

FORM 1

THE PATENTS ACT, 1970
(39 of 1970)

&

THE PATENTS RULES, 2003

APPLICATION FOR GRANT OF PATENT

[See sections 7,54 & 135 and rule 20(1)]

(FOR OFFICE USE ONLY)

Application No.:.....
 Filing Date:.....
 Amount of Fee Paid:.....
 CBR No.:.....
 Signature:.....

6. PARTICULARS FOR FILING PATENT COOPERATION TREATY (PCT) NATIONAL PHASE APPLICATION

International Application Number	International Filing Date as Allotted by the Receiving Office
PCT/IB2017/056589	24/10/2017

10. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION:

 I/We hereby declare that to the best of my/our knowledge, information and belief the fact and matters stated hering are correct and I/We request that a patent may be granted to me/us for the said invention.

DATED THIS **16 DAY OF May 2020**

Signature:.....
 Name: MALHOTRA RAJAT

To The Controller of Patents
 The Patent office at DEL

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FORM 2
THE PATENTS ACT 1970
(39 of 1970)
&
THE PATENTS RULES, 2003
COMPLETE SPECIFICATION
(See section 10 and rule 13)

1. TITLE OF THE INVENTION
ANNOUNCED ROAMING LOCATION (AROL) SERVICE

2. APPLICANT

- (i) NAME : JAMOUSSE, Mohamed
(ii) NATIONALITY : TN
(iii) ADDRESS : 3 Koulifa Rachidites Tunis, 1004 (TN)

2. PREAMBLE TO THE DESCRIPTION

COMPLETE

The following specification particularly describes the invention and the manner in which it is to be performed.

1 DEFINITIONS & ACRONYMS

1. **ARoL service** – Announced Roaming Location service
2. **ARoL subscriber** – A customer subscribed to the ARoL service. Of course, as an ARoL subscriber, he/she is assumed to have the IMR service with his/her Telco Operator (See Definition 12 for IMR service).
3. **BSC** – Base Station Controller, which controls a given number of BTSs (towers) (See Definition 4 for BTS).
4. **BTS** – Base Transceiver Station, which is the tower radiating the signal to the mobile.
5. **Callee** – The person being called (or intended to be called).
6. **Caller** – The person who is calling (or attempting to call). In this document, he can be:
 - a. calling locally (On-Net or Off-Net) or internationally, using a mobile network or a landline network.
 - b. a customer of the same operator as the callee, or not.
 - c. an ARoL subscriber, or not.
7. **GMSC** – Gateway MSC (See Definition 14 for MSC).
8. **GMSC_{HMNO}** – GMSC of the HMNO (See Definition 9 for HMNO)
9. **HMNO** – Home Mobile Network Operator, hosting the ARoL subscriber.
10. **HLR** – Home Location Register, storing the details of the all the subscribers permanently.
11. **HLR_{HMNO}** – HLR of the HMNO
12. **IMR service** – International Mobile Roaming service, granting a subscriber an automatic access to the visited operator (in in the visited country) when arriving; and, then, seamlessly using his mobile phone/device (voice calls, text messages, Internet ...).
13. **IMSI** – International Mobile Subscriber Identity (identity of the SIM card). It identifies the mobile station, its home wireless network, and its home country.
14. **MSC** – Mobile Switching Center, controlling a given number of BSCs and responsible for switching calls to called subscribers.

15. **MSISDN** – Mobile Station International Subscriber Directory Number. It is the number used for routing the call to the subscriber (dialed number to connect to a mobile phone).
16. **MSISDN_{ARoL}** – MSISDN of the ARoL subscriber
- 5 17. **MSRN** – Mobile Station Roaming Number. It is allocated by the VLR (from a list of numbers it holds) in order to route the call from the mobile phone to the MSC (via the BTS/BSC) (See Definition 21 for VLR).
18. **NITZ** – Network Identity and time Zone.
19. **SIM** – Subscriber Identity Module.
- 10 20. **Telco Operator** – It can be a Mobile Operator, a Landline Operator, or both.
21. **VLR** – Visitor Location Register, storing the details of the all the visiting subscribers temporarily, as long as they are “active” in the particular area it covers.
- 15 22. **VLR_{HMNO}** – VLR of the HMNO

2 ARoL SERVICE DESCRIPTION

ARoL service is a telecom mobile service. Its main objective is to permit to its subscriber a better management of his received calls when travelling abroad. The ARoL service main idea is to inform a caller – calling an ARoL subscriber – that
5 the called number is roaming abroad, the country (NOT THE CITY) where he is roaming and the local time there, in order to decide either to continue with the call or to call at a more convenient time. Of course, if more than one time zone apply to that country, the local time announced is of the city where the ARoL subscriber is when receiving the call.

10

The ARoL service has two levels:

- **Basic ARoL (Level 1)** – addressed to a caller – calling an ARoL subscriber – **who is NOT a customer of the HMNO**. The caller is a customer of another
15 Telco Operator – either within the same country or in another country.
- **Advanced ARoL (Level 2)** – addressed to a caller – calling an ARoL subscriber – **who is a customer of the HMNO**. In other words, the caller and the ARoL subscriber (the callee) are customers of the same Mobile Operator.

20

For the determination of the location and the local time, the NITZ feature can be used and the information forwarded to the mobile phone can be shared between the VLR to which the ARoL subscriber is attached (in the visited country where roaming) and the HLR of the HMNO.

25

It is important to note that the ARoL service is NOT an IMR service, requiring international agreements between operators. It is a local service that an operator is offering to its customers. Also, it is important to note that this service is **OPTIONAL** in roaming situations. As a matter of fact, while one of the main
30 features of mobile communication is to hide the location of the called number from the calling number, through the MSRN concept, the location release of the called person remains the choice of this latter – as an ARoL subscriber.

2.1 BASIC ARO L (LEVEL 1)

With this service level (Level 1), when calling an ARoL subscriber, travelling and roaming in another country, the caller is informed via a recorded voice message:

- In which country the “callee” is; and the local time there.
- 5 - Then, if the caller would like to continue with this initiated call or to hung up.

This recorded voice message is expected to be in two languages: English and the country official language. Of course, if the callee is switched off or out of coverage (not connected to any network), the caller will listen to the common and familiar recorded voice message, stating that the dialed number is currently unreachable. Of course, it is assumed that a roaming agreement is established between the HMNO and the network the ARoL subscriber is connected to (in the visited country). The following examples (Examples 1, 2 & 3) sketch how Basic ARoL works.

15

Example 1:

An ARoL subscriber, with a mobile line from STC (a Telco Operator in Saudi Arabia) is in a business trip in Chicago (USA) in February. He is being called from Riyadh (Saudi Arabia) at 1:25pm Saudi time (UTC + 03:00) by a caller with a mobile line from Mobily (a second Telco Operator in Saudi Arabia). When dialing the number, and after the setup of the related call signaling, the caller (in Riyadh) will listen to the following recorded voice message in both languages: English and Arabic.



**The number you are dialing is roaming in The United States
where the local time there is 04:25 am
To continue with this call, press (1). If not, just hung up**

الولايات المتحدة الأمريكية

04:25 صباحا

الرقم الذي طلبته في حالة تجوال بـ

أين التوقيت المحلي هناك هو

لموصلة هذه المكالمة، اضغط (1). أو أقفل الخط

Then, it is up to the caller to decide about the importance of the call, by either:

- Pressing (1) to continue, and the callee will hear his mobile phone ringing,
- Or, just hanging up and calling another time.

Notes:

- If the callee is busy with another call (and call waiting is not being used), the Visited MSC routes the call to a pre-determined Call Forward Busy (CFB) number. It may be set by default to the callee voice mail.
- If the callee does not answer, the Visited MSC routes the call to a pre-determined Call Forward No Reply (CFNRy) number. It may be set by default to the callee voice mail.
- If the caller does nothing or presses another digit, the call will be rejected (ended).
- When hanging up, or the call rejected, an SMS is forwarded to the called ARoL subscriber (the callee), informing him about an attempted call from “the caller number” at “the caller local time”.

Example 2:

An ARoL subscriber, with a mobile line from Saudi Telecom (STC), is in a business trip in Washington DC (USA) in February. He is receiving a landline/mobile call from London (UK) at 10:25am GMT (corresponding to 1:35pm Saudi Time). When dialing the number, and after the setup of the related call signaling, the caller (in London) will listen to the following recorded voice message in both languages: English and Arabic.



**The number you are dialing is roaming in The United States
where the local time there is 05:25 am
To continue with this call, press (1). If not, just hung up**

الولايات المتحدة الأمريكية

05:25 صباحا

الرقم الذي طلبته في حالة تجوال بـ

أين التوقيت المحلي هناك هو

لموصلة هذه المكالمة، اضغط (1). أو أقفل الخط

Then, it is up to the caller to decide about the importance of the call, by either:

- Pressing (1) to continue, and the callee will hear his mobile phone ringing,
- Or, just hanging up and calling another time.

Notes:

[Same notes as for Example 1]

Example 3:

An ARoL subscriber, with a mobile line from Saudi Telecom (STC), is in a business trip in Washington DC (USA). His mobile phone is switched off when receiving a landline/mobile call from London at 10:25am GMT (corresponding to 1:35pm Saudi Time). When dialing the number, and after the setup of the related call signaling, the caller (in London) will listen to the following recorded voice message in both languages, English and Arabic:



The number you are calling is off; please call again later.

إنَّ الرقم المطلوب مغلق، الرجاء الاتصال في وقت لاحق

Then, an SMS is forwarded to the called ARoL subscriber (the callee) informing him about an attempted call from “the caller number” at “the caller local time” once his mobile is switched on and attached to a visited mobile network.

Note:

- If the ARoL subscriber is either out of coverage, or his battery has gone flat/removed, the caller will listen to the above recorded voice message, in both languages: English and Arabic; and an SMS is forwarded to the called ARoL subscriber (the callee), informing him about an attempted call from “the caller number” at “the caller local time”.

2.2 ADVANCED AROL (LEVEL 2)

With this service level (Level 2), when the caller is calling an AROl subscriber, travelling and roaming in another country, the caller is informed in which country the “callee” is and the local time there. Then, the caller has the following choices:

- 5
- To continue with this initiated call normally.
 - Or, to continue with this initiated call and assuming roaming charges.
 - Or, to hung up.

10 The caller will be informed through a recorded voice message, which is expected to be in two languages: English and the country official language. The following example (Example 4) sketches how Advanced AROl works.

Example 4:

An AROl subscriber, with a mobile line from Saudi Telecom (STC), is in a business trip in Washington DC (USA) in February. He is receiving a landline/mobile call from another Saudi Telecom (STC) customer at 1:35 pm Saudi Time. When dialing the number, and after the setup of the related call signaling, the caller will listen to the following recorded voice message in both languages, English and Arabic:



**The number you are dialing is roaming in The United States
where the local time there is 05:25 am**

- To continue with this call normally, press (1)
- To continue with this call and assume roaming charges, press (2)
- Or, just hung up

الولايات المتحدة الأمريكية

05:25 صباحا

الرقم الذي طلبته في حالة تجوال بـ

أين التوقيت المحلي هناك هو

- لموصلة هذه المكالمة عاديًا، اضغط (1)
- لموصلة هذه المكالمة مع تحمّل تكاليف التجوال، اضغط (2)
- أو أقفل الخط

Then, it is up to the caller to decide about the importance of the call, by:

- Pressing (1) to continue, and the callee will hear his mobile phone ringing,
- Or, pressing (2) to continue and assuming roaming charges, and the called ARoL subscriber will hear his mobile phone ringing, **but he is advised that he is receiving a free call (Section 4)**.
- Or, just hanging up and calling another time.

