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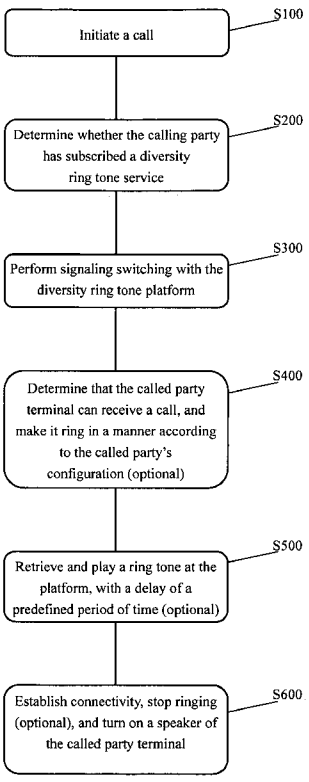

Fig. 3

(57) Abstract: Disclosed is a method and system for providing a diversity ring tone to a called party terminal under the control of a calling party terminal. The method comprises the steps of: initiating a call from the calling party terminal to the called party terminal; determining whether the calling party has subscribed a diversity ring tone service; if so, performing signaling switching with a diversity ring tone platform; determining whether the called party terminal is available to receive a call; if so, retrieving and playing a ring tone stored at the diversity ring tone platform; and establishing connectivity between the diversity ring tone platform and the called party terminal, and turning on a speaker of the called party terminal, thereby making the ring tone, which is being played at the diversity ring tone platform, audible by means of the speaker.

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Method and System for Providing Diversity Ring Tone under the Control of Calling Party

Field of the Invention

The present invention pertains generally to the field of telecommunication techniques. More particularly, the invention relates to a method and system for providing a diversity ring tone under the control of the calling party.

Background of the Invention

A ring tone is the sound made by a telephone to indicate an incoming call. Older telephones simply used a pair of bells such as "ring...ring..." to alert the users; however, modern ring tones have become extremely diverse, enabling phone personalization and customization. For example, newer mobile phones allow the users to associate different ring tones for different phone book entries. Taking advantage of this feature, the mobile phone owners would be able to readily determine which phone book entry the caller corresponds to. However, this is deficient in that it is very limited as far as the selection of ring tones playable, the complexity of ring tones playable, and the ways of programming the association of ring tones to calling numbers. For an example, the association between ring tones and calling numbers has to be defined by the phone owner in advance, and therefore, once the pre-definition is completed, the assigned ring tones can not be changed until next update.

A ring back tone is a ringing sound that a caller hears at the calling party terminal when calling a called party terminal. In recent years, color ring back tones (also known as personalized ring back tones) have become globally popular. With this feature, callers will hear an audio selection applied to the telephone line that has been determined by the called party. It is thus clear that the color ring back tones show diversity of the called party, not that of the calling party.

There is much room for improvements in ring tone services.

Summary of the Invention

Accordingly, the present invention has been made to overcome the problems associated with the prior art, and an object thereof is to provide a method and system capable of providing diversity ring tones under the control of the calling party.

According to an aspect of the present invention, there is proposed a method for providing a diversity ring tone to a called party terminal under the control of a calling party terminal, which comprises the steps of:

initiating a call from the calling party terminal to the called party terminal;

determining whether the calling party has subscribed a diversity ring tone service;

if so, performing signaling switching with a diversity ring tone platform;

determining whether the called party terminal is available to receive a call;

if so, retrieving and playing a ring tone stored at the diversity ring tone platform; and

establishing connectivity between the diversity ring tone platform and the called party terminal, and turning on a speaker of the called party terminal, thereby making the ring tone, which is being played at the diversity ring tone platform, audible by means of the speaker.

As a modification of the method according to this aspect of the invention, the second determination step further comprises making the called party terminal ring in a manner in accordance with the called party's configuration in the case that the called party terminal is available to receive a call; the step of retrieving and playing a ring tone further comprises, prior to performing playing, delaying for a predefined period of time; and the step of establishing connectivity and turning on a speaker further comprises, at the same time as turning on the speaker, stopping ringing in the manner in accordance with the called party's configuration. The predefined period of time is preferably defined at the calling party terminal in advance.

Preferably, the calling and called terminals and the diversity ring tone platform perform communications through a network element that includes a calling party switch and a called party switch to which the calling and called party terminal are coupled respectively.

The second determination step, the step of retrieving and playing a ring tone and the step of establishing connectivity and turning on a speaker are preferably performed by the diversity ring tone platform cooperating with the called party switch.

Alternatively, the second determination step and the step of establishing connectivity and turning on a speaker are performed by the calling party switch cooperating with the called party switch, and the step of retrieving and playing a ring tone are performed by the diversity ring tone platform under the instruction of the calling party switch.

According to another aspect of the present invention, there is proposed a system for providing a diversity ring tone, which comprises:

a calling party terminal which initiates a call;

a called party terminal which is the destination of the call;

a diversity ring tone platform, in which diversity ring tones for subscribers of the diversity ring tone service are stored;

a network element, through which the calling and called party terminal and the diversity ring tone platform perform communications.

In this system, when the calling party terminal initiates a call to the called party terminal, it is determined whether the calling party has subscribed a diversity ring tone service; and if so, signaling switching with a diversity ring tone platform is performed; thereafter, It is determined whether the called party terminal is available to receive a call; and if so, a ring tone stored at the diversity ring tone platform is retrieved and played; thereafter, connectivity between the diversity ring tone platform and the called party terminal is established, and a speaker of the called party terminal is turned on, thereby making the ring tone, which is being played at the diversity ring tone platform, audible by means of the speaker.

The network element preferably includes a calling party switch and a called party switch to which the calling and called party terminal are coupled respectively.

Preferably, the diversity ring tone platform is configured to:

cooperating with the called party switch, determine whether the called party terminal is available to receive a call,

retrieve and play a ring tone in the case that the called party terminal is available to receive a call, and

cooperating with the called party switch, establish connectivity between the diversity ring tone platform and the called party terminal, and turn on a speaker of the called party terminal.

Alternatively, the calling party switch is configured to:

cooperating with the called party switch, determine whether the called party terminal is available to receive a call,

instruct the diversity ring tone platform to retrieve and play a ring tone in the case that the called party terminal is available to receive a call, and

cooperating with the called party switch, establish connectivity between the diversity ring tone platform and the called party terminal, and turn on a speaker of the called party terminal.

