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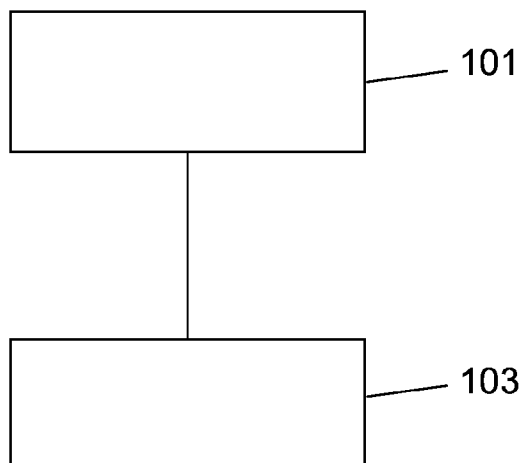
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(54) Title: METHOD AND COMMUNICATION DEVICE FOR COMMUNICATING DATA USING A MOBILE TERMINAL
HAVING AT LEAST TWO SUBSCRIBER IDENTITY MODULES

Fig. 1



(57) Abstract: The invention relates to a method for communicating data using a mobile terminal (201, 301) having at least two subscriber identity modules, wherein a first subscriber identity module (203, 303) is configured to identify a subscriber with a first operator and a second subscriber identity module (205, 305) is configured to identify the subscriber with a second operator, the method comprising a step (101) of communicating voice data towards a first communication network associated to the first operator by means of the first subscriber identity module (203, 303), and a step (102) of communicating data other than voice data towards a second communication network (217, 317) associated to the second operator by means of the second subscriber identity module (205, 305).



Method and communication device for communicating data using a mobile terminal having at least two subscriber identity modules

BACKGROUND OF THE INVENTION

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The present invention relates to mobile communications over communication networks.

10 For communicating voice data and data other than voice data over at least two communication networks, a mobile terminal and a wireless modem, e.g. a USB broadband wireless modem, are conventionally used. In this regard, operators particularly provide voice subscriptions for mobile terminals having high data billing rates and data subscriptions for wireless modems with lower billing rates without voice data. In particular, said data subscriptions may include flat rates.

15

Thus, the user has conventionally to use two separate modems, one in the mobile terminal and the wireless modem, for communicating voice data and data other than voice data over at least two communication networks.

20 **SUMMARY OF THE INVENTION**

A goal to be achieved by the present invention is to provide a cost-efficient solution for communicating data using one mobile terminal with at least two communication networks.

25

According to some implementations, at least two subscriber identity modules are used within one mobile terminal, wherein a first subscriber identity module is configured to identify the subscriber with a first operator and a second subscriber identity module is configured to identify the subscriber with a second operator.

30

According to some implementations, the at least two subscriber identity modules may have different types of subscription, in particular regarding their costs and their ability to access one or more communication networks. A first subscription may be embodied by the first subscriber identity module. Said first subscription
5 may be a voice subscription having relatively high data billing rates. Moreover, a second subscription may be embodied by the second subscriber identity module. Said second subscription may be a data subscription having relatively low data billing rates.

10 According to some implementations, an automatic switch between is used for switching between the at least two subscriber identity modules within the one mobile terminal or mobile phone.

Further, according to some implementations, the user or subscriber of the mobile
15 terminal may make use of the voice functionality of his mobile terminal even when the built-in modem for data communication is used. This may be an important aspect, since the mobile terminal may be not out of service regarding its voice functionality in a case that the built-in modem of the mobile terminal is used.

20 According to some implementations, differentiated subscriptions are provided for accessing at least two communication networks by using only one mobile terminal having only one single modem.

According to some implementations, the built-in modem of the mobile terminal
25 may be re-used for communicating data other than voice data to a further communication network.

