thereby judging whether or not to permit access to the second mailbox BOX2, and thereafter reads the electronic mail from the mailbox BOX2 and sends it to the mobile station MS (steps S66, S67).

In this way, it is possible to provide information to specific users registered with the IP server W.

(iii) Second Type of Service by means of Push-type Information Transmission

Next, the second type shall be explained. The second type is a service whereby electronic mail sent from the IP server for the purposes of providing information to users having attributes (attributes such as sex, age and address)

designated by the IP server is stored in a third mailbox BOX3, and the electronic mail is transmitted to relevant users in response to user requests after they have been called.

Fig. 7 is a conceptual diagram for explaining a second type. In the drawing, users who are prepared to receive services such as information provision from an unspecified IP operate the mobile station MS to access the network, and perform preliminary registration procedures with respect to the gateway server GWS (step S71). With this access, the telephone number of the mobile station MS is transferred to the gateway server GWS, and this is stored in the user information managing portion U-MAX of the gateway server GWS as user registration information.

Then, if the IP server W has information to be provided to users, the IP server W arranges the information in electronic mail form, appends attribute data such as sex, age and address for specifying the user to the electronic mail, and sends the mail to the gateway server GWS (step S72).

When the gateway server GWS receives the electronic mail containing the attribute data from the IP server W, it stores the electronic mail in the third mailbox BOX3, and in the user information managing portion U-MAX, compares the attribute data appended to the electronic mail with the attribute data of each user registered in the subscriber database UDB in order to specify relevant users. For example, if the attributes designated by the IP server W are "men in the thirties who live in Tokyo", then a search is made for relevant users having these attributes from among the users registered in the subscriber database UDB, and the telephone number of those users are extracted. The gateway server GWS calls the mobile stations MS of the telephone numbers extracted in this way (step S73).

If the user of a mobile station MS called in this way wishes to receive the

information provided by the IP server, the user operates the mobile station MS to access the gateway server GWS, and requests a download of electronic mail (step S74). At this time, the telephone number of the mobile station MS which is the source of the request is appended to the download request signal sent to the gateway server GWS.

The gateway server GWS, in the user information managing portion U-MAX, compares the telephone number of the mobile station MS from which the request signal is originated with the telephone numbers of users who have completed the above-described registration procedure in order to judge whether or not to permit access to the third mailbox BOX3, after which it reads the electronic mail from the third mailbox BOX3 and sends it to the mobile station MS which made the request (steps S75, S76).

In this way, it is possible for the IP server W to perform an information providing service to users who desire the provision of information from among users who are prepared to receive information from the unspecified IP server W.

B-2: Billing Procedure

While types of billing include communication fee billing for communication services and information fee billing for information providing services of IP's, communication fee billing shall be explained as an example in the present embodiment.

Additionally, the billing procedures for the present invention include user billing with respect to users who have been provided information and IP (Information Provider) billing for billing the IP's who have provided the information. In the present embodiment, whether to perform user billing or IP billing is managed by different methods for the case of pull-type information transmission and push-type information transmission. Both cases shall be explained below.

(1) In the Case of Pull-type Information Transmission

Generally, in the case of pull-type information transmission, the information is provided in accordance with a request from the user, so that user billing is more readily applicable. However, there are cases in which the IP wishes to provide information free in response to requests from unspecified users for the purposes of advertisement or the like, and in this case, IP billing is more readily applicable. Therefore, in the present embodiment, in the case of pull-type information transmission, user billing is applied in principle and in exceptional cases where IP billing is to be applied, the IP which is subject thereto is pre-registered in the subscriber database UDB. Then, the gateway server GWS extracts from the subscriber database UDB a list of URL's of IP servers W to which IP billing is to be applied, and stores it in a memory in the billing managing portion P-MAX as an IP-billing list table.

Fig. 8 is a flow chart showing the billing procedure for pull-type information transmission. In this drawing, the user first operates the mobile station MS to access a designated IP server W, and upon receiving a delivery acknowledgement signal from the user, the gateway server GWS checks whether or not the URL of the IP server W accessed by the user corresponds to an IP to be IP billed as listed in the above-described table (step S101).

Here, if it is not an IP sever to be IP-billed, then user billing is applied as usual. In this case, the billing managing portion P-MAX of the gateway GWS sends a user management number of the user who received the information transmission and the sum of received packet numbers to the billing system BILL (step S102). The billing system BILL calculates a communication fee by multiplying the sum of packets supplied from the gateway server GWS with a unit price, and issues a bill to the user specified by the user management number (step S103).

On the other hand, if the URL of the IP server W accessed by the user corresponds to an IP to be IP-billed, then IP billing is applied. In this case, the billing managing portion P-MAX of the gateway server GWS sends the sum of the received packets and the URL of the IP server W which was accessed to the billing system BILL (step S104). The billing system BILL calculates the communication fee by multiplying the sum of packets supplied from the gateway server GWS with a unit price, and issues a bill to the IP (step S105).

(2) In the Case of Push-type Information Transmission

Next, the billing procedure for the case of push-type information transmission shall be described. Fig. 9 is a flow chart showing a billing procedure for the case of push-type information transmission. In the drawing, when the gateway server GWS receives electronic mail from the IP server W in the second mailbox BOX2 or the third mailbox BOX3, it recognizes that there has been an order for push-type information transmission, and decides to apply IP billing (step S201). That is, in the case of push-type information transmission, IP billing is more readily applicable to this type of information transmission, so that in the present embodiment, IP billing is always applied.

Next, the gateway server GWS specifies the user to which information is to be provided as described above, then calls the mobile station MS to transmit the electronic mail received from the IP server to the mobile station MS, but in the case of IP billing, user billing is not performed with respect to this transmission, and the IP is billed for everything.

In this case, the billing managing portion P-MAX of the gateway server GWS references the IP registration information stored in the subscriber database UDB, and

checks whether the type of billing to be applied to the IP server W is amount-dependent or fixed-rate (step S202).

If the billing type is amount-dependent, the billing managing portion P-MAX of the gateway server GWS sends the sum of the packets exchanged in the transmission of electronic mail and the URL of the IP server W which was the source of the electronic mail to the billing system BILL (step S203). The billing system BILL multiplies the sum of the packets supplied from the gateway server GWS with a unit price to calculate the communication fee, and issues a bill to the IP (step S204).

On the other hand, if the billing type is fixed-rate, then the billing managing portion P-MAX of the gateway server GWS sends the URL of the IP server W to the billing system BILL at the same time as the electronic mail is received from the IP server, so as to order billing to that IP (step S205). The billing system BILL receives this and issues a bill of a standard amount to the indicated IP (step S206).

If the fixed-rate billing format is one where billing is applied to a standard period of time such as by monthly units, the IP is billed whether or not the electronic mail from the IP server W reaches the gateway server GWS. Therefore, in this case, there is no cooperation between the gateway server GWS and the billing system BILL, and the billing system BILL independently issues a bill to the IP at regular periods.

C: Modification Examples

As previously mentioned, the present invention is not restricted to the above-described embodiments. The present invention can have various modifications within the range of the technical concept of the present invention, for example the following.

(1) In the embodiments, information is provided to mobile stations MS belonging

to a mobile packet communication network MPN from another network such as the Internet INET (first communication network), but if for example there exists another global network which can replace the Internet INET, then the present invention is applicable to cases wherein information is provided from such a network to a mobile station MS belonging to a mobile packet communication network MPN. In this case, the information resource of the IP server W can be specified by means of an absolute address defined in the global network to which it is applied, instead of by a URL.

Additionally, the network (second communication network) to which the user terminal belongs is not restricted to being a mobile packet communication network MPN, and the invention is applicable for providing information to user terminals belonging to local networks such as fixed network which includes stationary terminals.

Furthermore, the present invention is not restricted to packet switching networks, and is applicable to data communication networks which perform other types of data communications, and the communication protocols indicated in the embodiments represent only one possible example. Additionally, the form of the data transmitted from the IP server is not restricted to HTML format, and other formats may be employed. For example, if the transmitted information is only text data, then it is of course not necessary to employ a data format such as HTML which can handle multimedia.

(2) In the embodiments, the communication fee billing for pull-type information transmission was uniformly made amount-dependent, but the present invention is not limited thereto, so that it is possible to register information indicating whether amount-dependent or fixed-rate in the subscriber database UDB as in the case of push-type information transmission, and to perform billing procedures in accordance with the type

of billing. In the case that a fixed-rate system is employed for pull-type information transmission, the user or IP is billed a standard amount regardless of the number of exchanged packets, as in the case of push-type information transmission.

Additionally, while the billing type was set for each IP in the IP registration file of the subscriber database UDB in the embodiments, the present invention is not restricted thereto, and it is possible to set for each user in the subscriber registration file. Additionally, when wishing to set the billing type according to the IP and the user, then the billing type for each user can be set for each IP in the IP registration information file, or the billing type for each IP can be set for each user in the subscriber registration information file.

(3) While only communication fee billing was explained in the embodiments for the purpose of retaining simplicity, the present invention can be similarly applied to information fee billing. However, when employing amount-dependent information fee billing, billing does not depend on the number of exchanged packets as in communication fee billing, but it is possible to apply various billing types such as for example, billing in accordance with the number of exchanged electronic mails or when wishing to change the amount depending on the case, appending amount information concerning a mail transmission to the electronic mail sent from the IP server W to send to the gateway server GWS.

Additionally, in the case of information fee billing, it is possible to perform only user billing and to not perform IP billing. In this case, all of the billing types in the IP registration information file in the subscriber database UDB can be set to user billing or the billing procedure can be not performed with respect to IP's which are set for IP billing.

(4) In the embodiments, the billing type in pull-type information transmission was decided by the gateway server GWS having a list table of IP-billing and referencing the table, but the present invention is not restricted thereto, and it is possible for example to append information indicating whether IP billing or not by adding a tag to the HTML data sent from the IP server W, and to have the gateway server GWS decide the billing type based on this information.

(5) The structure of the network in the embodiments is no more than one possible example, and the present invention is not restricted to such a structure. For example, it is possible to divide up the functions among a plurality of nodes such as by arranging into divisions of nodes having a communication protocol converting function and nodes having other functions.

(6) In the embodiments, the IP server W manages user registration information with respect to the IP's in a first type of service by means of push-type information transmission, but the present invention may be such that the gateway server GWS handles the management of user registration information. For example, as shown in Fig. 10, among the dialog screens displayed when a user performs registration procedures with the IP, it is possible to send and display only a dialog screen (hereafter referred to as a registration screen) for aiding in the registration operation as HTML data prepared by the gateway server GWS to the mobile station MS of the user, then store and manage the user registration information at the gateway server GWS based on the user registration procedures. In this case, it is possible for the gateway server GWS to find which IP server W the user has performed registration procedures, based on the address information such as the URL designated when the user accesses the IP server W. Therefore, if the gateway server GWS has HTML data for providing a

registration screen with respect to a plurality of IP servers W in correspondence to the address information such as the URL, then it is possible to specify the HTML data to be sent to the mobile station MS of the user as a registration screen based on the address information such as the URL designated by the user.