As a modification of the system according to this aspect of the invention, when it is determined that the called party terminal is available to receive a call, the called party

terminal is made ring in a manner in accordance with the called party's configuration. Furthermore, a ring tone stored at the diversity ring tone platform is delayed for a predefined period of time to be played. At the same time as the speaker is turned on, the called party terminal is stopped ringing in the manner in accordance with the called party's configuration. The predefined period of time is preferably defined at the calling party terminal in advance.

Preferably, the diversity ring tone platform is configured to:

cooperating with the called party switch, determine whether the called party terminal is available to receive a call, and if so, make the called party terminal ring in a manner in accordance with the called party's configuration,

retrieve a ring tone, delay for a predefined period of time, and play it, and

cooperating with the called party switch, establish connectivity between the diversity ring tone platform and the called party terminal, stop the called party terminal ringing, and turn on a speaker of the called party terminal.

Alternatively, the calling party switch is configured to:

cooperating with the called party switch, determine whether the called party terminal is available to receive a call, and if so, make the called party terminal ring in a manner in accordance with the called party's configuration,

instruct the diversity ring tone platform to retrieve a ring tone, delay for a predefined period of time and play it, and

cooperating with the called party switch, establish connectivity between the diversity ring tone platform and the called party terminal, stop the called party terminal ringing, and turn on a speaker of the called party terminal.

Brief Description of the Drawings

The novel features believed characteristic of the invention are set forth in the appended claims. The invention itself, further objectives, and advantages thereof, will be best understood by reference to the following detailed description of the illustrative embodiments when read in conjunction with the accompanying drawings, in which:

Fig. 1 is a schematic overview of the constructions of a system for providing diversity ring tones according to the embodiments of the present invention;

Fig. 2 schematically illustrates the storage structure of the platform shown in Fig. 1.

Fig. 3 is a flow chart showing the steps of a method for providing diversity ring tones according to the embodiments of the invention.

Fig. 4 is a call flow showing the call processing procedures between terminals in an unintelligent environment according to the first embodiment of the invention.

Fig. 5 is a call flow showing the call processing procedures between terminals in an intelligent environment according to the second embodiment of the invention.

Fig. 6 is a call flow showing the call processing procedures between terminals in an unintelligent environment according to the third embodiment of the invention.

Fig. 7 is a call flow showing the call processing procedures between terminals in an intelligent environment according to the forth embodiment of the invention.

Throughout the specification and the drawing, like numbers refer to like elements.

Preferential Embodiments

In the following, the illustrative embodiments of the present invention will be explained more fully with reference to the accompanying drawings. The invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather these embodiments are provided so that the disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

In Fig. 1, a schematic overview of the constructions of a system for providing diversity ring tones according to the embodiments of the invention is shown. As seen from Fig. 1, the system comprises a calling party terminal 10, a telecom network 20, a called party terminal 30, a diversity ring tone platform 40, and a signaling switching link 50. It should be appreciated that, for the purpose of simplicity, only two terminals are illustrated in this drawing.

Generally, the calling party terminal 10 can be any of devices with the function of audio communication, such as a fixed phone, mobile phone, PDA (Personal Digital Assistant), PC (Personal Computer), etc. A non-exhaustive list of potential terminals includes a fixed telephone connected to a POTS network or a PSTN (Public Switched Telephony Network), a mobile telephone coupled to a cellular radio network (such as GSM, GPRSIEDGE, CDMA or else UMTS), and a hand-held digital device provided with at least an audio communication module.

With appropriate adaptations, any of the above devices with the function of audio communication can be used as the called party terminal 30 capable to realize diverse ringing under the control of the calling party in accordance with the invention. These adaptations can be performed through software or hardware update on the existing audio

communication devices. The adapted called party terminal is provided with new table items, with which the user can select which of local ring tones and diversity ring tones will be preferred. If the local ring tones are preferred, the function of diversity ring tones is disabled, and the called party terminal always rings as the user's configuration when incoming calls reach it; otherwise, the function of diversity ring tones is supported at the called party terminal. In the following, the invention is explained with reference to the latter mode.

The telecom network 20 can be any appropriate wired or wireless communication medium such as but not limited to PSTN, GSM and CDMA network. Specifically, the telecom network 20 includes a plurality of switches, such as switches 21 and 22 which are coupled to the calling and called party terminals 10 and 30 respectively so as to provide telecommunication services therebetween.

The diversity ring tone platform 40 comprises a database for storing the various diversity ring tone uploaded or transferred from other data sources (e.g. without limitation, websites or other platforms) by subscribers, the storage structure of which is schematically illustrated in Fig. 2. Also, the platform 40 provides subscribers with functions of making and managing his or her ring tone strategy, which include but not limited to assigning an unique index to each ring tone, editing, copying or deleting a diversity ring tone from the database, rearranging the correspondence between ring tones and index, etc. Furthermore, the platform 40 is operable to retrieve and play a ring tone stored therein based on the request of the subscribers.

In the embodiments of the invention, the platform 40 is described as one dedicated to provide the diversity ring tone service. Alternatively, it is also possible to make appropriate adaptations to the pre-existing platforms such as a Text-Message platform or a Color Ring Back Tone Platform to supplement with such functions.

As used herein, the term "diversity ring tone" is a ringing sound heard by the called party when the calling party's calling reaches the called party terminal, which is selected by the calling party when initiating the call, in the purpose of showing the personality, character or identification thereof. The diversity ring tone includes, but is not limited to, a recorded voice message, a bit of dialogue, a snippet of music or any other sound effects. With this feature, the called party can obtain certain information from the ring tone before answering the call. Also, the diversity ring tone can be used by advertising companies to issue their advertisement information.

The signaling switching link 50 is configured to couple the telecom network 20 with

the diversity ring tone platform 40, which uses various signaling switching mechanisms such as but not limited to ISUP, TUP, SIP, R2 and MAP, etc. No matter what mechanism is adopted, the functions achieved are substantially similar, i.e. retrieving the target ring tone based on the telephone number of the calling party and the index (if any); establishing connectivity between the calling party terminal 10 and the platform 40, so as to collect at least one diversity ring tone from the calling party; establishing connectivity from the platform 40 to the telecom network 20 and further to the called party terminal 30, so as to make the ring tone being played by the platform 40 audible to the called party; etc.