Furthermore, according to some implementations, the acquisition costs for the user or subscriber may be lowered, in particular for making the transition from 2G
30 to 3G. Advantageously, the additional costs for providing a flat rate wireless modem inside a mobile terminal may be only a small fraction of the costs for an additional complete modem.

In particular, according to some implementations, the present invention may provide a cost-efficient solution for high speed data communication.

5 According to a first aspect, a method for communicating data using a mobile terminal having at least two subscriber identity modules is provided, wherein a first subscriber identity module is configured to identify a subscriber with a first operator and a second subscriber identity module is configured to identify the subscriber with a second operator. The method has a step of communicating voice
10 data with a first communication network associated to the first operator by means of the first subscriber identity module. Further, the method has a step of communicating data other than voice data with a second communication network associated to the second operator by means of the second subscriber identity module.

15

The mobile terminal may be a mobile phone, a Personal Digital Assistant (PDA) or a hand-held. The subscriber identity module may be a SIM. In particular, the first subscriber identity module may contain an internationally unique number of the mobile user, an International Mobile Subscriber Identity (IMSI).

20

According to an implementation form, the method further has a step of connecting either the first subscriber identity module or the second subscriber identity module to transceiver means of the mobile terminal dependent on status information provided by an access entity or a dialing entity of the mobile terminal. In particular,
25 said dialing entity may be configured to provide a call over the first communication network. Furthermore, said access entity may be configured to provide access to the second communication network.

In particular, said transceiver means may include radio and broadband
30 communication means. In particular, the transceiver means may include the built-in modem of the mobile terminal. Further, the transceiver means may be embodied as the built-in modem of the mobile terminal.

According to an implementation form, the method further has a step of associating the mobile terminal to a communication device, and a step of connecting the second subscriber identity module to transceiver means of the mobile terminal, if an available connection to the associated communication device is detected.

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According to an implementation form, the method further has a step of setting the mobile terminal in a wireless broadband mode in a default case and setting the mobile terminal in a voice mode in a case that the mobile terminal is initiating a call. In particular, in the wireless broadband mode, the transceiver means of the mobile terminal are connected to the second subscriber identity module. Moreover, in the voice mode, the transceiver means are connected to the first subscriber identity module.

10

According to an implementation form, the method further has a step of setting the mobile terminal in a wireless broadband mode in a default case, setting the mobile terminal in a voice mode in a case that the mobile terminal is initiating a call and setting the mobile terminal back to the wireless broadband mode after the call is finished.

15

According to an implementation form, the first communication network is a Universal Mobile Telecommunication System (UMTS) or a Long Term Evolution (LTE) network.

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According to an implementation form, the second communication network is a Long Term Evolution (LTE) network or a High Speed Packet Access (HSPA) network.

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According to a second aspect, the invention relates to a computer program comprising a program code for executing the method for communicating data using a mobile terminal having at least two subscriber identity modules when run on a computer.

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According to a third aspect, a communication device for communicating data integrable in a mobile terminal having at least two subscriber identity modules is suggested, wherein a first subscriber identity module is configured to identify a subscriber with a first operator and a second subscriber identity module is

5 configured to identify the subscriber with a second operator. The device has first receiving means, second receiving means, first communication means and second communication means.

Said first receiving means are configured to receive the first subscriber identity module. Moreover, said second receiving means are configured to receive the

10 second subscriber identity module. The first communication means are configured to communicate voice data towards a first communication network associated to the first operator by means of the first subscriber identity module. Also, the second communication means are configured to communicate data other than voice data towards a second communication network associated to the second operator by

15 means of the second subscriber identity module.

According to an implementation form, the device further has a dialing entity which is configured to provide a call over the first communication network by means of the first subscriber identity module, an access entity which is configured to provide

20 access to the second communication network by means of the second subscriber identity module, and a switching entity which is configured to connect either the first subscriber identity module or the second subscriber identity module to transceiver means of the mobile terminal dependent on status information provided by the access entity or the dialing entity.

