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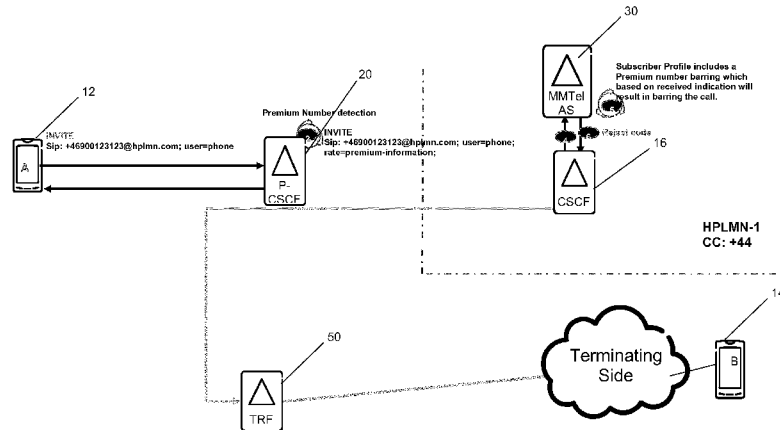


Figure 2

(57) Abstract: A method of call barring following a Proxy-Call Session Control Function receiving an SIP INVITE message from a UE, the SIP INVITE message includes an identity of a terminating endpoint. The P-CSCF compares the identity of the terminating endpoint to the identity of premium rate services stored in a memory of the P-CSCF and, if the identity of the terminating endpoint is the same as an identity of the premium rate service stored in the memory, inserting an indicator into the SIP INVITE message to produce a modified SIP INVITE message. When the modified SIP INVITE message is received at an Application Server, the Application Server determines, from a subscriber profile associated with the originating endpoint identity, if the subscriber associated with the originating endpoint identity has selected to deny connections to premium rate services. If the subscriber has selected to deny connections and an indicator is included in the SIP INVITE message then the Application Server causes the call connection requested in the SIP INVITE message to be denied. In an alternative method the Application Server receives an unmodified SIP INVITE message and determines, from a subscriber profile associated with the originating endpoint identity, if the subscriber associated with the originating endpoint identity has selected to deny connections to premium rate services. If the subscriber has selected to deny connections to premium rate services then the Application Server inserts an indicator into the SIP INVITE message to indicate that the connections are to be denied. This indicator may be used subsequently by another function to determine whether or not to deny the call connection request in the SIP INVITE message.



## Call Barring

### Technical Field

The present invention relates to a method of implementing call barring using an IP Multimedia Subsystem. It may be used for, although is not necessarily limited to, use with a roaming endpoint for a IP Multimedia Subsystem subscriber.

### Background

IP Multimedia Subsystems (IMS) provide a combination of voice, video, messaging, data, etc, within the same session. As the number of basic applications and the media which it is possible to combine increases, the number of services offered to the end users will grow, and the potential for enriching inter-personal communication experience will be improved. This leads to a new generation of personalised, rich multimedia communication services, including so called "combinational IP Multimedia" services.

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IMS is the technology defined by the Third Generation Partnership Project (3GPP) to provide IP Multimedia services over mobile and converged communication networks. IMS provides features to enhance the end user person-to-person communication experience through the integration and interaction of services. IMS allows enhanced person-to-person (client-to-client) as well as person-to-content (client-to-server) communications over an IP-based network. The IMS makes use of the Session Initiation Protocol (SIP) to set up and control calls or sessions between user terminals (or user terminals and Application Servers). The Session Description Protocol (SDP) carried by SIP signalling is used to describe and negotiate the media components of the session. Whilst SIP was created as a user-to-user protocol, IMS allows operators and service providers to control user access to services and to charge users accordingly. Other protocols are used for media transmission and control, such as Real-time Transport Protocol and Real-time Transport Control Protocol (RTP/RTCP).

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Within an IMS network, Call Session Control Functions (CSCFs) perform processing and routing of signalling. CSCFs handle session establishment, modification and release of IP multimedia sessions using the SIP/SDP protocol suite. 3GPP TS23.228 describes the logical nodes P-CSCF, I-CSCF, S-CSCF, E-CSCF and BGCF. The S-CSCF conforms to 3GPP TS 24.229 and performs session control services for User

Equipments (UEs). It maintains the session state to support the services, and performs the following functions:

it acts as a registrar according to [RFC3261] at registration;

it notifies subscribers about registration changes;

5 it provides session control for the registered users' sessions;

it handles SIP requests, and either services these internally or forwards them on to a further node; and

it interacts with IMS Application Servers.

10 The S-CSCF performs SIP routing according to 3GPP routing procedures. For inbound SIP traffic, the S-CSCF will route sessions to that P-CSCF whose address was stored during subscriber registration. For outbound SIP traffic, the S-CSCF interrogates a DNS/ENUM to determine how the call should be routed. The S-CSCF interacts with the Home Subscriber Server (HSS) to obtain subscriber data and to exchange  
15 authentication information using DIAMETER messages.

The IMS allows IMS subscribers to initiate sessions with non-IMS users, including users connected to conventional telephone networks. IMS subscribers may also be allocated addresses such as telephone numbers to allow for incoming calls to be made  
20 to these subscribers via external networks. This results in increased usage of new multimedia services and therefore higher revenues for operators.

Each UE in an IMS may preferentially use specific Application Servers for executing originating services, terminating services or any other services required in a  
25 communication or call session. These preferences are linked to each UE and stored in an Initial Filter Criteria (iFCs) located in the HSS of a user's home network. A user's iFCs are downloaded to the S-CSCF upon registration of the user with the S-CSCF, or upon receiving a particular service demand.

30 Whenever a user agent A sends an SIP request, such as a SIP INVITE signal, to the S-CSCF, indicating that it would like to enter a communication session with user agent B, the S-CSCF checks user agent A's iFC to determine which Application Server should execute outgoing services for A.

Similarly, user B may always use a particular Application Server to execute terminating services. In particular, an iFC for user B may specify that two distinct Application Servers are to be used for terminating services handled for B, and originating services handled for B, respectively.

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One function of an Application Server for an originating UE may be to implement call barring services, for example to prevent a user from connecting to premium rate services.

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Often a user's UE is not connected directly to the home network, for example if they are using a laptop or a cellular phone in a different geographical location to access a session. In this case they will wish to be able to access the services regardless of their geographical location. To this end roaming is enabled in an IMS.

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To enable roaming, a user's UE connects to a P-SCSF in the visited network (i.e. the network where they have an IP connection). The P-CSCF connects to the user's S-CSCF in the user's home network and the S-CSCF acts to perform session control for that user. An example of a network where call roaming occurs is illustrated in Figure 1.