Notes:

[Same notes as for Example 1]

3 ARoL SERVICE SUBSCRIPTIONS

The Telco Operator – providing the ARoL service – may offer two types of subscription to its customers willing to subscribe to this service:

- 5 ▪ **Basic ARoL Subscription** – Where there is NO distinction between callers –
 either customers of the HMNO or NOT. In other words, the option of
 assuming roaming charges is NOT offered to the caller. He is only informed
 about the roaming location of the callee and the local time of the city where he
 is; and accordingly, he makes the choice to keep with his call or to call another
10 time (as sketched in Examples 1 & 2).
- **Advanced ARoL Subscription** – Where there is distinction between callers –
 if they are customers of the HMNO or NOT. In other words:
- If the caller is a customer of the HMNO, after being informed about the
15 roaming location of the callee and the local time of the city where he is; the
 caller will be offered the option of assuming roaming charges (as sketched
 in Example 4).
- If the caller is NOT a customer of the HMNO, he is only informed about the
20 roaming location of the callee and the local time of the city where he is; and
 accordingly, the caller makes the choice to keep with his call or to call
 another time.

25

4 ARoL SUBSCRIBER CONTACTS UPDATE

Based on the type of subscription, a new **Advanced ARoL** subscriber is expected to duplicate and update his contacts (who are, basically, customers of the HMNO) in order to detect free roaming-charges calls, when traveling abroad.

5

The expected type of update is based on the “2-digit” extension that the Telco Operator will attach the caller MSISDN, and which will be forward it to the callee mobile phone. Note that this “2-digit” extension is communicated by the HMNO to its new Advanced ARoL Subscriber. The following example (Example 5) sketches how a new Advanced ARoL subscriber will duplicate and update one of his existing contacts, based on the “2-digit” extension provided by his HMNO.

10

Example 5:

An ARoL subscriber, with a mobile line from line from Saudi Telecom (STC) wants to duplicate the contact of “**Mohamed Jamoussi**” stored on his mobile phone, based on the “2-digit” extension provided to him by Saudi Telecom and which is “**99**” (as an example). This contact will be duplicated and updated as shown on “FIG. 1”.

When roaming abroad and receiving a call from “**Mohamed Jamoussi**” who has chosen to make a normal call by pressing (1), the mobile phone of the callee will display what is shown on “FIG. 2”; and the callee will assumed the roaming charges of this accepted call.

Now, if the caller “**Mohamed Jamoussi**” has chosen to assume the roaming charges for this call by pressing (2), the mobile phone of the callee will display what is shown on “FIG. 3”, and the callee is advised that the caller will assume the roaming charges of this accepted call.

15

5 ARoL SERVER

Though details may differ from one mobile network to another, but the overall architecture and key components are almost the same. For this ARoL service, an ARoL server connected to the HLR of the HMNO (or embedded) will be deployed for the voice messages related to different mobile networks that an ARoL subscriber could roam in across the world and which have roaming agreements with the HMNO (see "FIG. 4").

10

6 ARO L SERVICE PROCESS

When an ARoL subscriber is roaming internationally and is receiving a call, the ARoL service process is almost similar to the known roaming process. It basically involves:

- 5 • The GMSC & HLR of the HMNO, and
- The MSC & VLR of the visited network in the visited country.

6.1 ARO L SUBSCRIBER LOCATION IDENTIFICATION

10 The first step of the ARoL service process is typically the identification mechanism of any roaming process. This step determines the location of a mobile phone connected to a visited Mobile Network and at an idle state (no active traffic).

15 When an ARoL subscriber, travelling abroad, switches “ON” his mobile phone (*or transferred via a handover, which is the process in which a call/data session is transferred from one BTS to another without disconnection*), the Visited Mobile Network – detecting this new device – will notice that it is not registered with its own system, and will identify its HMNO. Then, both networks (Visited and Home) will exchange roaming information about this mobile phone using the IMSI number and the IMSI
20 attached procedure is executed. Of course, it is assumed that there is a roaming agreement between the two networks. If not, the mobile phone will be denied by the Visited Mobile Network.

25 If the Visited Mobile Network finds out that this mobile phone is allowed to roam, then it begins to maintain a temporary subscriber record for this device. The mobile phone is said to be attached. The HLR of the HMNO passes the information to the VLR in the Visited Network and updates its location information for this ARoL subscriber, so that any information sent to that device can be correctly routed. The HLR_{HMNO} instructs the old VLR to delete the information it
30 has on this ARoL subscriber.

6.2 ARO L SERVICE KEY STEPS

When a caller dials the mobile phone number of an ARoL subscriber roaming abroad, the ARoL service key steps are the following:

- 5 1. The caller dials the ARoL subscriber mobile phone number ($MSISDN_{ARoL}$)
2. The $MSISDN_{ARoL}$ is forwarded to the HLR_{HMNO} via the $GMSC_{HMNO}$ (see “FIG. 5”). And because of previous updates, the HLR_{HMNO} already knows which VLR – in the world – is serving the called ARoL subscriber.
- 10 3. The HLR_{HMNO} will:
 - a. identify if the caller is a subscriber of the HMNO (as the callee). If so, it could be either serviced by a VLR_{HMNO} or an external VLR to the HMNO (i.e. the caller is also roaming domestically or internationally)
 - 15 b. identify which ARoL level, the callee is subscribed to (*Basic* or *Advanced*).
 - c. instruct the ARoL server to deliver the corresponding message to the caller via the $GMSC_{HMNO}$, based on the information collected in steps/sub-steps (2), (3.a) and (3.b).
- 20 4. The ARoL server will deliver the appropriate message to the caller via the $GMSC_{HMNO}$.
5. The caller will make his choice, based on the options announced in the voice message.
- 25 6. **If the caller just hangs up, or press an unexpected digit, or does nothing**, the call is ended and an SMS is forwarded to the called ARoL subscriber (the callee), informing him about an attempted call from “the caller number” at “the caller local time”.
- 30 7. **If the caller presses (1) – as an offered option**, regardless of the information collected in sub-steps (3.a) and (3.b), the standard roaming process will take place to carry on with this initiated call. The VLR servicing the called ARoL subscriber will assign an MSRN (a temporary number). This MSRN number will be sent back to the HLR_{HMNO} , so that the $GMSC_{HMNO}$ knows how to route the call to reach the ARoL subscriber. Note
- 35

that, broadly speaking, the GMSC_{HMNO} will attach the MSISDN of the caller to the provided MSRN, so that the ARoL subscriber identifies who is calling.

From a billing standpoint, termination billing procedure and rate are applied, as per the agreement between the HMNO and the caller Telco Operator.

Notes:

- For the called ARoL subscriber:
 - If he is a **postpaid** subscriber, once the call is ended, the billing is made.
 - If he is a **prepaid** subscriber, a check is made to see if he has enough credit to receive this call. If so, the call is continually monitored and the appropriate amount is decremented from his account. When the credit reaches zero, the call is cut off.
- For the caller (either a subscriber of the HMNO or NOT):
 - If he is a **postpaid** subscriber, once the call is ended, the billing is made.
 - If he is a **prepaid** subscriber, a check is made to see if he has enough credit to make this call. If so, the call is continually monitored and the appropriate amount is decremented from his account. When the credit reaches zero, the call is cut off.

8. If the caller presses (2) – as an offered option, and based on the information collected in steps/sub-steps (2), (3.a) and (3.b), the standard roaming process will take place to carry on with this initiated call. The VLR servicing the called ARoL subscriber will assign an MSRN (a temporary number). This MSRN number will be sent back to the HLR_{HMNO}, so that the GMSC_{HMNO} knows how to route the call to reach the ARoL subscriber.

At this stage, the GMSC_{HMNO} will NOT attach the original MSISDN of the caller to the provided MSRN. Instead, the GMSC_{HMNO} will attach the extended MSISDN of the caller, which is a combination of the original MSISDN and a “2-digit” extension (as explained in Section 4). Therefore, as per Example 5 and updated contacts, the called ARoL subscriber will identify that he is receiving a free of charge call (as displayed on his mobile phone screen).

Notes:

- For the called ARoL subscriber, he is receiving the call for free – as if he is receiving it in his home country.
- 5 • For the caller (who is a subscriber of the HMNO), he will assume the charges of both:
 - The call made to the ARoL subscriber, as if he is in his home country.
 - The call received by the ARoL subscriber in the country where he is.

On another hand, depending on the caller type of subscription:

- 10 - If he is a **postpaid** subscriber, once the call is ended, the billing is made.
- If he is a **prepaid** subscriber, a check is made to see if he has enough credit to make this call. If so, the call is continually monitored and the appropriate amount is decremented from his account. When the credit reaches zero, the call is cut off.

15

6.3 ARoL SUBSCRIBER OFF

When the ARoL subscriber mobile phone is powered off, it sends an IMSI detach message to the network. The VLR marks that mobile phone as detached and
20 informs the HLR_{HMNO} (via the GMSC_{HMNO}) that it is about to remove this subscriber record from its register (VLR register). The HLR_{HMNO} then treats this ARoL subscriber as unreachable. Therefore, any caller dialing this ARoL subscriber number will be treated as sketched in Example 3.

25 Also, if the mobile phone is out of the area of coverage, it will miss sending a registration message to the network at the predefined intervals. Accordingly, the network will mark it as detached; and any caller dialing this mobile number will be treated as sketched in Example 3.

30

7 ARO L SERVICE BUSINESS ASPECTS

7.1 DRIVERS & TARGETED SEGMENTS

5 The ARoL service can be offered to all business and residential, postpaid and prepaid customers. By offering this service, a Mobile Operator will aim to:

- Offer a service that attracts frequent travelers, interested by substantially reducing their international communications spending, and limiting inconvenient incoming calls.
- 10 ▪ Offer a service that conveys a message on behalf of the “callee” when feeling embarrassed to do it himself (e.g. advising the caller that he is internationally roaming in order to make this call as short as possible, or the time is inconvenient)
- Offer a service that conveys a message expressing some show-off desires for certain categories of customers
- 15 ▪ Match “**Early Services/Technologies**” adopters’ expectations – constantly searching for new services/technologies.
- Increase customers’ retention and loyalty
- Generate new revenues and increase ARPU

20

7.2 POLICIES & PRICING

Basically, the overall ARoL service policies & pricing are established by the Mobile Operator, providing this service. Nevertheless, it is expected that:

- **Service Activation/Cancellation** – at no fees
- 25 ▪ **Service Charges** – through monthly/weekly subscriptions, or based on usage

As it can be a free service for retention purposes or bundled with other services. It is the Operator Marketing authority which decides on the service charging rules.

