



- (51) International Patent Classification:  
*H04W 12/12* (2009.01) *H04M 3/22* (2006.01)
- (21) International Application Number:  
PCT/TR2016/000203
- (22) International Filing Date:  
23 December 2016 (23.12.2016)
- (25) Filing Language: Turkish
- (26) Publication Language: English
- (30) Priority Data:  
2015/16919 25 December 2015 (25.12.2015) TR
- (71) Applicant: **TURKCELL TEKNOLOJI ARASTIRMA VE GELISTIRME ANONIM SIRKETI** [TR/TR]; Yeni Mahalle Pamukkale Sokak No:11, Soganlik, Kartal/Istambul (TR).
- (72) Inventors: **DELIOGLU, Mehmet, Yalcin**; Yeni Mahalle Pamukkale Sokak No:11, Soganlik, Kartal/Istambul (TR).

**DEVA, Mert**; Tubitak Mam Teknoloji Serbest Bolgesi, Gebze, 41470 Gebze/Kocaeli (TR).

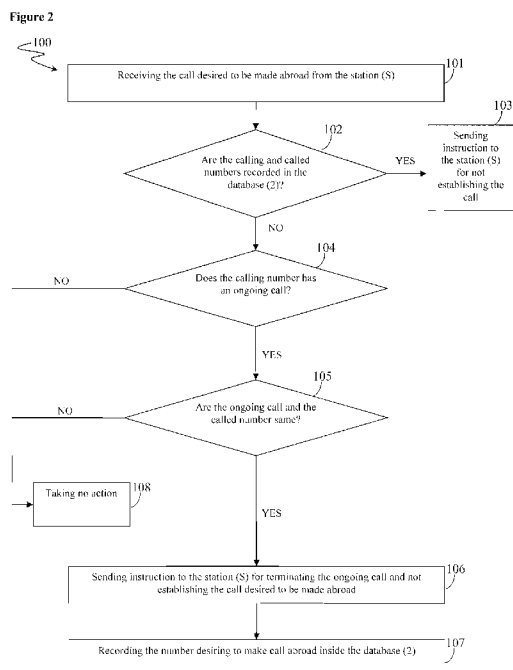
(74) Agent: **OZSOY, Zeliha**; Tritex Patent Trademark Consultancy Inc., Cankaya Mahallesi Mahmut Yesari Sokak No:8/5, Cankaya/Ankara (TR).

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

[Continued on next page]

(54) Title: A SYSTEM AND METHOD FOR PREVENTING INTERNATIONAL REVENUE SHARING FRAUD

(57) Abstract: The present invention relates to a system (1) and method (100) which enable to prevent mobile network operators from paying high fees by obstructing international revenue sharing fraud.





- (84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).
- Published:**
- *with international search report (Art. 21(3))*
  - *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

**DESCRIPTION**

**A SYSTEM AND METHOD FOR PREVENTING INTERNATIONAL  
REVENUE SHARING FRAUD**

5

**Technical Field**

The present invention relates to a system and method which enable to prevent mobile network operators from paying high fees by obstructing international revenue sharing fraud.

**Background of the Invention**

Today, international revenue sharing fraud (IRSF) –which causes network operators to make loss by being obliged to pay high prices due to swindlers– is generally realized in mobile telecommunication sector. International revenue sharing fraud is usually carried out in the form of multiple and long calls towards a single number. Mobile network operators pay high prices for the said calls which are realized in the form of calls made by international carriers and terminated by charging high prices.

International revenue sharing fraud can be defined as follows in the simplest term: The first condition for international revenue sharing fraud is to arrange subscribers from mobile network operators where the call will be initiated. The said can be obtained many different methods for example such as capturing SIM's, PBX systems, stolen lines. Then, the international premium rate number (IPRN) to be called is found out. The said international premium rate number can be obtained by means of international premium rate number providers who are located in a country different from the calling subscriber's country by using international carriers. After the subscribers wherein the call will be initiated and the international premium rate number to be called are obtained, long-held and

multiple calls are initiated towards the international premium rate number by using the subscribers who are included in the mobile network operator wherein the calls will be initiated. The fees obtained from the calls received over international carriers by the mobile network operator are shared with the international premium rate number committing fraud by revenue sharing and lastly, it is decided whether to make next calls or not by calculating the fees earned or lost in some cases.

