

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
21 February 2008 (21.02.2008)

PCT

(10) International Publication Number  
**WO 2008/020660 A1**

(51) International Patent Classification:  
*H04M 3/00* (2006.01)

(74) Agent: **CHO, Heum-o**; SAEUM Patent & Law Office,  
1903, Seongji Heights 3, 642-6, Yeoksam-dong, Kang-  
nam-gu, Seoul 135-717 (KR).

(21) International Application Number:  
PCT/KR2006/003252

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP,  
KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT,  
LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ,  
NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU,  
SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR,  
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(22) International Filing Date: 18 August 2006 (18.08.2006)

(25) Filing Language: Korean

(26) Publication Language: English

(71) Applicant (for all designated States except US): **ELUON  
CORPORATION** [KR/KR]; 5f, Ssangdong Bldg West  
B/d, 54-1, Banpo-dong, Seocho-gu, Seoul 137-803 (KR).

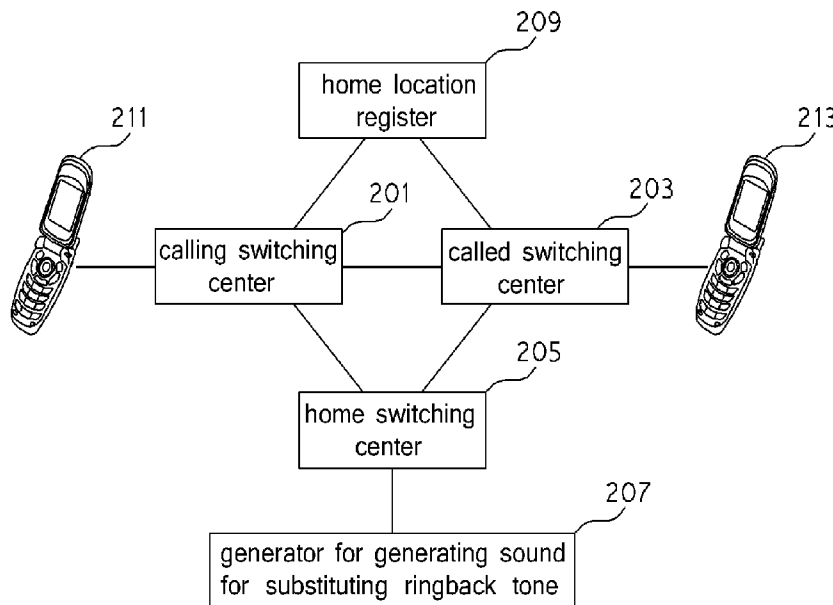
(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,  
RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,  
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WEON, Tae-hwan**  
[KR/KR]; 306-1001, Pureunmaeul, Sunae-dong, Bun-  
dang-gu, Seongnam-si, Gyeonggi-do 463-020 (KR). **KIM,  
Soon-ik** [KR/KR]; 102, 180-407, Bongcheon 11-dong,  
Gwanak-gu, Seoul 151-815 (KR).

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR PROVIDING SOUNDS FOR SUBSTITUTING RINGBACK TONES



(57) Abstract: The present invention relates to method and apparatus for providing sounds for substituting ringback tones. The present invention provides method and apparatus for providing sounds for substituting ringback tones comprising: receiving a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal; transmitting a call signal to the called terminal by corresponding to the first call connection request; judging whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones; when the calling terminal is registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, transmitting a second call connection request signal to the home switching center, and

receiving a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmitting a third call connection answer signal corresponding thereto to the calling switching center, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and answer signals.

WO 2008/020660 A1



---

**Published:**

— *with international search report*

## Description

# METHOD AND APPARATUS FOR PROVIDING SOUNDS FOR SUBSTITUTING RINGBACK TONES

### Technical Field

- [1] The present invention relates to method and apparatus for providing sounds for substituting ringback tones, and in particular to the method and apparatus capable of a pre-established sound source in a call standby state as the sounds for substituting the ringback tones using a home switching center.

### Background Art

- [2] There has been currently proposed various services for providing sounds for substituting ringback tones instead of general ringback tones transmitted to a calling subscriber from a communication network such as a general telephone network or a mobile communication network.
- [3] FIG. 1 is a signal flow diagram in a mobile communication network for providing sounds for substituting ringback tones according to the prior art.
- [4] Referring to FIG. 1, when a calling terminal request a call connection to a called terminal corresponding to a called party subscribing to a service for providing sounds for substituting ringback tones, a calling switching center transmits a LocReq (Location Request) to a home location register in order to query the location of the called terminal (a step 101). The home location register transmits RoutReq(Routing Request), which is a querying routing number request, to a called switching center in order to connect to the called switching center (step 103). The called switching center answers the RoutReq received from the home location register to return the RoutReq including a temporary local directory number (TLDN) to the home location register (step 105). Thereafter, the home location register uses the received routing information to return the LocReq to the calling switching center (step 107).
- [5] The calling switching center requests ISUP call connection to the called switching center based on the routing information (step 109). The called switching center extracts service setup information for sounds for substituting ringback tones pre-stored in a storage according to the ISUP call connection request signal received from the calling switching center. when a user corresponding to the called terminal is a service subscriber for the sounds for substituting the ringback tones, ISUP call connection request signal is transmitted to a sound source providing apparatus by using the routing information corresponding to the pre-stored sound source providing apparatus (step 111). At this time, the ISUP call connection request signal comprises a called terminal identifier and a calling terminal identifier. As a performance result, a speech path is es-

established between the calling switching center, the called switching center, and the sound source providing apparatus.

[6] The sound source providing apparatus asks a sound source providing control server for the sound source code based on the called terminal identifier and the calling terminal identifier received (step 113). The sound source providing control server answers the sound code request signal to connect to the called terminal identifier and the calling terminal identifier so that it searches the stored sound source code and then transmits the searched sound source code to the sound source providing apparatus (step 115). Thereafter, the sound source providing apparatus transmits the sounds for substituting the ringback tones corresponding to the sound source received from the sound source providing control server to the calling terminal by using the speech path (step 117). When the called switching center recognizes that the called terminal answers a call during the transmission of the sounds for substituting the ringback tones to the calling terminal, it request the ISUP call disconnection to the sound source providing apparatus (step 119). The sound source providing apparatus receives the ISUP call disconnection request signal from the called switching center and then disconnects the speech path established between the called switching center and the sound source providing apparatus. Thereafter, the called terminal uses the speech path established between the called terminal and the calling terminal to perform a normal call (step 121).

[7] As a method for providing the sounds for substituting the ringback tones in the prior art, there are a distributed mode and a centralized mode, wherein the distributed mode is that the sound source providing apparatus and the sound source providing control server are located at each switching center. The centralized mode couples an intelligent peripheral (IP) to the rear end of the called switching center. To this end, the centralized mode is based on an intelligent network or a wireless intelligent network that should comprises a service control point (SCP), which is a new switching center. As a result, in order for the existing switching center to connect to the SCP/IP, it has a problem that it should add-on a service switching point function separately. In other words, in order to add the SSP function to the existing switching center or substitute the SSP for the existing switching center, it has a problem that astronomical cost is required.

[8] Also, in the distributed mode and the centralized mode, when the subscriber with the terminal moves to any region, the any corresponding called switching center should provide the sounds for substituting the ringback tones. In order to implement this, it has a problem that all the additional service system connected to the called switching center should have the DB for the sounds for substituting the ringback tones. In other words, when the subscriber records a new sound source to select it as his/her ringback

tones, it has a problem that the same sound sources should copied in the additional service system connected to all the switching center and synchronized with each other. In other words, the distributed mode and the centralized mode require a resource of many signal points in order to connect to the additional service system. Also, since each additional service system has a database of the same contents, it has a problem that its installation and operating cost increases by geometric progression as service subscriber increases.

- [9] Also, the service for providing the sounds for substituting the ringback tones has a method for providing the sound source established by the calling party as the sounds for substituting the ringback tones in addition to a method for providing the sound source established by the called party as the sounds for substituting the ringback tones as described above. The service providing the sound source established by a calling party as the sounds for substituting the ringback tones has a problem that the sound source established by the calling party is unconditionally provided as the sounds for substituting the ringback tones irrespective of whether or not the called party subscribes to the service for providing the ringback tones.

## **Disclosure of Invention**

### **Technical Problem**

- [10] It is an object of the present invention to provide method and apparatus for providing sounds for substituting ringback tones using a home switching center capable of significantly reducing the capacity of the data base for providing an additional service by minimally correcting a function of a pre-installed switching center etc., in an existing mobile communication network.
- [11] It is an object of the present invention to provide method and apparatus for providing sounds for substituting ringback tones capable of providing a sound source established by a calling party as sounds for substituting ringback tones if the calling party is a subscriber of a service for providing the sounds for substituting the ringback tones, even when a called party is not a subscriber of a service for providing the sounds for substituting the ringback tones.
- [12] It is an object of the present invention to provide to provide method and apparatus for providing sounds for substituting ringback tones capable of providing a sound source established by a calling party as sounds for substituting ringback tones irrespective of whether or not the called party subscribes to the service for providing the ringback tones.

### **Technical Solution**

- [13] In order to accomplish the objects, according to one aspect of the present invention, there is provided A method for providing a service for providing sounds for sub-

stituting ringback tones in a called switching center, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the method comprising the steps of: receiving a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal; transmitting a call signal to the called terminal by corresponding to the first call connection request; judging whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones; when the calling terminal is registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, transmitting a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and receiving a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmitting a third call connection answer signal corresponding thereto to the calling switching center, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and an answer signals.

[14] Herein, when the called terminal answers a call by corresponding to the call signal, the method further comprises transmitting a speech path disconnect request signal to the home switching center, wherein the home switching center transmits the speech path disconnect request signal to the generator for generating the sounds for substituting ringback tones so that the speech path established between the generator for generating the sounds for substituting ringback tones and the called switching center is disconnected.

[15] Also, the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones selected by a calling party corresponding to the calling terminal by using the identifier of the calling terminal from the database previously provided by corresponding to the third call connection request

signal, and transmits the extracted the sounds for substituting ringback tones to the calling terminal, through the calling-side switching center, using the speech path established between the calling terminal by means of the first, second, and third connection request signals and answer signals.

[16] Also, the identifier of the calling terminal is a mobile identification number (MIN). Also, the speech path is made by means of an integrated service digital network user part (ISUP) call connection.