(7) While in the embodiments, in the case of push-type information transmission, the user of a mobile station MS who has received a call for electronic mail operates the mobile station MS to access the gateway server GWS and download the electronic mail, but the present invention is not restricted thereto, and it is possible to make the process such that when the mobile station MS receives a call, it automatically accesses the gateway server GWS and downloads the electronic mail without waiting for the instruction operations of the user.

(8) In the embodiments, IP billing is always used for push-type information transmission, but the present invention is not restricted thereto, and user billing can also be applied in the case of push-type information transmission. In this case, as with the pull-type information transmission described above, an IP billing list table should be made based on the set contents of a subscriber database UDB, this table should be referenced in order to determine whether to use IP billing or user billing, and in the case of user billing, the procedures appropriate for user billing should be followed.

Additionally, even in the case of exclusively IP billing, it is possible to prepare an IP billing list table for having a list of relevant IP servers to be IP-billed, so that when there is a request for push-type information transmission from an IP server not listed in this table, the information transmission will not be routed such as by disposing of the sent electronic mail.

CLAIMS

1. In a communication network comprising an information provider server, a plurality of user terminals, and a transfer device for routing information transmission between said information provider server and said user terminals, a push-type information transmission method performed by the transfer device comprising:

registering at least a network address of the information provider server with the transfer device;

registering at least a network address of a user terminal with the transfer device;

registering the user terminal by sending information regarding the user terminal from the transfer device to the information provider server;

receiving, at the transfer device, information for at least one of the plurality of user terminals and information identifying the at least one of the plurality of user terminals from said information provider server;

storing, at the transfer device, said information;

calling the at least one of the plurality of user terminals; and

transmitting from the transfer device the stored information in response to a request from said called user terminal.

2. A push-type information transmission method as in claim 1, wherein registering said user terminal with the information provider server comprises pre-accessing said server device and registering a network address of the user terminal with said information

provider server as a registration procedure for receiving an information transmission service offered by said information provider server, and

wherein said information provider server provides information to user terminals which have completed said registration.

3. In a communication network comprising an information provider server, a plurality of user terminals, and a transfer device for routing information transmission between said information provider server and said user terminals, a push-type information transmission method performed by said transfer device comprising:

storing identification information relating to user terminals which are to receive an information providing service offered by said information provider server;

modifying the identification information relating to the user terminals;

sending the modified identification information to the information provider server;

receiving information for transmission and a user terminal identifier from said information provider server;

storing said information for transmission;

calling a relevant user terminal based on the stored identification information relating to user terminals, the modified identification information, and the user terminal identifier; and

transmitting the stored information for transmission in response to a request from the called user terminal.

4. A push-type information transmission method as in claim 3, further comprising registering a network addresses of the user terminals with the transfer device,

wherein storing identification information comprises storing the network addresses of the user terminal;

wherein modifying the identification information comprises assigning user management numbers to the network addresses; and

wherein sending the modified identification information to the information provider server comprises sending the user management numbers to the information provider server.

5. In a communication network comprising an information provider server, a plurality of user terminals, and a transfer device for routing information transmission between said information provider server and said user terminals, a push-type information transmission method performed by said transfer device comprising:

storing user attribute data of users and network addresses of the user terminals in correspondence;

receiving information supplied from said information provider server together with attribute information of users designated as desired destinations;

storing said received information;

comparing said stored user attribute data and the designated user attribute data, and specifying network addresses of user terminals corresponding to users having the designated attributes;

calling the specified user terminals; and

sending the stored information mail in response to requests from said called user terminals.

6. A push-type information transmission method as in claim 5, wherein said user terminal comprises a step of pre-accessing said information provider server and registering an address with said information provider server as a registration procedure for receiving an information transmission service offered by said information provider server, and

said transfer device calls user terminals which have completed said registration.

7. A push-type information transmission method as in any one of claims 1-6, wherein said information provider server belongs to a first communication network which follows a first communication protocol, said plurality of user terminals belong to a second communication network which follows a second communication protocol different from said first communication protocol; and

said transfer device is a gateway for converting between said first and second communication protocols and routing the exchange of said information.

8. A push-type information transmission method as in claim 7, wherein said plurality of user terminals are given first network addresses used only on said first communication network and are discriminated on said first communication network by second network addresses which have a one-to-one correspondence with said first network addresses in said second communication network; and

said transfer device converts between said second network addresses in said first communication network and said first network addresses in said second communication network.

9. A push-type information transmission method as in claim 8, wherein said second communication network is a local network accommodating specific user terminals; and

said first communication network is a global network interconnecting information resources such as said information provider server to which are allotted identification information for identifying an absolute address in the network.

10. A push-type information transmission method as in claim 9, wherein said second communication network is a mobile communication network accommodating a plurality of user terminals which are mobile stations; and

said first communication network is the Internet.

11. A transfer device for routing information transmissions between an information provider server and a plurality of user terminals for receiving the information provided by said information provider server, comprising:

registering means for registering at least a network address of the information provider and at least a network address of a user terminal with the transfer device;

registering means for registering the user terminal with the information provider server;

receiving means for receiving information for at least one of the plurality of user terminals and information identifying the at least one of the plurality of user terminals supplied from said information provider server;

storage means for storing the received information;

calling means for calling the at least one of the plurality of user terminals; and

sending means for sending the stored information in response to a request from said called user terminal.

12. A transfer device for routing information transmissions between an information provider server and a plurality of user terminals for receiving the information provided by said information provider server, comprising:

memory for pre-recording identification information relating to a user terminal which is to receive an information providing service offered by said information provider server;

modification means for modifying the identification information relating to the user terminals;

sending means for sending the modified identification information to the information provider server;

receiving means for receiving information for transmission and a user terminal identifier from said information provider server;

storage means for storing the received information;

calling means for calling relevant user terminals based on the identification information relating to the pre-recorded user terminal, the modified identification information, and the user terminal identifier; and

sending means for sending said stored information in response to a request from said called user terminal.

13. A transfer device for routing information transmissions between an information provider server and a plurality of user terminals for receiving the information provided by said information provider server, comprising:

memory for recording user attribute information and a network address of the user terminal in correspondence with each other with respect to users;

receiving means for receiving from said information provider server information supplied together with attribute information of users designated as desired destinations;

storage means for storing the received information;

specifying means for comparing the recorded user attribute information with the designated user attribute information, and specifying network addresses of user terminals which correspond to users having the designated attributes;

calling means for calling the specified user terminals; and

sending means for sending said stored information in response to requests from the called user terminals.

14. A transfer device as in any one of claims 11-13, wherein said information provider server belongs to a first communication network which follows a first communication protocol, and said plurality of user terminals belong to a second communication network which follows a second communication protocol different from that of said first communication network; and

further comprising protocol converter for converting between said first and second protocols.

15. A transfer device as in claim 14, wherein said plurality of user terminals are given first network addresses used only on said second communication network and are discriminated on said first information transmission network by second network addresses which have a one-to-one correspondence with said first network addresses in said second communication network; and

further comprising address converter for converting between said second network addresses in said first communication network and said first network addresses in said second communication network.

16. A transfer device as in claim 15, wherein said second communication network is a local network accommodating specific user terminals; and

said first communication network is a global network interconnecting information resources such as said information provider server to which are allotted identification information for identifying an absolute address in the network.

17. A transfer device as in claim 16, wherein said second communication network is a mobile communication network accommodating a plurality of user terminals which are mobile stations; and

said first communication network is the Internet.

18. A push-type information transmission method as in claim 1, wherein registering the user terminal with the information provider server comprises registering by the transfer device an address of the user terminal.

19. A push-type information transmission method as in claim 18, further comprising:

registering a network address of the user terminal with the transfer device;

storing in a database of the transfer device the network address of the user terminal and a user management number, the user management number being correlated to the network address of the user terminal; and

wherein registering by the transfer device an address of the user terminal comprises registering the user management number.

20. A push-type information transmission method as in claim 19, wherein receiving information for the user terminal comprises receiving information and the user management number;

further comprising determining the network address for the user terminal by searching the database with the user management number to determine the correlated network address; and

wherein calling the user terminal comprises calling the user terminal at the correlated network address.

21. A push-type information transmission method as in claim 1, wherein receiving information for the user terminal further comprises receiving a mailbox address; and

wherein storing said information comprises storing said information at the mailbox address in the transfer device.

22. A push-type information transmission method as in claim 2, wherein receiving information for the user terminal comprises receiving information and the network address;

wherein the request from said called user terminal comprises a telephone number of the user terminal;

further comprising comparing the telephone number in the request with the network address; and

wherein transmitting the stored information comprises transmitting the stored information if at least a part of network address matches the telephone number in the request.

23. A push-type information transmission method as in claim 19, wherein the request from said called user terminal comprises a telephone number of the user terminal;

further comprising comparing the telephone number in the request with a telephone number correlated to the user management number received from the information provider; and

wherein transmitting the stored information comprises transmitting the stored information if at least a part of telephone number correlated to the user management number received from the information provider matches the telephone number in the request.

24. In a communication network comprising a plurality of information provider servers, a plurality of user terminals, and a transfer device for routing information transmission between said information provider servers and said user terminals, a push-type information transmission method performed by said transfer device comprising:

receiving, from an information provider server, push-type information for transmitting to at least one user terminal;

determining whether the information provider server is registered with the transfer device; and

rejecting the push-type information if the information provider is not registered with the transfer device.

25. A push-type information transmission method as in claim 24, wherein rejecting the push-type information comprises disposing of the push-type information.

26. A push-type information transmission method as in claim 24, wherein the transfer device receives a network address of the information provider server; and

wherein determining whether the information provider server is registered with the transfer device comprises comparing the network address of the information provider server with a list of network addresses of registered information provider servers.

27. A push-type information transmission method as in claim 26, further comprising registering, by the information provider server, the network address for the information provider server in the list of network addresses,

wherein registering is performed prior to receiving the push-type information.

28. A push-type information transmission method as in claim 26, further comprising storing the push-type information if the information provider server is registered.

29. A push-type information transmission method as in claim 26, further comprising determining at least one user terminal to transmit the push-type information if the information provider server is registered with the transfer device.

30. A push-type information transmission method as in claim 29, further comprising:

calling the user terminal;

receiving a request from the user terminal to send the information; and

sending the information to the user terminal after receiving the request.

31. A push-type information transmission method as in claim 24, wherein receiving push-type information further comprises receiving information for identifying at least one user terminal.