As for wireless terminals and network, the at least one diversity ring tone can be uploaded from the terminal 10 to the platform 40 as a data package via the network 20 by sharing the paging frequency and via the signaling switching link 50. As for wired terminals and network, during off-hook state of the calling party terminal 10, the calling party can record the at least one diversity ring tone at the platform 40 via the existing connectivity between the terminal 10 and the network 20 and via the signaling switching link 50.

Referring now to Fig. 3, the method of providing diversity ring tones will be described.

Assuming that the calling party has subscribed the diversity ring tone service, uploaded at least one ring tone and made his or her strategy at the platform 40, in S100, by dialing "the called party' telephone number + a separator (for example, *or #) + index" at the calling party terminal 10, he or she initiates a call relating to the service to the called party terminal 30. For example, returning to Fig. 2, when the subscriber as shown with a telephone number 138XXXXXXXX dials his friend Mary's telephone number + *(or #) + 1, the call relating to the diversity ring tone service is initiated, and the ring.1 is designated as the target ring tone to become audible at Mary's telephone, i.e. the called party terminal 30.

Upon detecting such a call, the telecom network 20 identifies that the call is one relating to the diversity ring tone service and determines whether the calling party has subscribed the service (S200). If so, the index information embedded in the call is extracted and signaling switching with the diversity ring tone platform 40 is performed (S300).

In S400, it is determined whether the called party terminal 30 is available to receive a call. If so, in S500, the ring tone pre-stored at the diversity ring tone platform 40 which corresponds to the extracted index information is retrieved and played.

It will be appreciated that index information is not necessarily embedded in the call. In

some applications, without such embedded information, or if the extracted index information is inactive, a default ring tone determined by the calling party in advance is retrieved and played at the diversity ring tone platform 40. It is clear to those skilled in the art that, in light of the teaching of the invention, other various deployments are also possible.

Then, in S600, connectivity between the diversity ring tone platform 40 and the called party terminal 30 is established, and a speaker of the called party terminal 30 is turned on, thereby making the ring tone, which is being played, audible by means of the speaker.

In the above scheme, immediately after it is determined that the called party terminal 30 is available to receive a call, make the diversity ring tone determined by the calling party become audible at the called party terminal 30. An alternative scheme is also possible, in that the diversity ring tone is played at the calling party terminal 10 after the called party terminal 30 has ringed in an ordinary manner in accordance with the called party's configuration for a predefined period of time. In some applications, the latter scheme may be of advantages in better attracting the called party's attention.

The process in the latter scheme is similar to that in the former one, except that S400 further comprises making the called party terminal 30 ring in an ordinary manner in accordance with the called party's configuration in the case that the called party terminal 30 is available to receive a call; that S400 further comprises delaying for a predefined period of time prior to performing playing; and that S600 further comprises stopping ringing in the manner in accordance with the called party's configuration at the same time as turning on the speaker.

It is noted that the predefined period of time may be specified in the call by the calling party terminal 10 as time information, and then be extracted in S300. It will readily come to those skilled in the art that the predefined period of time may be defined at the called party terminal 30 in advance.

Figs 4-7 are call flows showing the call processing procedures between terminals based on the former or latter schemes and in an unintelligent or intelligent environment, respectively. They schematically illustrate examples of inter-working between the terminals 10 and 30, the switches 21 and 22 and the platform 40.

(The first Embodiment)

Fig. 4 is a call flow showing the call processing procedures between terminals in an unintelligent environment according to the first embodiment of the invention.

a) The calling party terminal 10 sends Call_Request_Message 101 to the calling party

switch 21, thereby initiating the call.

b) The calling party switch 21 determines that this call relates to the diversity ring tone service and that the calling party has subscribed the service, analyzes and extracts the index information embedded therein (if any), and sends Call_Request_Message 102 to the diversity ring tone platform 40.

c) The diversity ring tone platform 40 replies to the calling party switch 21 with Call_Continue_Message 103.

d) The calling party switch 21 sends Call_Request_Message 104 to the called party switch 22.

e) The called party switch 22 replies to the calling party switch 21 with Call_Continue_Message 105.

f) The calling party switch 21 sends Diversity_Ring_Request_Message 106 to the diversity ring tone platform 40.

g) The diversity ring tone platform 40 replies to the calling party switch 21 with Call_Continue_Message 107, and plays the ring tone corresponding to the extracted index information (or a default ring tone).

h) The calling party switch 21 sends Diversity_Ring_Command_Message 108 to the called party switch 22.

i) The called party switch 22 sends Diversity_Ring_Command_Message 109 to the called party terminal 22 to make it turn on it's speaker, thereby the ring tone which is played by the diversity ring tone platform 40 being heard at the called party terminal 30.

j) The called party switch 22 sends Ring_Message 110 to the calling party switch 21.

k) The Calling party switch 21 sends Ring_Message 111 to the calling party terminal 10.

l) If the called party answers the call, the called party terminal 30 sends Call_Respond_Message 112 to the called party switch 22.

m) The called party switch 22 sends Call_Respond_Message 113 to the calling party switch 21.

n) The calling party switch 21 sends Diversity_Ring_End_Message 114 to the diversity ring tone platform 40, thereby stopping playing the diversity ring tone and releasing the existing connectivity for playing the ring tone.

o) The calling party switch 21 sends Call_Respond_Message 115 to the calling party terminal 10, thereby establishing connectivity for normal voice communication between the terminals 10 and 30.