25

According to an implementation form, the device further has associating means for associating the mobile terminal to a communication device, and switching means for connecting the second subscriber identity module to transceiver means of the mobile terminal, if an available connection to the associated communication device

30 is detected.

According to an implementation form, the device further has setting means for setting the mobile terminal in a wireless broadband mode in a default case and for

setting the mobile terminal in a voice mode in a case that the user or the mobile terminal is initiating a call. Particularly, the transceiver means of the mobile terminal are connected to the second subscriber identity module in the wireless broadband mode and the transceiver means are connected to the first subscriber
5 identity module in the voice mode.

According to an implementation form, the device further has setting means for setting the mobile terminal in a wireless broadband mode in a default case, for setting the mobile terminal in a voice mode in a case that the mobile terminal is
10 initiating a call and for setting the mobile terminal back to the wireless broadband mode after the call is finished.

According to a third aspect, a mobile terminal is provided. The mobile terminal has at least one above mentioned device for communicating data, wherein the mobile
15 terminal has at least two subscriber identity modules.

The respective means or the respective entity may be implemented in hardware or in software. If said means are implemented in hardware, it may be embodied as a device, e.g. as a computer or as a processor, or as a part of a system, e.g. a
20 computer system. If said means are implemented in software, it may be embodied as a computer program product, as a function, as a routine, as a program code or as an executable object.

BRIEF DESCRIPTION OF THE DRAWINGS

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Further embodiments of the invention will be described with respect to the following figures, in which:

Fig. 1 shows an embodiment of a method for communicating data using a mobile
30 terminal having at least two subscriber identity modules;

Fig. 2 shows a first embodiment of a device for communicating data integrable in a mobile terminal having at least two subscriber identity modules; and

Fig. 3 shows a second embodiment of a device for communicating data integrable
5 in a mobile terminal having at least two subscriber identity modules.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

In Fig. 1, an embodiment of a method for communicating data using a mobile
10 terminal having at least two subscriber identity modules is depicted.

The method of Fig. 1 has a step 101 of communicating voice data towards the first communication network associated to the first operator by means of the first subscriber identity module. Further, the method of Fig. 1 has a step of
15 communicating data other than voice data towards a second communication network associated to the second operator by means of the second subscriber identity module.

Fig. 2 shows a first embodiment of a device 200 for communicating data, wherein
20 said device 200 is integrated in a mobile terminal 201. The mobile terminal 201 has two subscriber identity modules 203 and 205. The first subscriber identity module 203 is configured to indentify a subscriber with a first operator. The second subscriber identity module 205 is configured to identify the subscriber with a second operator.

25

Said device 200 has first receiving means 207, second receiving means 209, first communication means 211 for communicating voice data towards a first communication network 213 and second communication means 215 for communicating data other than voice data towards a second communication
30 network 217. Moreover, the second communication means 215 may comprise Wireless FireWire, a USB modem and or a serial modem. Further, the second

communication means 215 may use the Wi-Fi standard and/or the Worldwide Interoperability for Microwave Access (WiMAX) standard.

5 Said first receiving means 207 may be adapted to receive the first subscriber identity module 203. In an analogous way, said second receiving means 209 may be adapted to receive the second subscriber identity module 205.

10 The first communication network 213 may be associated to the first operator by means of the first subscriber identity module 203. Furthermore, said second communication network 217 may be associated to the second operator by means of the second subscriber identity module 205. The first and second operator may be different operators. Further, the first and second operator may be embodied by one operator.

15 Moreover, said device 200 may have a dialing entity 219. Said dialing entity 219 may be configured to provide a call over the first communication network 213 by means of the first subscriber identity module 203. In particular, said dialing entity 219 may be part of said first communication means 211.

20 Further, said device 200 may have an access entity 221 for providing access to the second communication network 217 by means of the second subscriber identity module 205. Furthermore, said access entity 219 may be part of the second communication means 215.