32. A push-type information transmission method as in claim 31, further comprising registering the user terminals; and

wherein determining at least one user terminal is based on the information for identifying at least one user terminal and the registration of the user terminals.

33. A push-type information transmission method as in claim 32, wherein the information for identifying at least one terminal comprises a user management number;

wherein registering the user terminals comprises registering a network addresses of the user terminals; and

wherein determining at least one user terminal comprises selecting a network address from a list of registered addresses based on the user management number.

34. A push-type information transmission method as in claim 32, wherein registering the user terminals comprises registering attributes of users of the user terminals;

wherein the information for identifying at least one terminal comprises attribute information of users designated as desired destinations; and

wherein determining at least one terminal comprises comparing the registered attributes of users with the designated user attribute information, and specifying user terminals which correspond to users having the designated attributes.

35. A push-type information transmission method as in claim 34, wherein registering the user terminals further comprises registering telephone numbers of the user terminals,

a telephone number of a specific user terminal being correlated to attributes of a user of the specific user terminal; and

wherein specifying user terminals comprises specifying telephone numbers of user terminals which correspond to users having the designated attributes.

36. In a communication network comprising a plurality of information provider servers, a plurality of user terminals, and a transfer device for routing information transmission between said information provider servers and said user terminals, a push-type information transmission method comprising:

registering the user terminals with the transfer device;

registering the user terminals with the information provider servers by sending information regarding the user terminals from the transfer device to the information provider servers;

registering the information provider servers with the transfer device;

receiving push-type information at the transfer device from an information provider server; and

determining, by the transfer device, which user terminals to send the push-type information based on the registration of the user terminals and the information provider servers.

37. A push-type information transmission method as in claim 36, wherein determining which user terminals to send the push-type information comprises

determining whether the information provider, from which the push-type information is received, is registered with the transfer device.

38. A push-type information transmission method as in claim 37, wherein determining which user terminals to send the push-type information further comprises determining that no user terminals are sent the push-type information if the information provider server is not registered with the transfer device.

39. A push-type information transmission method as in claim 36, wherein registering the user terminals comprises registering network addresses of the user terminals;

wherein receiving push-type information further comprises receiving at least one user management number, the user management number for designating at least one user terminal and is other than the registered network addresses of the user terminals;

wherein determining which user terminals to send the push-type information comprises selecting a network address from a list of registered addresses based on the user management number.

40. A push-type information transmission method as in claim 36, wherein registering the user terminals comprises registering attributes of users of the user terminals;

wherein receiving push-type information further comprises receiving attribute information of users designated as desired destinations; and

wherein determining which user terminals to send the push-type information comprises comparing the registered attributes of users with the designated user attribute information, and specifying user terminals which correspond to users having the designated attributes.

41. A push-type information transmission method as in claim 36, further comprising calling the determined user terminals; and

transmitting from the transfer device the push-type information in response to requests from said called user terminals.

42. In a communication network comprising an information provider server, a plurality of user terminals, and a transfer device for routing information transmission between said information provider server and said user terminals, a push-type information transmission method performed by said transfer device comprising:

storing user terminal information;

receiving, from the information provider server, information to transmit to at least one of the user terminals and a user terminal identifier for identifying the at least one of the user terminals, wherein the user terminal identifier is other than a network address of a user terminal;

storing the transmitted information;

determining at least one user terminal to send the information to transmit based on the user terminal identifier and the user terminal information; and

sending the transmitted information to the determined user terminal.

43. A push-type information transmission method as in claim 42, further comprising:

calling the user terminal to request whether to transfer the information; and

receiving a request from the user terminal to transfer the information,

wherein sending the transmitted information comprises sending the transmitted information in response to the request from the called user terminal.

44. A push-type information transmission method as in claim 42, wherein storing user terminal information comprises registering the user terminals with the transfer device.

45. A push-type information transmission method as in claim 44, wherein registering the user terminals comprises storing, for a specific user terminal, attributes of a user of the specific user terminal and a network address of the specific user terminal with the transfer device.

46. A push-type information transmission method as in claim 42, further comprising registering the user terminals with the information provider server.

47. A push-type information transmission method as in claim 46, wherein registering the user terminals with the information provider server comprises:

receiving from the user terminal a network address of the user terminal;

creating the user terminal identifier based on the network address; and

sending the user terminal identifier to the information provider server.

48. A push-type information transmission method as in claim 47, wherein the user terminal identifier is a user management number; and

wherein creating the user terminal identifier based on the network address comprises selecting the user management number and creating a one-to-one correspondence between the user management number and the network address for the user terminal.

49. A push-type information transmission method as in claim 42, wherein the stored user terminal information comprises stored attribute data for users of the user terminals; wherein the user terminal identifier comprises designated attributes; and wherein determining at least one user terminal comprises:

comparing the designated attributes with stored attribute data; and

specifying network addresses of user terminals corresponding to users having the designated attributes.

50. A transfer device for routing information transmission from an information provider server to a plurality of user terminals, the transfer device comprising:

programming code in said transfer device for:

receiving, from an information provider server, push-type information for transmitting to at least one user terminal;

determining whether the information provider server is registered with the transfer device; and

rejecting the push-type information if the information provider is not registered with the transfer device.

51. The transfer device of claim 50, wherein the programming code for rejecting the push-type information comprises programming code for disposing of the push-type information.

52. The transfer device of claim 50, wherein the transfer device receives a network address of the information provider server; and

wherein the programming code for determining whether the information provider server is registered with the transfer device comprises programming code for comparing the network address of the information provider server with a list of network addresses of registered information provider servers.

53. The transfer device of claim 52, further comprising programming code for registering, by the information provider server, the network address for the information provider server in the list of network addresses.

54. The transfer device of claim 52, further comprising programming code for storing the push-type information if the information provider server is registered.

55. A transfer device for routing information from an information provider server to a plurality of user terminals, the transfer device comprising:

a database;

an information managing portion for storing registration information from the user terminals and the information provider server in the database, for registering the user terminals with the information provider server, and for determining which user terminal to transmit information to based on the stored registration information from the user terminals and the information provider server;

an electronic mail managing portion comprising at least one mailbox for storing the information to be transmitted; and

a bus for connecting the information managing portion and the electronic mail managing portion.

56. The transfer device of claim 55, wherein the registration information for the user terminals stored in the database comprises telephone numbers of the user terminals and corresponding user management numbers; and

wherein the information managing portion receives user management numbers from the information provider server and converts the user management numbers into telephone numbers based on the database.

57. The transfer device of claim 55, wherein the registration information for the user terminals stored in the database comprises attributes of users of the user terminals; and

wherein the information managing portion receives designated attributes from the information provider server and determines user terminals which have attributes in the database that match the designated attributes.

58. The transfer device of claim 55, further comprising a system control portion for performing protocol conversion between a mobile packet communication network for the user terminals and an Internet for the information provider server.

59. An information provider server in an Internet sending information to a plurality of user terminals in a mobile telephone network via a transfer device acting as a gateway, the information provider server comprising:

registration means for registering user management numbers of the user terminals with the information provider server, the user management numbers being received from the transfer device and having a one-to-one correspondence with telephone numbers of the user terminals; and

providing means for providing information services to the user terminals via the transfer device in response to requests from registered user terminals.

60. The information provider server of claim 59, wherein the registration means comprises receiving means for receiving the user management numbers from the transfer device.

61. An information provider server in an Internet sending information to a plurality of user terminals in a mobile telephone network via a transfer device, the information provider server comprising:

identifying means for identifying a set of attributes with respect to users of the user terminals for purposes of providing information services; and

providing means for providing information to the user terminals by forwarding to the transfer device the information with the identified set of attributes so that the transfer device specifies addresses of the user terminals corresponding to users having the identified set of attributes.

62. Mobile terminal device for receiving information from an information provider server via a transfer device, the mobile terminal device comprising:

requesting means for requesting registration of the user terminal at the transfer device and the information provider device, the registration at the transfer device comprising registering a telephone number of the user terminal and the registration at the information provider server comprising registering a user management number of the user terminal, the user management number having a one-to-one correspondence with the telephone number; and

receiving means for receiving information, the information provider server sending the information and the user management number to the transfer device, the transfer device selecting the telephone number corresponding to the user management number and sending the information to the receiving means.

63. Mobile terminal device for receiving information from an information provider server via a transfer device, the mobile terminal device comprising:

requesting means for requesting registration of the user terminal at the transfer device, the registration at the transfer device comprising registering attributes of a user of the user terminal and a telephone number of the user terminal; and

receiving means for receiving information, the information provider server sending the information and designated attributes to the transfer device, the transfer device sending the information to the receiving means if the designated attributes match at least some of the registered attributes.

64. A push-type information transmission method in a communication network comprising an information provider device, a plurality of user terminals for receiving information provided by the information provider device, and a transfer device for routing information between the information provider device and the user terminals, the method comprising the transfer device performing:

registering at least IP registration information of the information provider device;

registering at least user registration information of the user terminals;

receiving from the information provider device push-type information supplied with an identification of a user terminal designated as a desired destination; and

transmitting at least a part of the push-type information to the user terminal designated as a desired destination.

65. The method of claim 64, wherein transmitting at least a part of the push-type information comprises transmitting based on at least one of the IP registration information or the user registration information.

66. The method of claim 65, wherein at least a part of the information received from the information provider device is compared with at least a part of the IP registration information.

67. The method of claim 66, wherein receiving from the information provider device comprises receiving an address related to the information provider device; and

wherein transmitting based on at least one of the IP registration information or the user registration information comprises:

determining whether at least a part of the address related to the information provider device is registered with the transfer device in order to determine whether to transmit or reject the push-type information.

68. The method of claim 65, wherein transmitting based on at least one of the IP registration information or the user registration information comprises:

determining whether at least a part of the information used for identifying a user terminal designated as a desired destination is registered with the transfer device.

69. The method of claim 68, wherein the information used for identifying a user terminal designated as a desired destination comprises a user management number.

70. The method of claim 65, wherein transmitting at least a part of the information comprises transmitting based on both the IP registration information and the user registration information.

71. The method of claim 64, further comprising registering user terminal identification information with the information provider device as a registration procedure for receiving an information transmission service offered by the information provider device; and

wherein the information provider device provides information to the user terminals registered.

72. The method of claim 64, wherein the registering IP registration information comprises a network address.

73. The method of claim 64, wherein the user registration information comprises a network address.

74. The method of claim 73, wherein the user registration information further comprises user attributes.

75. The method of claim 64, wherein the information used for identifying a user terminal comprises a user management number.

76. The method of claim 64, wherein the information used for identifying a user terminal comprises an address for the user terminal.