The International patent document no. **WO2013030574**, an application in the state of the art, discloses a system for detecting forgery and fraud situations within a mobile communication network. The said system comprises components which are configured in order to observe pre-determined types of data within the data being carried over interfaces within mobile communication network. After the observation carried out by these components; many types of forgery/fraud such as gateway forgery/fraud, revenue sharing fraud, credit card fraud can be detected.

### **Summary of the Invention**

An objective of the present invention is to realize a system and method for preventing international revenue sharing fraud.

Another objective of the present invention is to realize a system and method which enable to prevent mobile network operators from paying high fees by obstructing international revenue sharing fraud.

### **Detailed Description of the Invention**

“A System and Method for Preventing International Revenue Sharing Fraud” realized to fulfill the objectives of the present invention is shown in the figures attached, in which:

**Figure 1** is a schematic view of the inventive system.

**Figure 2** is a flow chart of the inventive method.

The components illustrated in the figures are individually numbered, where the  
5 numbers refer to the following:

- 1. System
- 2. Database
- 3. Fraud prevention unit
- 10 100. Method
- S. Station

The inventive system (1) for preventing international revenue sharing fraud  
comprises:

- 15 at least one database (2) wherein the international premium rate numbers (IPRN) determined previously and used in international revenue sharing fraud are recorded; and
- at least one fraud prevention unit (3) which is in communication with the database (2) and the station (S) included within the mobile network operator; when it is desired to make call abroad by a mobile network operator subscriber, connects to the database (2) by receiving the said call  
20 from the station (S) and controls whether the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2) or not; if it reaches the information as a result of the control transaction that the number desiring  
25 to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2), sends instruction to the station (S) for not establishing the call; if it reaches the information as a result of the control transaction that the number desiring  
30 to make call abroad and the number where the call desired to be made abroad will be established are not recorded in the database (2), controls

whether the number desiring to make call abroad has an ongoing call or not by getting in contact with the station (S); if it determines as a result of the control transaction that the number desiring to make call abroad has no ongoing call, takes no action; if it determines as a result of the control transaction that the number desiring to make call abroad has an ongoing call, controls whether the ongoing call determined and the call desired to be made abroad are made to the same number or not; if it determines as a result of the control transaction that the ongoing call determined and the call desired to be made abroad are desired to be made to different numbers, takes no action; if it determines as a result of the control transaction that the ongoing call determined and the call desired to be made abroad are desired to be made to same numbers, sends instruction to the station (S) for terminating the ongoing call and not establishing the call desired to be made abroad; and records the said number inside the database (2) by connecting to the database (2).

The database (2) included in the inventive system (1) is in communication with the fraud prevention unit (3) and the international premium rate numbers determined previously and used in international revenue sharing fraud are recorded in thereof.

The fraud prevention unit (3) included in the inventive system (1) is in communication with the database (2) and the station (S) that is included within the mobile network operator and enables to establish the calls desired by subscribers by receiving the call establishment demands from the subscribers of the mobile network operator. The fraud prevention unit (3) receives the said call from the station (S) when a mobile network operator subscriber wants to make call abroad. In one preferred embodiment of the invention, the call is directed from the station (S) to the fraud prevention unit (3) over SS7 CAMEL messaging. The fraud prevention unit (3) connects to the database (2) after receiving the call directed from the station (S) and controls whether the number desiring to make call abroad

and the number where the call desired to be made abroad will be established are recorded in the database (2) or not. If the fraud prevention unit (3) reaches the information as a result of the control transaction that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2), the fraud prevention unit (3) sends instruction to the station (S) for not establishing the call. If the fraud prevention unit (3) reaches the information as a result of the control transaction that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are not recorded in the database (2), the fraud prevention unit (3) controls whether the number desiring to make call abroad has an ongoing call or not by getting in contact with the station (S). If the fraud prevention unit (3) determines as a result of the control transaction that the number desiring to make call abroad has no ongoing call, the fraud prevention unit (3) takes no action. If the fraud prevention unit (3) determines as a result of the control transaction that the number desiring to make call abroad has an ongoing call, the fraud prevention unit (3) controls whether the ongoing call determined and the call desired to be made abroad are made to the same number or not. If the fraud prevention unit (3) determines as a result of the control transaction that the ongoing call determined and the call desired to be made abroad are desired to be made to different numbers, the fraud prevention unit (3) takes no action. If the fraud prevention unit (3) determines as a result of the control transaction that the ongoing call determined and the call desired to be made abroad are desired to be made to same numbers, the fraud prevention unit (3) sends instruction to the station (S) for terminating the ongoing call and not establishing the call desired to be made abroad. The fraud prevention unit (3) also records the number desiring to make call abroad inside the database (2) by connecting to the database (2).