[17] According to another aspect of the present invention, there is provided a method for providing a service for providing sounds for substituting ringback tones in a calling switching center, which corresponds to a calling terminal and is coupled to a called switching center corresponding to a called terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the method comprising the steps of: receiving a call for the called terminal from the calling terminal; transmitting a first call connection request signal for the called terminal to the called switching center by corresponding to the call request; receiving a first call connection answer signal corresponding to the first call connection request from the called switching center; and transmitting a second call connection request signal to the home switching center by corresponding to the first call connection answer signal, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the calling switching center, and the generator for generating the sounds for substituting ringback tones transmits a second call connection answer signal to the home switching center by corresponding to the third call connection request signal, wherein the home switching center transmits a third call connection answer signal to the calling switching center by corresponding to the second call connection answer signal, extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the second and third call connection request signals and answer signals.

[18] According to another aspect of the present invention, there is provided a method for providing a service for providing sounds for substituting ringback tones in a called switching center, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the method comprising the

steps of: receiving a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal; transmitting a call signal to the called terminal by corresponding to the first call connection request; judging whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones; when the called terminal is not registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, transmitting a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and receiving a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmitting a third call connection answer signal corresponding thereto to the calling switching center, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and answer signals.

- [19] According to another aspect of the present invention, there is provided a called switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the called switching center comprising: a means for receiving a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal; a means for transmitting a call signal to the called terminal by corresponding to the first call connection request; a means for judging whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones; when the calling terminal is registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, a means for transmitting a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received



from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and a means for receiving a second call answer signal by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmitting a third call connection answer signal corresponding thereto to the calling switching center, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and answer signals.

- [20] According to another aspect of the present invention, there is provided a calling switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a calling terminal and is coupled to a called switching center corresponding to a called terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the calling switching center comprising: a means for receiving a call for the called terminal from the calling terminal; a means for transmitting a first call connection request signal for the called terminal to the called switching center by corresponding to the call request; a means for receiving a first call connection answer signal corresponding to the first call connection request from the called switching center; and a means for transmitting a second call connection request signal to the home switching center by corresponding to the first call connection answer signal, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the calling switching center, and the generator for generating the sounds for substituting ringback tones transmits a second call connection answer signal to the home switching center by corresponding to the third call connection request signal, wherein the home switching center transmits a third call connection answer signal to the calling switching center by corresponding to the second call connection answer signal, extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the second and third call connection request signals and answer signals.

[21] According to another aspect of the present invention, there is provided a called switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the called switching center comprising: a means for receiving a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal; a means for transmitting a call signal to the called terminal by corresponding to the first call connection request; a means for judging whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones; when the called terminal is not registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, a means for transmitting a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and a means for receiving a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmitting a third call connection answer signal corresponding thereto to the calling switching center, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and answer signals.

[22] According to another aspect of the present invention, there is provided a called switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the called switching center comprising: a memory stored with a program; and a processor coupled to the memory to run the program, wherein by means of the program, the processor transmits a call signal to the called terminal by corresponding to the first call connection request; judges whether the

calling terminal is registered on the service for providing the sounds for substituting ringback tones; when the called terminal is not registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, transmits a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and receives a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmits a third call connection answer signal corresponding thereto to the calling switching center, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and answer signals.

- [23] According to another aspect of the present invention, there is provided a calling switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a calling terminal and is coupled to a called switching center corresponding to a called terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the calling switching center comprising: a memory stored with a program; and a processor coupled to the memory to run the program, wherein by means of the program, the processor receives a call for the called terminal from the calling terminal; transmits a first call connection request signal for the called terminal to the called switching center by corresponding to the call request; receives a first call connection answer signal corresponding to the first call connection request from the called switching center; and transmits a second call connection request signal to the home switching center by corresponding to the first call connection answer signal, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the calling switching center, and the generator for generating the sounds for substituting ringback tones transmits a second call connection answer signal to the home switching center by corresponding to the third call connection request signal, wherein the home switching

center transmits a third call connection answer signal to the calling switching center by corresponding to the second call connection answer signal, extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the second and third call connection request signals and answer signals.

- [24] According to another aspect of the present invention, there is provided a called switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the called switching center comprising: a memory stored with a program; and a processor coupled to the memory to run the program, wherein by means of the program, the processor receives a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal; transmits a call signal to the called terminal by corresponding to the first call connection request; judges whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones; when the called terminal is not registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, transmits a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and receives a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmits a third call connection answer signal corresponding thereto to the calling switching center, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and answer signals.

### **Advantageous Effects**

[25] The present invention has an effect capable of significantly reducing the capacity of the data base for providing sounds for substituting ringback tones by minimally correcting a function of a pre-installed switching center etc., in an existing mobile communication network.

[26] The present invention has an effect capable of providing a sound source established by a calling party as sounds for substituting ringback tones if the calling party is a subscriber of a service for providing the sounds for substituting the ringback tones, even when a called party is not a subscriber of a service for providing the sounds for substituting the ringback tones.

[27] The present has an effect capable of providing a sound source established by a calling party as sounds for substituting ringback tones irrespective of whether or not the called party subscribes to the service for providing the ringback tones.

### **Brief Description of the Drawings**

[28] FIG. 1 is a signal flow diagram in a mobile communication network for providing sounds for substituting ringback tones according to the prior art;

[29] FIG. 2 is a view showing a constitution of an apparatus for providing a service for providing sounds for substituting ringback tones according to one preferred embodiment of the present invention;

[30] FIG. 3 is a flow chart for providing a service for providing sounds for substituting ringback tones according to one preferred embodiment of the present invention;

[31] FIG. 4 is a flow chart for providing a service for providing sounds for substituting ringback tones according to another embodiment of the present invention;

[32] FIG. 5 is a signal flow diagram showing a procedure for providing a service for providing sounds for substituting ringback tones according to one preferred embodiment of the present invention;

[33] FIG. 6 is a signal flow diagram showing a procedure for providing a service for providing sounds for substituting ringback tones according to another of the present invention;

[34] FIG. 7 is a flow chart schematically showing a process for providing sounds for substituting ringback tones according to one preferred embodiment of the present invention;

[35] FIG. 8 is a signal flow diagram showing a connecting process to a called switching center according to one preferred embodiment of the present invention;

[36] FIG. 9 is a signal flow diagram showing a process for generating and providing sounds for substituting ringback tones according to one preferred embodiment of the present invention;

[37] FIGS. 10 and 11 are signal flow diagrams showing a process of performing a normal

call forwarding according to one preferred embodiment of the present invention; and  
[38] FIG. 12 is a view schematically a region distributed structure of a generator for generating sounds for substituting ringback tones according to one preferred embodiment of the present invention.

### **Best Mode for Carrying Out the Invention**

[39] Hereinafter, preferred embodiments of the present invention will be described in detail with reference to accompanying drawings.

[40] FIG. 2 is a view showing a constitution of an apparatus for providing a service for providing sounds for substituting ringback tones according to one preferred embodiment of the present invention

[41] Referring to FIG. 2, the apparatus for providing the service for providing the sounds for substituting the ringback tones comprises an calling switching center 201, a called switching center 203, a home switching center, a generator 207 for generating the sounds for substituting the ringback tones, a home location register (HLR) 209, an originating terminal 211, and a called terminal 213.

[42] The calling switching center 201 has all the existing functions in a mobile communication network. Also, the calling switching center 201 further comprises a function of transmitting a call connection request signal to the called switching center 203 in order to form a speech path with the generator 207 for generating the sounds for substituting the ringback tones for providing the service for providing the sounds for substituting the ringback tones according to the present invention after receiving the answer for a location registration request from the home location register 209.

[43] The called switching center 203 has all the existing functions in the mobile communication network. Also, in order to provide the service for providing the sound for substituting the ringback tones according to the present invention, the called switching center further comprises a function of transmitting a call connection request signal to the home switching center 205 after receiving the call connection request signal from the calling switching center 201.

[44] The home switching center 205 has all of functions of the switching center in the existing mobile communication network. The home switching center 205 means a single switching center to which subscribers to the service for providing the sounds for substituting the ringback tones according to the present invention belong. In the case where the subscriber with the terminal moves to other region, the locations of the calling switching center and the called switching center can be changed, while the location of the home switching center does not change. Also, in order to provide the service for providing the sounds for substituting the ringback tones according to the present invention, the home switching center 205 further comprises function receiving

the call connection request signal from the calling switching center 201 or the called switching center 203 and transmitting the call connections request signal to the generator for generating the sound for substituting the ringback tones.

[45] The generator 207 for generating the sound for substituting the ringback tones has a function transmitting the sound for substituting the ringback tones to the calling terminal. In order to provide the service for providing the sound for substituting the ringback tones according to the present invention, the generator 207 for generating the sound for substituting the ringback tones further comprises a function receiving the call connection request signal from the home switching center 205 and transmitting the corresponding call connection request answer signal to the home switching center 205.

[46] The method for providing the service for providing the sounds for substituting the ring tones according to one preferred embodiment of the present invention will be schematically described with reference to the above configuration. First, if a calling party requests a telephone call with the called terminal 213 using the calling terminal 211, the calling switching center 201 grasps the location of the called terminal 213 and then, requests call connection with the called switching center 203. At this time, the called switching center 203 requests call connection to the home switching center 305 using the information of the service for providing the sounds for substituting the ring tones according to the present invention to which the calling party subscribes, while requesting call connection with the called terminal 213. That is, the called switching center 203 requests call routing to the home switching center 205 using the mobile identification number (MIN) of the calling terminal 211. The home switching center 205 receiving the call routing request attempts the ISUP call connection to the generator 207 for generating the sound for substituting the ringback tones connected to the home switching center. When the ISUP call connection to the generator 207 for generating the sound for substituting the ringback tones is made, the generator 207 for generating the sound for substituting the ringback tones provides the service for providing the sound for substituting the ringback tones using the MIN of the calling terminal 211.

[47] In addition, according to another preferred embodiment of the present invention, after the calling switching center 201 transmits/receives the call connection request signal to/from the called switching center 203, it can request the call connection to the home switching center 207 using the MIN of the calling terminal 211.

[48] FIG. 3 is a flow chart for providing a service for providing sounds for substituting ringback tones according to one preferred embodiment of the present invention.