77. The method of claim 64, wherein registering at least user registration information of the user terminals comprises storing a network address in correspondence with user attributes;

wherein the information used for identifying a user terminal comprises designated user attributes; and

further comprising:

comparing the stored user attributes with the designated user attributes; and

specifying the network addresses of the user terminals corresponding to users having the designated user attributes.

78. The method of claim 64, wherein the information provider device belongs to a first communication network which follows a first communication protocol;

wherein the user terminals belong to a second communication network which follows a second communication protocol different from the first communication protocol; and

wherein the transfer device comprises a gateway that converts between the first and second communication protocols.

79. The method of claim 78, wherein the user terminals are given first network addresses used only on the first communication network;

wherein the user terminals have second network addresses used on the second communication network, the second network addresses having a one-to-one correspondence with the first network addresses; and

wherein the transfer device converts between the first network addresses in the first communication network and the second network addresses in the second communication network.

80. The method of claim 79, wherein the user terminals comprise mobile stations;

wherein the second communication network comprises a mobile communication network accommodating the mobile stations; and

wherein the first communication network comprises an Internet.

81. A transfer device for communicating in a network comprising an information provider device and a plurality of user terminals for receiving information provided by the information provider device, the transfer device for routing information between the information provider device and the user terminals, the transfer device comprising:

means for registering at least IP registration information of the information provider device;

means for registering at least user registration information of the user terminals;

means for receiving from the information provider device push-type information supplied with an identification of a user terminal designated as a desired destination; and

means for transmitting at least a part of the push-type information to the user terminal designated as a desired destination.

82. The transfer device of claim 81, wherein the means for transmitting at least a part of the push-type information comprises means for transmitting based on at least one of the IP registration information or the user registration information.

83. The transfer device of claim 82, wherein at least a part of the information received from the information provider device is compared with at least a part of the IP registration information.

84. The transfer device of claim 83, wherein the means for receiving from the information provider device comprises means for receiving an address related to the information provider device; and

wherein the means for transmitting based on at least one of the IP registration information or the user registration information comprises:

means for determining whether at least a part of the address related to the information provider device is registered with the transfer device in order to determine whether to transmit or reject the push-type information.

85. The transfer device of claim 82, wherein the means for transmitting based on at least one of the IP registration information or the user registration information comprises:

means for determining whether at least a part of the information used for identifying a user terminal designated as a desired destination is registered with the transfer device.

86. The transfer device of claim 85, wherein the information used for identifying a user terminal designated as a desired destination comprises a user management number.

87. The transfer device of claim 82, wherein the means for transmitting at least a part of the information comprises means for transmitting based on both the IP registration information and the user registration information.

88. The transfer device of claim 81, further comprising means for registering user terminal identification information with the information provider device as a registration procedure for receiving an information transmission service offered by the information provider device; and

wherein the information provider device provides information to the user terminals registered.

89. The transfer device of claim 81, wherein the registering IP registration information comprises a network address.

90. The transfer device of claim 81, wherein the user registration information comprises a network address.

91. The transfer device of claim 90, wherein the user registration information further comprises user attributes.

92. The transfer device of claim 81, wherein the information used for identifying a user terminal comprises a user management number.

93. The transfer device of claim 81, wherein the information used for identifying a user terminal comprises an address for the user terminal.

94. The transfer device of claim 81, wherein the means for registering at least user registration information of the user terminals comprises storing a network address in correspondence with user attributes;

wherein the information used for identifying a user terminal comprises designated user attributes; and

further comprising:

means for comparing the stored user attributes with the designated user attributes; and

means for specifying the network addresses of the user terminals corresponding to users having the designated user attributes.

95. The transfer device of claim 81, wherein the information provider device belongs to a first communication network which follows a first communication protocol;

wherein the user terminals belong to a second communication network which follows a second communication protocol different from the first communication protocol; and

wherein the transfer device comprises a gateway that converts between the first and second communication protocols.

96. The transfer device of claim 95, wherein the user terminals are given first network addresses used only on the first communication network;

wherein the user terminals have second network addresses used on the second communication network, the second network addresses having a one-to-one correspondence with the first network addresses; and

wherein the transfer device converts between the first network addresses in the first communication network and the second network addresses in the second communication network.

97. The transfer device of claim 96, wherein the user terminals comprise mobile stations;

wherein the second communication network comprises a mobile communication network accommodating the mobile stations; and

wherein the first communication network comprises an Internet.

98. A transfer device communicating with at least one information provider device via a first network and communicating with a plurality of mobile user terminals via a wireless mobile communication network, comprising:

means for receiving, from an information provider device via the first network, an information transmission, the information transmission comprising an address for the transfer device, address information for a mobile user terminal, and push-type information, the transfer device using the address information for the mobile user terminal to push at least a part of the push-type information to the mobile user terminal; and

means for wirelessly notifying the mobile user terminal, using the address information for the mobile user terminal, of the push-type information without awaiting a triggering event from the mobile user terminal.

99. The transfer device of claim 98, wherein the triggering event comprises a user of the mobile user terminal accessing the transfer device.

100. The transfer device of claim 98, wherein the triggering event comprises a user of the mobile user terminal providing at least one instruction to the transfer device for receiving the push-type information.

101. The transfer device of claim 98, wherein the address information for the transfer device comprises a mailbox associated with the transfer device.

102. The transfer device of claim 98, wherein the address information for the transfer device is used to route the information transmission to the transfer device.

103. The transfer device of claim 98, wherein the address information for the mobile user terminal comprises a user management number.

104. The transfer device of claim 103, further comprising means for determining a network address for the mobile user terminal from the user management number; and

wherein the means for notifying via the mobile communication network comprises means for notifying using the network address for the mobile user terminal.

105. The transfer device of claim 104, wherein the means for determining a network address for the mobile user terminal comprises means for accessing a memory correlating the user management number with the network address for the mobile user terminal.

106. The transfer device of claim 105, wherein the means for notifying comprises means for calling the network address for the mobile user terminal.

107. The transfer device of claim 98, wherein the first communication network comprises an Internet.

108. The transfer device of claim 98, wherein the information provider device in the first network follows a first communication protocol;

wherein the plurality of mobile user terminals in the mobile communication network follows a second communication protocol; and

wherein the transfer device comprises a gateway server converting between the first and second communication protocols.

109. A method for a transfer device to communicate with at least one information provider device via a first network and communicating with a plurality of mobile user terminals via a wireless mobile communication network, the method comprising:

receiving, from an information provider device via the first network, an information transmission, the information transmission comprising an address for the transfer device, address information for a mobile user terminal, and push-type

information, the transfer device using the address information for the mobile user terminal to push at least a part of the push-type information to the mobile user terminal; and

wirelessly notifying the mobile user terminal, using the address information for the mobile user terminal, of the push-type information without awaiting a triggering event from the mobile user terminal.

110. The method of claim 109, wherein the triggering event comprises a user of the mobile user terminal accessing the transfer device.

111. The method of claim 109, wherein the triggering event comprises a user of the mobile user terminal providing at least one instruction to the transfer device for receiving the push-type information.

112. The method of claim 109, wherein the address information for the transfer device comprises a mailbox associated with the transfer device.

113. The method of claim 109, wherein the address information for the transfer device is used to route the information transmission to the transfer device.

114. The method of claim 109, wherein the address information for the mobile user terminal comprises a user management number.

115. The method of claim 114, further comprising determining a network address for the mobile user terminal from the user management number; and

wherein notifying via the mobile communication network comprises notifying using the network address for the mobile user terminal.

116. The method of claim 115, wherein determining a network address for the mobile user terminal comprises accessing a memory correlating the user management number with the network address for the mobile user terminal.

117. The method of claim 116, wherein notifying comprises calling the network address for the mobile user terminal.

118. The method of claim 109, wherein the first communication network comprises an Internet.

119. The method of claim 109, wherein the information provider device in the first network follows a first communication protocol;

wherein the plurality of mobile user terminals in the mobile communication network follows a second communication protocol; and

wherein the transfer device comprises a gateway server converting between the first and second communication protocols.

120. A transfer device (GWS) communicating with at least one information provider device (W) via a first network (INET) and communicating with a plurality of user terminals (MS) via a second network (MPN), the transfer device (GWS) comprising:

means for receiving, from an information provider device (W), push-type information and an address related to the information provider device, the push-type information for transmitting to at least one user terminal (MS); and

means for determining whether the address related to the information provider device (W) is registered with the transfer device (GWS) in order to determine whether to transmit or not transmit the push-type information.

121. The transfer device of claim 120, further comprising means for transmitting (S35) at least a part of the push-type information if at least a part of the address related to the information provider device (W) is registered.

122. The transfer device of claim 121, wherein the means for transmitting comprises means for:

calling (S22, S23) the user terminal;

receiving (S32) a request from the user terminal to send the information; and

sending (S35) the information to the user terminal after receiving the request.

123. The transfer device of claim 120, further comprising means for not transmitting the push-type information if at least a part of the address related to the information provider device (W) is not registered.

124. The transfer device of claim 123, wherein the means for not transmitting the push-type information comprises means for disposing of the push-type information.

125. The transfer device of claim 120, wherein the means for determining whether the address related to the information provider device (W) is registered with the transfer device comprises means for comparing at least a part of the address related to the information provider device (W) with at least a part of stored (UDB) information provider device registration information.

126. The transfer device of claim 125, wherein the information provider device registration information comprises an information provider device name.

127. The transfer device of claim 125, wherein the information provider device registration information comprises an information provider device address on the first network.

128. The transfer device of claim 127, wherein the information provider device address on the first network comprises a universal resource locator (URL).

129. The transfer device of claim 120, wherein the means for determining whether the address related to the information provider device (W) is registered with the transfer device (GWS) comprises means for comparing at least a part of the address related to the information provider device (W) with at least a part of a list of network addresses of registered information provider devices.

130. The transfer device of claim 129, further comprising means for registering (UDB), by the information provider device, the network address for the information provider device in the list of network addresses,

wherein registering is performed prior to receiving the push-type information.

131. The transfer device of claim 120, wherein the user terminals comprise mobile stations (MS);

wherein the second communication network comprises a mobile communication network (MPN) accommodating the mobile stations; and

wherein the first communication network comprises an Internet (INET).

132. A method for a transfer device (GWS) to communicate with at least one information provider device (W) via a first network (INET) and communicating with a plurality of user terminals (MS) via a second network (MPN), the method being performed by the transfer device comprising:

receiving (S21), from an information provider device (W), push-type information and an address related to an information provider device, the push-type information for transmitting to at least one user terminal (MS); and

determining whether the address related to the information provider device is registered with the transfer device (GWS) in order to determine whether to transmit or not transmit the push-type information.

133. The method of claim 132, further comprising transmitting (S35) at least a part of the push-type information if at least a part of the address related to the information provider device (W) is registered.