30

8 ARoL DRAWINGS – DESCRIPTIONS

FIG. 1 – CONTACT DUPLICATION & UPDATE

Figure 1 shows how contacts are duplicated by adding the “2-digit” extension provided the Telco Operator. The “2-digit” extension is manually added to the MSISDN of the contact to be updated.

FIG. 2 – REGULAR DISPLAY – WHEN PRESSING (1)

Figure 2 shows the regular display on the called ARoL subscriber handset, as the caller chose to make a regular call by pressing (1). The called ARoL subscriber is receiving a call as if he is in his home country – but assuming the international roaming cost.

FIG. 3 – MODIFIED DISPLAY – WHEN PRESSING (2)

Figure 3 shows the modified display on the called ARoL subscriber handset, as the caller chose to assume all the call costs by pressing (2). Therefore, the callee is receiving a call with NO charge though he is roaming abroad.

FIG. 4 – MAIN NETWORK COMPONENTS, INCLUDING PROPOSED ARoL SERVER

Figure 4 shows the main components of the mobile network and how the **ARoL Server** is proposed to be integrated in this network. The legend of this figure is the following:

- ① – Home Network Operator
- ② – Home Location Register (HLR)
- ③ – **Proposed ARoL Server**
- ④ – Gateway MSC (GMSC)
- ⑤ – Mobile Switching Center (MSC)
- ⑥ – Visited Location Register (VLR)
- ⑦ ⑧ – Other Network Operators

30

FIG. 5 – ARoL SERVICE

Figure 5 shows the main components of the mobile network and how the **ARoL Server** is proposed to be integrated in this network. The legend of this figure is the following:

- 5 ① – Home Mobile Network of the ARoL Subscriber
- ② – Home Location Register (HLR)
- ③ – **Proposed ARoL Server**
- ④ – Gateway MSC (GMSC)
- ⑤ – Mobile Switching Center (MSC)
- 10 ⑥ – Visited Location Register (VLR)
- ⑦ ⑧ – Other Network Operators
- ⑨ – A call to an ARoL Subscriber (On-Net, Off-Net, or International)
- ⑩ – MSISDN_{ARoL} transmitted to the GMSC
- ⑪ – MSISDN_{ARoL} transmitted from GMSC to HLR
- 15 ⑫ – Country & Local time of “Visited Network” transmitted to “ARoL Server”
- ⑬ – Corresponding recorder voice message transmitted to the Caller
- ⑭ – Caller Selection

I claim:

A telecom service that permits to his subscriber, when roaming abroad, to:

1. Limit calls at inconvenient times, by informing the caller, where he is
5 roaming and the local time there
2. Better managing received calls, by inviting – indirectly – the caller to
assume roaming charges in certain situations, rather than rejecting the call
reception.

Dated this the 16th day of May, 2020

10



RAJAT MALHOTRA

Agent for the Applicant [IN/PA -1775]

15

Ideas2IPR

ABSTRACT

ANNOUNCED ROAMING LOCATION (AROL) SERVICE

Announced Roaming Location (ARoL) Service is a telecom service that permits a better management of received calls when travelling abroad. The ARoL service
5 main idea is to inform a caller - calling an ARoL subscriber - where he is roaming and the local time there. This service is proposed with two levels: □ Basic ARoL Level - where the caller is simply informed about the country where the called ARoL subscriber is roaming and the local time there. □ Advanced ARoL Level - where the caller is further offered the option of assuming roaming charges. By
10 offering this service, a Mobile Operator aims further enhancements of its customers' retention and loyalty, and creation of a new revenue stream.

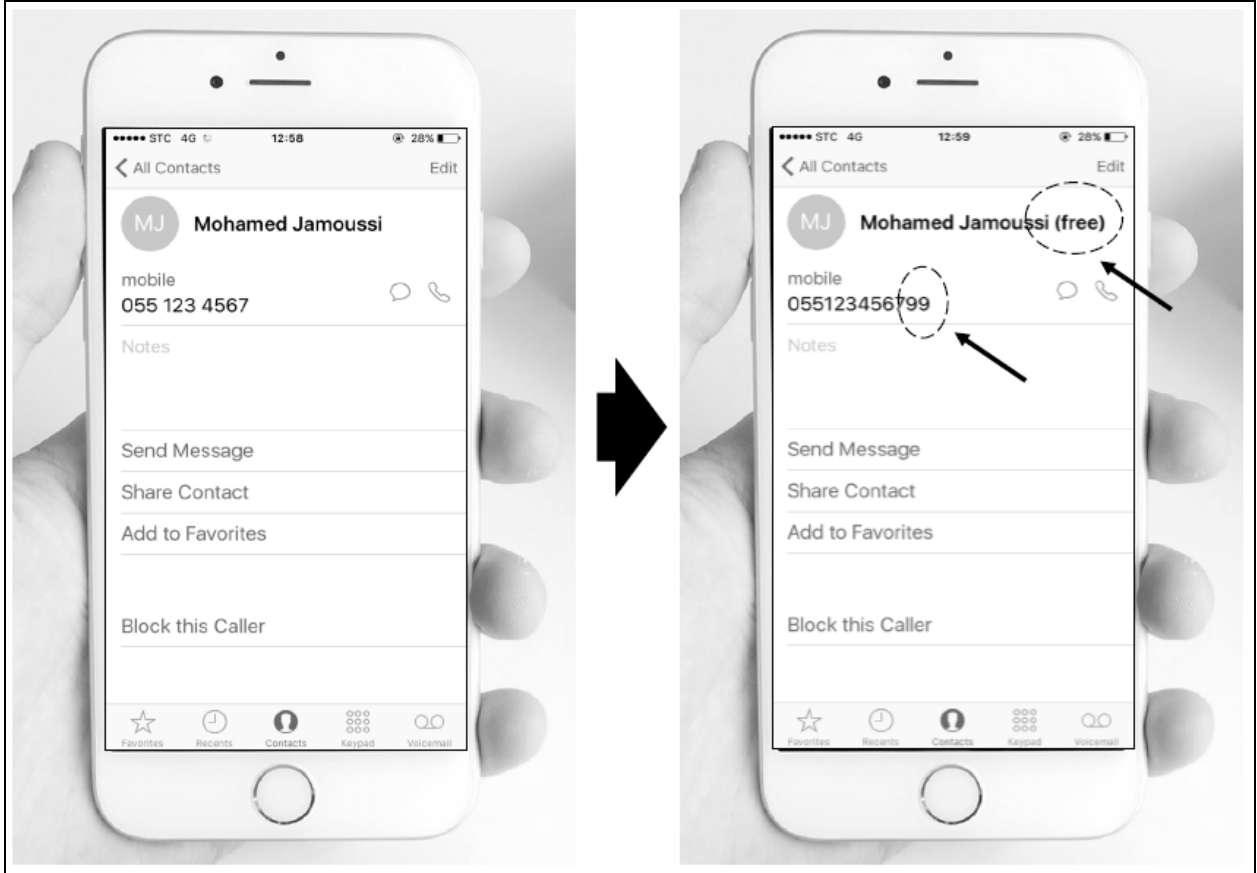


FIG. 1 -

Rajat

RAJAT MALHOTRA
Agent for the Applicant [IN/PA -1775]
Ideas2IPR



FIG. 2 -

Rajat

RAJAT MALHOTRA
Agent for the Applicant [IN/PA -1775]
Ideas2IPR



FIG. 3 -

Rajat

RAJAT MALHOTRA
Agent for the Applicant [IN/PA -1775]
Ideas2IPR

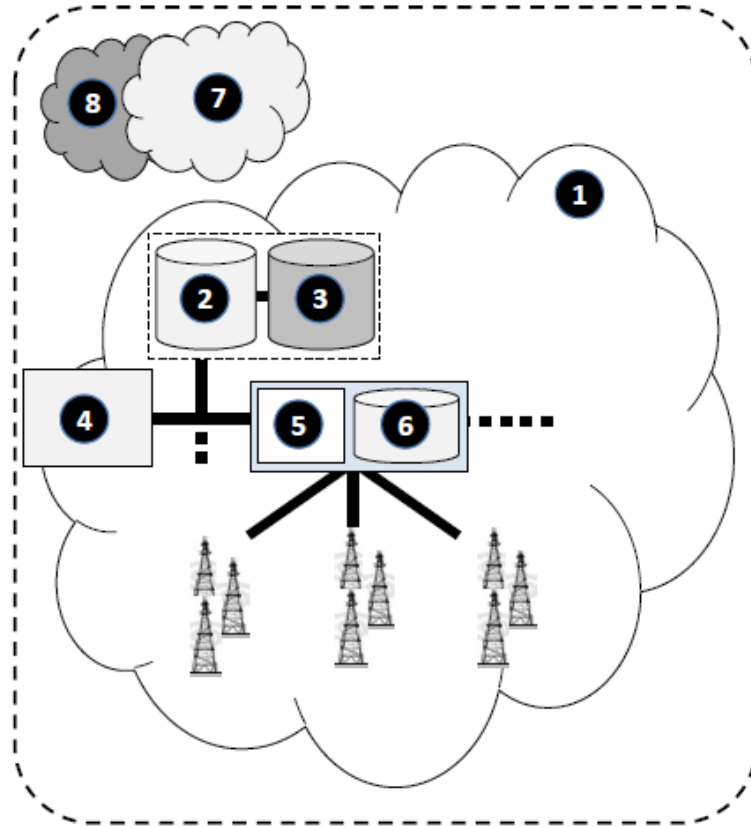


FIG. 4 -

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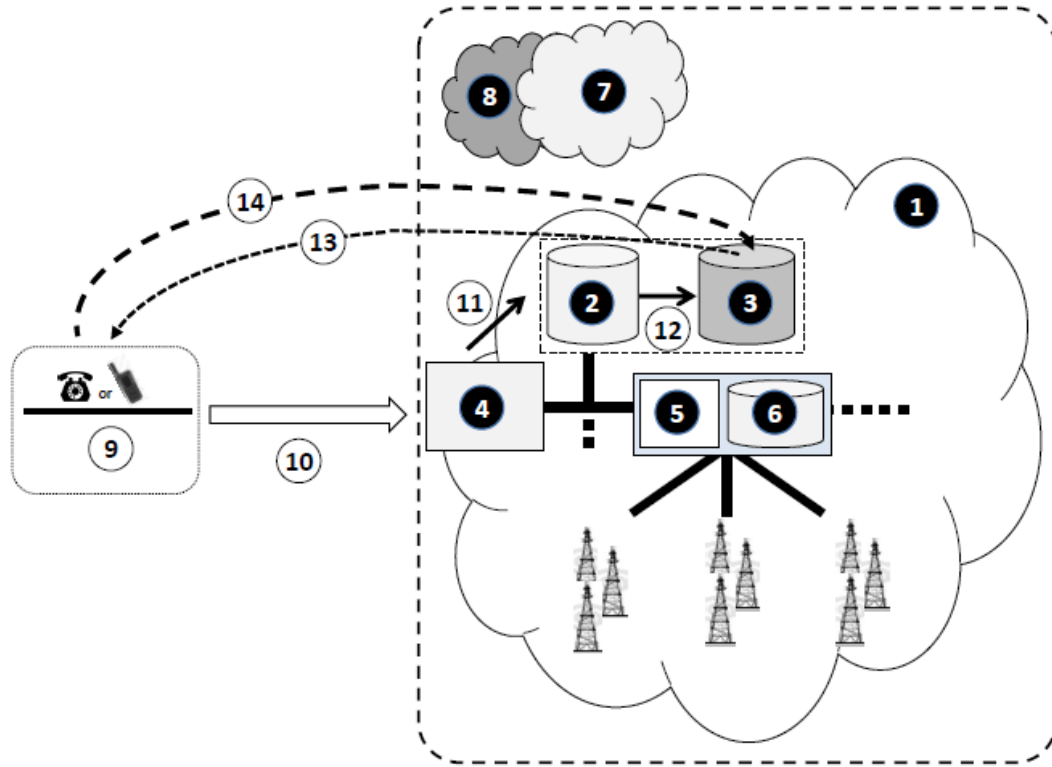