25 Furthermore, said device 200 may have a switching entity 223. Said switching entity 223 may be configured to connect either the first subscriber identity module 203 or the second subscriber identity module 205 to transceiver means 225 of the mobile terminal 201 dependent on status information provided by the access entity 219 or the dialing entity 221.

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Fig. 3 shows a second embodiment of a device 300 for communicating data. Said device 300 is integrated in a mobile terminal 301 having at least two subscriber identity modules 303 and 305.

- 5 Said device 301 has first receiving means 307, second receiving means 309, first communication means 311 for communicating voice data towards a first communication network 313 and second communication means 315 for communicating data other than voice data towards a second communication network 317. The second communication means 315 may comprise Wireless
10 FireWire, a USB modem and or a serial modem. Further, the second communication means 315 may use the Wi-Fi standard and/or the Worldwide Interoperability for Microwave Access (WiMAX) standard.

- Said first receiving means 307 may be adapted to receive the first subscriber
15 identity module 303. In an analogous way, said second receiving means 309 may be adapted to receive the second subscriber identity module 305.

- The first communication network 313 may be associated to the first operator by means of the first subscriber identity module 303. Further, said second
20 communication network 317 may be associated to the second operator by means of the second subscriber identity module 305. The first and second operator may be different operators. Further, the first and second operator may be embodied by one operator.

- 25 Further, said device 300 may have a dialing entity 319. Said dialing entity 319 may be configured to provide a call over the first communication network 313 by means of the first subscriber identity module 303. In particular, said dialing entity 319 may be part of said first communication means 311.

- 30 Furthermore, said device 300 may have an access entity 321 for providing access to the second communication network 317 by means of the second subscriber

identity module 305. Further, said access entity 319 may be part of the second communication means 315.

5 Furthermore, said device 300 may have a switching entity 323. Said switching entity 323 may be configured to connect either the first subscriber identity module 303 or the second subscriber identity module 305 to transceiver means 325 of the mobile terminal 301 dependent on status information provided by the access entity 319 or the dialing entity 321.

10 Moreover, the device 300 of Fig. 3 has associating means 327 for associating the mobile terminal 300 to a communication device 329. In such a case, said switching means 323 may be adapted to connect the second subscriber identity module 305 to the transceiver means 325 of the mobile terminal 300, if an available connection to the associated communication device 329 is detected. For the purpose of
15 detection, said associating means 327 may include detecting means (not shown). The communication device 329 may be embodied as a Personal Computer (PC), a laptop, a notebook or a Personal Digital Assistant (PDA).

Further, the device 300 of Fig. 3 may have setting means 331. The setting means
20 331 may be connected between the dialing entity 319 and the switching means 323. Said setting means 331 may be adapted to set the mobile terminal 300 in a wireless broadband mode in a default case. Further, said setting means 331 may be adapted to set the mobile terminal 300 in a voice mode in a case that the mobile terminal 300 is initiating a call. In the wireless broadband mode, the
25 transceiver means 325 may be connected to the second subscriber identity module 305. Further, in the voice mode, the transceiver means 325 may be connected to the first subscriber identity module 303.

In particular, said setting means 331 may be further adapted to set the mobile
30 terminal 300 back to the wireless broadband mode after the call is finished.

According to some implementations, the first communication means may provide a voice data communication, e.g. in GSM, in UMTS or in LTE technologies.

- 5 According to some implementations, the second communication means may provide a wireless broadband data communication, e.g. in HSPA or in LTE technologies.