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To enable an Application Server to implement call barring service for premium numbers effectively the Application Server in the home network must be aware of all of the relevant premium numbers across the world. This can be time consuming to configure and, if the list is not up to date then connections to premium rate services may inadvertently occur.

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### Summary

In accordance with an aspect of a first embodiment of the present invention there is provided a Proxy-Call Session Control Function, P-CSCF. The P-CSCF includes an input to receive a SIP INVITE message from a UE. The SIP INVITE message includes an identity of a terminating endpoint. The P-CSCF also includes a memory including an identity of a premium rate service and a processor to compare the identity of the terminating endpoint to the identity of the premium rate service. If the identity of the terminating endpoint is the same as the identity of the premium rate service, the P-CSCF inserts an indicator into the SIP INVITE message to produce a modified SIP INVITE message. The P-CSCF may then transmit the modified SIP INVITE message

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from an output. By including an indicator in the SIP INVITE message a P-CSCF in a visited network can indicate whether the terminating identity relates to a premium rate service in the visited network. This means that network each need only maintain a database of identities associated with premium rate services in their network as, if the terminating identity relates to a premium rate service in the visited network this will be indicated in the SIP INVITE message.

The memory of the P-CSCF may optionally include identities for a plurality of premium rate services, each premium rate service relating to one or more of a plurality of types of premium rate services. In such an instance the inserted indicator will relate to one of the plurality of types of premium rate service or may be a general indicator indicating that connections to any type of premium rate service are to be denied. This allows call connections to be denied selectively according to the types of services a user is barred from connecting to.

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In accordance with a second aspect of a first embodiment of the present invention there is provided a method where a Proxy-Call Session Control Function, P-CSCF, receives a SIP INVITE message from a UE. The SIP INVITE message includes an identity of a terminating endpoint. The method includes comparing the identity of the terminating endpoint to the identity of a premium rate service stored in a memory of the P-CSCF. An indicator is inserted into the SIP INVITE message to produce a modified SIP INVITE message if the identity of the terminating endpoint is the same as the identity of the premium rate service. Finally, the modified SIP INVITE message is transmitted. By including an indicator in the SIP INVITE message a P-CSCF in a visited network can indicate whether the terminating identity relates to a premium rate service in the visited network. This means that each network need only maintain a database of identities associated with premium rate services in their network as, if the terminating identity relates to a premium rate service in the visited network this will be indicated in the SIP INVITE message.

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Optionally, the memory includes identities for a plurality of premium rate services and the premium rate services relate to a plurality of types of premium rate services. In such an instance, inserting an indicator into the SIP INVITE message takes the form of inserting an indicator to one of the plurality of types of premium rate service. This

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allows call connections to be denied selectively according to the types of services a user is barred from connecting to.

5 In accordance with a third aspect of a first embodiment of the present invention there is provided an Application Server. The Application Server includes an input to receive an SIP INVITE message. The SIP INVITE message includes an originating endpoint identity, a terminating endpoint identity and an indicator that the terminating endpoint is associated with a premium rate service. The Application Server also includes a memory including a subscriber profile associated with the originating endpoint identity.  
10 A processor is included in the Application Server and generates a reject message if it determines, from the subscriber profile, that connections from the subscriber associated with the originating endpoint identity to premium rate services are to be denied and, from the indicator, that the terminating endpoint is associated with a premium rate service. The Application Server further includes an output to transmit the  
15 reject message in order to terminate the call. By receiving an indicator in the SIP INVITE message that the call set up request relates to a premium rate service the Application Server can easily determine whether or not to deny the connection.

20 Optionally, the indicator in the SIP INVITE message may specify a type of premium rate service. In this case the processor of the Application Server determines from the subscriber profile that connections from endpoints associated with the subscriber to terminating identities associate with the type of premium rate service in the indicator should be barred. This allows call connections to be denied selectively according to the types of services a user is barred from connecting to.

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The processor of the Application Server may alternatively determine, from the indicator or an absence of an indicator that the identity of the terminating endpoint is not an identity associated with a premium rate service. This enables the Application Server to automatically continue with connection initiation procedures without having to further  
30 consult the subscriber profile to determine whether call barring is implemented for that subscriber.

An input of the Application Server may receive a request from the subscriber or a third party to include in the subscriber's profile an indication to deny connections to premium

rate services or to deny connections to one or more types of premium rate services. The third party may be, for example, a telephony operator

5 The Application Server may be a multimedia telephony service (MMTel AS), telephony Application Server, or any other related Application Server.

10 In accordance with a fourth aspect of a first embodiment of the present invention there is provided a method of implementing call barring. The method includes receiving a SIP INVITE message at an Application Server. The SIP INVITE message includes an originating endpoint identity, a terminating endpoint identity and an indicator that the terminating endpoint is associated with a premium rate service. The method further includes determining, from a subscriber profile associated with the originating endpoint identity, if the subscriber associated with the originating endpoint identity has selected to deny connections to premium rate services. If the subscriber associated with the originating endpoint identity has selected to deny connections to premium rate services and the indicator indicates that the terminating endpoint is associated with a premium rate service then a reject message is generated and transmitted. In this way the Application Server can easily determine whether or not to deny the connection requested in the SIP INVITE message.

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The indicator may specify a type of premium rate service in which case the Application Server performs the step of determining from the subscriber profile whether the subscriber has selected to deny connections to the type of premium rate service in the indicator and generates a reject message if the subscriber associated with the originating endpoint identity has selected to deny connections to a type of premium rate service presented in the indicator.

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30 The method may further include the step of determining, from the indicator or an absence of an indicator that the identity of the terminating endpoint is not an identity associated with a premium rate service. This enables the Application Server to automatically continue with connection initiation procedures without having to further consult the subscriber profile to determine whether call barring is implemented for that subscriber.

In accordance with a first aspect of a second embodiment of the present invention there is provided an Application Server. The Application Server includes an input to receive an SIP INVITE message, the SIP INVITE message including an originating endpoint identity. The Application Server further includes a memory including a  
5 subscriber profile associated with the originating endpoint identity and a processor. The processor determines, from the subscriber profile associated with the originating endpoint identity, that connections from the subscriber associated with the originating endpoint identity to premium rate services are to be denied. If connections to premium rate services by the subscriber are to be denied then the Application Server inserts an  
10 indicator into the SIP INVITE message to produce a modified SIP INVITE message. Finally, the Application Server transmits the modified SIP INVITE message from an output. By inserting an indicator into the SIP INVITE message to indicate whether the connections to premium rate services are to be denied the Application Server does not need to perform a look-up to determine whether or not the terminating identity in the  
15 SIP INVITE message relates to premium rate services. This means that the CSCF of the subscriber's home network need not keep details of every identity providing premium rate services in every network but rather may be limited to maintaining details of identities within its network that provide premium rate services.