(The Second Embodiment)

Fig. 5 is a call flow showing the call processing procedures between terminals in an intelligent environment according to the second embodiment of the invention.

a) The calling party terminal 10 sends Call_Request_Message 201 to the calling party switch 21, thereby initiating the call.

b) The calling party switch 21 determines that this call relates to the diversity ring tone service and that the calling party has subscribed the service, analyzes and extracts the index information embedded therein (if any), and sends Call_Request_Message 202 to the diversity ring tone platform 40.

c) The diversity ring tone platform 40 sends Call_Request_Message 203 to the called party switch 22.

d) The called party switch 22 replies to the diversity ring tone platform 40 with Call_Continue_Message 204.

e) The diversity ring tone platform 40 plays the ring tone corresponding to the extracted index information (or a default ring tone), and sends Diversity_Ring_Command_Message 205 to the called party switch 22.

f) The called party switch 22 sends Diversity_Ring_Command_Message 206 to the called party terminal 22 to make it turn on a speaker, thereby the ring tone which is played by the diversity ring tone platform 40 being heard at the called party terminal 30.

g) The called arty switch 22 sends Ring_Message 207 to the calling party switch 21.

h) The calling party 21 sends Ring_Message 208 to the calling party terminal 10.

i) If the called party answers the call, the called party terminal 30 sends Call_Respond_Message 209 to the called party switch 22.

j) The called party switch 22 sends Call_Respond_Message 210 to the diversity ring tone platform 40, thereby stopping playing the ring tone and releasing the existing connectivity for playing the ring tone.

k) The diversity ring tone platform 40 sends Call_Respond_Message 211 to the calling party switch 21.

l) The calling party switch 21 sends Call_Respond_Message 212 to the calling party terminal 10, thereby establishing connectivity for normal voice communication between the terminals 10 and 30.

(The Third Embodiment)

Fig. 6 is a call flow showing the call processing procedures between terminals in an unintelligent environment according to the third embodiment of the invention.

a) The calling party terminal 10 sends Call_Request_Message 301 to the calling party switch 21, thereby initiating the call.

b) The calling party switch 21 determines that this call relates to the diversity ring tone service and that the calling party has subscribed the service, analyzes and extracts the index information (if any) and time information embedded therein, and sends Call_Request_Message 302 to the diversity ring tone platform 40.

c) The diversity ring tone platform 40 replies to the calling party switch 21 with Call_Continue_Message 303.

d) The calling party switch 21 sends Call_Request_Message 304 to the called party switch 22.

e) The called party switch 22 sends Call_Request_Message 305 to the called party terminal 30.

f) The called party terminal 30 rings as the called party's configuration, and replies to the called party switch 22 with Ring_Message 306.

g) The called party switch 22 sends Call_Continue_Message 307 to the calling party switch 21.

h) The calling party switch 21 sends Ring_Message 308 to the calling party terminal 10.

i) The calling party switch 21 sends Diversity_Ring_Request_Message 309 to the diversity ring tone platform 40.

j) The diversity ring tone platform 40 replies to the calling party switch 21 with Call_Respond_Message 310, retrieves the ring tone corresponding to the extracted index information (or a default ring tone), delays for a period of time which is in accordance with the time information and plays it.

k) The calling party switch 21 sends Diversity_Ring_Command_Message 311 to the called party switch 22.

l) The called party switch 22 sends Diversity_Ring_Command_Message 312 to the called party terminal 30 to make it stop ringing as the called party's configuration and turn on a speaker, thereby the ring tone which is played by the diversity ring tone platform 40 being heard at the called party terminal 30.

m) If the called party answers the call, the called party terminal 30 sends Call_Respond_Message 313 to the called party switch 22.

n) The called party switch 22 sends Call_Respond_Message 314 to the calling party switch 21.

o) The calling party switch 21 sends Call_End_Message 315 to the diversity ring tone platform 40, thereby stopping playing the ring tone and releasing the existing connectivity for playing the ring tone.

p) The calling party switch 21 sends Call_Establish_Message 316 to the calling party terminal 10, thereby establishing connectivity for normal voice communication between the terminals 10 and 30.

(The Forth Embodiment)

Fig. 7 is a call flow showing the call processing procedures between terminals in an intelligent environment according to the forth embodiment of the invention.

a) The calling party terminal 10 sends Call_Request_Message 401 to the calling party switch 21, thereby initiating the call.

b) The calling party switch 21 determines that this call relates to the diversity ring tone service and that the calling party has subscribed the service, analyzes and extracts the index information (if any) and time information embedded therein, and sends Call_Request_Message 402 to the diversity ring tone platform 40.

c) The diversity ring tone platform 40 sends Call_Request_Message 403 to the called party switch 22.

d) The called party switch 22 sends Call_Request_Message 404 to the called party terminal 30.

e) The called party terminal 30 rings as the called party's configuration, and replies to the called party switch 22 with Ring_Message 405.

f) The called party switch 22 replies to the diversity ring tone platform 40 with Call_Continue_Message 406.

g) The diversity ring tone platform 40 replies to the calling party switch 21 with Call_Continue_Message 407.

h) The calling party switch 21 sends Ring_Message 408 to the calling party terminal 10.

i) The diversity ring tone platform 40 retrieves the ring tone corresponding to the extracted index information (or a default ring tone), delays for a period of time which is in accordance with the time information and plays it, and sends Diversity_Ring_Command_Message 409 to the called party switch 22.

j) The called party switch 22 sends Diversity_Ring_Command_Message 410 to the called party terminal 30 to make it stop ringing as the called party's configuration and turn on it's speaker, thereby the ring tone which is played by the diversity ring tone platform 40

being heard at the called party terminal 30.

k) If the called party answers the call, the called party terminal 30 sends Call_Respond_Message 411 to the called party switch 22.

l) The called party switch 22 sends Call_Respond_Message 412 to the diversity ring tone platform 40, thereby stopping playing the ring tone and releasing the existing connectivity for playing the ring tone.

m) The diversity ring tone platform 40 sends Call_Respond_Message 413 to the calling party switch 21.

n) The calling party switch 21 sends Call_Respond_Message 414 to the calling party terminal 10, thereby establishing connectivity for normal voice communication between the terminals 10 and 30.

The foregoing descriptions of specific embodiments of the present invention have been presented for purposes of illustration and description. They are not intended to be exhaustive or to limit the invention to the precise forms disclosed, and obviously many modifications and variations are possible in light of the above teaching. It is intended that the scope of the invention be defined by the claims appended hereto and their equivalents.

CLAIMS

1. A method for providing a diversity ring tone to a called party terminal (30) under the control of a calling party terminal (10), comprises the steps of:

initiating a call from the calling party terminal (10) to the called party terminal (30);

determining whether the calling party has subscribed a diversity ring tone service;

if so, performing signaling switching with a diversity ring tone platform (40);

determining whether the called party terminal (30) is available to receive a call;

if so, retrieving and playing a ring tone stored at the diversity ring tone platform (40) ; and

establishing connectivity between the diversity ring tone platform (40) and the called party terminal (30), and turning on a speaker of the called party terminal (30), thereby making the ring tone, which is being played at the diversity ring tone platform (40), audible by means of the speaker.