134. The method of claim 133, wherein transmitting comprises:

calling (S22, S23) the user terminal;

receiving (S32) a request from the user terminal to send the information; and

sending (S35) the information to the user terminal after receiving the request.

135. The method of claim 132, further comprising disposing of the push-type information if at least a part of the address related to the information provider device (W) is not registered.

136. The method of claim 132, wherein determining whether the address related to the information provider device (W) is registered with the transfer device comprises comparing at least a part of the address related to the information provider device (W) with at least a part of stored (UDB) information provider device registration information.

137. The method of claim 136, wherein the information provider device registration information comprises an information provider device name.

138. The method of claim 136, wherein the information provider device registration information comprises an information provider device address on the first network.

139. The method of claim 138, wherein the information provider device address on the first network comprises a universal resource locator (URL).

140. The method of claim 132, wherein determining whether the address related to the information provider device (W) is registered with the transfer device (GWS) comprises comparing at least a part of the address related to the information provider device (W) with at least a part of a list of network addresses of registered information provider devices.

141. The method of claim 140, further comprising registering (UDB), by the information provider device, the network address for the information provider device in the list of network addresses,

wherein registering is performed prior to receiving the push-type information.

142. The method of claim 132, wherein the user terminals comprise mobile stations (MS);

wherein the second communication network comprises a mobile communication network (MPN) accommodating the mobile stations; and

wherein the first communication network comprises an Internet (INET).

143. A information transmission method in a communication network comprising an information provider device (W) communicating in a first network (INET), a plurality of user terminals (MS) for receiving information provided by the information provider

device (W) communicating in a second network (MPN), and a transfer device (GWS) for routing information between the information provider device (W) and the user terminals (MS), the method comprising the transfer device performing:

registering (S61) at least a network address of a user terminal (MS) in correlation with a user management number for the user terminal, the user management number used for identification of the user terminal only in the first communication network (INET), the user management number having a one-to-one correspondence with the network address for the user terminal and being different from the user terminal;

receiving (S63) from the information provider device information supplied with a designated user management number as a desired destination;

determining a network address that corresponds to the designated user management number; and

transmitting (S67) at least a part of the information to the determined network address.

144. The method of claim 143, wherein the user terminal comprises a mobile user terminal (MS).

145. The method of claim 144, wherein the network address for the user terminal (MS) comprise a telephone number.

146. The method of claim 143, wherein the first network comprises an Internet (INET); and

wherein the second network comprises a mobile communication network (MPN).

147. The method of claim 143, further comprising sending (S62) from the transfer device to the information provider device the user management number for a registration procedure of the user terminal with the information provider device.

148. The method of claim 143, wherein the information received from the information provider device (W) comprises push-type information.

149. The method of claim 143, wherein the information received from the information provider device (W) comprises pull-type information.

150. The method of claim 143, further comprising the transfer device (GWS) generating the user management number.

151. The method of claim 143, wherein determining a network address that corresponds to the designated user management number comprises:

matching the designated user management number with a registered user management number; and

selecting the network address correlated to the registered user management number that matched with the designated user management number.

152. A transfer device (GWS) for communicating with an information provider device (W) in a first network (INET), and a plurality of user terminals (MS) in a second network (MPN), the user terminals (MS) for receiving information provided by the information provider device (W), the transfer device (GWS) for routing information between the information provider device (W) and the user terminals (MS), the transfer device (GWS) comprising:

means for registering (S61) at least a network address of a user terminal in correlation with a user management number for the user terminal, the user management number used for identification of the user terminal only in the first communication network, the user management number having a one-to-one correspondence with the network address for the user terminal and being different from the user terminal;

means for receiving (S63) from the information provider device information supplied with a designated user management number as a desired destination;

means for determining a network address that corresponds to the designated user management number; and

means for transmitting (S67) at least a part of the information to the determined network address.

153. The transfer device of claim 152, wherein the user terminal comprises a mobile user terminal (MS).

154. The transfer device of claim 153, wherein the network address for the user terminal (MS) comprise a telephone number.

155. The transfer device of claim 152, wherein the first network comprises an Internet (INET); and

wherein the second network comprises a mobile communication network (MPN).

156. The transfer device of claim 152, further comprising means for sending (S62) from the transfer device to the information provider device the user management number for a registration procedure of the user terminal with the information provider device.

157. The transfer device of claim 152, wherein the information received from the information provider device (W) comprises push-type information.

158. The transfer device of claim 152, wherein the information received from the information provider device (W) comprises pull-type information.

159. The transfer device of claim 152, further comprising means for generating the user management number.

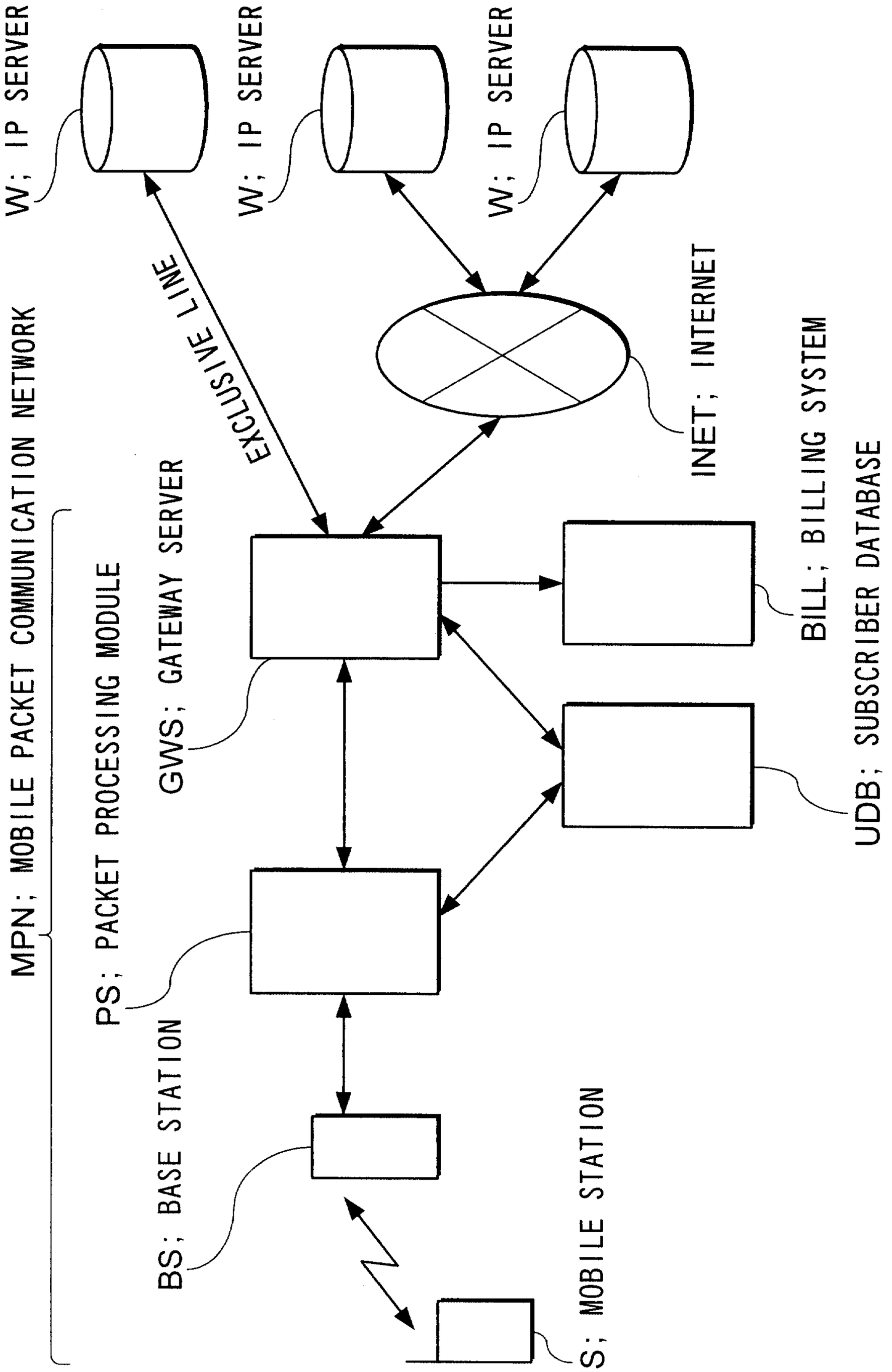
160. The transfer device of claim 152, wherein the means for determining a network address that corresponds to the designated user management number comprises:

means for matching the designated user management number with a registered user management number; and

means for selecting the network address correlated to the registered user management number that matched with the designated user management number.

F0269/3012

FIG. 1



F0269/3012

FIG. 2

SUBSCRIBER REGISTRATION INFORMATION FILE

TELEPHONE NUMBER	NAME	SEX	BIRTHDATE	ADDRESS
.....	.....	...	.....	.....
.....	.....	...	.....	.....
.....	.....	...	.....	.....
.....	.....	...	.....	.....
.....	.....	...	.....	.....
.....	.....	...	.....	.....
.....	.....	...	.....	.....

IP REGISTRATION INFORMATION FILE

COMPANY NAME	URL	IP BILLING/USER BILLING	AMOUNT-DEPENDENT/FIXED-RATE
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