CLAIMS:

1. Method for communicating data using a mobile terminal (201, 301) having
5 at least two subscriber identity modules, wherein a first subscriber identity module (203, 303) is configured to identify a subscriber with a first operator and a second subscriber identity module (205, 305) is configured to identify the subscriber with a second operator, the method comprising:
- 10 communicating voice data towards a first communication network associated to the first operator by means of the first subscriber identity module (203, 303), and
- communicating data other than voice data towards a second communication network (217, 317) associated to the second operator by means of the second
15 subscriber identity module (205, 305).
2. Method of claim 1, further comprising:
- connecting either the first subscriber identity module (203, 303) or the second
subscriber identity module (205, 305) to transceiver means (225, 325) of the
20 mobile terminal (201, 301) dependent on status information provided by a dialing entity (219, 319) or an access entity (221, 321) of the mobile terminal (201, 301), wherein said dialing entity (219, 319) is configured to provide a call over the first communication network (213, 313), and wherein said access entity (221, 321) is configured to provide access to the second communication network (217, 317).
- 25
3. Method of one of the preceding claims, further comprising.
- associating the mobile terminal (201, 301) to a communication device (329), and
- connecting the second subscriber identity module (205, 305) to transceiver means (225, 325) of the mobile terminal (201, 301), if an available connection to the
30 associated communication device (329) is detected.

4. Method of one of the preceding claims, further comprising:

setting the mobile terminal (201, 301) in a wireless broadband mode in a default case and setting the mobile terminal (201, 301) in a voice mode in a case that the mobile terminal (201, 301) is initiating a call, wherein transceiver means (225, 325) of the mobile terminal (201, 301) are connected to the second subscriber identity module (205, 305) in the wireless broadband mode and the transceiver means (225, 325) are connected to the first subscriber identity module (203, 303) in the voice mode.

10

5. Method of one of the preceding claims, further comprising:

setting the mobile terminal (201, 301) in a wireless broadband mode in a default case, setting the mobile terminal (201, 301) in a voice mode in a case that the mobile terminal (201, 301) is initiating a call and setting the mobile terminal (201, 301) back to the wireless broadband mode after the call is finished, wherein transceiver means (225, 325) of the mobile terminal (201, 301) are connected to the second subscriber identity module (205, 305) in the wireless broadband mode and the transceiver means (225, 325) are connected to the first subscriber identity module (203, 303) in the voice mode.

20

6. Method of one of the preceding claims, wherein the first communication network (213, 313) is a Universal Mobile Telecommunication System (UMTS) or a Long Term Evolution (LTE) network.

25 7. Method of one of the preceding claims, wherein the second communication network (217, 317) is a Long Term Evolution (LTE) network or a High Speed Packet Access network (HSPA).

8. Computer program comprising a program code for executing the method of one of the preceding claims when run on a computer.

9. Communication device (200, 300) for communicating data integrable in a mobile terminal (201, 301) having at least two subscriber identity modules, wherein a first subscriber identity module (203, 303) is configured to identify a subscriber with a first operator and a second subscriber identity module (205, 305) is configured to identify the subscriber with a second operator, the device comprising:

first receiving means (207, 307) for receiving the first subscriber identity module (203, 303),

second receiving means (209, 309) for receiving the second subscriber identity module (205, 305),

first communication means (211, 311) for communicating voice data towards a first communication network (213, 313) associated to the first operator by means of the first subscriber identity module (203, 303), and

second communication means (215, 315) for communicating data other than voice data towards a second communication network (217, 317) associated to the second operator by means of the second subscriber identity module (205, 305).

10. Communication device of claim 9, further comprising:

a dialing entity (219, 319) which is configured to provide a call towards the first communication network (213, 313) by means of the first subscriber identity module (203, 303),

an access entity (221, 321) which is configured to provide access to the second communication network (217, 317) by means of the second subscriber identity module (205, 305), and

- 5 a switching entity (225, 325) which is configured to connect either the first subscriber identity module (203, 303) or the second subscriber identity module (205, 305) to transceiver means (225, 325) of the mobile terminal (201, 301) dependent on status information provided by the dialing entity (219, 319) or the access entity (221, 321).