FIG. 5 -

Rajat

RAJAT MALHOTRA
Agent for the Applicant [IN/PA -1775]
Ideas2IPR

FORM 3
THE PATENTS ACT, 1970
(39 of 1970)
&
THE PATENTS (AMENDMENT) RULES, 2006
Statement and Undertaking under Section 8
[See Section 8; rule 12]

I, JAMOUSSEI, Mohamed do hereby declare:

- (i) That I who have made this Application No. _____ dated 16th May, 2020 alone, made for the same/substantially same invention applications for patent in the other countries, the particulars of which are given below:

Name of the Country	Date of Application	Application No:	Status of the Application	Date of Publication	Date of Grant
US	22 October 2017	15/790,018	-	-	-
PCT	24 October 2017	PCT/IB2017/056589	Published	25 April 2019	-

- (ii) That the rights in the application has been assigned to:

JAMOUSSEI, Mohamed of 3 Koulifa Rachidites Tunis, 1004 (TN)

- (iii) That I undertake that upto the date of grant of the patent by the Controller, I would keep him informed in writing the details regarding corresponding applications for patents filed outside India within six months from the date of filing of such application.

Dated this the 16th day of May, 2020



RAJAT MALHOTRA
Agent for the Applicant [IN/PA -1775]
Ideas2IPR

To
The Controller of Patents
The Patent Office
At New Delhi

FORM 5
THE PATENTS ACT, 1970
(39 OF 1970)
&
THE PATENTS (AMENDMENT) RULES, 2006
DECLARATION AS TO INVENTORSHIP
[See section 10(6) and rule 13(6)]

1. NAME OF APPLICANT

JAMOUSSE, Mohamed

hereby declare that the true and first inventor of the invention disclosed in the complete specification filed in pursuance of our application numbered _____ dated May 16, 2020 is:

2. INVENTOR:

- (i) NAME : JAMOUSSE, Mohamed
- (ii) NATIONALITY : TN
- (iii) ADDRESS : 3 Koulifa Rachidites Tunis, 1004 (TN)

Dated this the 16th day of May, 2020



RAJAT MALHOTRA
Agent for the Applicant [IN/PA -1775]
Ideas2IPR

To,
The Controller of Patents
The Patent Office,
At New Delhi

<p align="center">FORM 1 THE PATENTS ACT 1970 (39 of 1970) and THE PATENTS RULES, 2003 APPLICATION FOR GRANT OF PATENT (See section 7, 54 and 135 and sub-rule (1) of rule 20)</p>				<p align="center">(FOR OFFICE USE ONLY)</p>			
				Application No.			
				Filing date:			
				Amount of Fee paid:			
				CBR No:			
				Signature:			
1. APPLICANT'S REFERENCE / IDENTIFICATION NO. (AS ALLOTTED BY OFFICE)							
2. TYPE OF APPLICATION [Please tick (✓) at the appropriate category]							
Ordinary ()		Convention ()		PCT-NP (✓)			
Divisional ()	Patent of Addition ()	Divisional ()	Patent of Addition ()	Divisional ()	Patent of Addition ()	Divisional ()	Patent of Addition ()
3A. APPLICANT							
Name in Full		Nationality	Country of Residence	Address of the Applicant			
JAMOUSSE, Mohamed		TN	TN	House No.	3 Koulifa Rachidites Tunis, 1004 (TN)		
				Street			
				City			
				State			
				Country	TN		
				Pin code			

3B. CATEGORY OF APPLICANT [Please tick (√) at the appropriate category]					
Natural Person (√)		Other than Natural Person			
		Small Entity ()	Startup ()	Others ()	
4. INVENTOR(S) [Please tick (√) at the appropriate category]					
Are all the inventor(s) same as the applicant(s) named above?		Yes (√)		No ()	
If "No", furnish the details of the inventor(s)					
Name in Full		Nationality	Country of Residence	Address of the Inventor	
5. TITLE OF THE INVENTION					
ANNOUNCED ROAMING LOCATION (AROL) SERVICE					
6. AUTHORISED REGISTERED PATENT AGENT(S)		IN/PA No.		1775	
		Name		Rajat Malhotra	
		Mobile No.		9891016781	
7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA		Name		Ideas2IPR	
		Postal Address		B-115 Chander Nagar, Janak Puri, New Delhi-110058.	
		Telephone No.		9910222350	
		Mobile No.		9891016781	
		Fax No.		01125620164	
		E-mail ID		mail@ideas2ipr.com	
8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION					
Country	Application Number	Filing date	Name of the Applicant	Title of the Invention	IPC (as classified in the convention country)

US	15/790,018	22 October 2017	-	-	-
9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)					
International application number			International filing date		
PCT/IB2017/056589			24 October 2017		
10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF ORIGINAL (FIRST) APPLICATION					
Original (first) application No.			Date of filing of original (first) application		
11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT					
Main application/patent No.			Date of filing of main application		

12. DECLARATIONS
<p>(i) Declaration by the inventors</p> <p>I, the above named inventor is the true & first inventor for this Invention and declare that the applicant herein is our assignee or legal representative.</p>

Date _____

JAMOUSSE, Mohamed

(ii) Declaration by the applicant(s) in the convention country

I/We, the applicant(s) in the convention country declare that the applicant(s) herein is/are my/our assignee or legal representative. : NA

(iii) Declaration by the applicant

I the applicant hereby declare(s) that: -

I am in possession of the above-mentioned invention.

The Complete specification relating to the invention is filed with this application.

The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me/us before the grant of patent to me/us.

There is no lawful ground of objection(s) to the grant of the Patent to us.

I am the assignee or legal representative of true & first inventors.

The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country/countries in respect of our invention(s).

I claim the priority from the above mentioned application(s) filed in convention country/countries and state that no application for protection in respect of the invention had been made in a convention country before that date by me/us or by any person from which We derive the title.

My application in India is based on international application under Patent Cooperation Treaty (PCT) as mentioned in Paragraph-9.

The application is divided out of my /our application particulars of which is given in Paragraph-10 and pray that this application may be treated as deemed to have been filed on DD/MM/YYYY under section 16 of the Act.

The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph-11.

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

a. Form 2

Item	Details	Fee	Remarks
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Complete Specification	No. of pages: 19	INR 1600	Paid online
No. of Claim(s)	No. of claims: 02 No. of pages: 01	-	
Abstract	No. of pages: 01		
No. of Drawing(s)	No. of drawings: 05 No. of pages: 05		

- b. Complete specification;
- c. Drawings
- d. Statement and Undertaking on Form 3;
- e. Declaration of Inventorship on Form 5;
- f. Total fee : INR 1600 paid online

I hereby declare that to the best of our knowledge, information and belief the fact and matters stated herein are correct and I request that a patent may be granted to us for the said invention.

Dated this 16 May 2020



Rajat Malhotra
Agent for the Applicant [IN/PA-1775]
Ideas2IPR

To,
The Controller of Patents
The Patent Office, at New Delhi



(43) International Publication Date
25 April 2019 (25.04.2019)

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15/790,018 22 October 2017 (22.10.2017) US
- (72) Inventor; and
- (71) Applicant: **JAMOSSI, Mohamed** [TN/TN]; 3 Koulifa Rachidites, Tunis, 1004 (TN).
- (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, JO, 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.

(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).

(54) Title: ANNOUNCED ROAMING LOCATION (ARoL) SERVICE

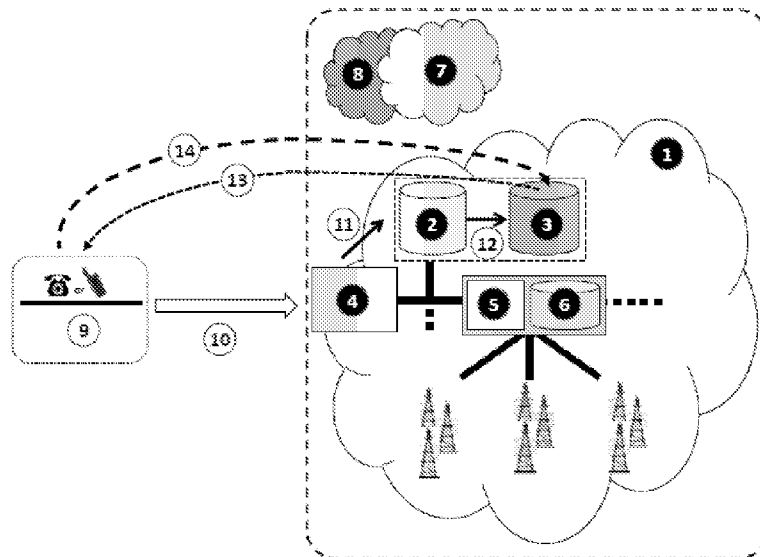


FIG. 5 -

(57) Abstract: Announced Roaming Location (ARoL) Service is a telecom service that permits a better management of received calls when travelling abroad. The ARoL service main idea is to inform a caller – calling an ARoL subscriber – where he is roaming and the local time there. This service is proposed with two levels: # Basic ARoL Level – where the caller is simply informed about the country where the called ARoL subscriber is roaming and the local time there. # Advanced ARoL Level – where the caller is further offered the option of assuming roaming charges. By offering this service, a Mobile Operator aims further enhancements of its customers' retention and loyalty, and creation of a new revenue stream.