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FIG. 3

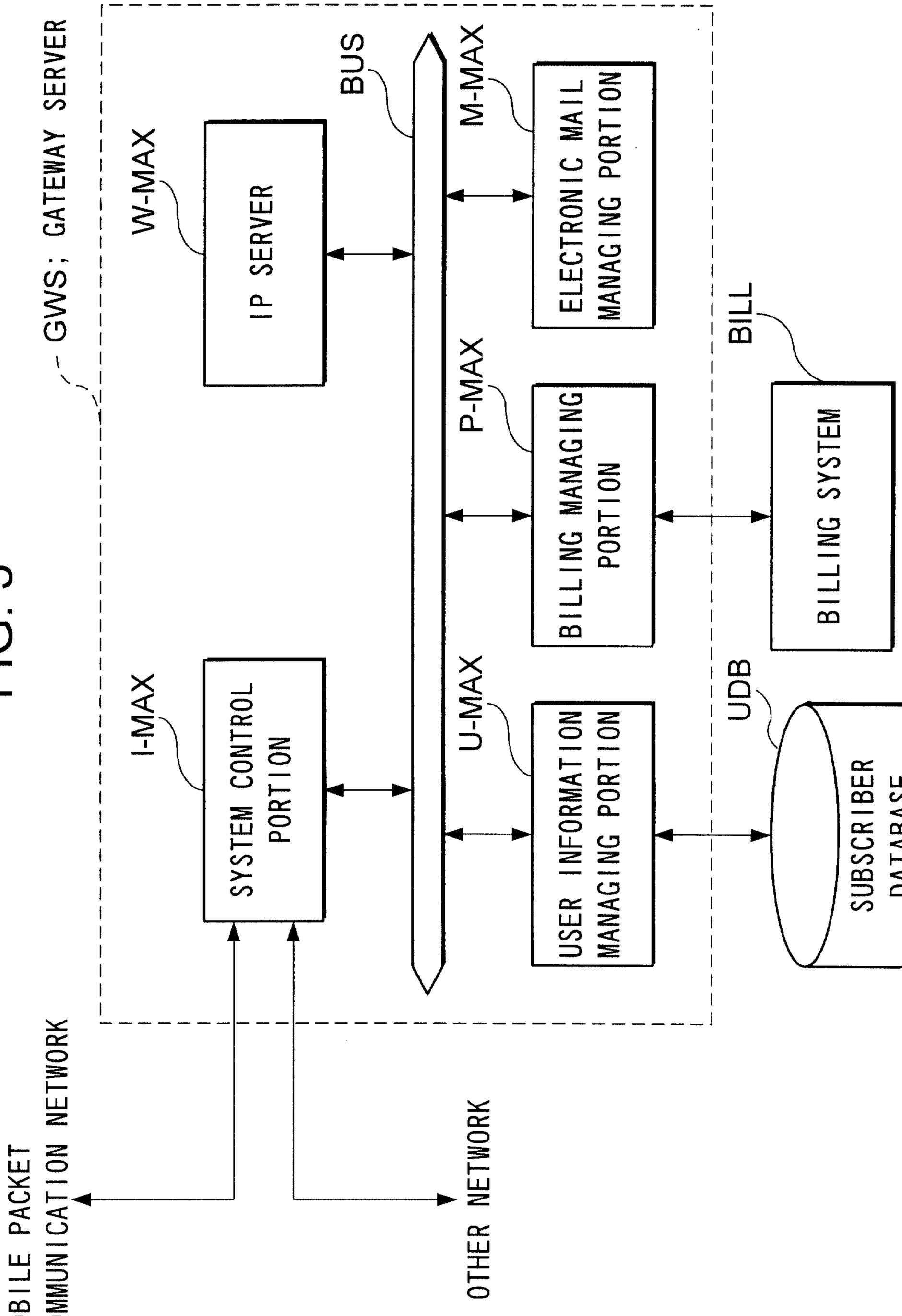

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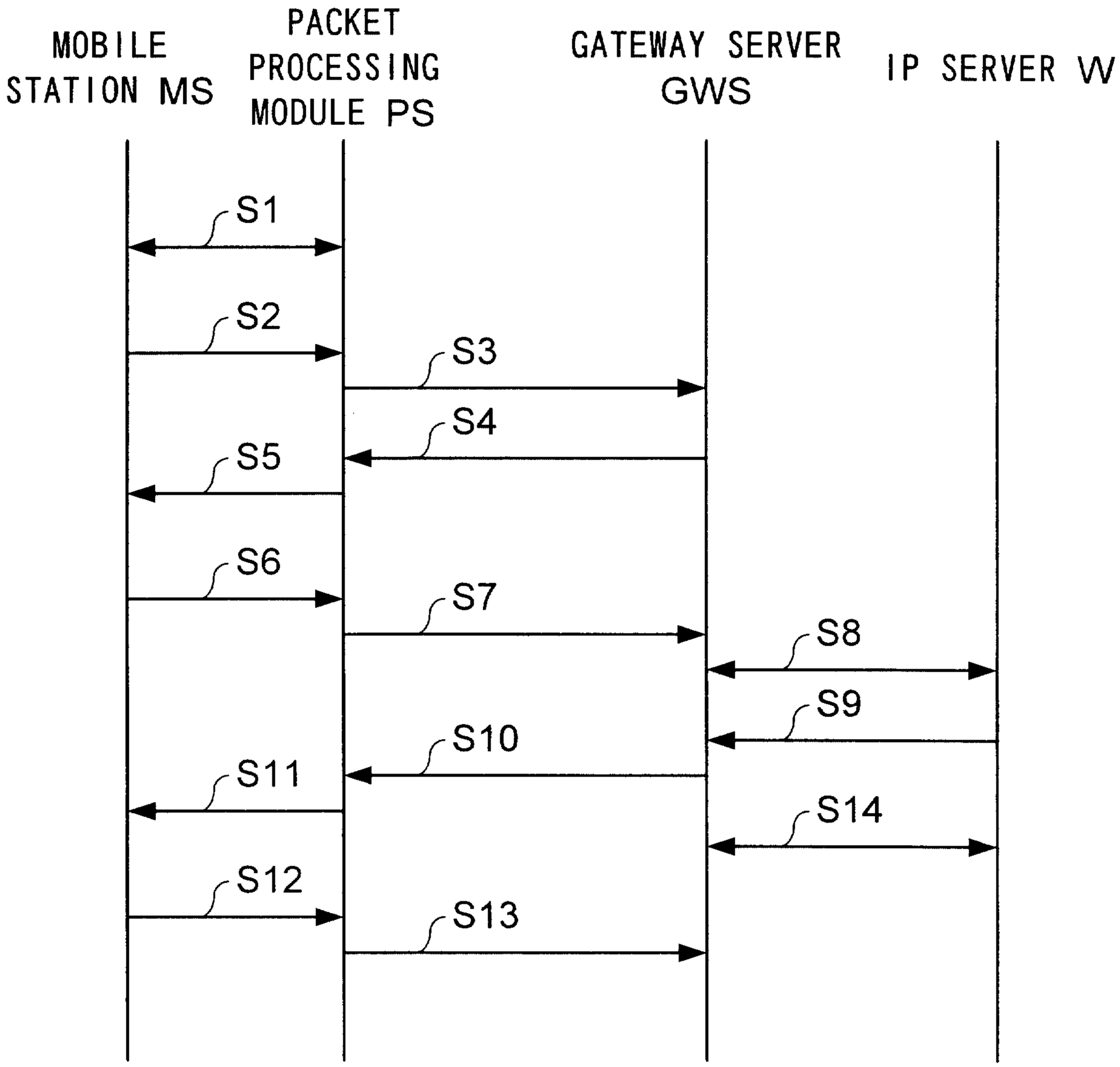
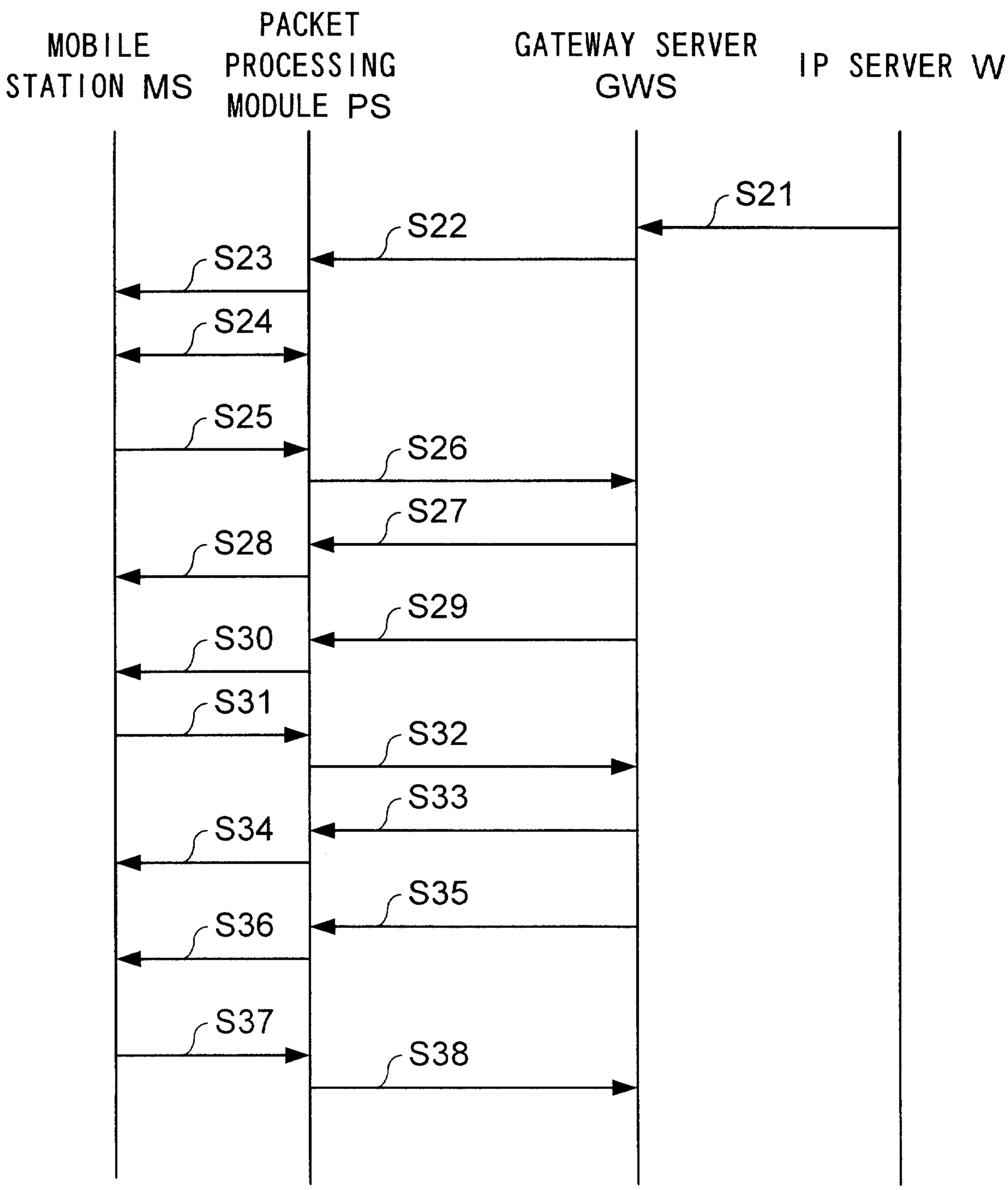
FIG. 4