[49] Referring to FIG. 3, first the calling party asks the called terminal for a call using the calling terminal (step 301). Thereafter, the called switching center judges whether the calling terminal is registered in the service for providing the sounds for substituting

the ringback tones (step 303). The judgment can be performed in both of the calling switching center and the called switching center. As the result of the judgment, if it is judged that the calling terminal has been registered in the service for providing the sounds for substituting the ringback tones, step 305 is performed, and if it is judged that the calling terminal has not been registered in the service for providing the sounds for substituting the ringback tones, step 307 is performed.

[50] In a step 305, the calling switching center or the called switching center requests call connection to the home switching center in which the calling terminal is registered, to form the speech path. The generator for generating the sounds for substituting the ringback tones connected to the home switching center provides the sound source established by the calling party as the sounds for substituting the ringback tones using the speech path.

[51] In a step 307, the calling switching center or the called switching center judges whether the called terminal has been registered in the service for providing the sound for substituting the ringback tones. As the result of the judgment, if it is judged that the called terminal has been registered in the service for providing the sounds for substituting the ringback tones, a step 309 is performed, and it is judged that the called terminal has not been registered in the service for providing the sounds for substituting the ringback tones, step 311 is performed. In the step 309, the calling switching center or the called switching center requests call connection to the home switching center in which the called terminal is registered, to form the speech path, and the generator for generating the sounds for substituting the ringback tones connected to the home switching center provides the sound source established by the called party as the sounds for substituting the ringback tones using the speech path. In a step 311, the calling terminal receives a general ringback tone.

[52] Thereafter, when a called party answers a call by inputting a call button of the called terminal or opening a flip thereof, the service for providing the ringback tones is stopped and a calling party and the called party perform a normal call (Step 313). When the calling terminal is registered on the service for providing the sounds for substituting ringback tones through the process, the calling terminal is provided with a sound source established by the calling party as the sounds for substituting ringback tones, irrespective of whether the called terminal is registered on the service for providing the sounds for substituting ringback tones.

[53] FIG. 4 is a flow chart for providing a service for providing sounds for substituting ringback tones according to another embodiment of the present invention.

[54] Referring to FIG. 4, first a calling party requests a call to a called terminal using a calling terminal (Step 401). Thereafter, a called switching center judges whether the called terminal is registered on the service for providing the sounds for substituting



ringback tones (Step 403). The judgment is possible to be performed on the calling switching center as well as on the called switching center. As a result of the judgment, when the called terminal is judged to be registered on the service for providing the sounds for substituting ringback tones, a Step 405 is performed, and when the called terminal is judged not to be registered on the service for providing the sounds for substituting ringback tones, a Step 407 is performed.

[55] In the Step 405, the calling switching center or the called switching center requests a call connection request to a home switching center registered with the called terminal to form a speech path. The generator for generating sounds for substituting ringback tones connected to the home switching center provides a sound source established by the called party using the speech path as the sounds for substituting ringback tones.

[56] In the Step 407, the calling switching center or the called switching center judges whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones. As a result of the judgment, when the calling terminal is judged to be registered on the service for providing the sounds for substituting ringback tones, a Step 409 is performed, and when the calling terminal is judged not to be registered on the service for providing the sounds for substituting ringback tones, a Step 411 is performed. In the Step 409, the calling switching center or the called switching center requests a call connection request to a home switching center registered with the calling terminal to form a speech path, and a generator for generating sounds for substituting ringback tones connected to the home switching center provides a sound source established by the calling party using the speech path as the sounds for substituting ringback tones. In the Step 411, the calling terminal is provided with general ringback tones.

[57] Thereafter, when a called party answers a call by inputting a call button of the called terminal or opening a flip thereof, the service for providing the ringback tones is stopped and a calling party and the called party perform a normal call (Step 413). Although the called terminal is not registered on the service for providing the sounds for substituting ringback tones through the process, when the calling terminal is registered on the service for providing the sounds for substituting ringback tones, the calling terminal can be provided with a sound source established by the calling party as the sounds for substituting ringback tones.

[58] FIG. 5 is a signal flow diagram showing a procedure for providing a service for providing sounds for substituting ringback tones according to one preferred embodiment of the present invention.

[59] Referring to FIG. 5, a calling terminal transmits a location request (LocReq) for querying a location of a called terminal to a home location register (Step 501). The home location register comprehends the location of the called terminal and then returns

a query and answer (locReq) to the calling switching center in response to the received LocReq (Step 503).

- [60] The calling switching center transmits an initial address message (IAM) to the called switching center using the returned query and answer (locReq) (Step 505). The called switching center returns an address complete message (ACM) to the calling switching center in response to the IAM received from the calling switching center (Step 507). Thereafter, the called switching center judges a home switching center to be routed for providing a service for providing sounds for substituting ringback tones (Step 509). The judgment is performed, through the processes of FIG. 3 or 4, depending on whether the calling terminal and called terminal are registered on the service for providing the sounds for substituting ringback tones.
- [61] Thereafter, the called switching center transmits the IAM to the home switching center (Step 511). At this time, the IAM is included with the MIN information of the calling terminal or the called terminal. The home switching center transmits the IAM corresponding to the IAM received from the called switching center to a generator for generating sounds for substituting ringback tones and thus requests a call connection (Step 513). The generator for generating the sounds for substituting ringback tones transmits the ACM to the home switching center in response to the call connection request (Step 515). The home switching center transmits the ACM to the called switching center by corresponding to the ACM received from the generator for generating the sounds for substituting ringback tones (Step 517).
- [62] Also, the generator for generating the sounds for substituting ringback tones transmits an answer message (ANM) to the home switching center in response to the call connection request (Step 519), wherein the ANM is transmitted to the called switching center (Step 521). When the called switching center transmits the ANM to the calling switching center by corresponding to the ANM received from the home switching center (Step 523), a speech path is formed between the calling terminal and the generator for generating the sounds for substituting ringback tones. The generator for generating the sounds for substituting ringback tones substitutes a sound source established by the calling party or the called party by using the speech path based on the MIN of the calling terminal or the called terminal for the ringback tones and thus transmits it to the calling terminal (Step 525).
- [63] Thereafter, in order to disconnect the speech path between the called switching center and the generator for generating the sounds for substituting ringback tones when the called terminal answers a call, the called switching center transmits a release (REL) to the home switching center (Step 527), wherein the home switching center transmits the REL to the generator for generating the sounds for substituting ringback tones (Step 529). The generator for generating the sounds for substituting ringback tones

transmits a release complete (RLC) to the home switching center in response to the REL received from the home switching center (Step 531), wherein the home switching center transmits the RLC to the called switching center (Step 533). Through the process, the speech path between the called switching center and the generator for generating the sounds for substituting ringback tones is disconnected. Thereafter, in the step 535, a normal call is performed between the calling terminal and the called terminal.

[64] FIG. 6 is a signal flow diagram showing a procedure for providing a service for providing sounds for substituting ringback tones according to another of the present invention.

[65] Referring to FIG. 6, a calling switching center transmits a location request (LocReq) for querying a location of a called terminal to a home location register (Step 601). The home location register comprehends the location of the called terminal and then returns a query and answer (locReq) to the calling switching center in response to the received LocReq (Step 603).

[66] The calling switching center transmits an initial address message (IAM) to the called switching center using the returned query and answer (locReq) (Step 605). The called switching center returns an address complete message (ACM) to the calling switching center in response to the IAM received from the calling switching center (Step 607). Thereafter, the calling switching center judges a home switching center to be routed for providing a service for providing sounds for substituting ringback tones (Step 609). The judgment is performed, through the processes of FIG. 3 or 4, depending on whether the calling terminal and called terminal are registered on the service for providing the sounds for substituting ringback tones.

[67] Thereafter, the calling switching center transmits the IAM to the home switching center (Step 611). At this time, the IAM is included with the MIN information of the calling terminal or the called terminal. The home switching center transmits the IAM corresponding to the IAM received from the calling switching center to a generator for generating sounds for substituting ringback tones and thus requests a call connection (Step 613). The generator for generating the sounds for substituting ringback tones transmits the ACM to the home switching center in response to the call connection request (Step 615). The home switching center transmits the ACM to the calling switching center by corresponding to the ACM received from the generator for generating the sounds for substituting ringback tones (Step 617).

[68] Also, the generator for generating the sounds for substituting ringback tones transmits an answer message (ANM) to the home switching center in response to the call connection request (Step 619). When the ANM is transmitted to the called switching center (Step 621), a speech path is formed between the calling terminal and

the generator for generating the sounds for substituting ringback tones. The generator for generating the sounds for substituting ringback tones substitutes a sound source established by the calling party or the called party by using the speech path based on the MIN of the calling terminal or the called terminal for the ringback tones and thus transmits it to the calling terminal (Step 625).

[69] Thereafter, the called switching center transmits the ANM to the calling switching center at the time point when the called terminal answers a call (Step 625). Thereafter, in order to disconnect the speech path between the calling switching center and the generator for generating the sounds for substituting ringback tones, the calling switching center transmits a release (REL) to the home switching center (Step 627), wherein the home switching center transmits the REL to the generator for generating the sounds for substituting ringback tones (Step 629). The generator for generating the sounds for substituting ringback tones transmits a release complete (RLC) to the home switching center in response to the REL received from the home switching center (Step 631), wherein the home switching center transmits the RLC to the calling switching center (Step 633). Through the process, the speech path between the calling switching center and the generator for generating the sounds for substituting ringback tones is disconnected. Thereafter, in the step 635, a normal call is performed between the calling terminal and the called terminal.

[70] Through the processes, the sounds for substituting the ringback tones can be easily transmitted to the calling terminal by using the home switching center and a generator for generating the sounds for substituting the ringback tones irrespective of the location of the called terminal.

[71] FIG. 7 is a flow chart schematically showing a process for providing sounds for substituting ringback tones according to one preferred embodiment of the present invention.

[72] Referring to FIG. 7, the method for providing the sounds for substituting the ringback tones according to the present invention comprises the steps of: schematically grasping the location of the called terminal (step 701); connecting the called switching center (step 703); generating and providing the sounds for substituting the ringback tones, and performing a normal call forwarding (step 707).

[73] First, the step of grasping the location of the called terminal (step 701) is a step of grasping a region where the called terminal is located in the mobile communication network by using the home location register. The description thereof is described in detail with reference to FIGS. 5 and 6 and will be therefore omitted.

[74] Next, the step of connecting to the called switching center (step 703) will be described in detail with reference to FIG. 8.

[75] FIG. 8 is a signal flow diagram showing a connecting process to a called switching

center according to one preferred embodiment of the present invention.