The inventive method (100) for preventing international revenue sharing fraud comprises steps of:

receiving the call desired to be made abroad from the station (S) (101);

controlling whether the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2) or not (102);

5 if it is determined as a result of the control transaction (102) that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2), sending instruction to the station (S) for not establishing the call (103);

10 if it is determined as a result of the control transaction (102) that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are not recorded in the database (2), controlling whether the number desiring to make call abroad has an ongoing call or not (104);

15 if it is determined as a result of the control transaction (104) that the number desiring to make call abroad has no ongoing call, taking no action (108);

if it is determined as a result of the control transaction (104) that the number desiring to make call abroad an ongoing call, controlling whether the ongoing call determined and the call desired to be made abroad are made to the same number or not (105);

20 if it is determined as a result of the control transaction (105) that the ongoing call determined and the call desired to be made abroad are desired to be made to different numbers, taking no action (108);

if it is determined as a result of the control transaction (105) that the ongoing call determined and the call desired to be made abroad are desired to be made to same numbers, sending instruction to the station (S) for terminating the ongoing call and not establishing the call desired to be made abroad (106); and

25 recording the number desiring to make call abroad inside the database (2) by connecting to the database (2).

30

In the method (100) for preventing international revenue sharing fraud, the fraud prevention unit (3) receives the said call from the station (S) when a mobile network operator subscriber wants to make call abroad (101). In one preferred embodiment of the invention, the call is directed from the station (S) to the fraud prevention unit (3) over SS7 CAMEL messaging. After the fraud prevention unit (3) receives the call directed from the station (S) (101), it connects to the database (2) and controls whether the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2) or not (102). If the fraud prevention unit (3) reaches the information as a result of the control transaction (102) that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2), the fraud prevention unit (3) sends instruction to the station (S) for not establishing the call (103). If the fraud prevention unit (3) reaches the information as a result of the control transaction (102) that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are not recorded in the database (2), the fraud prevention unit (3) controls whether the number desiring to make call abroad has an ongoing call or not by getting in contact with the station (S) (104). If the fraud prevention unit (3) determines as a result of the control transaction (104) that the number desiring to make call abroad has no ongoing call, the fraud prevention unit (3) takes no action (108). If the fraud prevention unit (3) determines as a result of the control transaction (104) that the number desiring to make call abroad has an ongoing call, the fraud prevention unit (3) controls whether the ongoing call determined and the call desired to be made abroad are made to the same number or not (105). If the fraud prevention unit (3) determines as a result of the control transaction (105) that the ongoing call determined and the call desired to be made abroad are desired to be made to different numbers, the fraud prevention unit (3) takes no action (108). If the fraud prevention unit (3) determines as a result of the control transaction (105) that the ongoing call determined and the call desired to be made abroad are desired to be made to same numbers, the fraud prevention unit (3) sends instruction to the station (S) for

terminating the ongoing call and not establishing the call desired to be made abroad (106). The fraud prevention unit (3) also records the number desiring to make call abroad inside the database (2) by connecting to the database (2) (107).

- 5 Within these basic concepts; it is possible to develop a wide range of embodiments of the inventive “System (1) and Method (100) for Preventing International Revenue Sharing Fraud, the invention cannot be limited to examples disclosed herein and it is essentially according to claims.

## CLAIMS

1. A system (1) for preventing international revenue sharing fraud;

**comprising:**

5 at least one database (2) wherein the international premium rate numbers (IPRN) determined previously and used in international revenue sharing fraud are recorded;

**and characterized by**

10 at least one fraud prevention unit (3) which is in communication with the database (2) and the station (S) included within the mobile network operator; when it is desired to make call abroad by a mobile network operator subscriber, connects to the database (2) by receiving the said call from the station (S) and controls whether the number desiring to make call abroad and the number where the call desired to be made abroad will be  
15 established are recorded in the database (2) or not; if it reaches the information as a result of the control transaction that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2), sends instruction to the station (S) for not establishing the call; if it reaches the  
20 information as a result of the control transaction that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are not recorded in the database (2), controls whether the number desiring to make call abroad has an ongoing call or not by getting in contact with the station (S); if it determines as a result of  
25 the control transaction that the number desiring to make call abroad has no ongoing call, takes no action; if it determines as a result of the control transaction that the number desiring to make call abroad has an ongoing call, controls whether the ongoing call determined and the call desired to be made abroad are made to the same number or not; if it determines as a  
30 result of the control transaction that the ongoing call determined and the call desired to be made abroad are desired to be made to different numbers,

takes no action; if it determines as a result of the control transaction that the ongoing call determined and the call desired to be made abroad are desired to be made to same numbers, sends instruction to the station (S) for terminating the ongoing call and not establishing the call desired to be made abroad; and records the said number inside the database (2) by connecting to the database (2).