2. The method according to claim 1, wherein

the second determination step further comprises, making the called party terminal (30) ring in a manner in accordance with the called party's configuration, in the case that the called party terminal (30) is available to receive a call; wherein

the step of retrieving and playing a ring tone further comprises: prior to performing playing, delaying for a predefined period of time; and wherein

the step of establishing connectivity and turning on a speaker further comprises, at the same time as turning on the speaker, stopping ringing in the manner in accordance with the called party's configuration.

3. The method according to claim 1 or 2, wherein the calling and called terminals (10, 30) and the diversity ring tone platform (40) perform communications through a network element (20) that includes a calling party switch (21) and a called party switch (22) to which the calling party terminal (10) and the called party terminal (30) are coupled respectively.

4. The method according to claim 3, wherein the second determination step, the step of retrieving and playing a ring tone and the step of establishing connectivity and turning on a speaker are performed by the diversity ring tone platform (40) cooperating with the called party switch (22).

5. The method according to claim 3, wherein the second determination step and the

step of establishing connectivity and turning on a speaker are performed by the calling party switch (21) cooperating with the called party switch (22); and wherein

the step of retrieving and playing a ring tone are performed by the diversity ring tone platform (40) under the instruction of the calling party switch (21).

6. The method according to claim 1 or 2, further comprises a step of storing at least one audio file at the diversity ring tone platform (40) as at least one ring tone by the calling party terminal (10), and assigning an unique index to each of the at least one ring tone.

7. The method according to claim 6, wherein the call initiated by the calling party terminal (10) further specifies an index, and the ting tone corresponding to the index is retrieved and played in the step of retrieving and playing a ring tone.

8. The method according to claim 1 or 2, further comprises a step following the step of establishing connectivity and turning on a speaker, in which if the called party terminal (30) answers the call, terminate the connectivity between the diversity ring tone platform (40) and the called party terminal (30), stop playing the ring tone at the diversity ring tone platform (40), and establish connectivity between the calling and the called party terminal (10, 30); else if the called party terminal (30) rejects the call, release all the resource.

9. The method according to claim 2, wherein the predefined period of time is defined at the calling party terminal (10).

10. A system for providing a diversity ring tone, comprises:

a calling party terminal (10) which initiates a call;

a called party terminal (30) which is the destination of the call;

a diversity ring tone platform (40), in which diversity ring tones are stored for subscribers of the diversity ring tone service;

a network element (20), through which the calling and called party terminal (10, 30) and the diversity ring tone platform (40) perform communications; wherein

when the calling party terminal (10) initiates a call to the called party terminal (30), it is determined whether the calling party has subscribed a diversity ring tone service; and if so, signaling switching with a diversity ring tone platform (40) is performed; thereafter, It is determined whether the called party terminal (30) is available to receive a call; and if so, a ring tone stored at the diversity ring tone platform (40) is retrieved and played; thereafter, connectivity between the diversity ring tone platform (40) and the called party terminal (30) is established, and a speaker of the called party terminal (30) is turned on, thereby making the ring tone, which is being played at the diversity ring tone platform (40), audible by means of the speaker.

11. The system according to claim 10, wherein when it is determined that the called party terminal (30) is available to receive a call, the called party terminal (30) is made ring in a manner in accordance with the called party's configuration; wherein

a ring tone stored at the diversity ring tone platform (40) is delayed for a predefined period of time to be played; and wherein

at the same time as the speaker is turned on, the called party terminal (30) is stopped ringing in the manner in accordance with the called party's configuration.

12. The system according to claim 10, wherein the network element (20) includes a calling party switch (21) and a called party switch (22) to which the calling party terminal (10) and the called party terminal (30) are coupled respectively.

13. The system according to claim 12, wherein the diversity ring tone platform (40) is configured to:

cooperating with the called party switch (22), determine whether the called party terminal (30) is available to receive a call,

retrieve and play a ring tone in the case that the called party terminal (30) is available to receive a call, and

cooperating with the called party switch (22), establish connectivity between the diversity ring tone platform (40) and the called party terminal (30), and turn on a speaker of the called party terminal (30).

14. The system according to claim 12, wherein the calling party switch (21) is configured to:

cooperating with the called party switch (22), determine whether the called party terminal (30) is available to receive a call,

instruct the diversity ring tone platform (40) to retrieve and play a ring tone in the case that the called party terminal (30) is available to receive a call, and

cooperating with the called party switch (22), establish connectivity between the diversity ring tone platform (40) and the called party terminal (30), and turn on a speaker of the called party terminal (30).

15. The system according to claim 11, wherein the network element (20) includes a calling party switch (21) and a called party switch (22) to which the calling party terminal (10) and the called party terminal (30) are coupled respectively.

16. The system according to claim 15, wherein the diversity ring tone platform (40) is configured to:

cooperating with the called party switch (22), determine whether the called party

terminal (30) is available to receive a call, and if so, make the called party terminal (30) ring in a manner in accordance with the called party's configuration,

retrieve a ring tone, delay for a predefined period of time, and play it, and

cooperating with the called party switch (22), establish connectivity between the diversity ring tone platform (40) and the called party terminal (30), stop the called party terminal (30) ringing, and turn on a speaker of the called party terminal (30).

17. The system according to claim 15, wherein the calling party switch (21) is configured to:

cooperating with the called party switch (22), determine whether the called party terminal (30) is available to receive a call, and if so, make the called party terminal (30) ring in a manner in accordance with the called party's configuration,

instruct the diversity ring tone platform (40) to retrieve a ring tone, delay for a predefined period of time and play it, and

cooperating with the called party switch (22), establish connectivity between the diversity ring tone platform (40) and the called party terminal (30), stop the called party terminal (30) ringing, and turn on a speaker of the called party terminal (30).

18. The system according to claim 10 or 11, wherein the calling party terminal (10) is configured to store at least one audio file at the diversity ring tone platform (40) as at least one ring tone and assign an unique index to each of the at least one ring tone.