[76] Referring to FIG. 8, the calling switching center asks the called switching center for a call connection by using a query and answer (Locseq) returned through the home location register (step 801). More specifically, the calling switching center transmits an initial address message (IAM) to the called switching center to request a call connection. The called switching center answers the call connection request from the calling switching center to return an address complete message, which is an acknowledgement message, to the calling terminal so that it asks the called terminal located at its own region for the call connection. At this time, the called switching center can judge whether the calling terminal or the called terminal is registered in the service for providing the sounds for substituting the ringback tones according to the present invention. If it is confirmed that at least any one of the calling terminal and the called terminal is registered in the service for providing the sounds for substituting the ringback tones, the next step is performed. On the other hand, the judgment may be performed on the calling switching center.

[77] In the processes as described above, in the prior art the called switching center transmits the ACM to the calling switching center, requests a call connection to the called terminal, analyzes the state of the called terminal, and transmits the ringback tones to the calling terminal until the speech path is established according to the contents described in an ITU-T specification. However, the called switching center according to the present invention does not directly transmit the ringback tones to the calling terminal and in the state where it requests the call connection to the called terminal, the calling switching center or the called switching center asks the home switching center connected to the communication network for the call connection. The sound source substituting the ringback tones is transmitted from the generator for generating the sounds for substituting the ringback tones connected to the home switching center to the calling terminal so that the service for providing the sounds for substituting the ringback tones according to the one preferred embodiment of the present invention may be performed.

[78] Referring again to FIG. 7, the step of generating and providing the sounds for substituting the ringback tones (step 705) will be described in detail with reference to FIG. 9.

[79] FIG. 9 is a signal flow diagram showing a process for generating and providing sounds for substituting ringback tones according to one preferred embodiment of the present invention.

[80] Referring to FIG. 9, in a step 901, the called switching center judges the home switching center to be routed. The judgment is performed through the process of FIG. 3 or FIG. 4 according to whether the calling terminal or the called terminal is

registered in the service for providing the sounds for substituting the ringback tones. In other words, the called switching center uses the MIN of the calling terminal or the MIN of the called terminal, making it possible to judge whether the calling terminal or the called terminal connected to the database is registered in the service for providing the sounds for substituting the ringback tones. If it is judged that the called terminal is registered in the sounds for substituting the ringback tones, the called switching center uses the MIN of the called terminal to route the call to the home switching (step 903). If it is judged that the calling terminal is registered in the service for providing the sounds for substituting the ringback tones even when the called terminal is not registered in the service for providing the sounds for substituting the ringback tones, the called switching center also uses the MIN of the calling terminal to route the call to the home switching (step 903). On the other hand, it is not first judged the called terminal is registered in the service for providing the sounds for substituting the ringback tones, but it may be first judged that the calling terminal is registered in the service for providing the sounds for substituting the ringback tones. In this case, if the calling terminal is registered in the service for providing the sounds for substituting the ringback tones irrespective of whether the called terminal is registered in the service for providing the sounds for substituting the ringback tones, the called switching center uses the MIN of the calling terminal to route the call to the home switching. Also, it judges the home switching center to be routed and the subject of routing the call may be the called switching center as well as the calling switching center.

[81] The home switching center answers the call routing of the called switching center to attempt to make the ISUP call connection to the generator for generating the sounds for substituting the ringback tones connected to the home switching center. Through the processes, if the ISUP call connection to the generator for generating the sounds for substituting the ringback tones is made, the generator for generating the sounds for substituting the ringback tones uses the MIN of the calling terminal or the called terminal to extract the sounds for substituting the ringback tones established by the called party or the calling party from the pre-installed data base 95 for the sounds for substituting the ringback tones (step 907). Thereafter, the generator for generating the sounds for substituting the ringback tones transmits the extracted the sounds for substituting the ringback tones established by the called party or the calling party to the calling terminal by using the established speech path (step 909).

[82] Referring again to FIG. 7, the step of performing the normal call forwarding (step 707) will be described in detail with reference to FIGS. 10 and 11.

[83] FIG. 10 is a signal flow diagram showing a process of performing a normal call forwarding according to one preferred embodiment of the present invention.

[84] Referring to FIG. 10, in a state where the called switching center asks the called

terminal for the call connection, if the called terminal answers a call (step 1001), the called switching center transmits an REL to the home switching center in order to disconnect the speech path with the generator for generating the sounds for substituting the ringback tones (step 1003). The home switching center transmits the REL to the generator for generating the sounds for substituting the ringback tones (step 1005) so that the speech path between the called terminal and the generator for generating the sounds for substituting the ringback tones is disconnected.

[85] FIG. 11 is a signal flow diagram showing a process of performing a normal call forwarding according to one preferred embodiment of the present invention.

[86] Referring to FIG. 11, in a state where the called switching center asks the existing called terminal for the call connection, if the called terminal answers a call, the called switching center transmits the ANM of the ISUP to the calling switching center. Thereafter, the calling switching center transmits the REL to the home switching center in order to disconnecting disconnect the speech path established to the generator for generating the sounds for substituting the ringback tones for providing the sounds for substituting the ringback tones (step 1009). The home switching center also transmits the REL to the generator for generating the sounds for substituting the ringback tones (step 1001), the speech path established between the calling switching center and the generator for generating the sounds for substituting the ringback tones is disconnected, Subsequent processes are identical with a voice call process using the general terminal and the detailed description thereof will be thus omitted.

[87] In order to implement the method for providing the sounds for substituting the ringback tones according to the aforementioned present invention, the constitution of the called switching center and the generator for generating the sounds for substituting the ringback tones may be constituted by a E1 trunk, SS7 signal mode similar to a voice messaging system (VMS). Also, the service registration field for providing the sounds for substituting the ringback tones may be implemented by a similar form to the VMS. However, although the speech path connection from the called switching center to the home switching center in the call forwarding to the existing VMS is not made, the speech path connection in the call forwarding according to the present invention is required. Also, the call characteristics information is defined on the IAM message so that the home switching center may be connected to the generator for generating the sounds for substituting the ringback tones. In order to receive the information query standard, which is a standard of the home location register and the visited location register in IS-41C or IS-41D, a Special Route Sequence in the switching center can be used in order to make the routing by founding the home switching center in the called switching center.

[88] The problem to be solved in order for the apparatus for providing the sounds for

substituting the ringback tones according to the present invention to be matched with the current voice switching center is to efficiently distribute the sounds for substituting the ringback tones of a subscriber. The subscriber in the mobile communication network can moved to any locations. In this case, in order to apply the apparatus for providing the sounds for substituting the ringback tones according to the present invention, the generator for generating the sounds for substituting the ringback tones may be distributed for each region. The description thereof will be described in detail with reference to FIG. 12.

[89] FIG. 12 is a view schematically explaining a region distributed structure of the generator for generating the sounds for substituting the ringback tones according to one preferred embodiment of the present invention.

[90] Referring to FIG. 12, the region distributed structure of the generator for generating the sounds for substituting the ringback tones comprises a switching center 1101, the generator 207 for generating the sounds for substituting the ringback tones, the home location register 209 and a central database 1103. The respective switching centers are coupled to each other through No. 7 network 1105, and the generators 207 for generating the sounds for substituting the ringback tones are connected to the corresponding switching centers, respectively. Subscriber information including the sounds for substituting the ringback tones selected by the subscriber is stored in the generators 207 for generating the sounds for substituting the ringback tones to which the subscriber belongs. Also, information on the subscriber is separately stored in the central database 1103 for redundancy flexibly coping with the fault of the corresponding generator 207 for generating the sounds for substituting the ringback tones, etc. When the service of providing the sounds for substituting the ringback tones according to the present invention is performed, the subscriber information stored in the central database 1103 is only used for backup purpose, and the subscriber information stored in the generator 207 for generating the sounds for substituting the ringback tones to which the subscriber belongs is actually used. Through this configuration, it is possible to provide the service for providing the sounds for substituting the ringback tones to the service subscriber in real time. Also, the respective generators for generating the sounds for substituting the ringback tones manage the database and perform the service in accepted subscriber limit, thereby making it possible to guarantee the quality of the service.

[91] And, by assigning the subscribers to the specific generator 207 for generating the sounds for substituting the ringback tones, in the case where the subscribers subsequently increase, new generators 207 for generating the sounds for substituting the ringback tones is matched in order to accept the increased subscribers and then, information on the home switching center of new subscribers can be stored in the home



location register. Through this configuration, it is possible to accept a large number of new subscribers without greatly changing the system, and provide the service for providing the sounds for substituting the ringback tones only through the home switching center specified by the subscribers and the generator 207 for generating the sound for substituting the ringback tones connected thereto. That is, it is not required to enlarge the capacity of the database to infinity.

[92] The present invention is not limited the aforementioned embodiments and it would be appreciated by those skilled in the art that many changes might be made in this embodiment without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

## Claims

- [1] A method for providing a service for providing sounds for substituting ringback tones in a called switching center, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the method comprising the steps of:
- receiving a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal;
  - transmitting a call signal to the called terminal by corresponding to the first call connection request;
  - judging whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones;
  - when the calling terminal is registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, transmitting a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and
  - receiving a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and
  - transmitting a third call connection answer signal corresponding thereto to the calling switching center,
- wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and an answer signals.
- [2] The method for providing the service for providing sounds for substituting ringback in the called switching center as claimed in claim 1, further comprising: when the called terminal answers a call by corresponding to the call signal, transmitting a speech path disconnect request signal to the home switching

center,

wherein the home switching center transmits the speech path disconnect request signal to the generator for generating the sounds for substituting ringback tones so that the speech path established between the generator for generating the sounds for substituting ringback tones and the called switching center is disconnected.