10

11. Communication device of claim 9 or 10, further comprising.

associating means (327) for associating the mobile terminal (201, 301) to a communication device, and

- 15 switching means (323) for connecting the second subscriber identity module (305) to transceiver means (325) of the mobile terminal (301), if an available connection to the associated communication device (329) is detected.

12. Communication device of one of claims 9 to 11, further comprising.

- 20 setting means (331) for setting the mobile terminal (301) in a wireless broadband mode in a default case and for setting the mobile terminal (301) in a voice mode in a case that the mobile terminal (301) is initiating a call, wherein transceiver means (325) of the mobile terminal (301) are connected to the second subscriber identity module (305) in the wireless broadband mode and the transceiver means (325) are connected to the first subscriber identity module (303) in the voice mode.

25

13. Communication device of one of claims 9 to 11, further comprising.

setting means (331) for setting the mobile terminal (301) in a wireless broadband mode in a default case, for setting the mobile terminal (301) in a voice mode in a case that the mobile terminal (301) is initiating a call and for setting the mobile

terminal (301) back to the wireless broadband mode after the call is finished,
wherein transceiver means (325) of the mobile terminal (301) are connected to the
second subscriber identity module (305) in the wireless broadband mode and the
transceiver means (325) are connected to the first subscriber identity module (303)
5 in the voice mode.

14. Mobile terminal (201, 301) comprising a device of one of claims 9 to 13 for
communicating data.

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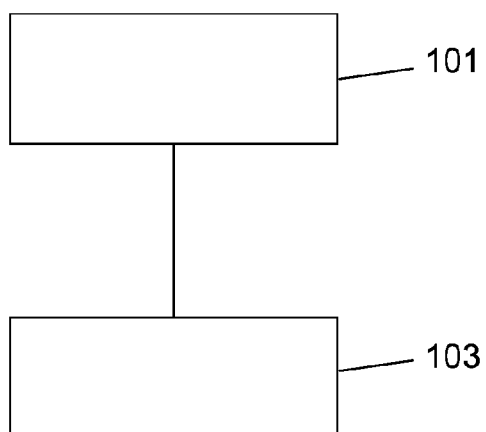