19. The system according to claim 17, wherein the call initiated by the calling party terminal (10) further specifies an index, and wherein the ring tone stored at the diversity ring tone platform (40) which corresponds to the index is retrieved and played.

20. The system according to claim 10 or 11, wherein if the called party terminal (30) answers the call, the connectivity between the diversity ring tone platform (40) and the called party terminal (30) is terminated, the ring tone is stopped being played at the diversity ring tone platform (40), and connectivity between the calling and the called party terminal (10, 30) is established; else if the called party terminal (30) rejects the call, all the resource is released.

21. The system according to claim 11, 15, 16 or 17, wherein the predefined period of time is defined at the calling party terminal (10).

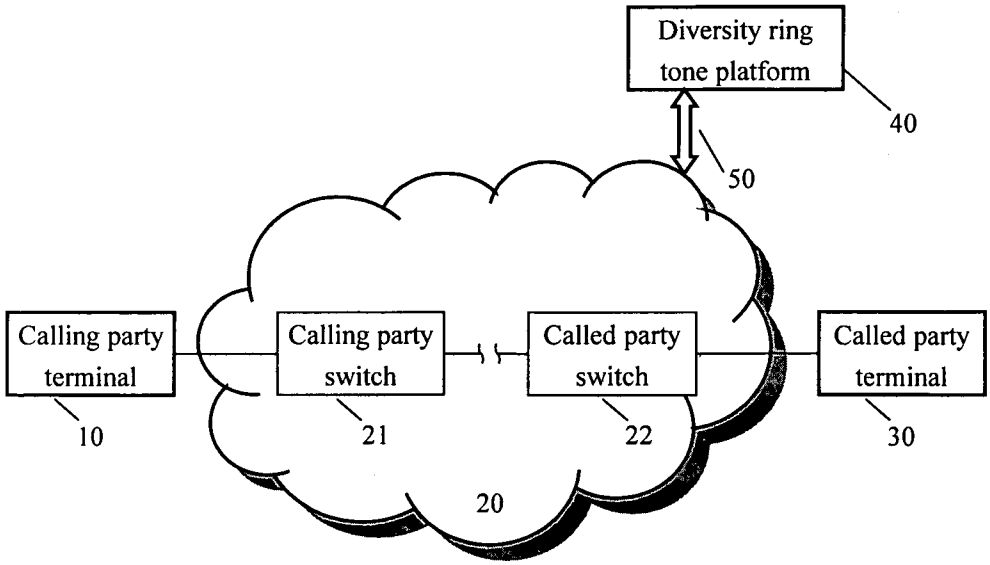

Fig. 1

Diversity ring tone service subscribers	Diversity ring tones	Index
138XXXXXXXX	Ring tone 1	1
	Ring tone 2	2
	…	…
…	…	…
010-XXXXXXXX	Ring tone 1	1
	Ring tone 2	2
	…	…
…	…	…

Fig. 2

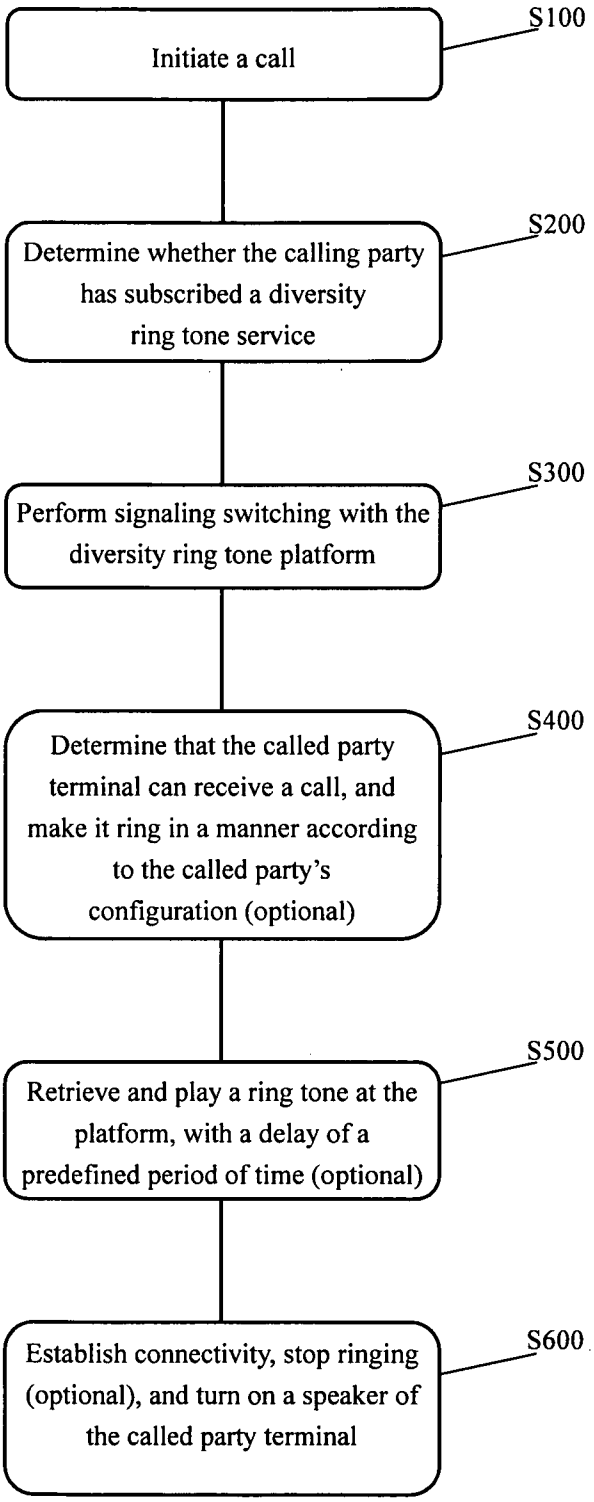
Initiate a call
S100
Determine whether the calling party has subscribed a diversity ring tone service
S200
Perform signaling switching with the diversity ring tone platform
S300
Determine that the called party terminal can receive a call, and make it ring in a manner according to the called party's configuration (optional)
S400
Retrieve and play a ring tone at the platform, with a delay of a predefined period of time (optional)
S500
Establish connectivity, stop ringing (optional), and turn on a speaker of the called party terminal
S600