- [3] The method for providing the service for providing sounds for substituting ringback in the called switching center as claimed in claim 1, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones selected by a calling party corresponding to the calling terminal by using the identifier of the calling terminal from the database previously provided by corresponding to the third call connection request signal, and transmits the extracted the sounds for substituting ringback tones to the calling terminal, through the calling-side switching center, using the speech path established between the calling terminal by means of the first, second, and third connection request signals and answer signals.
- [4] The method for providing the service for providing sounds for substituting ringback in the called switching center as claimed in claim 3, wherein the identifier of the calling terminal is a mobile identification number (MIN).
- [5] The method for providing the service for providing sounds for substituting ringback in the called switching center as claimed in claim 1, wherein the speech path is made by means of an integrated service digital network user part (ISUP) call connection.
- [6] A method for providing a service for providing sounds for substituting ringback tones in a calling switching center, which corresponds to a calling terminal and is coupled to a called switching center corresponding to a called terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the method comprising the steps of:  
receiving a call for the called terminal from the calling terminal;  
transmitting a first call connection request signal for the called terminal to the called switching center by corresponding to the call request;  
receiving a first call connection answer signal corresponding to the first call connection request from the called switching center; and  
transmitting a second call connection request signal to the home switching center by corresponding to the first call connection answer signal,  
wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones

by corresponding to the second call connection request signal received from the calling switching center, and the generator for generating the sounds for substituting ringback tones transmits a second call connection answer signal to the home switching center by corresponding to the third call connection request signal, wherein the home switching center transmits a third call connection answer signal to the calling switching center by corresponding to the second call connection answer signal, extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the second and third call connection request signals and answer signals.

- [7] A method for providing a service for providing sounds for substituting ringback tones in a called switching center, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the method comprising the steps of:
- receiving a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal;
  - transmitting a call signal to the called terminal by corresponding to the first call connection request;
  - judging whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones;
  - when the called terminal is not registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, transmitting a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and
  - receiving a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmitting a third call connection answer signal corresponding thereto to the calling switching center,
- wherein the generator for generating the sounds for substituting ringback tones

extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and answer signals.

- [8] A called switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the called switching center comprising:
- a means for receiving a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal;
  - a means for transmitting a call signal to the called terminal by corresponding to the first call connection request;
  - a means for judging whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones;
  - when the calling terminal is registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, a means for transmitting a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and
  - a means for receiving a second call answer signal by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmitting a third call connection answer signal corresponding thereto to the calling switching center,
- wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call

connection request signals and answer signals.

- [9] A calling switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a calling terminal and is coupled to a called switching center corresponding to a called terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the calling switching center comprising:

a means for receiving a call for the called terminal from the calling terminal;

a means for transmitting a first call connection request signal for the called terminal to the called switching center by corresponding to the call request;

a means for receiving a first call connection answer signal corresponding to the first call connection request from the called switching center; and

a means for transmitting a second call connection request signal to the home switching center by corresponding to the first call connection answer signal,

wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones

by corresponding to the second call connection request signal received from the calling switching center, and the generator for generating the sounds for substituting ringback tones

transmits a second call connection answer signal to the home switching center by corresponding to the third call connection request signal,

wherein the home switching center transmits a third call connection

answer signal to the calling switching center by corresponding to the second call connection answer signal, extracts the sounds for substituting ringback tones

corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones

to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the second and third call

connection request signals and answer signals.

- [10] A called switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the called switching center comprising:

a means for receiving a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal;

a means for transmitting a call signal to the called terminal by corresponding to the first call connection request;

a means for judging whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones;  
when the called terminal is not registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, a means for transmitting a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and  
a means for receiving a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmitting a third call connection answer signal corresponding thereto to the calling switching center,  
wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and answer signals.

[11] A called switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the called switching center comprising:

a memory stored with a program; and  
a processor coupled to the memory to run the program,  
wherein by means of the program, the processor transmits a call signal to the called terminal by corresponding to the first call connection request; judges whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones; when the called terminal is not registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, transmits a second call connection request signal to the home switching center, wherein the home switching center transmits a third call

connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and receives a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmits a third call connection answer signal corresponding thereto to the calling switching center, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the first, second, and third call connection request signals and answer signals.

- [12] A calling switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a calling terminal and is coupled to a called switching center corresponding to a called terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the calling switching center comprising:
- a memory stored with a program; and
  - a processor coupled to the memory to run the program,
- wherein by means of the program, the processor receives a call for the called terminal from the calling terminal; transmits a first call connection request signal for the called terminal to the called switching center by corresponding to the call request; receives a first call connection answer signal corresponding to the first call connection request from the called switching center; and transmits a second call connection request signal to the home switching center by corresponding to the first call connection answer signal, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the calling switching center, and the generator for generating the sounds for substituting ringback tones transmits a second call connection answer signal to the home switching center by corresponding to the third call connection request signal, wherein the home switching center transmits a third call connection answer signal to the calling

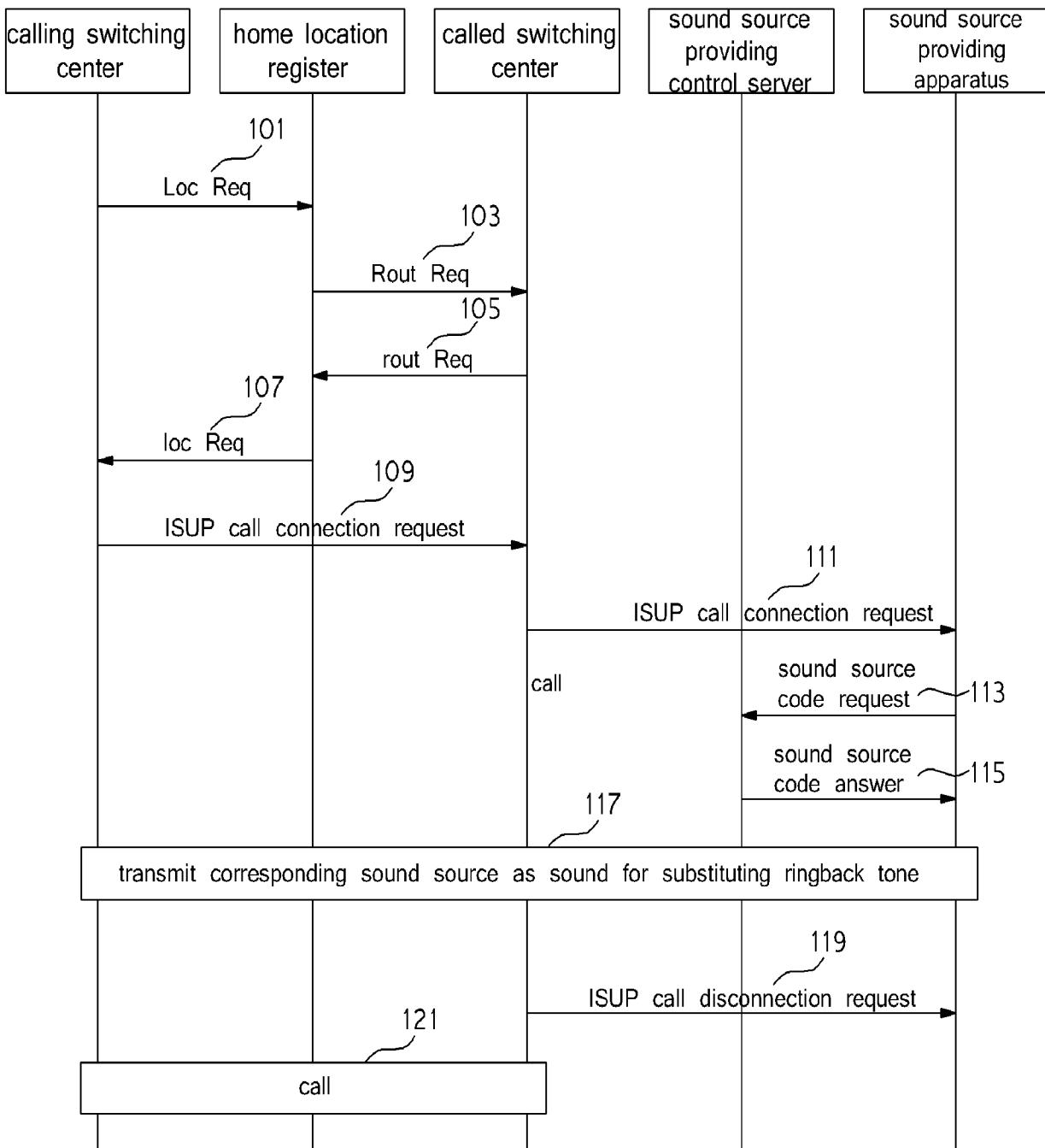


switching center by corresponding to the second call connection answer signal, extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of the second and third call connection request signals and answer signals.

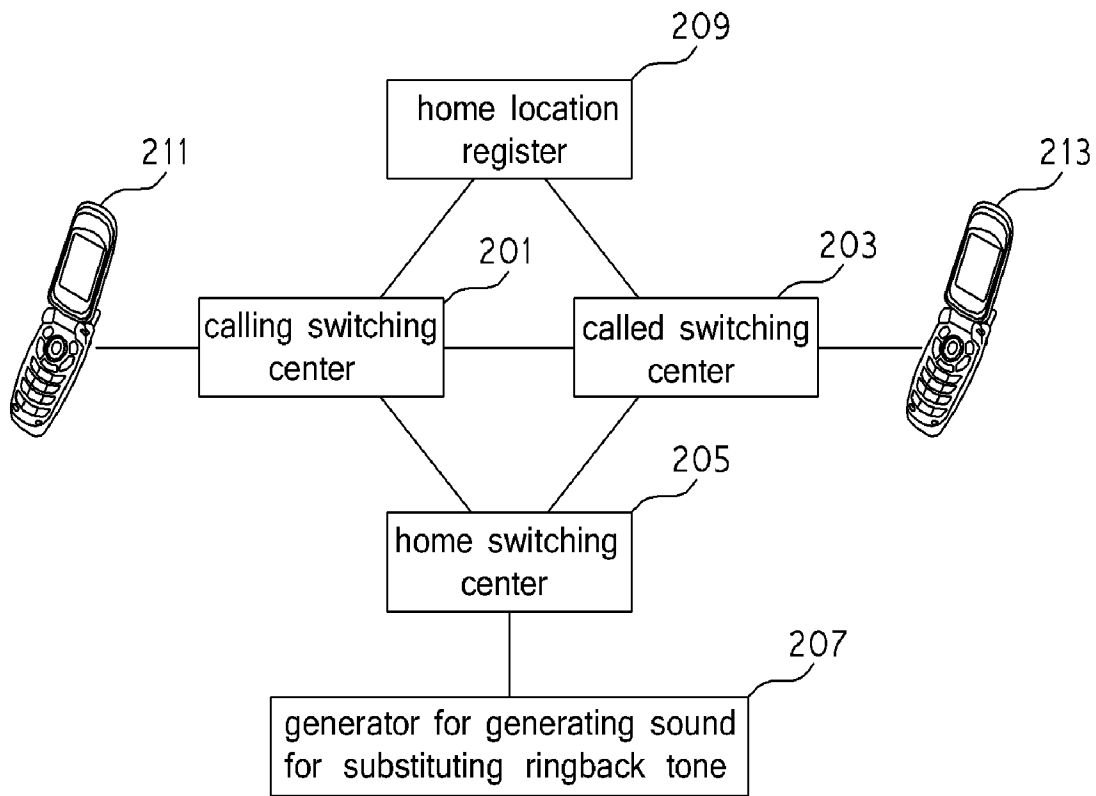
- [13] A called switching center for providing a service for providing sounds for substituting ringback tones, which corresponds to a called terminal and is coupled to a calling switching center corresponding to a calling terminal, a home switching center registered with the calling terminal and a generator for generating sounds for substituting ringback tones, through a communication network, the called switching center comprising:
- a memory stored with a program; and
  - a processor coupled to the memory to run the program,
- wherein by means of the program, the processor receives a first call connection request signal requested from the calling terminal in the calling switching center to the called terminal; transmits a call signal to the called terminal by corresponding to the first call connection request; judges whether the calling terminal is registered on the service for providing the sounds for substituting ringback tones; when the called terminal is not registered on the service for providing the sounds for substituting ringback tones as a result of the judgment, transmits a second call connection request signal to the home switching center, wherein the home switching center transmits a third call connection request signal to the generator for generating the sounds for substituting ringback tones by corresponding to the second call connection request signal received from the called switching center, and receives a first call connection answer signal from the generator for generating the sounds for substituting ringback tones corresponding thereto; and receives a second call answer signal generated by corresponding to the first call connection answer signal that the home switching center receives from the generator for generating the sounds for substituting ringback tones, and transmits a third call connection answer signal corresponding thereto to the calling switching center, wherein the generator for generating the sounds for substituting ringback tones extracts the sounds for substituting ringback tones corresponding to the calling terminal by corresponding to the third call connection request signal, and transmits the extracted sounds for substituting ringback tones to the calling terminal, through the calling switching center, using a speech path established between the calling terminal by means of