20 The processor of the Application Server may further determine from the subscriber profile indicates whether connections between an endpoint associated with the subscriber and a type of premium rate service are to be denied. In such a case the indicator inserted into the SIP INVITE message specifies the type of premium rate service. Optionally, the indicator may specifically indicate that connections to any type  
25 of premium rate service are to be denied. Further the processor may also be configured to determine, from the subscriber profile that connections to premium rate services are allowed and include an indicator that connections for the subscriber to premium rate services should be allowed.

30 The Application Server may include an input to receive a request from a subscriber or a third party to include in a subscriber profile indications to deny connections to premium rate services. The third party may be a telephony operator.

In accordance with a second aspect of a second embodiment of the present invention  
35 there is provided a method of implementing call barring. The method includes the step



of receiving a SIP INVITE message, the SIP INVITE message including an originating endpoint identity. A subscriber profile associated with the originating endpoint identity, is used to determine that connections from the subscriber associated with the originating endpoint identity to premium rate services are to be denied. If the subscriber associated with the originating endpoint identity has selected to deny connections to premium rate services an indicator is inserted into the SIP INVITE message to produce a modified SIP INVITE message. The modified SIP INVITE message is then transmitted.

10 In accordance with a third aspect of a second embodiment of the present invention there is provided a transit roaming function, TRF. The TRF includes an input, a memory and a processor. The input receives a SIP INVITE message, the SIP INVITE message including an identity of an originating endpoint, an identity of a terminating endpoint and an indicator that connections from the subscriber associated with the originating endpoint identity to premium rate services are to be denied. The memory includes an identity of a premium rate service. The processor is arranged to compare the identity of the terminating endpoint to the identity of the premium rate service and, if the identity of the terminating endpoint is the same as the identity of the premium rate service, generate a reject message.

20 The indicator in the SIP INVITE message may specify a type of premium rate service and the memory of the TRF include identities for a plurality of premium rate services, the premium rate services relating to a plurality of types of premium rate services. In such a case the processor of the TRF generates the reject message if the type of premium rate service associated with the identity of the terminating endpoint in the memory is the same as the type of premium rate service specified in the indicator.

30 The input of the TRF may also be able to receive an SIP INVITE message including an indicator that connections to premium rate services for the subscriber associated with the originating endpoint are not to be denied. This means that the TRF does not need to determine whether the terminating endpoint relates to a premium rate service but can continue with call set-up.

#### Brief Description of the Drawings

Figure 1 is a block diagram of elements in a home network and a visited network including an IMS;

Figure 2 illustrates the paths of signals according in a first embodiment of the invention;

Figure 3 is a flow diagram of the first embodiment of the invention;

5 Figure 4 illustrates a P-CSCF for use in the first embodiment of the invention;

Figure 5 illustrates an MMTel Application Server for use in the first embodiment of the invention;

Figure 6 illustrates the paths of signals according to a second embodiment of the invention;

10 Figure 7 is a flow diagram of the second embodiment of the invention;

Figure 8 illustrates an MMTel Application Server for use in the first embodiment of the invention; and

Figure 9 illustrates a transit routing function for use in the first embodiment of the invention.

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#### Detailed Description

A first embodiment of the present invention will now be described with reference to Figures 2 and 3. A UE 12 of a user registered with an IMS is connected to a visited network. In Step 1 the UE 12 transmits a SIP INVITE to the P-CSCF 20 in the visited network.

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An example of such a P-CSCF 20 is illustrated in Figure 4. The P-CSCF 20 has a memory 24 which stores identities of premium rate services for the visited network and a processor 26. The P-CSCF receives the SIP INVITE message at an input 22. In step 2 the P-CSCF 20 determines whether the terminating identity in the SIP INVITE message is a number relating to a premium rate service using the identities of premium rate services stored in the memory 24.

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If the P-CSCF 20 determines that the terminating identity does not relate to that of a premium service then the SIP INVITE message is transmitted from the output 28 to the CSCF of the home network in the usual manner.

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If the P-CSCF 20 determines that the terminating number is included in the identities of premium services stored in the memory 24 then the processor 26 inserts an indicator into the SIP INVITE message indicating that the terminating identity relates to a

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premium rate service. An example of such a message is illustrated in Figure 2. The modified SIP INVITE message is transmitted from the output 26 to the CSCF of the home network in step 3.

5 The S-CSCF of the home network receives the modified SIP INVITE message it examines the initial Filter Criteria (iFC) for the user that the UE is associated with. The iFCs for the user includes an iFC for an MMTel Application Server 30 requiring invocation of the MMTel Application Server 30 when a SIP INVITE message is received by the S-CSCF. Thus, the S-CSCF forwards the modified SIP INVITE  
10 message to the MMTel Application Server 30 in step 4 of the method.

An example of an MMTel Application Server 30 according to the present invention is illustrated in Figure 5. The MMTel Application Server 30 receives the modified SIP INVITE at the input and the processor 36 determines whether the SIP INVITE message  
15 includes an indication that the terminating identity is for a premium service. If the SIP INVITE message includes no indication then the MMTel Application Server carries out any other processing required by the user and transmits the SIP INVITE message from the output 38 to the CSCF 16.

20 If the SIP INVITE includes an indication then in Step 5 the MMTel Application Server will also determine from the user's subscriber profile stored in the memory 34 whether connections to premium rate services are barred for the user. If connections to premium rate services are barred for the user and the SIP INVITE message includes an indication that the terminating identity is for a premium rate service, then the MMTel  
25 Application Server 30 transmits a reject message to the CSCF 16 of the home network in step 6. The S-CSCF then terminates the call initiation sequence in step 7. The call initiation sequence may be terminated using any suitable method.

The second embodiment of the invention is illustrated in Figures 6 and 7. As in the first  
30 embodiment UE 12 which is registered with an IMS transmits a SIP INVITE message to a P-CSCF 20 in the visited network. In step 2 the P-CSCF determines the CSCF in for the home network and in step 3, the P-CSCF 20 forwards the SIP INVITE message to the CSCF 16 of the home network according to any suitable method. As discussed with reference to the first embodiment the S-CSCF of the home network upon receiving  
35 the SIP INVITE message examines the initial Filter Criteria (iFC) for the user that the

UE is associated with. The iFCs for the user includes an iFC for an MMTel Application Server 30 requiring invocation of the MMTel Application Server 30 when a SIP INVITE message is received by the S-CSCF. Thus, the S-CSCF forwards the modified SIP INVITE message to the MMTel Application Server 30 in step 4 of the method.