Declarations under Rule 4.17:

- *as to the identity of the inventor (Rule 4.17(i))*
- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*

1 DEFINITIONS & ACRONYMS

1. **ARoL service** – Announced Roaming Location service
2. **ARoL subscriber** – A customer subscribed to the ARoL service. Of course, as an ARoL subscriber, he/she is assumed to have the IMR service with his/her Telco Operator (See Definition 12 for IMR service).
3. **BSC** – Base Station Controller, which controls a given number of BTSs (towers) (See Definition 4 for BTS).
4. **BTS** – Base Transceiver Station, which is the tower radiating the signal to the mobile.
5. **Callee** – The person being called (or intended to be called).
6. **Caller** – The person who is calling (or attempting to call). In this document, he can be:
 - a. calling locally (On-Net or Off-Net) or internationally, using a mobile network or a landline network.
 - b. a customer of the same operator as the callee, or not.
 - c. an ARoL subscriber, or not.
7. **GMSC** – Gateway MSC (See Definition 14 for MSC).
8. **GMSC_{HMNO}** – GMSC of the HMNO (See Definition 9 for HMNO)
9. **HMNO** – Home Mobile Network Operator, hosting the ARoL subscriber.
10. **HLR** – Home Location Register, storing the details of the all the subscribers permanently.
11. **HLR_{HMNO}** – HLR of the HMNO
12. **IMR service** – International Mobile Roaming service, granting a subscriber an automatic access to the visited operator (in in the visited country) when arriving; and, then, seamlessly using his mobile phone/device (voice calls, text messages, Internet ...).
13. **IMSI** – International Mobile Subscriber Identity (identity of the SIM card). It identifies the mobile station, its home wireless network, and its home country.
14. **MSC** – Mobile Switching Center, controlling a given number of BSCs and responsible for switching calls to called subscribers.

15. **MSISDN** – Mobile Station International Subscriber Directory Number. It is the number used for routing the call to the subscriber (dialed number to connect to a mobile phone).
16. **MSISDN_{ARoL}** – MSISDN of the ARoL subscriber
17. **MSRN** – Mobile Station Roaming Number. It is allocated by the VLR (from a list of numbers it holds) in order to route the call from the mobile phone to the MSC (via the BTS/BSC) (See Definition 21 for VLR).
18. **NITZ** – Network Identity and time Zone.
19. **SIM** – Subscriber Identity Module.
20. **Telco Operator** – It can be a Mobile Operator, a Landline Operator, or both.
21. **VLR** – Visitor Location Register, storing the details of the all the visiting subscribers temporarily, as long as they are “active” in the particular area it covers.
22. **VLR_{HMNO}** – VLR of the HMNO

2 ARoL SERVICE DESCRIPTION

ARoL service is a telecom mobile service. Its main objective is to permit to its subscriber a better management of his received calls when travelling abroad. The ARoL service main idea is to inform a caller – calling an ARoL subscriber – that the called number is roaming abroad, the country (NOT THE CITY) where he is roaming and the local time there, in order to decide either to continue with the call or to call at a more convenient time. Of course, if more than one time zone apply to that country, the local time announced is of the city where the ARoL subscriber is when receiving the call.

The ARoL service has two levels:

- **Basic ARoL (Level 1)** – addressed to a caller – calling an ARoL subscriber – **who is NOT a customer of the HMNO**. The caller is a customer of another Telco Operator – either within the same country or in another country.
- **Advanced ARoL (Level 2)** – addressed to a caller – calling an ARoL subscriber – **who is a customer of the HMNO**. In other words, the caller and the ARoL subscriber (the callee) are customers of the same Mobile Operator.

For the determination of the location and the local time, the NITZ feature can be used and the information forwarded to the mobile phone can be shared between the VLR to which the ARoL subscriber is attached (in the visited country where roaming) and the HLR of the HMNO.

It is important to note that the ARoL service is NOT an IMR service, requiring international agreements between operators. It is a local service that an operator is offering to its customers. Also, it is important to note that this service is **OPTIONAL** in roaming situations. As a matter of fact, while one of the main features of mobile communication is to hide the location of the called number from the calling number, through the MSRN concept, the location release of the called person remains the choice of this latter – as an ARoL subscriber.

2.1 BASIC ARoL (LEVEL 1)

With this service level (Level 1), when calling an ARoL subscriber, travelling and roaming in another country, the caller is informed via a recorded voice message:

- In which country the “callee” is; and the local time there.
- Then, if the caller would like to continue with this initiated call or to hung up.

This recorded voice message is expected to be in two languages: English and the country official language. Of course, if the callee is switched off or out of coverage (not connected to any network), the caller will listen to the common and familiar recorded voice message, stating that the dialed number is currently unreachable. Of course, it is assumed that a roaming agreement is established between the HMNO and the network the ARoL subscriber is connected to (in the visited country). The following examples (Examples 1, 2 & 3) sketch how Basic ARoL works.

Example 1:

An ARoL subscriber, with a mobile line from STC (a Telco Operator in Saudi Arabia) is in a business trip in Chicago (USA) in February. He is being called from Riyadh (Saudi Arabia) at 1:25pm Saudi time (UTC + 03:00) by a caller with a mobile line from Mobily (a second Telco Operator in Saudi Arabia). When dialing the number, and after the setup of the related call signaling, the caller (in Riyadh) will listen to the following recorded voice message in both languages: English and Arabic.



**The number you are dialing is roaming in The United States
where the local time there is 04:25 am
To continue with this call, press (1). If not, just hung up**

الولايات المتحدة الأمريكية

04:25 صباحا

الرقم الذي طلبته في حالة تجوال بـ

أين التوقيت المحلي هناك هو

لموصلة هذه المكالمة، اضغط (1). أو أقفل الخط

Then, it is up to the caller to decide about the importance of the call, by either:

- Pressing (1) to continue, and the callee will hear his mobile phone ringing,
- Or, just hanging up and calling another time.

Notes:

- If the callee is busy with another call (and call waiting is not being used), the Visited MSC routes the call to a pre-determined Call Forward Busy (CFB) number. It may be set by default to the callee voice mail.
- If the callee does not answer, the Visited MSC routes the call to a pre-determined Call Forward No Reply (CFNRy) number. It may be set by default to the callee voice mail.
- If the caller does nothing or presses another digit, the call will be rejected (ended).
- When hanging up, or the call rejected, an SMS is forwarded to the called ARoL subscriber (the callee), informing him about an attempted call from “the caller number” at “the caller local time”.

Example 2:

An ARoL subscriber, with a mobile line from Saudi Telecom (STC), is in a business trip in Washington DC (USA) in February. He is receiving a landline/mobile call from London (UK) at 10:25am GMT (corresponding to 1:35pm Saudi Time). When dialing the number, and after the setup of the related call signaling, the caller (in London) will listen to the following recorded voice message in both languages: English and Arabic.



**The number you are dialing is roaming in The United States
where the local time there is 05:25 am
To continue with this call, press (1). If not, just hung up**

الولايات المتحدة الأمريكية

05:25 صباحا

الرقم الذي طلبته في حالة تجوال بـ

أين التوقيت المحلي هناك هو

لموصلة هذه المكالمة، اضغط (1). أو أقفل الخط

Then, it is up to the caller to decide about the importance of the call, by either:

- Pressing (1) to continue, and the callee will hear his mobile phone ringing,
- Or, just hanging up and calling another time.

Notes:

[Same notes as for Example 1]

Example 3:

An ARoL subscriber, with a mobile line from Saudi Telecom (STC), is in a business trip in Washington DC (USA). His mobile phone is switched off when receiving a landline/mobile call from London at 10:25am GMT (corresponding to 1:35pm Saudi Time). When dialing the number, and after the setup of the related call signaling, the caller (in London) will listen to the following recorded voice message in both languages, English and Arabic:



The number you are calling is off; please call again later.

إنَّ الرقم المطلوب مغلق، الرجاء الاتصال في وقت لاحق

Then, an SMS is forwarded to the called ARoL subscriber (the callee) informing him about an attempted call from “the caller number” at “the caller local time” once his mobile is switched on and attached to a visited mobile network.

Note:

- If the ARoL subscriber is either out of coverage, or his battery has gone flat/removed, the caller will listen to the above recorded voice message, in both languages: English and Arabic; and an SMS is forwarded to the called ARoL subscriber (the callee), informing him about an attempted call from “the caller number” at “the caller local time”.

2.2 ADVANCED AROl (LEVEL 2)

With this service level (Level 2), when the caller is calling an ARoL subscriber, travelling and roaming in another country, the caller is informed in which country the “callee” is and the local time there. Then, the caller has the following choices:

- To continue with this initiated call normally.
- Or, to continue with this initiated call and assuming roaming charges.
- Or, to hung up.

The caller will be informed through a recorded voice message, which is expected to be in two languages: English and the country official language. The following example (Example 4) sketches how Advanced ARoL works.

Example 4:

An ARoL subscriber, with a mobile line from Saudi Telecom (STC), is in a business trip in Washington DC (USA) in February. He is receiving a landline/mobile call from another Saudi Telecom (STC) customer at 1:35 pm Saudi Time. When dialing the number, and after the setup of the related call signaling, the caller will listen to the following recorded voice message in both languages, English and Arabic:



**The number you are dialing is roaming in The United States
where the local time there is 05:25 am**

- **To continue with this call normally, press (1)**
- **To continue with this call and assume roaming charges, press (2)**
- **Or, just hung up**

الولايات المتحدة الأمريكية

05:25 صباحا

الرقم الذي طلبته في حالة تجوال بـ

أين التوقيت المحلي هناك هو

- لموصلة هذه المكالمة عادية، اضغط (1)

- لموصلة هذه المكالمة مع تحمّل تكاليف التجوال، اضغط (2)

- أو أقفل الخط

Then, it is up to the caller to decide about the importance of the call, by:

- Pressing (1) to continue, and the callee will hear his mobile phone ringing,
- Or, pressing (2) to continue and assuming roaming charges, and the called ARoL subscriber will hear his mobile phone ringing, **but he is advised that he is receiving a free call (Section 4)**.
- Or, just hanging up and calling another time.

Notes:

[Same notes as for Example 1]

3 ARoL SERVICE SUBSCRIPTIONS

The Telco Operator – providing the ARoL service – may offer two types of subscription to its customers willing to subscribe to this service:

- **Basic ARoL Subscription** – Where there is NO distinction between callers – **either customers of the HMNO or NOT**. In other words, the option of assuming roaming charges is NOT offered to the caller. He is only informed about the roaming location of the callee and the local time of the city where he is; and accordingly, he makes the choice to keep with his call or to call another time (as sketched in Examples 1 & 2).

- **Advanced ARoL Subscription** – Where there is distinction between callers – **if they are customers of the HMNO or NOT**. In other words:
 - If the caller is a customer of the HMNO, after being informed about the roaming location of the callee and the local time of the city where he is; the caller will be offered the option of assuming roaming charges (as sketched in Example 4).
 - If the caller is NOT a customer of the HMNO, he is only informed about the roaming location of the callee and the local time of the city where he is; and accordingly, the caller makes the choice to keep with his call or to call another time.

4 ARoL SUBSCRIBER CONTACTS UPDATE

Based on the type of subscription, a new **Advanced ARoL** subscriber is expected to duplicate and update his contacts (who are, basically, customers of the HMNO) in order to detect free roaming-charges calls, when traveling abroad.

The expected type of update is based on the “2-digit” extension that the Telco Operator will attach the caller MSISDN, and which will be forward it to the callee mobile phone. Note that this “2-digit” extension is communicated by the HMNO to its new Advanced ARoL Subscriber. The following example (Example 5) sketches how a new Advanced ARoL subscriber will duplicate and update one of his existing contacts, based on the “2-digit” extension provided by his HMNO.