the first, second, and third call connection request signals and answer signals.

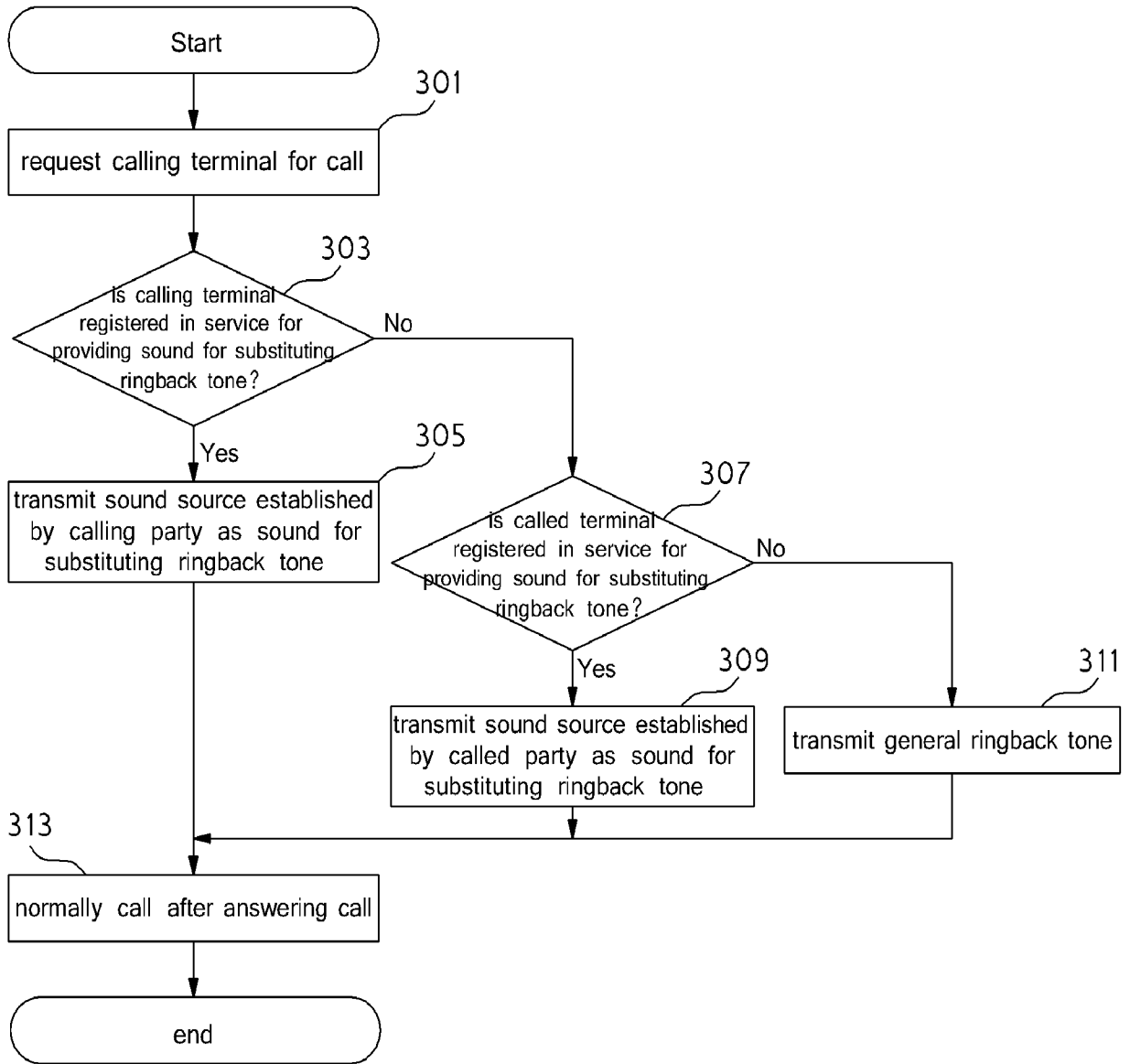
[Fig. 1]



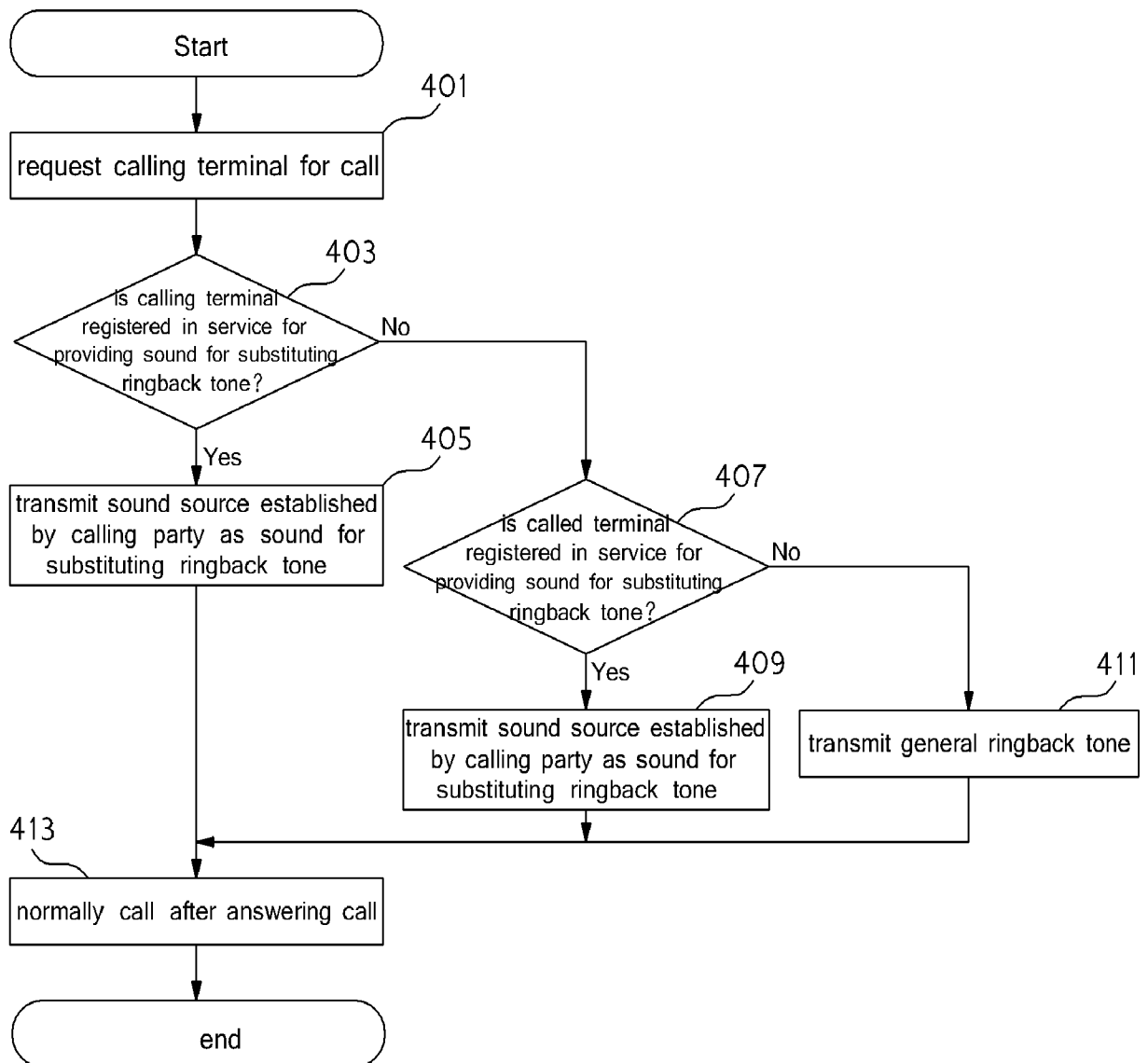
[Fig. 2]