2. A system (1) according to Claim 1, **characterized by** the database (2) which is in communication with the fraud prevention unit (3) and wherein the international premium rate numbers determined previously and used in international revenue sharing fraud are recorded.
3. A system (1) according to Claim 1 or 2, **characterized by** the fraud prevention unit (3) which is in communication with the database (2) and the station (S) that is included within the mobile network operator and enables to establish the calls desired by subscribers by receiving the call establishment demands from the subscribers of the mobile network operator.
4. A system (1) according to any of the preceding claims, **characterized by** the fraud prevention unit (3) which receives the said call from the station (S) when a mobile network operator subscriber wants to make call abroad.
5. A system (1) according to Claim 4, **characterized by** the fraud prevention unit (3) which receives the call desired to be made abroad from the station (S) over SS7 CAMEL messaging.
6. A system (1) according to Claim 4 or 5, **characterized by** the fraud prevention unit (3) which connects to the database (2) after receiving the call from the station (S).

7. A system (1) according to Claim 6, **characterized by** the fraud prevention unit (3) which controls whether the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2) or not.
- 5
8. A system (1) according to Claim 7, **characterized by** the fraud prevention unit (3) which sends instruction to the station (S) for not establishing the call if it reaches the information as a result of the control transaction that the number desiring to make call abroad and the number where the call  
10 desired to be made abroad will be established are recorded in the database (2).
9. A system (1) according to Claim 7, **characterized by** the fraud prevention unit (3) which controls whether the number desiring to make call abroad  
15 has an ongoing call or not by getting in contact with the station (S) if it reaches the information as a result of the control transaction that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are not recorded in the database (2).
- 20
10. A system (1) according to Claim 9, **characterized by** the fraud prevention unit (3) which takes no action if it determines as a result of the control transaction that the number desiring to make call abroad has no ongoing call.
- 25
11. A system (1) according to Claim 9, **characterized by** the fraud prevention unit (3) which controls whether the ongoing call determined and the call desired to be made abroad are made to the same number or not if it determines as a result of the control transaction that the number desiring to  
30 make call abroad has an ongoing call.

12. A system (1) according to Claim 11, **characterized by** the fraud prevention unit (3) which takes no action if it determines as a result of the control transaction that the ongoing call determined and the call desired to be made abroad are desired to be made to different numbers.

5

13. A system (1) according to Claim 11, **characterized by** the fraud prevention unit (3) which sends instruction to the station (S) for terminating the ongoing call and not establishing the call desired to be made abroad if it determines as a result of the control transaction that the ongoing call determined and the call desired to be made abroad are desired to be made to same numbers.

10

14. A system (1) according to Claim 13, **characterized by** the fraud prevention unit (3) which records the number desiring to make call abroad inside the database (2) by connecting to the database (2).

15

15. A method (100) for preventing international revenue sharing fraud; **characterized by** steps of:

receiving the call desired to be made abroad from the station (S) (101);

20

controlling whether the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2) or not (102);

if it is determined as a result of the control transaction (102) that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are recorded in the database (2), sending instruction to the station (S) for not establishing the call (103);

25

if it is determined as a result of the control transaction (102) that the number desiring to make call abroad and the number where the call desired to be made abroad will be established are not recorded in the database (2),

30

controlling whether the number desiring to make call abroad has an ongoing call or not (104);

if it is determined as a result of the control transaction (104) that the number desiring to make call abroad has no ongoing call, taking no action (108);

5 if it is determined as a result of the control transaction (104) that the number desiring to make call abroad an ongoing call, controlling whether the ongoing call determined and the call desired to be made abroad are made to the same number or not (105);

10 if it is determined as a result of the control transaction (105) that the ongoing call determined and the call desired to be made abroad are desired to be made to different numbers, taking no action (108);

15 if it is determined as a result of the control transaction (105) that the ongoing call determined and the call desired to be made abroad are desired to be made to same numbers, sending instruction to the station (S) for terminating the ongoing call and not establishing the call desired to be made abroad (106); and

recording the number desiring to make call abroad inside the database (2) by connecting to the database (2).