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An example of an MMTel Application Server 40 is illustrated in Figure 8. The MMTel Application Server 40 includes a number of subscriber profiles in the memory, amongst other information a subscriber profile may include information on whether connections to premium rate services are barred for the user. Upon receiving the SIP INVITE message at the input 42 the processor 46 of the MMTel Application Server 40 determines from the subscriber profile whether connections to premium rate services are barred for the user.

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If the connections to premium rate services are not barred then the SIP INVITE message is transmitted from the output 48 of the MMTel Application Server 40 to the CSCF 16 and a call connection can continue according to any suitable method.

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If connections to premium rate services are barred for the user then the processor 46 modifies the SIP INVITE message to include an indicator that connections to premium rate services are barred for the users (Step 5). The modified SIP INVITE message is transmitted from the output 26 to the CSCF in step 6. An example of such a modified SIP INVITE message is illustrated in Figure 6.

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In step 7 the CSCF 16 upon receiving the modified SIP INVITE message transmits the modified SIP INVITE message to a transit routing function (TRF) 50 such as that illustrated in Figure 9. The TRF 50 may be implemented on any suitable device, for example, it may be implemented on a device as part of the I-CSCF.

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The TRF 50 includes a memory 54 which stores identities of premium rate services for the visited network and a processor 56. The TRF 50 receives the SIP INVITE message at an input 52. In step 8, processor 56 of the TRF 50 determines whether the SIP INVITE message includes an indication that the connections to premium rate services are barred for the subscriber. If the SIP INVITE message includes no such indication then the TRF continues call set up in the usual manner.

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If the SIP INVITE includes an indication then in Step 8 the TRF 50 will also determine whether the terminating identity in the SIP INVITE message is a number relating to a premium rate service using the identities of premium rate services stored in the memory 54. If the terminating identity is for a premium rate service and the SIP INVITE message includes an indication that connections to premium rate services are barred for the user then the TRF 50 terminates the call initiation sequence in step 9. The call initiation sequence may be terminated using any suitable method.

Although the present invention has been described with reference to barring of connections to premium rate services the skilled person will understand that the present invention may equally be applied to subsets of types of terminating identities. For example, there are presently information premium rate services and entertainment premium rate services and the invention may be implemented to bar calls to one or more of these types of premium rate services. In such a case the indicator inserted into the SIP INVITE message will indicate the type of services to which call connections are barred. A call connection will only be denied if connections to the type of service provided by the terminating identity is the same as a type of service that is indicated as being barred in the subscriber profile for the user.

The Application Server may be a multimedia telephony application server, a telephony server or any other suitable type of application server.

The subscriber profile may include information on barred services entered by the subscriber or by the operator of the home network.

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Although the present invention has been described with reference to an endpoint connecting to a P-CSCF in a visited network it is clear that it is equally applicable to a SIP INVITE message sent to a P-CSCF in the subscriber's home network.

**CLAIMS:**

1. A Proxy-Call Session Control Function, P-CSCF, (20) comprising:
  - an input (22) to receive a SIP INVITE message from a UE (12), the SIP INVITE message including an identity of a terminating endpoint (14);
  - 5 a memory (24) including an identity of a premium rate service;
  - a processor (26) to compare the identity of the terminating endpoint (14) to the identity of the premium rate service and, if the identity of the terminating endpoint (14) is the same as the identity of the premium rate service, insert an indicator into the SIP INVITE message to produce a modified SIP INVITE message; and
  - 10 an output (28) to transmit the modified SIP INVITE message.
  
2. The P-CSCF (20) of claim 1 wherein the memory (24) includes identities for a plurality of premium rate services and the premium rate services relate to a plurality of types of premium rate services, wherein the inserted indicator relates to one of the  
15 plurality of types of premium rate service.
  
3. A method comprising receiving, at a Proxy-Call Session Control Function, P-CSCF, (20) a SIP INVITE message from a UE (12), the SIP INVITE message including an identity of a terminating endpoint (14), compare the identity of the terminating  
20 endpoint (14) to the identity of the premium rate service stored in a memory (24) of the P-CSCF (20), inserting an indicator into the SIP INVITE message to produce a modified SIP INVITE message if the identity of the terminating endpoint (14) is the same as the identity of the premium rate service, and transmitting the modified SIP INVITE message.  
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4. The method of claim 3 wherein the memory (24) includes identities for a plurality of premium rate services and the premium rate services relate to a plurality of types of premium rate services, wherein the step of inserting an indicator comprises inserting an indicator to one of the plurality of types of premium rate service.  
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5. An Application Server (30) comprising:
  - an input (32) to receive an SIP INVITE message, the SIP INVITE message including an originating endpoint identity, a terminating endpoint identity and an indicator that the terminating endpoint (14) is associated with a premium rate service;

a memory (34) including a subscriber profile associated with the originating endpoint identity;

5 a processor (36) to generate a reject message if it determines from the subscriber profile that connections from the subscriber associated with the originating endpoint identity to premium rate services are to be denied and, from the indicator, that the terminating endpoint (14) is associated with a premium rate service; and  
an output (38) to transmit the reject message.

6. The Application Server (30) of claim 5 wherein the indicator specifies a type of  
10 premium rate service and the processor (36) determining from the subscriber profile that connections from endpoints associated with the subscriber to terminating identities associate with the type of premium rate service in the indicator should be barred.

7. The Application Server (30) of claim 5 or claim 6 wherein the processor (36) is  
15 configured to determine, from the indicator that the identity of the terminating endpoint is not an identity associated with a premium rate service.

8. The Application Server (30) of any one of claims 5 to 7 wherein the Application  
20 Server (30) is configured by the subscriber or a third party to include in a subscriber profile an indication to deny connections to premium rate services or to deny connections to one or more types of premium rate services.

9. The Application Server (30) as claimed in claim 8 wherein the third party is a  
25 telephony operator

10. The Application Server (30) of any one of claims 5 to 9 wherein the Application  
Server is a multimedia telephony service or telephony Application Server.

11. A method comprising receiving an SIP INVITE message at an Application  
30 Server(30), the SIP INVITE message including an originating endpoint identity, a terminating endpoint identity and an indicator that the terminating endpoint (14) is associated with a premium rate service, determining from a subscriber profile associated with the originating endpoint identity that connections from the subscriber associated with the originating endpoint identity to premium rate services are to be  
35 denied and generating and transmitting a reject message if connections from the

subscriber associated with the originating endpoint identity to premium rate services are to be denied and the indicator indicates that the terminating endpoint is associated with a premium rate service.