Fig. 3

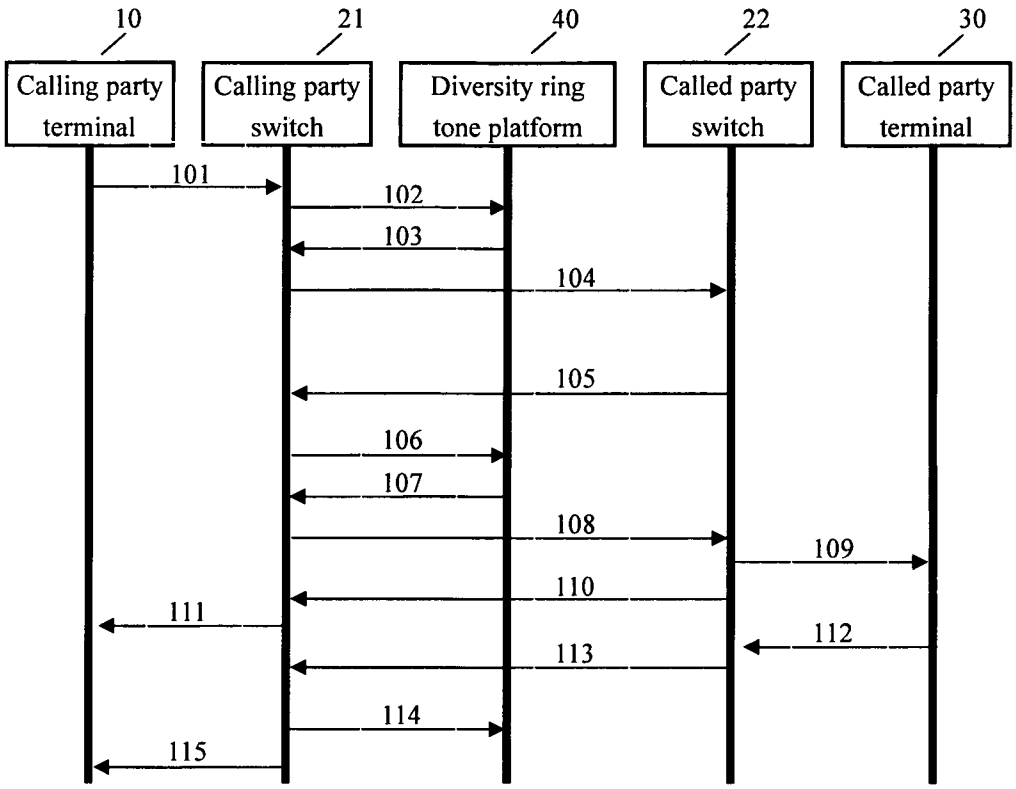
10
21
40
22
30
Calling party terminal
Calling party switch
Diversity ring tone platform
Called party switch
Called party terminal
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115

Fig. 4

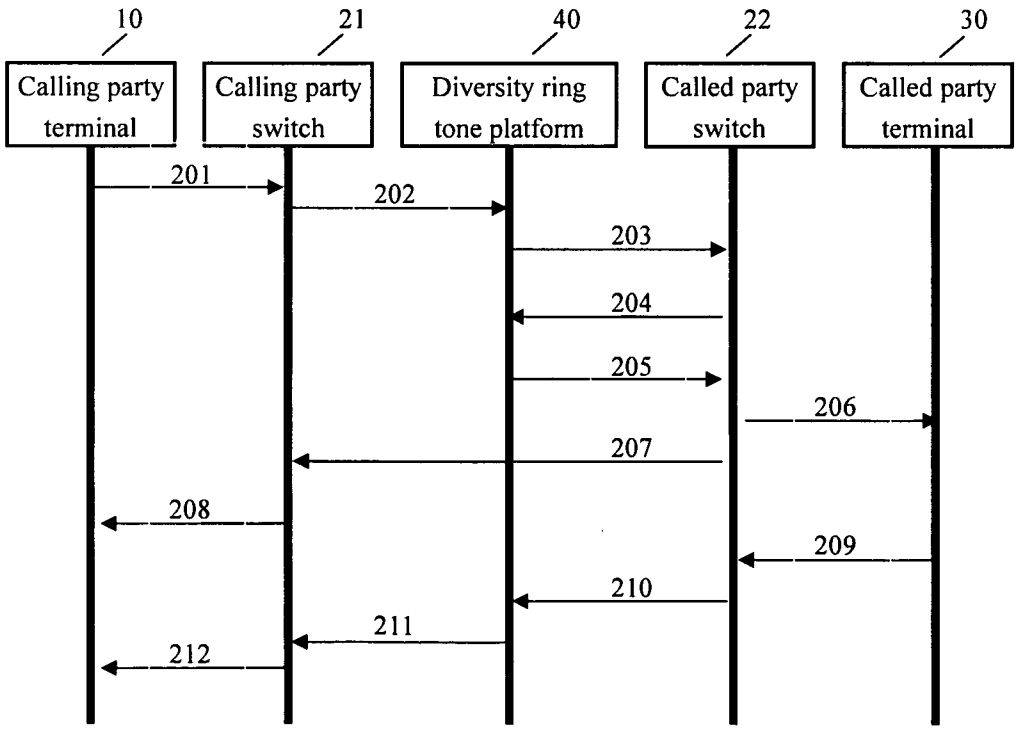
10
21
40
22
30
Calling party terminal
Calling party switch
Diversity ring tone platform
Called party switch
Called party terminal
201
202
203
204
205
206
207
208
209
210
211
212