Figure 1

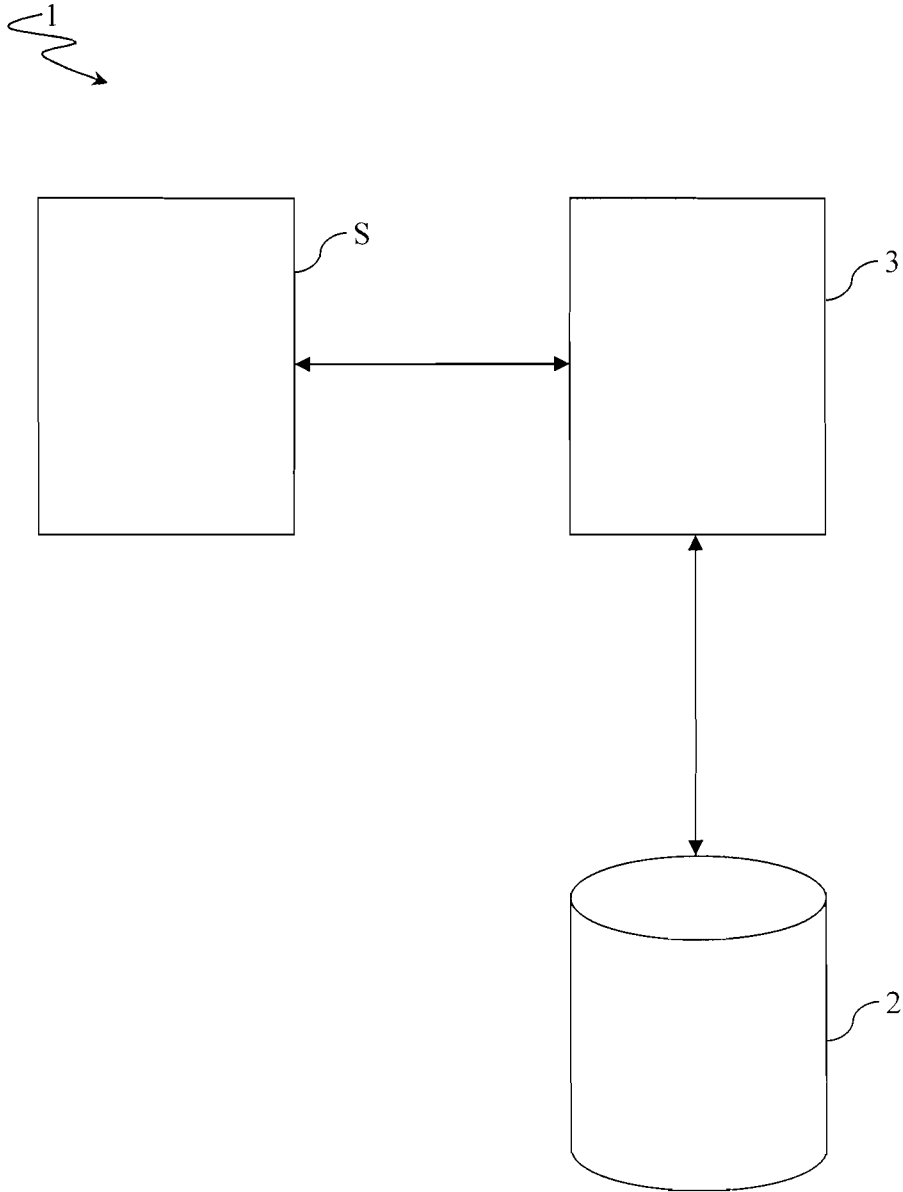
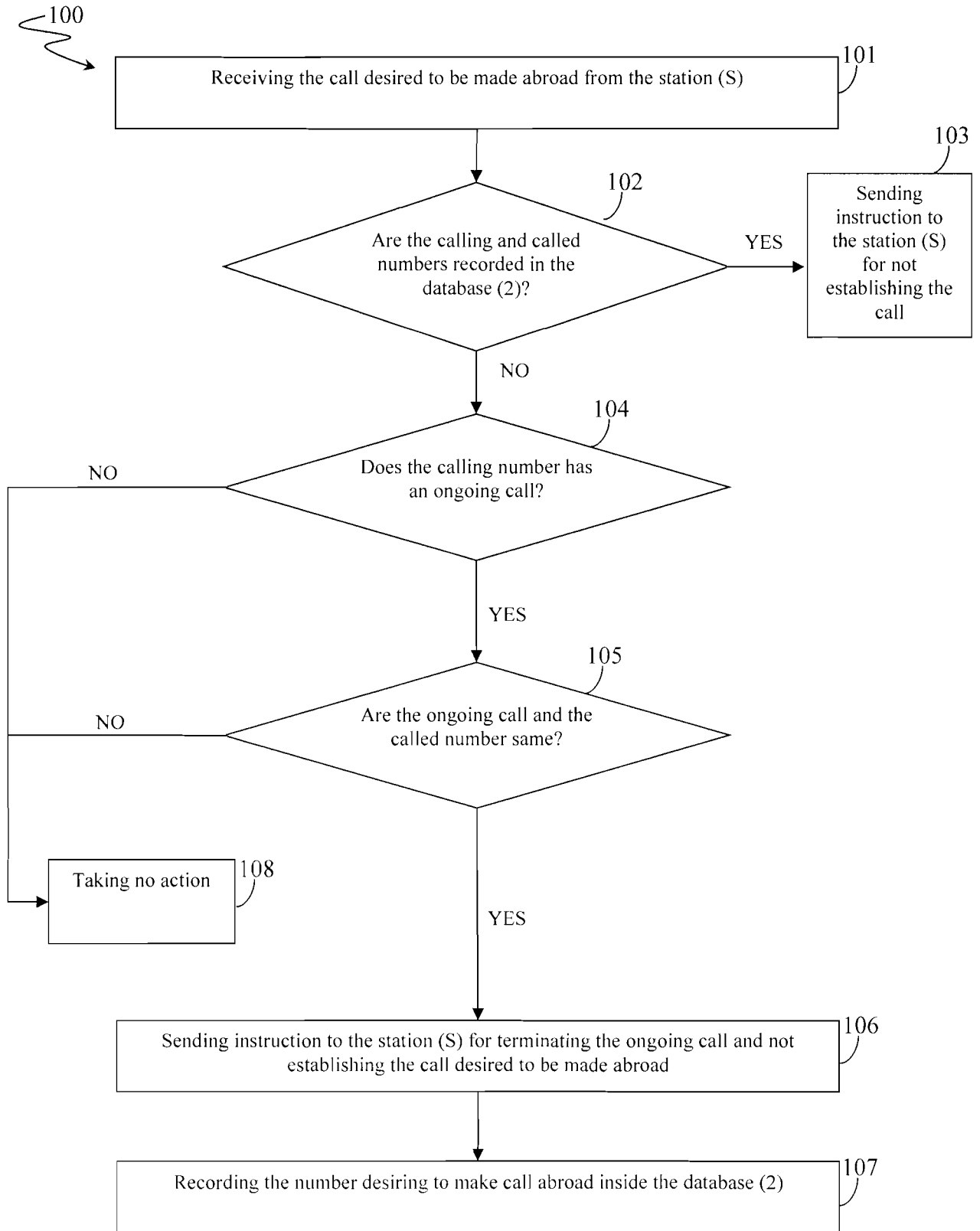


Figure 2



**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/TR2016/000203

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. H04W12/12 H04M3/22  
 ADD.  
 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)  
 H04W 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)  
 EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2015/039016 A1 (NETWORK KINETIX LLC [US]) 19 March 2015 (2015-03-19) paragraph [0084] - paragraph [0097] -----	1-15

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  
 19 May 2017

Date of mailing of the international search report  
 31/05/2017

Name and mailing address of the ISA/  
 European Patent Office, P.B. 5818 Patentlaan 2  
 NL - 2280 HV Rijswijk  
 Tel. (+31-70) 340-2040,  
 Fax: (+31-70) 340-3016

Authorized officer  
 Lamelas Polo, Yvan

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/TR2016/000203

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015039016	A1	19-03-2015	US 8966074 B1 24-02-2015
			US 2015156098 A1 04-06-2015
			US 2016094429 A1 31-03-2016
			US 2016299776 A1 13-10-2016
			US 2017054854 A1 23-02-2017
			WO 2015039016 A1 19-03-2015
-----			