5 12. The method of claim 11 wherein the indicator specifies a type of premium rate service and step of determining comprises determining from the subscriber profile whether the subscriber has selected to deny connections to the type of premium rate service in the indicator.

10 13. The method of claim 11 or claim 12 further comprising determining, from an indicator in the SIP INVITE message that the identity of the terminating endpoint is not an identity associated with a premium rate service.

14. An Application Server (40) comprising:

15 an input (42) to receive an SIP INVITE message, the SIP INVITE message including an originating endpoint identity;

a memory (44) including a subscriber profile associated with the originating endpoint identity;

20 a processor (46) to determine, from the subscriber profile, that connections from the subscriber associated with the originating endpoint identity to premium rate services are to be denied and, if connections to premium rate services by the subscriber are to be denied, insert an indicator into the SIP INVITE message to produce a modified SIP INVITE message; and

an output (48) to transmit the modified SIP INVITE message.

25

15. The Application Server (40) of claim 14 wherein the processor (46) determines from the subscriber profile whether connections between an endpoint associated with the subscriber and a type of premium rate service are to be denied and the indicator specifies the type of premium rate service.

30

16. The Application Server (40) of claim 14 or claim 15 wherein the processor is configured to determine, from the subscriber profile that connections to a type of premium rate service should not be denied and the indicator specifies that connections for the subscriber to premium rate services should not be denied.

35



17. The Application Server (40) of any one of claims 14 to 15 wherein the Application Server is further configured by the subscriber or a third party to include in a subscriber profile indications to deny connections to premium rate services

5 18. The Application Server (40) as claimed in claim 17 wherein the third party is a telephony operator.

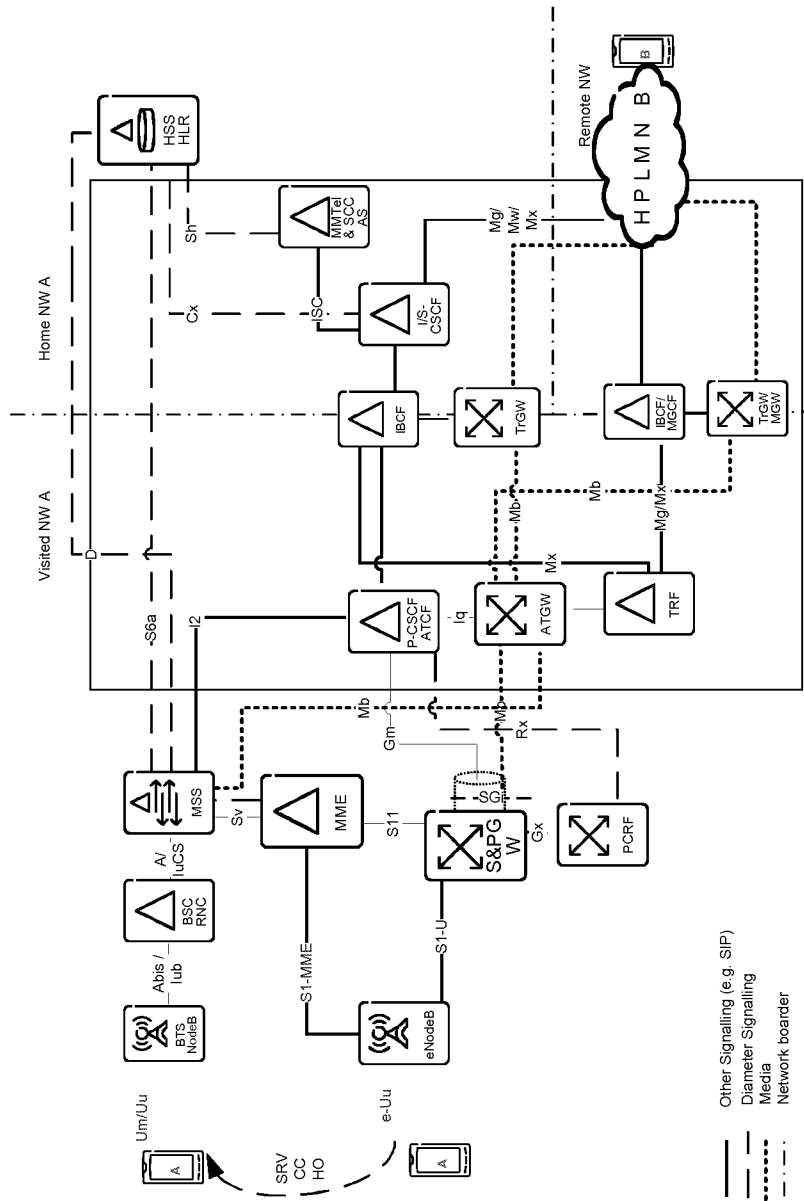
10 19. A method comprising receiving an SIP INVITE message, the SIP INVITE message including an originating endpoint identity, determine, from a subscriber profile associated with the originating endpoint identity, that connections from the subscriber associated with the originating endpoint identity to premium rate services are to be denied and if the subscriber associated with the originating endpoint identity has selected to deny connections to premium rate services inserting an indicator into the SIP INVITE message to produce a modified SIP INVITE message, and transmitting the  
15 modified SIP INVITE message.

20. A transit roaming function, TRF, (50) comprising:  
an input (52) to receive an SIP INVITE message, the SIP INVITE message including an identity of an originating endpoint (12), an identity of a terminating  
20 endpoint (14) and an indicator that connections from the subscriber associated with the originating endpoint identity to premium rate services are to be denied;  
a memory (54) including an identity of a premium rate service;  
a processor (56) to compare the identity of the terminating endpoint to the identity of the premium rate service and, if the identity of the terminating endpoint is the  
25 same as the identity of the premium rate service, generate a reject message.

30 21. The TRF (50) of claim 20 wherein the indicator specifies a type of premium rate service, the memory (56) includes identities for a plurality of premium rate services, the premium rate services relating to a plurality of types of premium rate services, and the processor (56) generates the reject message if the type of premium rate service associated with the identity of the terminating endpoint (14) in the memory is the same as the type of premium rate service specified in the indicator.

35 22. The TRF of claim 20 or claim 21 wherein the input is further configured to receive an SIP INVITE message including an indicator that connections to premium

rate services for the subscriber associated with the originating endpoint are not to be denied.