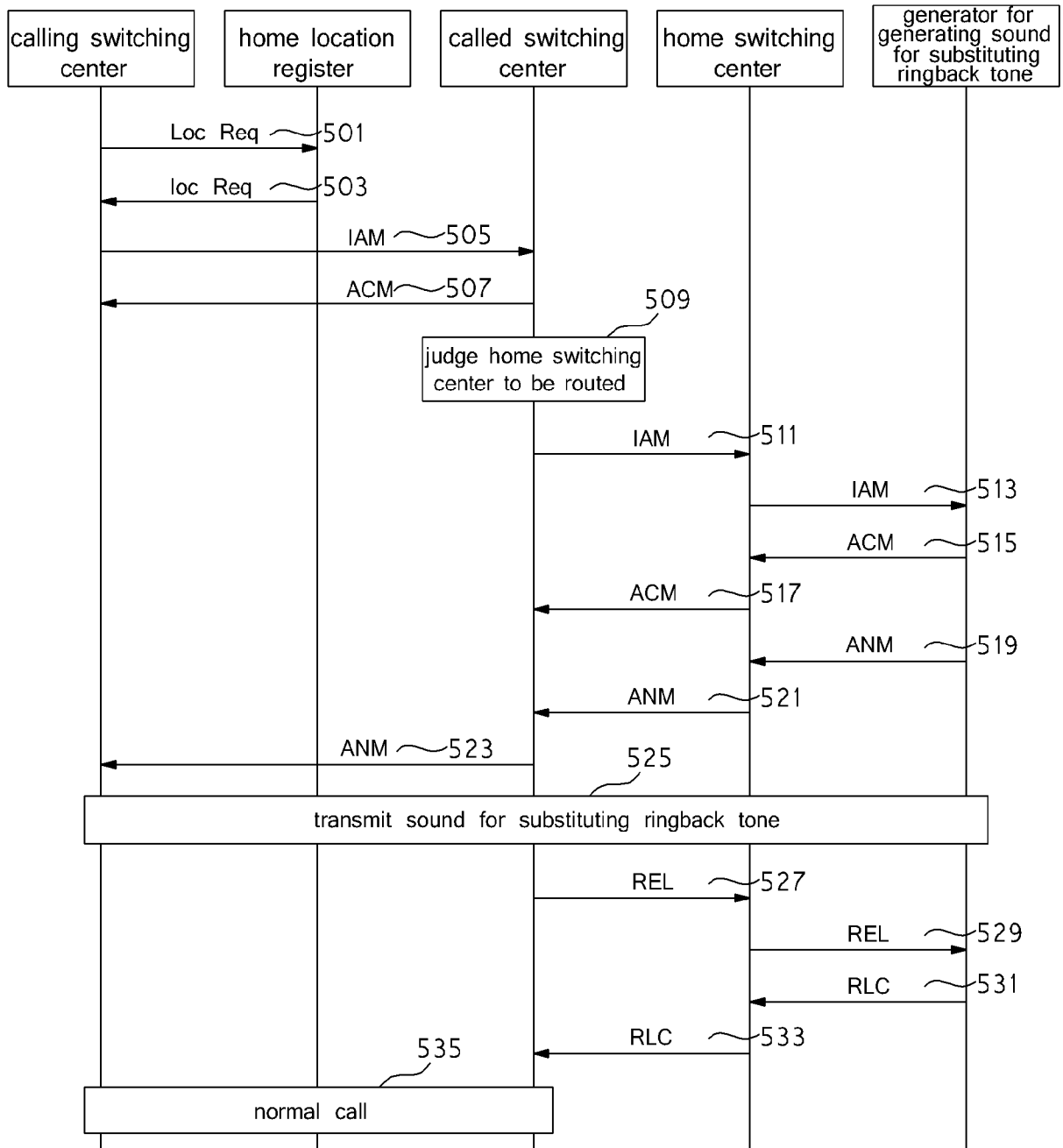
[Fig. 3]



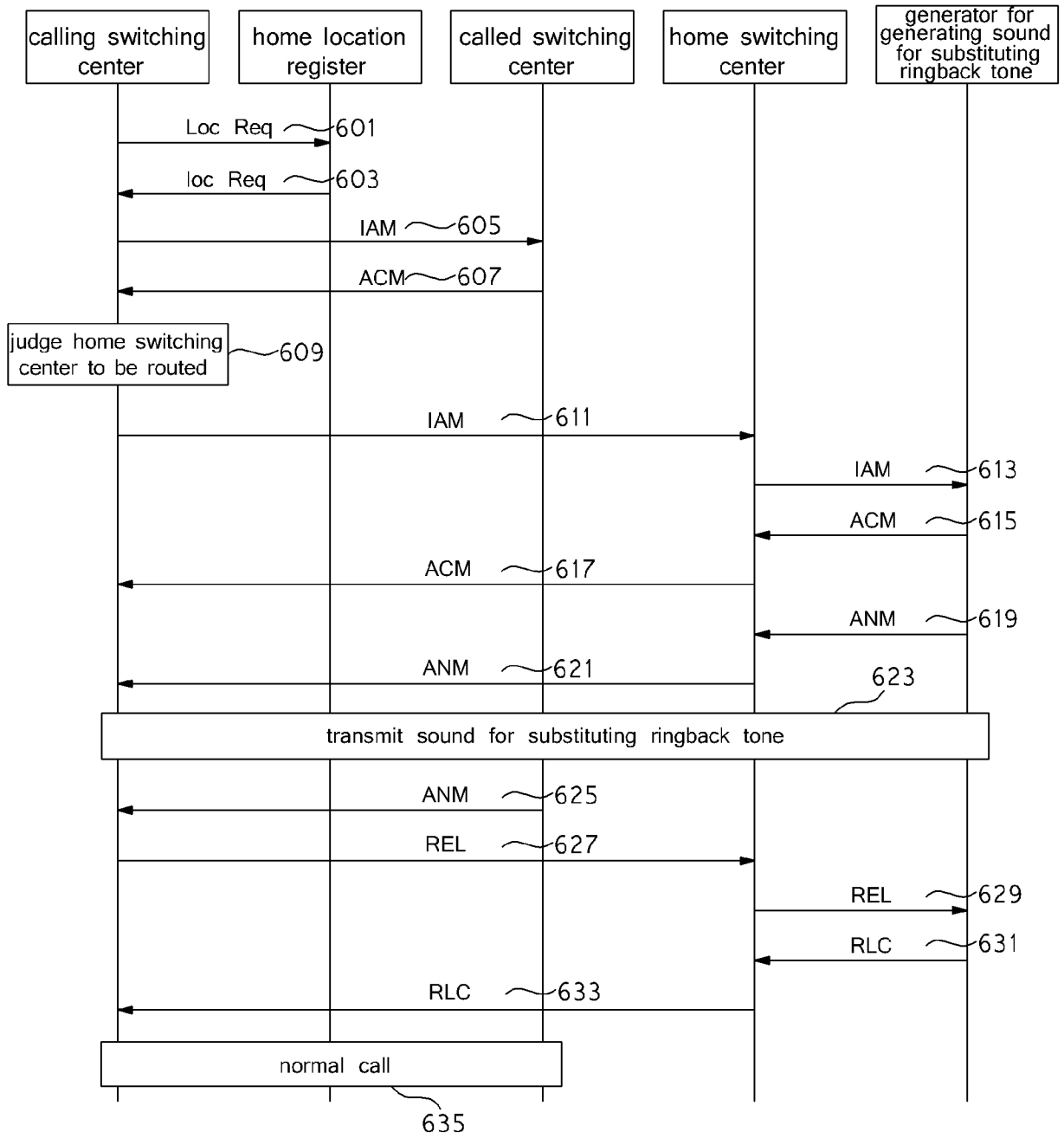
[Fig. 4]



[Fig. 5]

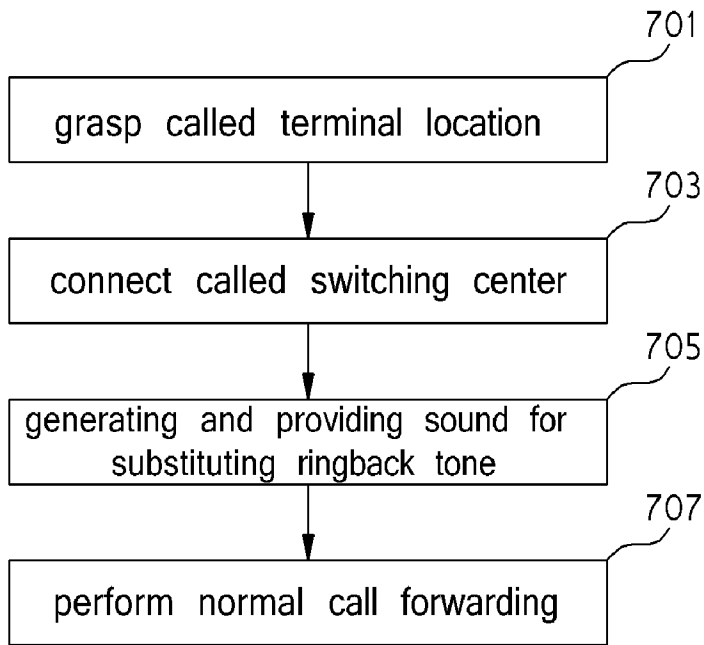


[Fig. 6]