Example 5:

An ARoL subscriber, with a mobile line from line from Saudi Telecom (STC) wants to duplicate the contact of “**Mohamed Jamoussi**” stored on his mobile phone, based on the “2-digit” extension provided to him by Saudi Telecom and which is “99” (as an example). This contact will be duplicated and updated as shown on “FIG. 1”.

When roaming abroad and receiving a call from “**Mohamed Jamoussi**” who has chosen to make a normal call by pressing (1), the mobile phone of the callee will display what is shown on “FIG. 2”; and the callee will assumed the roaming charges of this accepted call.

Now, if the caller “**Mohamed Jamoussi**” has chosen to assume the roaming charges for this call by pressing (2), the mobile phone of the callee will display what is shown on “FIG. 3”, and the callee is advised that the caller will assume the roaming charges of this accepted call.

5 ARoL SERVER

Though details may differ from one mobile network to another, but the overall architecture and key components are almost the same. For this ARoL service, an ARoL server connected to the HLR of the HMNO (or embedded) will be deployed for the voice messages related to different mobile networks that an ARoL subscriber could roam in across the world and which have roaming agreements with the HMNO (see "FIG. 4").

6 ARO L SERVICE PROCESS

When an ARO L subscriber is roaming internationally and is receiving a call, the ARO L service process is almost similar to the known roaming process. It basically involves:

- The GMSC & HLR of the HMNO, and
- The MSC & VLR of the visited network in the visited country.

6.1 ARO L SUBSCRIBER LOCATION IDENTIFICATION

The first step of the ARO L service process is typically the identification mechanism of any roaming process. This step determines the location of a mobile phone connected to a visited Mobile Network and at an idle state (no active traffic).

When an ARO L subscriber, travelling abroad, switches “ON” his mobile phone (*or transferred via a handover, which is the process in which a call/data session is transferred from one BTS to another without disconnection*), the Visited Mobile Network – detecting this new device – will notice that it is not registered with its own system, and will identify its HMNO. Then, both networks (Visited and Home) will exchange roaming information about this mobile phone using the IMSI number and the IMSI attached procedure is executed. Of course, it is assumed that there is a roaming agreement between the two networks. If not, the mobile phone will be denied by the Visited Mobile Network.

If the Visited Mobile Network finds out that this mobile phone is allowed to roam, then it begins to maintain a temporary subscriber record for this device. The mobile phone is said to be attached. The HLR of the HMNO passes the information to the VLR in the Visited Network and updates its location information for this ARO L subscriber, so that any information sent to that device can be correctly routed. The HLR_{HMNO} instructs the old VLR to delete the information it has on this ARO L subscriber.

6.2 ARO L SERVICE KEY STEPS

When a caller dials the mobile phone number of an ARO L subscriber roaming abroad, the ARO L service key steps are the following:

1. The caller dials the ARO L subscriber mobile phone number ($MSISDN_{ARO L}$)
2. The $MSISDN_{ARO L}$ is forwarded to the HLR_{HMNO} via the $GMSC_{HMNO}$ (see “FIG. 5”). And because of previous updates, the HLR_{HMNO} already knows which VLR – in the world – is serving the called ARO L subscriber.
3. The HLR_{HMNO} will:
 - a. identify if the caller is a subscriber of the HMNO (as the callee). If so, it could be either serviced by a VLR_{HMNO} or an external VLR to the HMNO (i.e. the caller is also roaming domestically or internationally)
 - b. identify which ARO L level, the callee is subscribed to (*Basic* or *Advanced*).
 - c. instruct the ARO L server to deliver the corresponding message to the caller via the $GMSC_{HMNO}$, based on the information collected in steps/sub-steps (2), (3.a) and (3.b).
4. The ARO L server will deliver the appropriate message to the caller via the $GMSC_{HMNO}$.
5. The caller will make his choice, based on the options announced in the voice message.
6. **If the caller just hangs up, or press an unexpected digit, or does nothing**, the call is ended and an SMS is forwarded to the called ARO L subscriber (the callee), informing him about an attempted call from “the caller number” at “the caller local time”.
7. **If the caller presses (1) – as an offered option**, regardless of the information collected in sub-steps (3.a) and (3.b), the standard roaming process will take place to carry on with this initiated call. The VLR servicing the called ARO L subscriber will assign an MSRN (a temporary number).

This MSRN number will be sent back to the HLR_{HMNO}, so that the GMSC_{HMNO} knows how to route the call to reach the ARoL subscriber. Note that, broadly speaking, the GMSC_{HMNO} will attach the MSISDN of the caller to the provided MSRN, so that the ARoL subscriber identifies who is calling.

From a billing standpoint, termination billing procedure and rate are applied, as per the agreement between the HMNO and the caller Telco Operator.

Notes:

- For the called ARoL subscriber:
 - If he is a **postpaid** subscriber, once the call is ended, the billing is made.
 - If he is a **prepaid** subscriber, a check is made to see if he has enough credit to receive this call. If so, the call is continually monitored and the appropriate amount is decremented from his account. When the credit reaches zero, the call is cut off.
- For the caller (either a subscriber of the HMNO or NOT):
 - If he is a **postpaid** subscriber, once the call is ended, the billing is made.
 - If he is a **prepaid** subscriber, a check is made to see if he has enough credit to receive this call. If so, the call is continually monitored and the appropriate amount is decremented from his account. When the credit reaches zero, the call is cut off.

8. **If the caller presses (2) – as an offered option**, and based on the information collected in steps/sub-steps (2), (3.a) and (3.b), the standard roaming process will take place to carry on with this initiated call. The VLR servicing the called ARoL subscriber will assign an MSRN (a temporary number). This MSRN number will be sent back to the HLR_{HMNO}, so that the GMSC_{HMNO} knows how to route the call to reach the ARoL subscriber.

At this stage, the GMSC_{HMNO} will NOT attach the original MSISDN of the caller to the provided MSRN. Instead, the GMSC_{HMNO} will attach the extended MSISDN of the caller, which is a combination of the original MSISDN and a “2-digit” extension (as explained in Section 4). Therefore, as per Example 5 and updated contacts, the called ARoL subscriber will

identify that he is receiving a free of charge call (as displayed on his mobile phone screen).

Notes:

- For the called ARoL subscriber, he is receiving the call for free – as if he is receiving it in his home country.
- For the caller (who is a subscriber of the HMNO), he will assume the charges of both:
 - The call made to the ARoL subscriber, as if he is in his home country.
 - The call received by the ARoL subscriber in the country where he is.

On another hand, depending on the caller type of subscription:

- If he is a **postpaid** subscriber, once the call is ended, the billing is made.
- If he is a **prepaid** subscriber, a check is made to see if he has enough credit to receive this call. If so, the call is continually monitored and the appropriate amount is decremented from his account. When the credit reaches zero, the call is cut off.

6.3 ARO L SUBSCRIBER OFF

When the ARoL subscriber mobile phone is powered off, it sends an IMSI detach message to the network. The VLR marks that mobile phone as detached and informs the HLR_{HMNO} (via the GMSC_{HMNO}) that it is about to remove this subscriber record from its register (VLR register). The HLR_{HMNO} then treats this ARoL subscriber as unreachable. Therefore, any caller dialing this ARoL subscriber number will be treated as sketched in Example 3.

Also, if the mobile phone is out of the area of coverage, it will miss sending a registration message to the network at the predefined intervals. Accordingly, the network will mark it as detached; and any caller dialing this mobile number will be treated as sketched in Example 3.

7 ARO L SERVICE BUSINESS ASPECTS

7.1 DRIVERS & TARGETED SEGMENTS

The ARoL service can be offered to all business and residential, postpaid and prepaid customers. By offering this service, a Mobile Operator will aim to:

- Offer a service that attracts frequent travelers, interested by substantially reducing their international communications spending, and limiting inconvenient incoming calls.
- Offer a service that conveys a message on behalf of the “callee” when feeling embarrassed to do it himself (e.g. advising the caller that he is internationally roaming in order to make this call as short as possible, or the time is inconvenient)
- Offer a service that conveys a message expressing some show-off desires for certain categories of customers
- Match “**Early Services/Technologies**” adopters’ expectations – constantly searching for new services/technologies.
- Increase customers’ retention and loyalty
- Generate new revenues and increase ARPU

7.2 POLICIES & PRICING

Basically, the overall ARoL service policies & pricing are established by the Mobile Operator, providing this service. Nevertheless, it is expected that:

- **Service Activation/Cancellation** – at no fees
- **Service Charges** – through monthly/weekly subscriptions, or based on usage

As it can be a free service for retention purposes or bundled with other services. It is the Operator Marketing authority which decides on the service charging rules.

8 ARO L DRAWINGS – DESCRIPTIONS

FIG. 1 – CONTACT DUPLICATION & UPDATE

Figure 1 shows how contacts are duplicated by adding the “2-digit” extension provided the Telco Operator. The “2-digit” extension is manually added to the MSISDN of the contact to be updated.

FIG. 2 – REGULAR DISPLAY – WHEN PRESSING (1)

Figure 2 shows the regular display when the caller chooses to make a normal call by pressing (1). The called ARO L subscriber is receiving a call as if he is in his home country – but assuming the international roaming cost.

FIG. 3 – MODIFIED DISPLAY – WHEN PRESSING (2)

Figure 3 shows the modified display on the called ARO L subscriber handset, as the caller chose to assume all the call costs by pressing (2). Therefore, the callee is receiving a call with NO charge though he is roaming abroad.

FIG. 4 – MAIN NETWORK COMPONENTS, INCLUDING PROPOSED ARO L SERVER

Figure 4 shows the main components of the mobile network and how the **ARoL Server** is proposed to be integrated in this network. The legend of this figure is the following:

- ① – Home Network Operator
- ② – Home Location Register (HLR)
- ③ – **Proposed ARO L Server**
- ④ – Gateway MSC (GMSC)
- ⑤ – Mobile Switching Center (MSC)
- ⑥ – Visited Location Register (VLR)
- ⑦⑧ – Other Network Operators

FIG. 5 – ARoL SERVICE

Figure 5 shows the main components of the mobile network and how the **ARoL Server** is proposed to be integrated in this network. The legend of this figure is the following:

- ① – Home Mobile Network of the ARoL Subscriber “A”
- ② – Home Location Register (HLR)
- ③ – **Proposed ARoL Server**
- ④ – Gateway MSC (GMSC)
- ⑤ – Mobile Switching Center (MSC)
- ⑥ – Visited Location Register (VLR)
- ⑦ ⑧ – Other Network Operators
- ⑨ – A call to an ARoL Subscriber (On-Net, Off-Net, or International)
- ⑩ – MSISDN_{ARoL} transmitted to the GMSC
- ⑪ – MSISDN_{ARoL} transmitted from GMSC to HLR
- ⑫ – Country & Local time of “Visited Network” transmitted to “ARoL Server”
- ⑬ – Corresponding recorder voice message transmitted to the Caller
- ⑭ – Caller Selection

----- END OF DOCUMENT -----

ANNOUNCED ROAMING LOCATION (AROL) SERVICE

CLAIMS

A telecom service that permits to his subscriber, when roaming abroad, to:

1. Limit calls at inconvenient times, by informing the caller, where he is roaming and the local time there
2. Better managing received calls, by inviting – indirectly – the caller to assume roaming charges in certain situations, rather than rejecting the call reception.