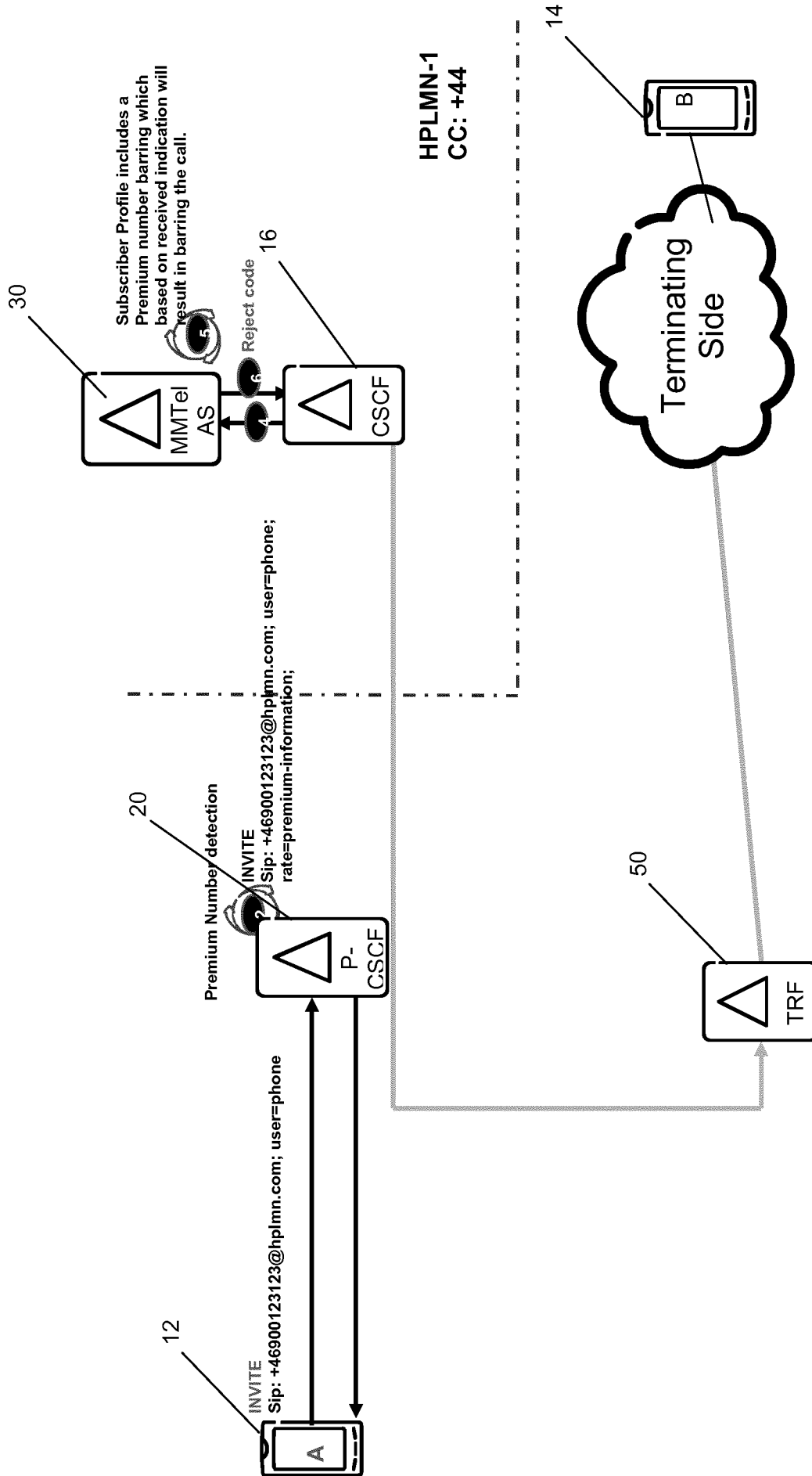


Figure 2

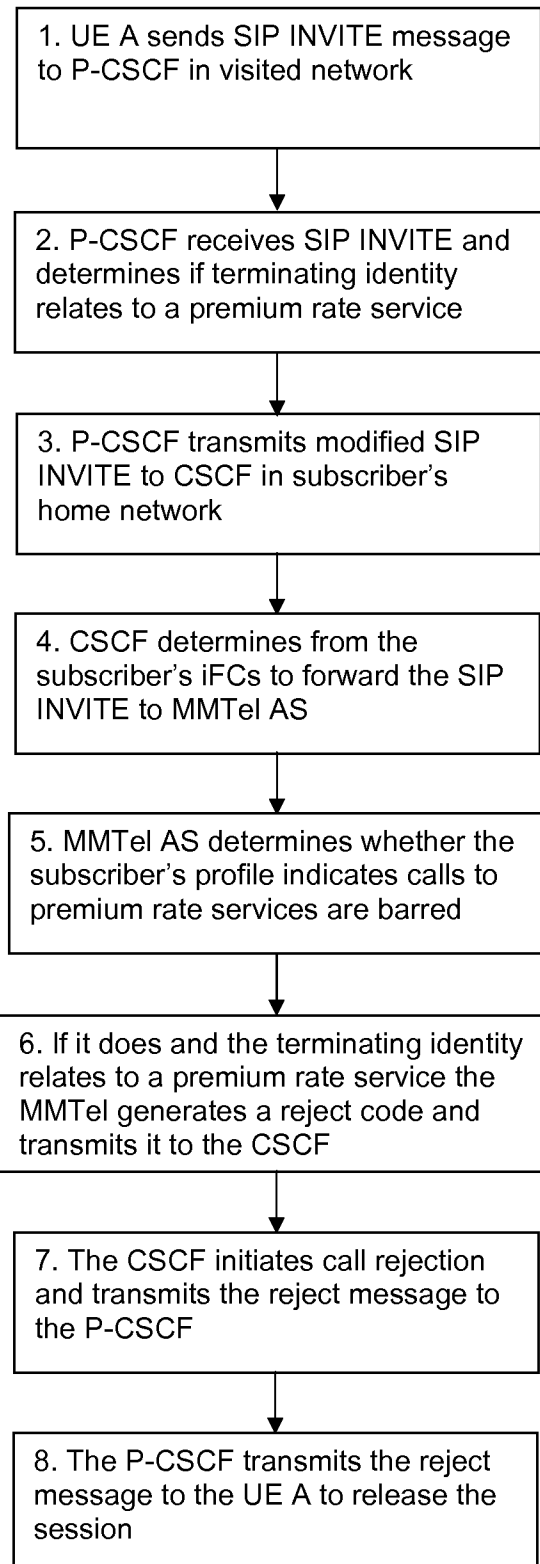


Figure 3

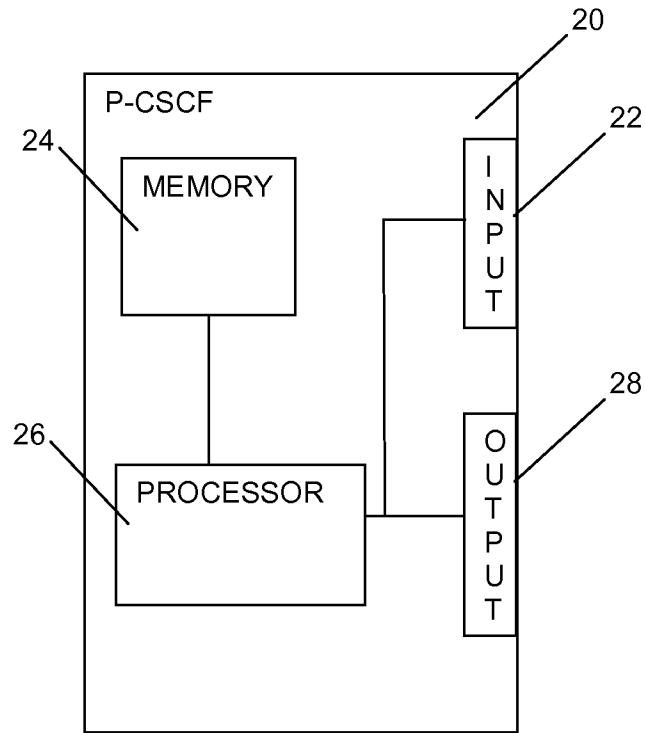


Figure 4

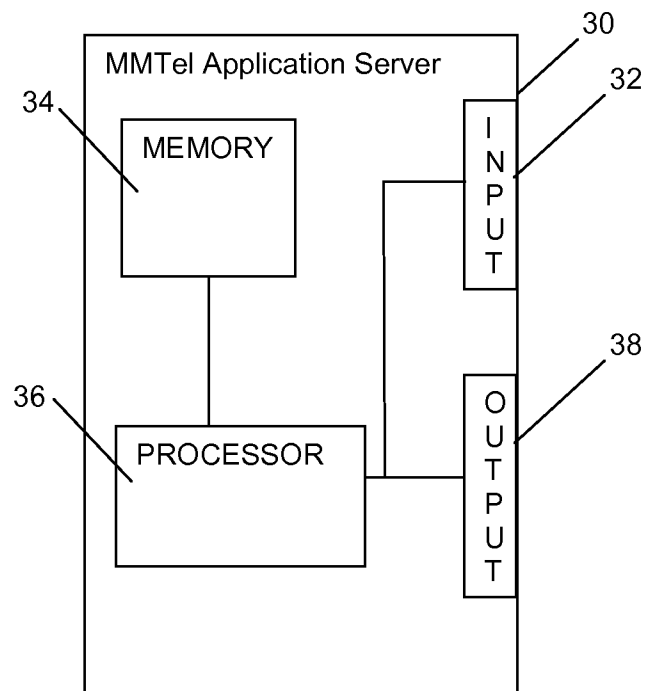


Figure 5

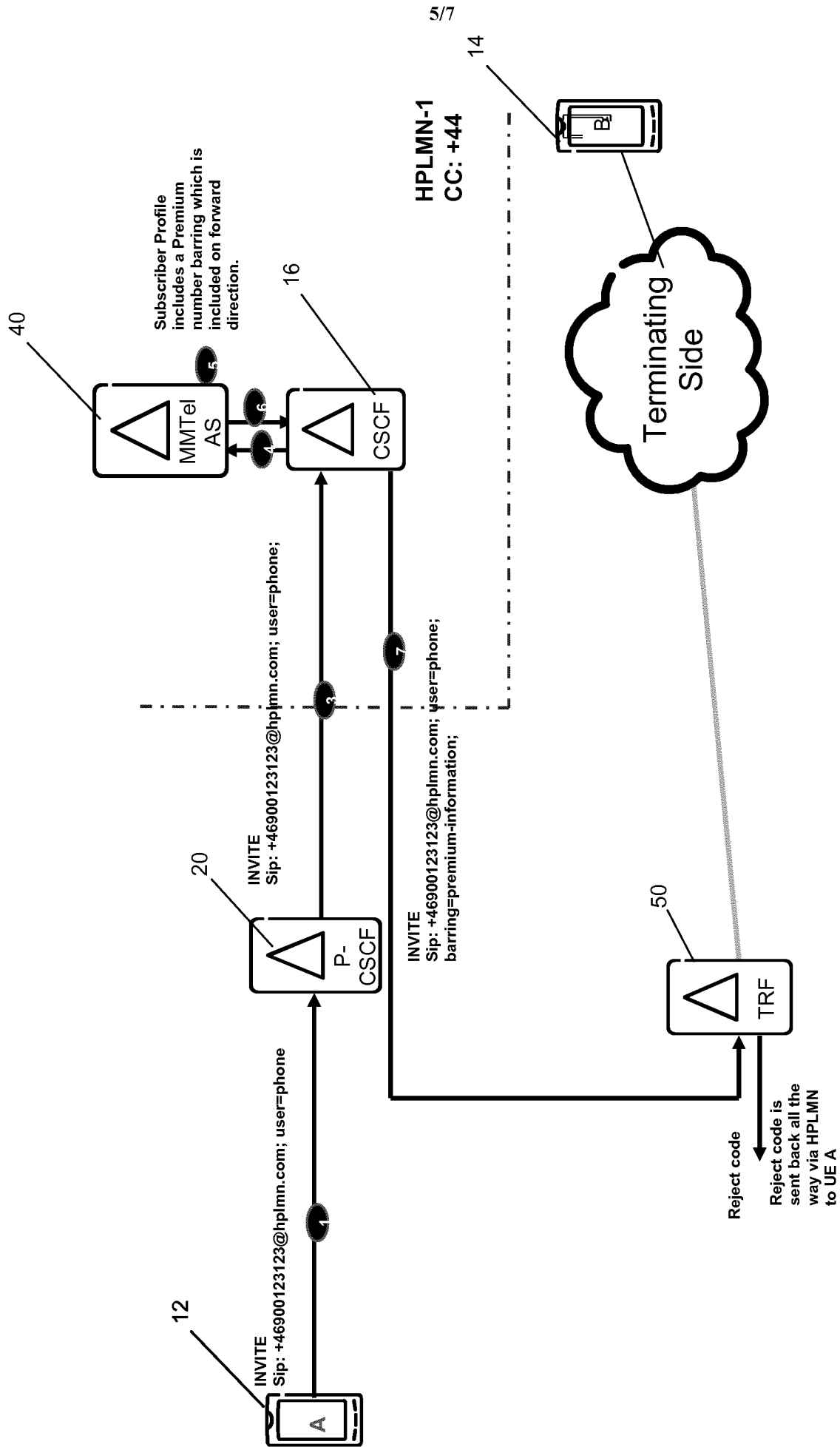


Figure 6

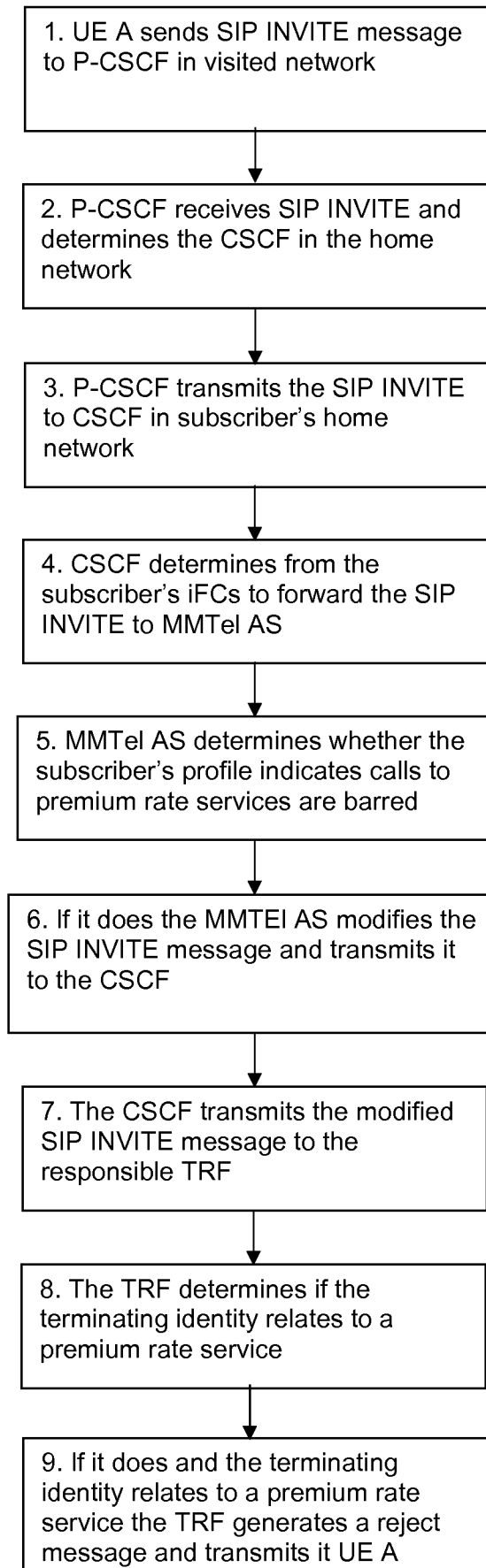


Figure 7



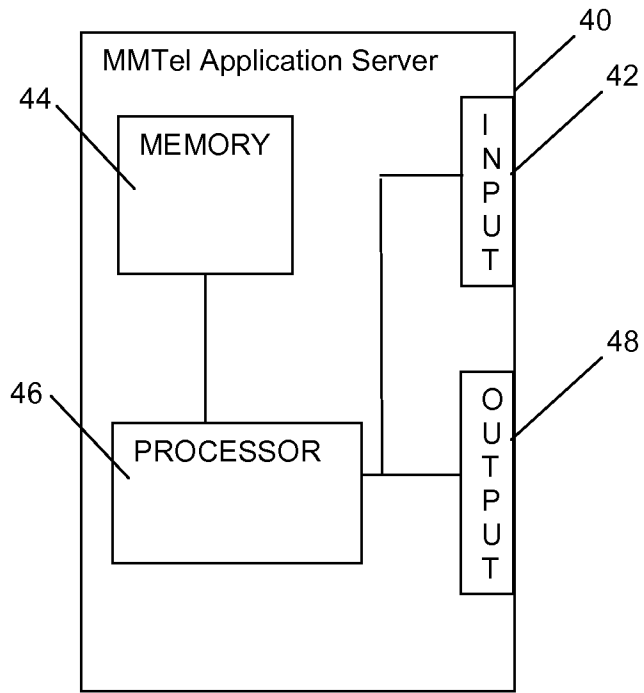


Figure 8

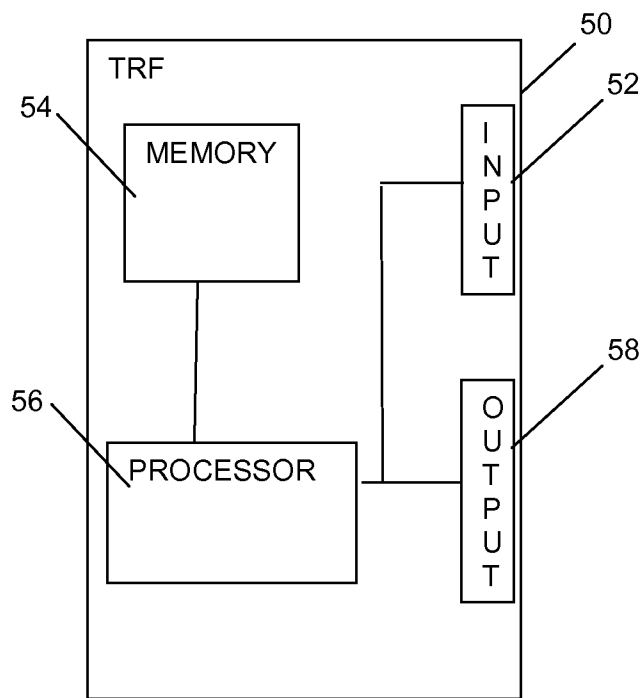


Figure 9

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/EP2012/060975

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. H04L29/06  
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)  
H04L  
  
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EPO-Internal, COMPENDEX, 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	SIVACHELVAN CISCO SYSTEMS C ET AL: "The Call Type tel URI Parameter for Session Initiation Protocol (SIP); draft-sivachelvan-iptel-call-type-00.txt", 20060906, 6 September 2006 (2006-09-06), XP015047269, ISSN: 0000-0004 abstract paragraphs [0001], [0003] - [0004], [0006] -----	1-22

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  1 February 2013	Date of mailing of the international search report  08/02/2013
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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  Mannekens, Jan
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