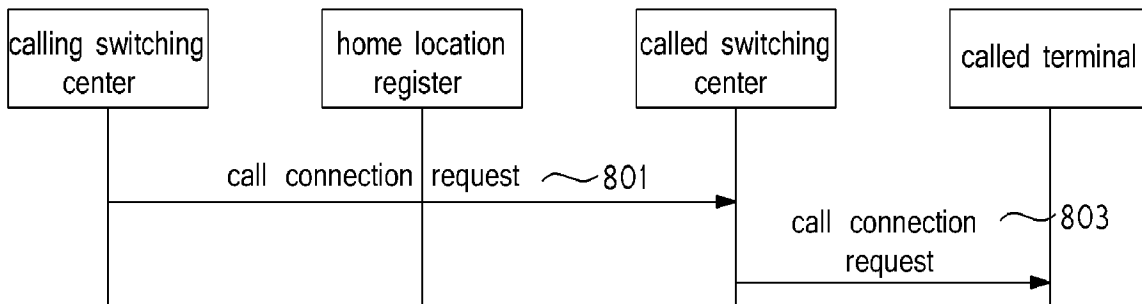




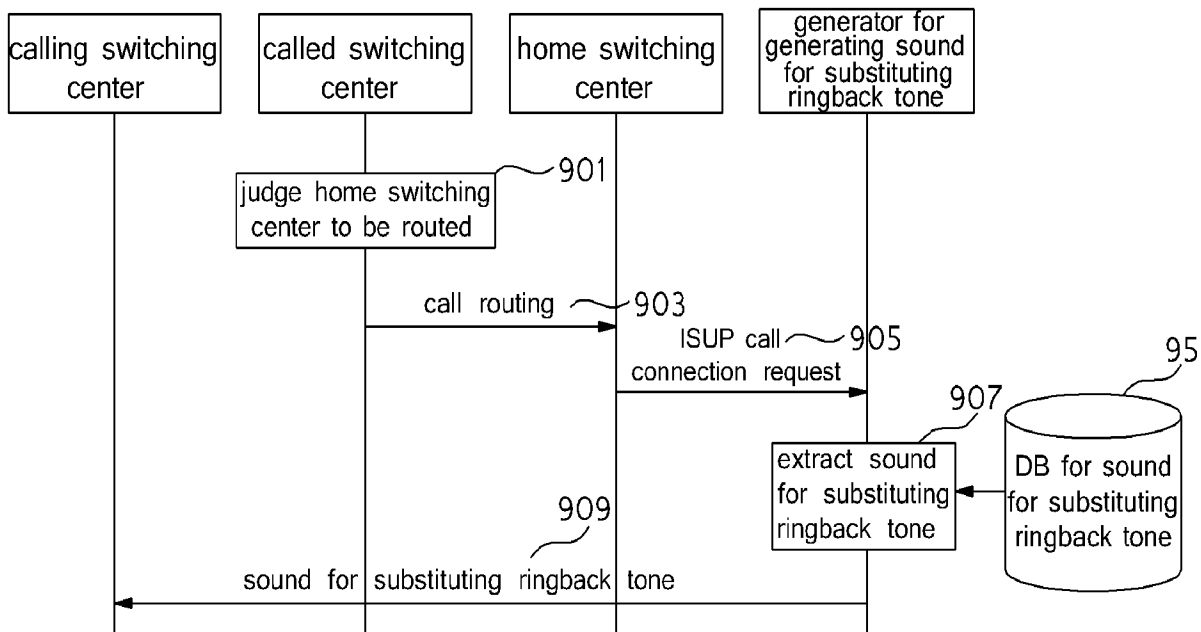
[Fig. 7]



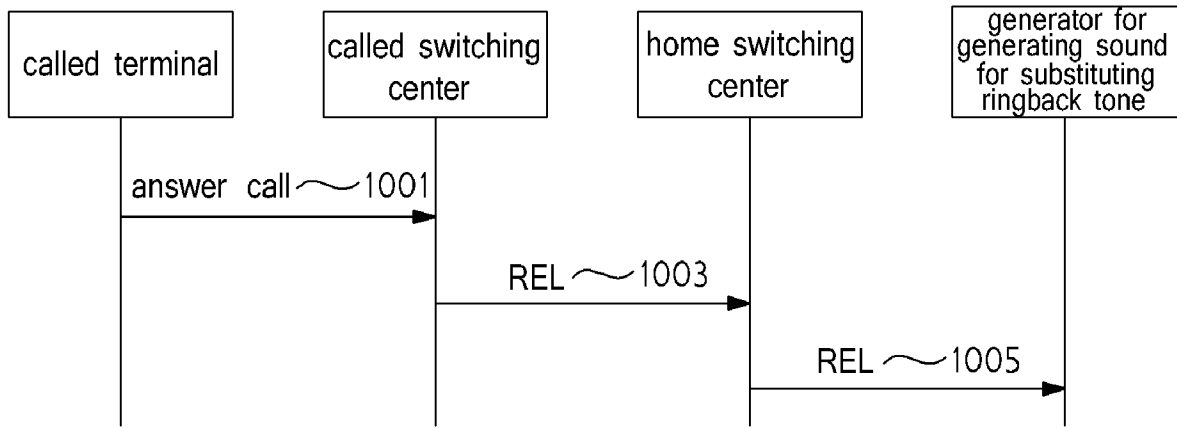
[Fig. 8]



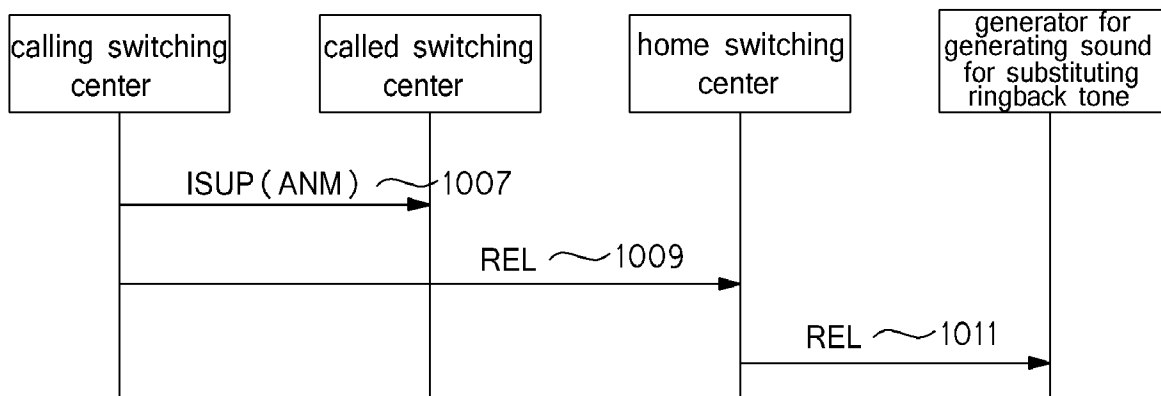
[Fig. 9]



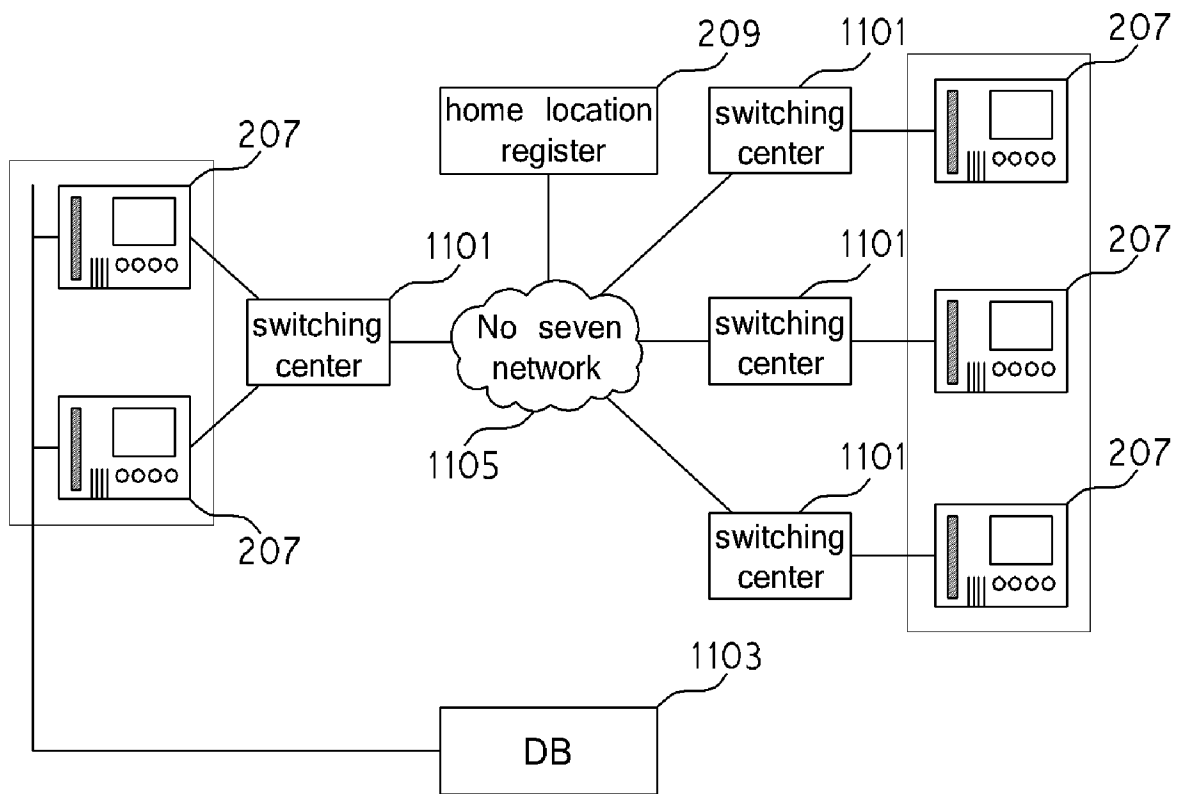
[Fig. 10]



[Fig. 11]



[Fig. 12]



**A. CLASSIFICATION OF SUBJECT MATTER****H04M 3/00(2006.01)i**

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

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
Korean and Japanese Utility Models and applications for utility models since 1975Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
eKIPASS(KIPO internal) "ringback tone(RBT)", "replace\* or substitute"**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2005-0055997 A (DIGITALWAVE INC.) 14 JUNE 2005 See the whole documents (The same invention as the present invention)	1-13
X	JP 2003-338871 A (WIZ COMMUNICATIONS CO., LTD.) 28 NOVEMBER 2003 See the abstract, claims and figure 2	1-13
X	US 2006/0098801 A1 (HAHM et al.) 11 MAY 2006 See claims and figures	1-3, 6-13
X	US 2006/0013377 A1(AHN et al.) 19 JANUARY 2006 See claims and figures	1-3, 6-13
A	KR 10-2004-0075568 A (BAEK) 30 AUGUST 2004 See the abstract and figure 2	1-13

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

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

17 MAY 2007 (17.05.2007)

Date of mailing of the international search report

**17 MAY 2007 (17.05.2007)**

Name and mailing address of the ISA/KR

Korean Intellectual Property Office  
920 Dunsan-dong, Seo-gu, Daejeon 302-701,  
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

HAN, Choong Hee

Telephone No. 82-42-481-8475



**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/KR2006/003252**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-2005-0055997 A	14-06-2005	NONE	
JP 2003-338871 A	28-11-2003	KR 10-2003-0089369 A	21-11-2003
US 2006/0098801 A1	11-05-2006	WO 2004-032547 A1 KR 10-2002-0097076 A AU 2003251219 A1	15-04-2004 31-12-2002 23-04-2004
US 2006/0013377 A1	19-01-2006	WO 2004-036944 A1 KR 10-2003-0005076 A AU 2003260992 A1	29-04-2004 15-01-2003 04-05-2004
KR 10-2004-0075568 A	30-08-2004	NONE	