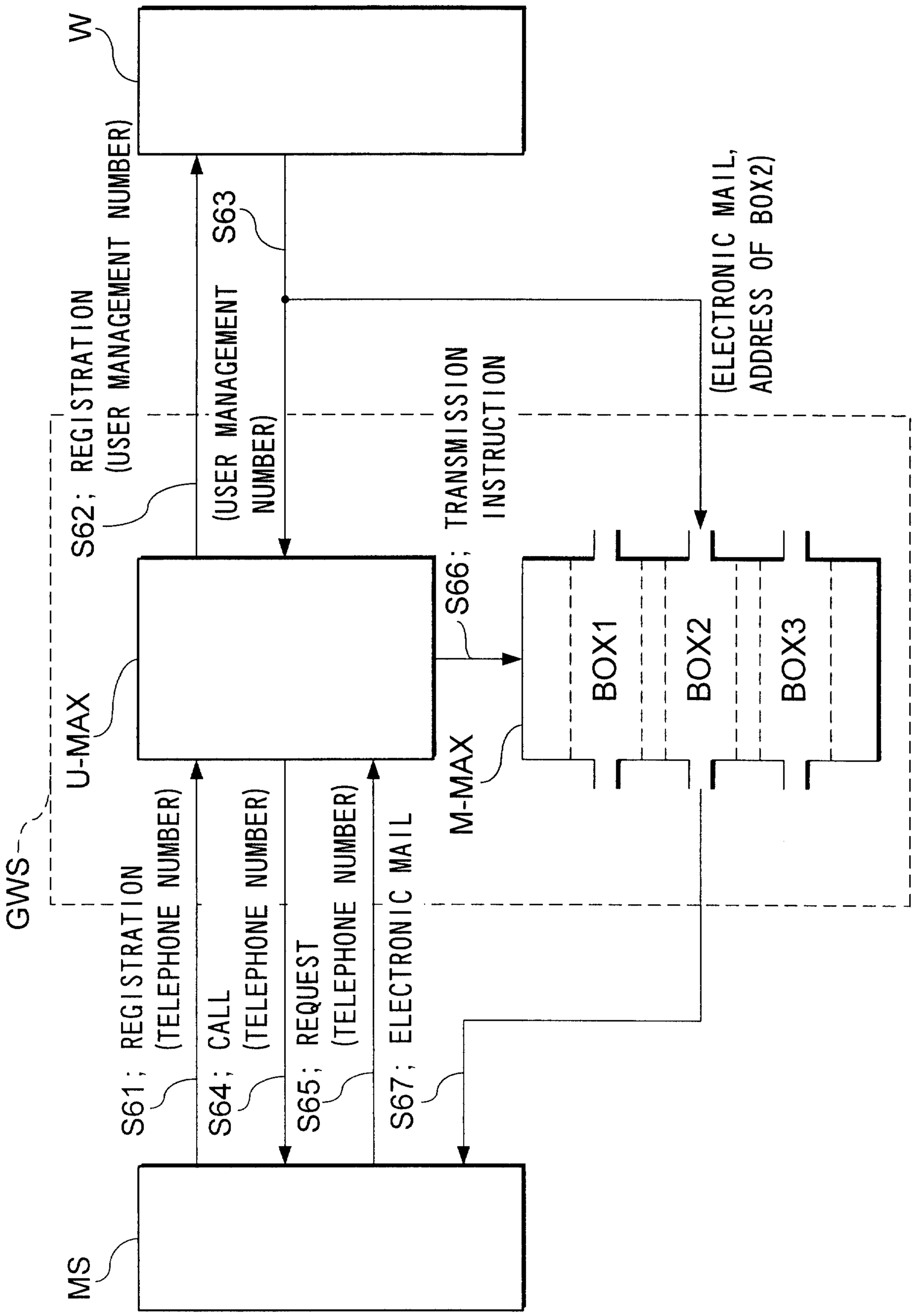
F0269/3012

FIG. 5



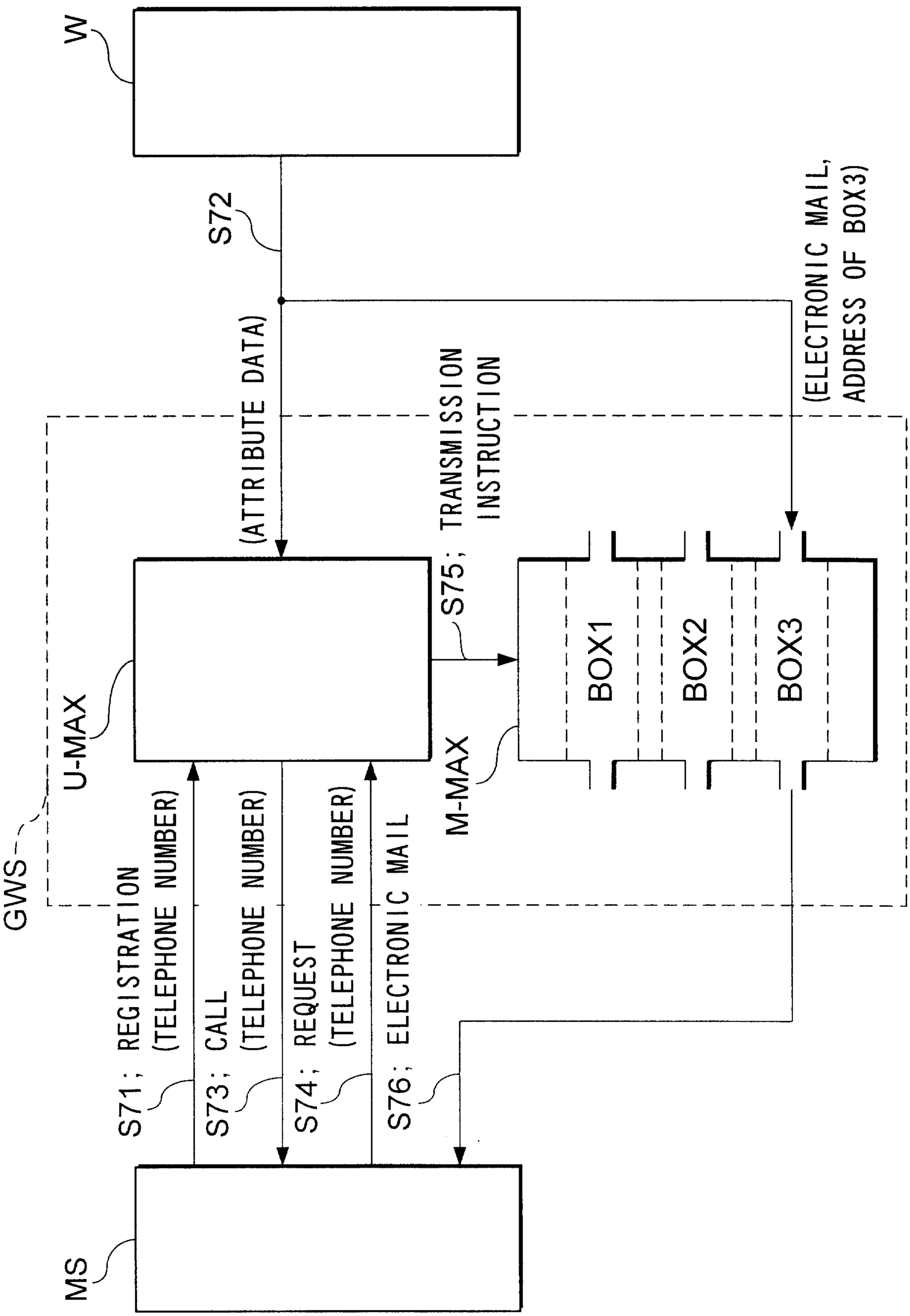
F0269/3012

FIG. 6



F0269/3012

FIG. 7



F0269/3012

FIG. 8

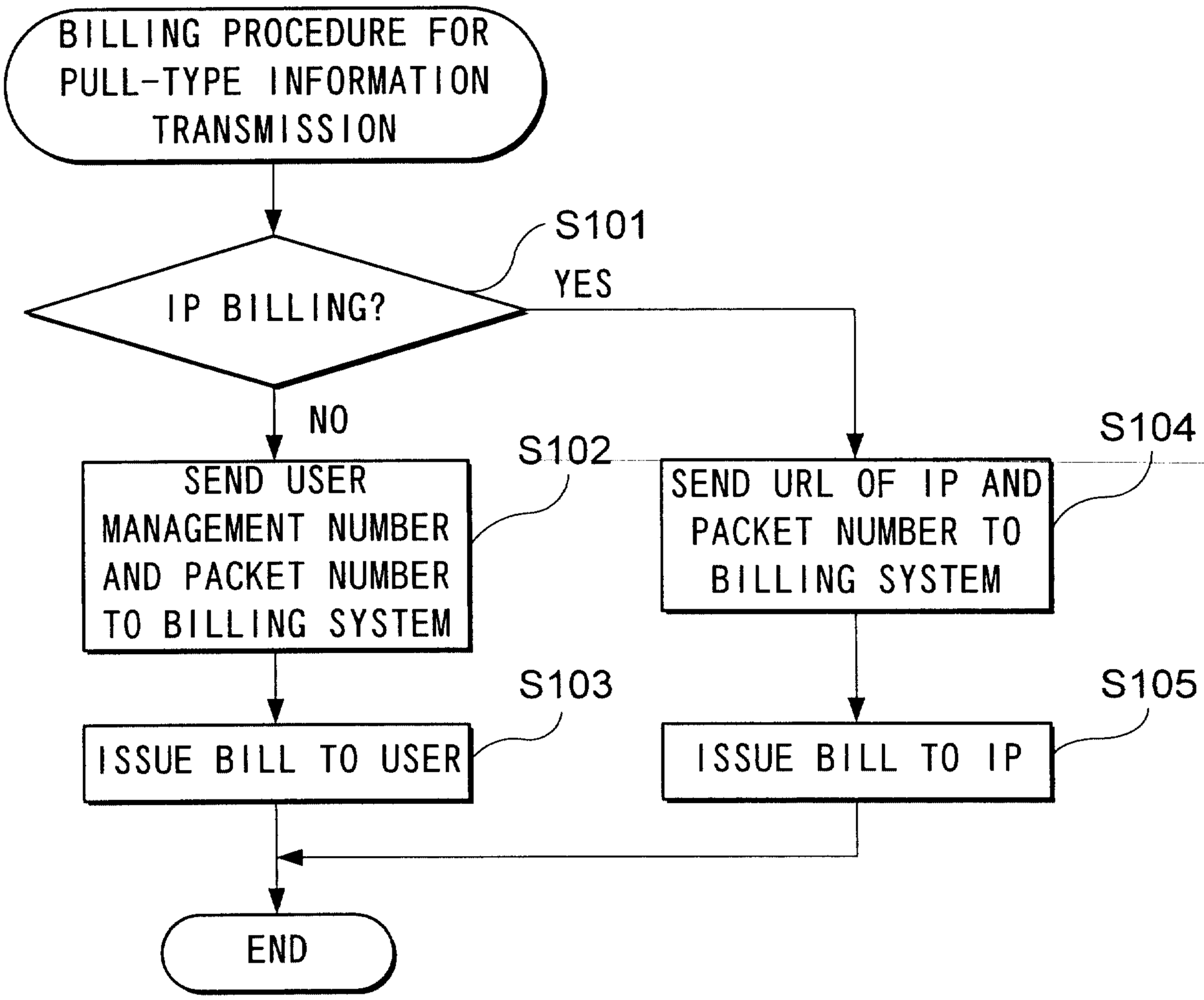


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FIG. 9

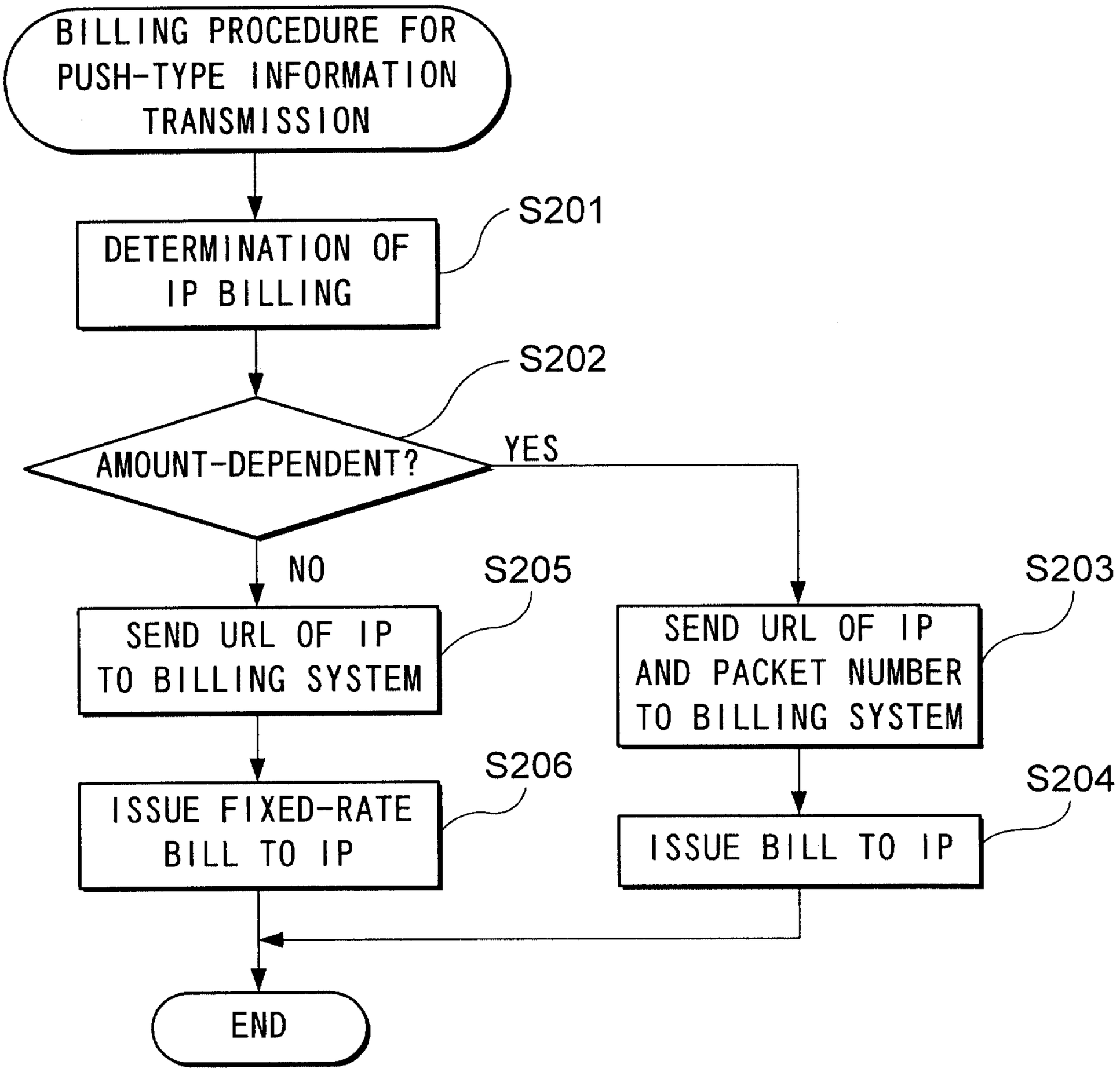
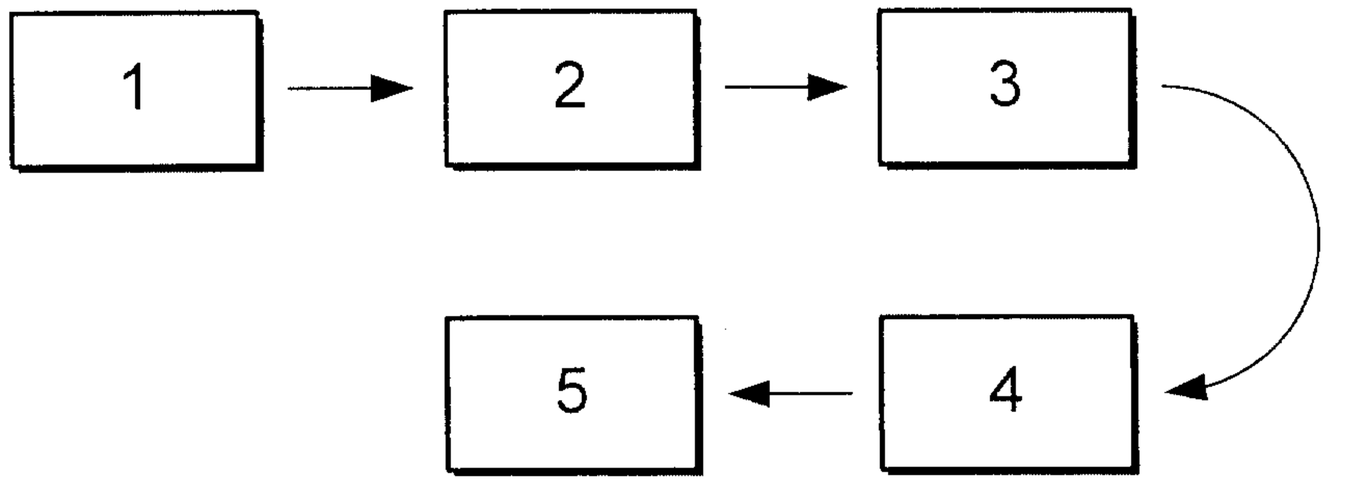
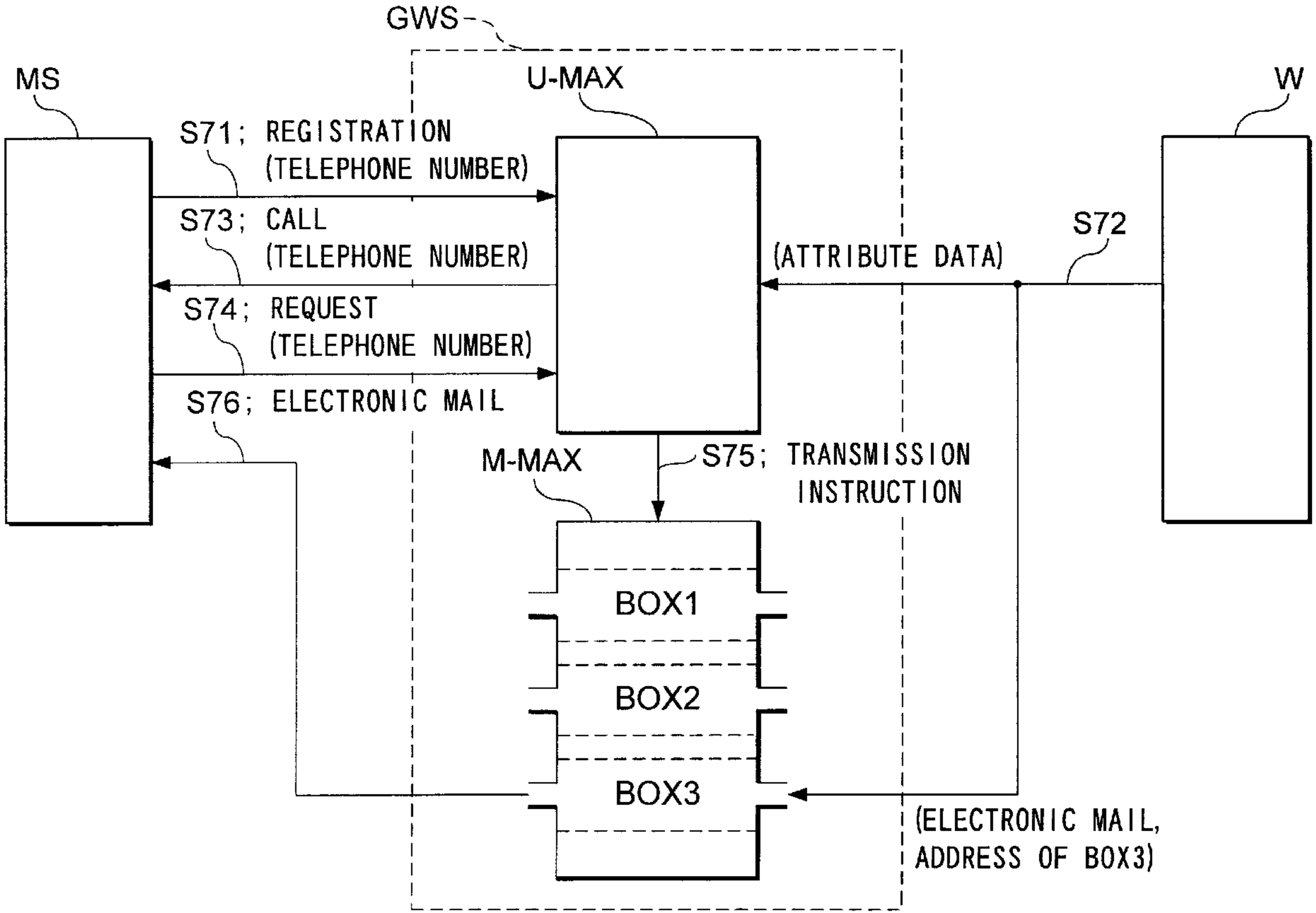


FIG. 10



1~5; SEQUENCE OF DIALOG SCREENS DISPLAYED WHEN USER PERFORMS REGISTRATION PROCEDURES

4; REGISTRATION SCREEN PROVIDED BY GATEWAY SERVER


GWS
MS
U-MAX
W
S71; REGISTRATION
(TELEPHONE NUMBER)
S73; CALL
(TELEPHONE NUMBER)
S74; REQUEST
(TELEPHONE NUMBER)
S76; ELECTRONIC MAIL
S72
(ATTRIBUTE DATA)
M-MAX
S75; TRANSMISSION
INSTRUCTION
BOX1
BOX2
BOX3
(ELECTRONIC MAIL,
ADDRESS OF BOX3)