Fig. 5

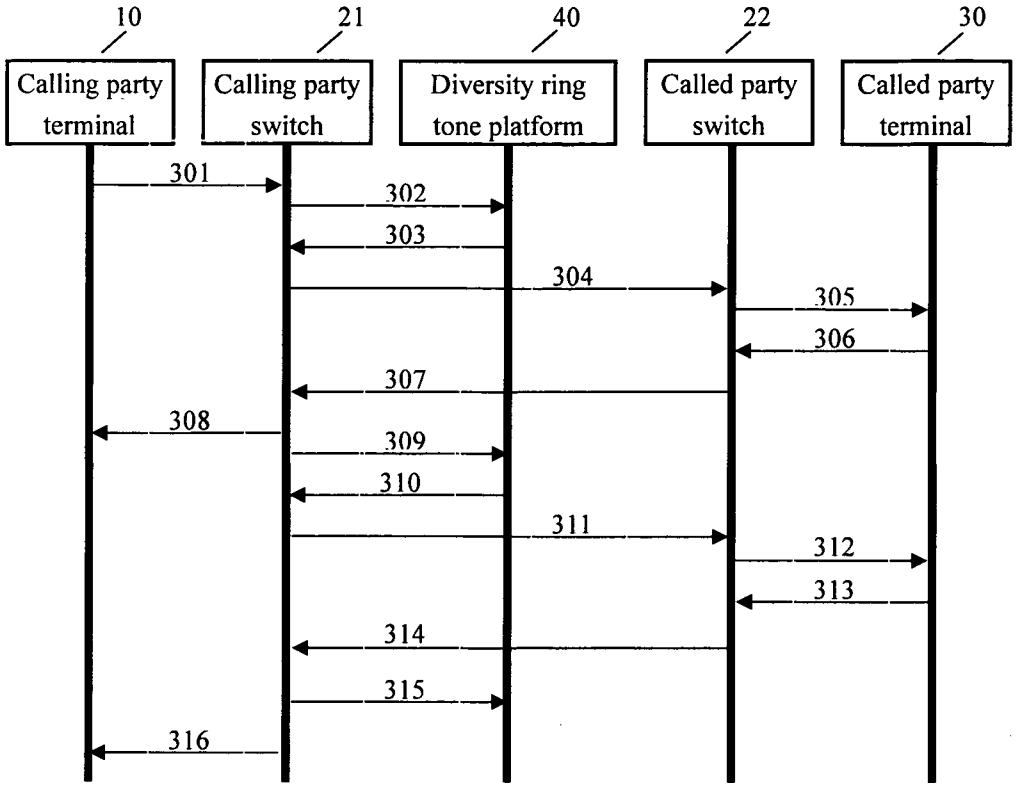
10
21
40
22
30
Calling party terminal
Calling party switch
Diversity ring tone platform
Called party switch
Called party terminal
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316

Fig.6

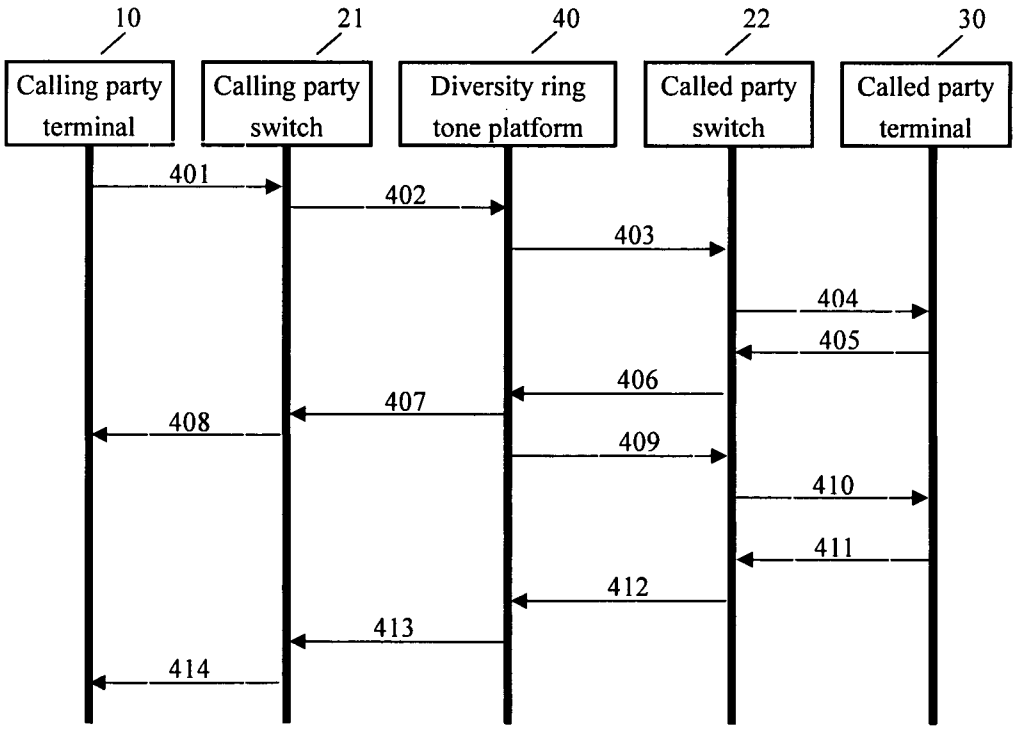
10
21
40
22
30
Calling party terminal
Calling party switch
Diversity ring tone platform
Called party switch
Called party terminal
401
402
403
404
405
406
407
408
409
410
411
412
413
414

Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2007/002780

A. CLASSIFICATION OF SUBJECT MATTER

H04L12/66 (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: H04L, H04J, H04M

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

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

CNPAT, WPI, PAJ, EPODOC, IEEE, CNKI: tone, ring, call+, diversity, service, switch, signal+, terminal, mobile, turn, platform, intiat+.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN1571323A (HUAWEI TECHNOLOGIES CO., LTD.) 26 Jan. 2005 (26.01.2005) The whole document	1-21
A	WO2005/009015A1(AEONTEL CO., LTD.) 27 Jan. 2005(27.01.2005) The whole document	1-21
A	WO2005/051015A1(WIDERTHAN.COM CO., LTD.) 2 Jun. 2005 (02.06.2005) The whole document	1-21

☐ 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 another 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

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
11 Jun. 2008 (11.06.2008)	**03 Jul. 2008 (03.07.2008)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer YANG,Zhen Telephone No. (86-10)62413538

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2007/002780

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN1571323A	26.01.2005	NONE	
WO2005/009015A1	27.01.2005	CN1813466A	02.08.2006
		EP1649674A1	26.04.2006
		KR20050011658A	29.01.2005
		US2007116251A1	24.05.2005
WO2005/051015A1	02.06.2005	AU2003284728A1	08.06.2005
		CN1910945A	07.02.2007
		EP1692892A1	23.08.2006
		US2007123331A1	31.05.2007