1 / 5

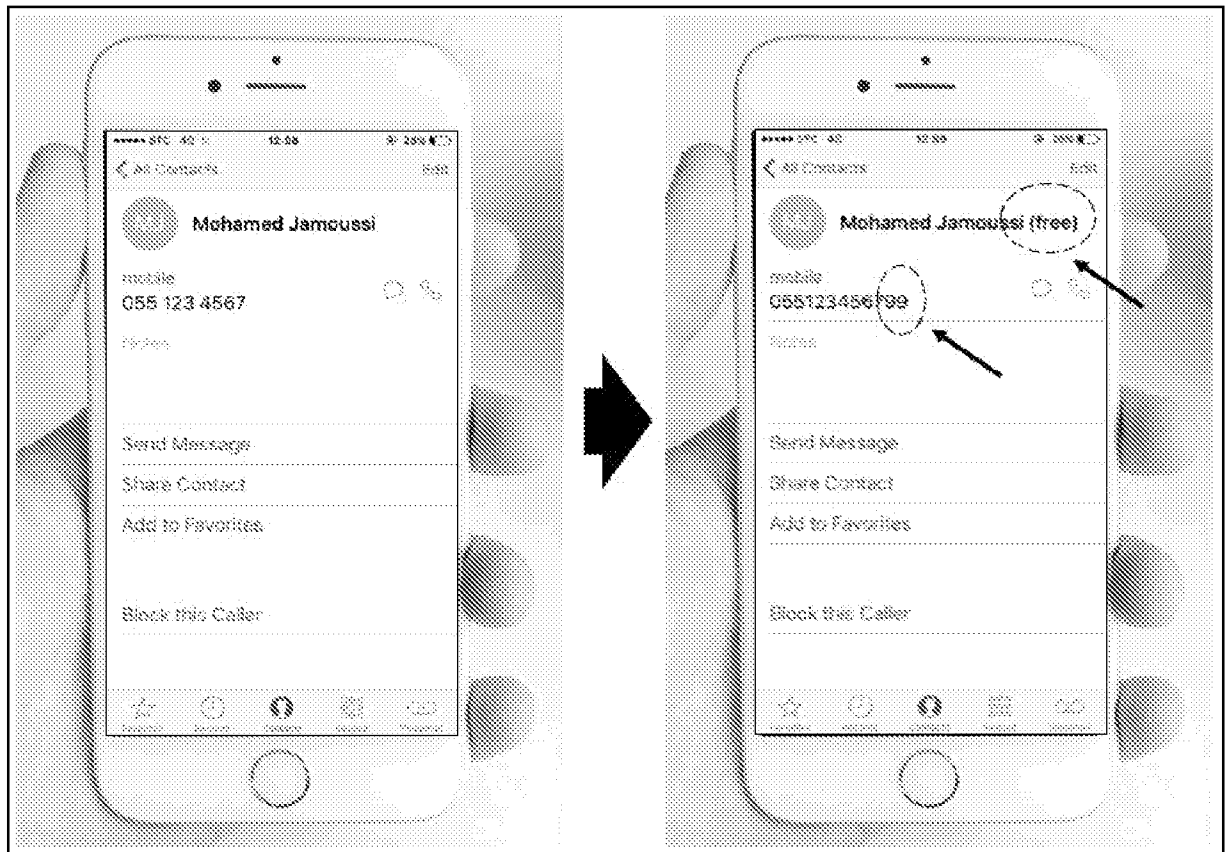


FIG. 1 -





2 / 5



FIG. 2 -





3 / 5

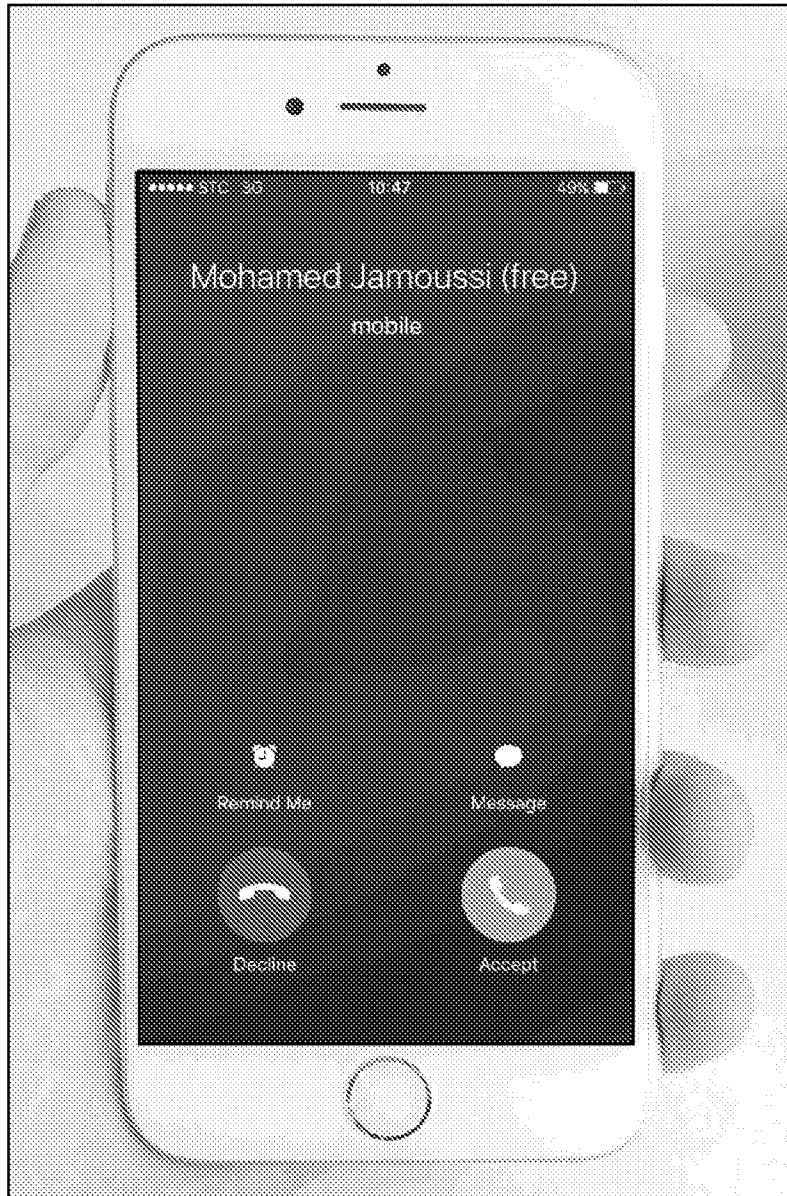


FIG. 3 -



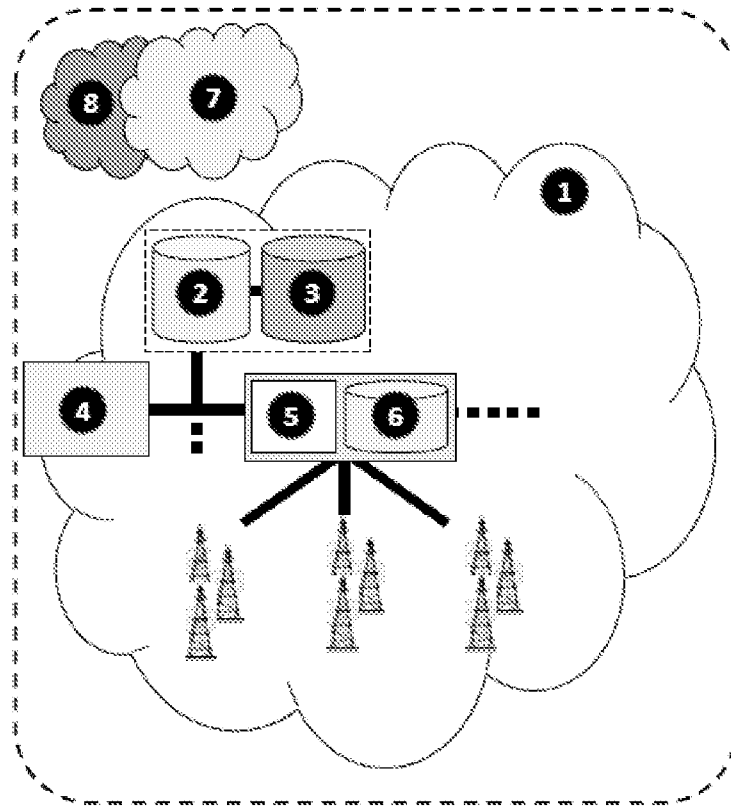


FIG. 4 -



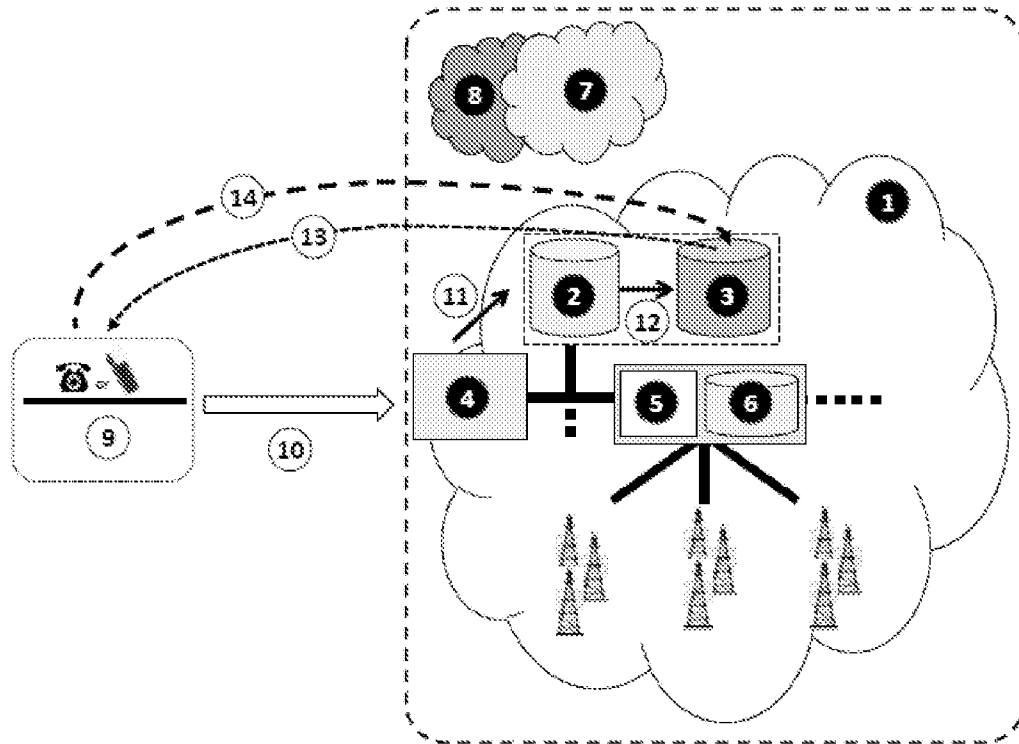


FIG. 5 -

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2017/056589

A. CLASSIFICATION OF SUBJECT MATTER
 INV. H04W8/12 H04W8/18
 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
 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.
X	US 2008/139202 A1 (WANG BINGFU [CN] ET AL) 12 June 2008 (2008-06-12) paragraphs [0059] - [0061], [0065] -----	1