Fig. 1

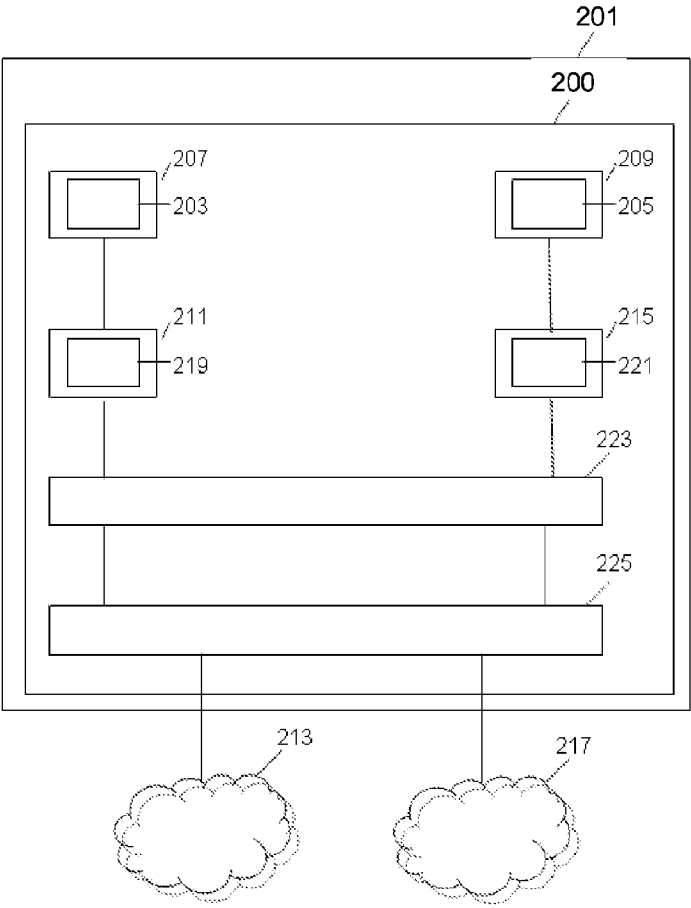


Fig. 2

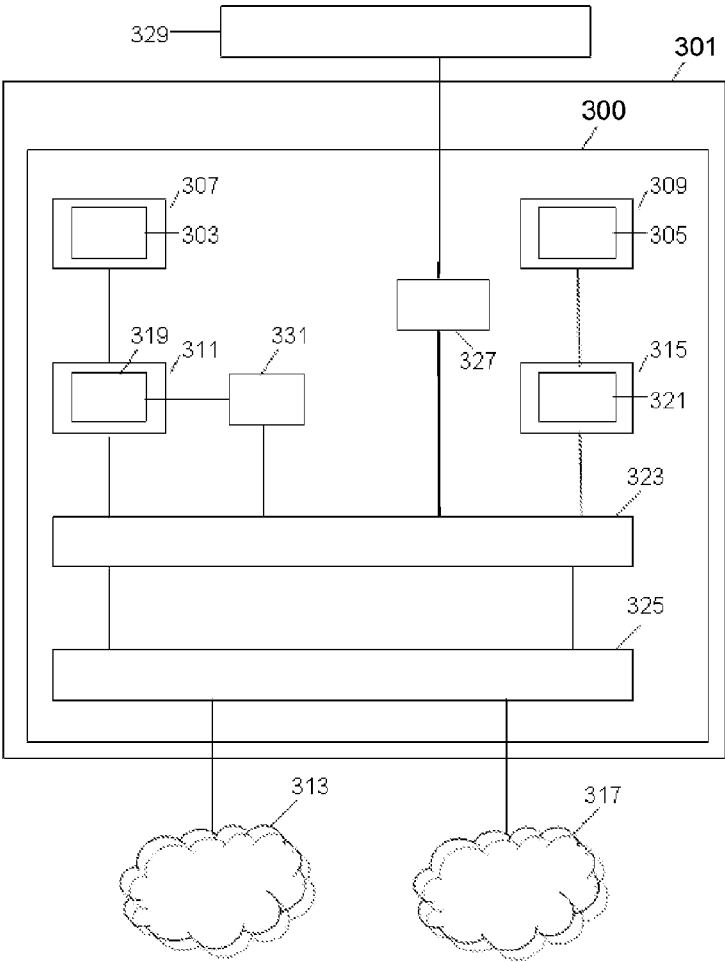


Fig. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2010/070882

A. CLASSIFICATION OF SUBJECT MATTER

H04W 88/06 (2009.01)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: H04W, H04Q, H04L

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)

CNKI, CPRSABS, WPI, EPODOC: dual mode, double mode, multi mode, multiple mode, SIM, subscriber identity module, operator?, voice, data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO2007033116A1 (LUCENT TECHNOLOGIES INC) 22 Mar. 2007 (22.03.2007) Page 1 lines 12-26, page 2 line 30 to page 3 line 3, page 4 line 13 to page 6 line 9, page 8 line 11 to page 9 line 23 of the description, claims 1-10, figures 1,4	1-14
X	WO2010022575A1 (ZTE CORP) 04 Mar. 2010 (04.03.2010) Page 1 lines 9-20, page 6 lines 1-16, page 10 line 9 to page 12 line 4 of the description, claims 1-10, figures 1,4,6	1-14
A	US2004266426A1 (LONGBORD INC) 30 Dec. 2004 (30.12.2004) The whole document	1-14
A	GB2381418A (SAMSUNG ELECTRONICS CO LTD) 30 Apr. 2003 (30.04.2003) The whole document	1-14

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
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"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	

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100088
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LV, Sihua
Telephone No. (86-10)62411386

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2010/070882

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