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 2 January 2018	Date of mailing of the international search report 12/01/2018
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 Tessier, Serge

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2017/056589

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008139202 A1	12-06-2008	CN 1917692 A	21-02-2007
		EP 1916832 A1	30-04-2008
		US 2008139202 A1	12-06-2008
		WO 2007019773 A1	22-02-2007

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43bis.1)**

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IB2017/056589

International filing date (day/month/year)
24.10.2017

Priority date (day/month/year)
22.10.2017

International Patent Classification (IPC) or both national classification and IPC
INV. H04W8/12 H04W8/18

Applicant
JAMOSSI, MOHAMED

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0
Fax: +49 89 2399 - 4465


Date of completion of this opinion

see form
PCT/ISA/210

Authorized Officer

Tessier, Serge

Telephone No. +49 89 2399-0



Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed.
 - a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	<u>1</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1</u>
Industrial applicability (IA)	Yes: Claims	<u>1</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document:

D1 US 2008/139202 A1 (WANG BINGFU [CN] ET AL) 12 June 2008
(2008-06-12)

1 Independent claim 1

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

D1 discloses a telecom service that permits to his subscriber, when roaming abroad, to:

- Limit calls at inconvenient times, by informing the caller, where he is roaming and the local time there
- Better managing received calls, by inviting - indirectly - the caller to assume roaming charges in certain situations, rather than rejecting the call reception ([0065]: "*prompting the roaming state of the called subscriber, when a call is initiated by a calling party, roaming state information of a called subscriber is sent by the network side to the calling party, so as to allow the calling party to determine whether to proceed with or terminate the call according to the roaming state information. Therefore, according to the method, the situation that the calling party initiates a call at an inappropriate time or initiates some unnecessary calls may be avoided, thus saving the communication fee for the called subscriber*").

Therefore, the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT, and the requirements of Article 33(1) PCT are therefore not met.

Re Item VII

Certain defects in the international application

- 1 The independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from prior art D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

- 2 The steps and features of independent claim 1 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- 3 The relevant background art disclosed in D1 should be acknowledged in the description (Rule 5.1(a)(ii) PCT).

Re Item VIII

Certain observations on the international application

- 1 Claim 1 is unclear (Article 6 PCT) because the expression "a telecom service that **permits (..) to**" is a result to be achieved (See PCT Guidelines, 5.35). In the light of the description of the present application it appears that the invention could be described in more concrete terms i.e. in terms of *how* the effect is to be achieved. using, for instance, the "ARol Server" and the steps defined on page 14.
- 2 The expression "**he** is roaming" used in claim 1 is ambiguous and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT because it is unclear who is the person defined by the pronoun "he". There are two possibilities indeed: Either "the subscriber" or "the caller". However, in the light of the description, it appears that the pronoun "he" refers only to "the subscriber" and not to "the caller".
- 3 The feature of claim 1 "**informing** the caller, where he is roaming and **the local time there**" is unclear thereby rendering claim 1 unclear (Article 6 PCT).
 - 3.1 First, the expression is linguistically inappropriate since the last part of the expression, "and **the local time there**", seems to relate to the task of informing. However, it is unclear what a sentence like "**informing** the caller (..) **the local time there**" could mean. In the light of the description on page 10, the expression should be understood as "(..) informed about the roaming location of the **callee** and the **local time** of the city where he is".
 - 3.2 Second, it appears however that the said feature is not supported by the description as required by Article 6 PCT, which renders the scope of claim 1 broader than justified by the description. What is more, claim 1 again attempts to define the subject-matter in terms of a **result to be achieved**:

It is indeed not defined in the description *how* concretely the local time of the roaming location that the callee/subscriber could be computed and it additionally appears that the invention is in that respect **insufficiently disclosed**, rendering it unclear (Article 6 PCT).

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference ARoL	FOR FURTHER ACTION		See item 4 below
International application No. PCT/IB2017/056589	International filing date (<i>day/month/year</i>) 24 October 2017 (24.10.2017)	Priority date (<i>day/month/year</i>) 22 October 2017 (22.10.2017)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant JAMOUSI, Mohamed			

<p>1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.</p>																								
<p>3. This report contains indications relating to the following items:</p> <table> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> <p>4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).</p>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
<input checked="" type="checkbox"/>	Box No. I	Basis of the report																						
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<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																						
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<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application																						
<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application																						

	Date of issuance of this report 28 April 2020 (28.04.2020)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Cécile Chatel
Facsimile No. +41 22 338 82 70	e-mail: ro.ib@wipo.int

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**
(PCT Rule 43*bis*.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IB2017/056589

International filing date (day/month/year)
24.10.2017

Priority date (day/month/year)
22.10.2017

International Patent Classification (IPC) or both national classification and IPC
INV. H04W8/12 H04W8/18

Applicant
JAMOUSSE, MOHAMED

1. This opinion contains indications relating to the following items:

- Box No. I Basis of the opinion
- Box No. II Priority
- Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- Box No. IV Lack of unity of invention
- Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- Box No. VI Certain documents cited
- Box No. VII Certain defects in the international application
- Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0
Fax: +49 89 2399 - 4465

Date of completion of this opinion

see form
PCT/ISA/210

Authorized Officer

Tessier, Serge

Telephone No. +49 89 2399-0



Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - the international application in the language in which it was filed.
 - a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
 - a. forming part of the international application as filed:
 - in the form of an Annex C/ST.25 text file.
 - on paper or in the form of an image file.
 - b. furnished together with the international application under PCT Rule 13ter.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. furnished subsequent to the international filing date for the purposes of international search only:
 - in the form of an Annex C/ST.25 text file (Rule 13ter.1(a)).
 - on paper or in the form of an image file (Rule 13ter.1(b) and Administrative Instructions, Section 713).
4. In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	<u>1</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1</u>
Industrial applicability (IA)	Yes: Claims	<u>1</u>
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following document:

D1 US 2008/139202 A1 (WANG BINGFU [CN] ET AL) 12 June 2008
(2008-06-12)

1 Independent claim 1

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

D1 discloses a telecom service that permits to his subscriber, when roaming abroad, to:

- Limit calls at inconvenient times, by informing the caller, where he is roaming and the local time there
- Better managing received calls, by inviting - indirectly - the caller to assume roaming charges in certain situations, rather than rejecting the call reception ([0065]: "*prompting the roaming state of the called subscriber, when a call is initiated by a calling party, roaming state information of a called subscriber is sent by the network side to the calling party, so as to allow the calling party to determine whether to proceed with or terminate the call according to the roaming state information. Therefore, according to the method, the situation that the calling party initiates a call at an inappropriate time or initiates some unnecessary calls may be avoided, thus saving the communication fee for the called subscriber*").

Therefore, the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT, and the requirements of Article 33(1) PCT are therefore not met.

Re Item VII

Certain defects in the international application

- 1 The independent claim 1 is not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from prior art D1 being placed in the preamble (Rule 6.3(b)(i) PCT) and the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).


- 2 The steps and features of independent claim 1 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- 3 The relevant background art disclosed in D1 should be acknowledged in the description (Rule 5.1(a)(ii) PCT).

Re Item VIII

Certain observations on the international application

- 1 Claim 1 is unclear (Article 6 PCT) because the expression "a telecom service that **permits (..) to**" is a result to be achieved (See PCT Guidelines, 5.35). In the light of the description of the present application it appears that the invention could be described in more concrete terms i.e. in terms of *how* the effect is to be achieved. using, for instance, the "ARol Server" and the steps defined on page 14.
- 2 The expression "**he** is roaming" used in claim 1 is ambiguous and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT because it is unclear who is the person defined by the pronoun "he". There are two possibilities indeed: Either "the subscriber" or "the caller". However, in the light of the description, it appears that the pronoun "he" refers only to "the subscriber" and not to "the caller".
- 3 The feature of claim 1 "**informing** the caller, where he is roaming and **the local time there**" is unclear thereby rendering claim 1 unclear (Article 6 PCT).
 - 3.1 First, the expression is linguistically inappropriate since the last part of the expression, "and **the local time there**", seems to relate to the task of informing. However, it is unclear what a sentence like "**informing** the caller (..) **the local time there**" could mean. In the light of the description on page 10, the expression should be understood as "(..) informed about the roaming location of the **callee** and the **local time** of the city where he is".
 - 3.2 Second, it appears however that the said feature is not supported by the description as required by Article 6 PCT, which renders the scope of claim 1 broader than justified by the description. What is more, claim 1 again attempts to define the subject-matter in terms of a **result to be achieved**:

It is indeed not defined in the description *how* concretely the local time of the roaming location that the callee/subscriber could be computed and it additionally appears that the invention is in that respect **insufficiently disclosed**, rendering it unclear (Article 6 PCT).

<p style="text-align: center;">FORM 18 THE PATENT ACT, 1970 (39 of 1970) & THE PATENT [AMENDMENT] RULES, 2006 REQUEST FOR EXAMINATION OF APPLICATION FOR PATENT [See section 11B and rule 20(4)(ii), 24B(1)(i)]</p>	<p style="text-align: right;">(FOR OFFICE USE ONLY)</p> <p>RQ. No. Filing Date: Amount of Fee Paid: CBR No: Signature</p>
<p>1. APPLICANT</p> <p>(i) NAME : JAMOUSSE, Mohamed</p> <p>(ii) NATIONALITY : TUNISIA</p> <p>(iii) ADDRESS : 3 Koulifa Rachidites Tunis, 1004(TN)</p>	
<p>2. Statement in case of request for examination made by the applicant(s)</p> <p>We hereby request that our application for patent no. 202017020730 dated May 16, 2020 for the invention titled “<u>ANNOUNCED ROAMING LOCATION (AROL) SERVICE</u>” shall be examined under sections 12 and 13 of the Act.</p>	
<p>3. Statement in Case of Request for Examination made by any other Interested Person</p> <p style="text-align: center;">Not Applicable</p>	
<p>4. ADDRESS FOR SERVICE:</p> <p>Ideas2IPR B-115 Chander Nagar, Janak Puri, New Delhi-110058 Tel: +91 9891016781 Fax: +91 11 25620164 Email: mail@ideas2ipr.com</p>	
<p style="text-align: center;">Dated this the 21st day of May, 2020</p> <div style="text-align: right; margin-right: 20%;">  RAJAT MALHOTRA Agent for the Applicant [IN/PA-1775] Ideas2IPR </div> <p>To, The Controller of Patents The Patent Office, At New Delhi</p>	