(54) Title: METHOD AND SYSTEM FOR PROVIDING CALLER RELATED INFORMATION TO CALLED PARTY IN TELE-COMMUNICATION NETWORK
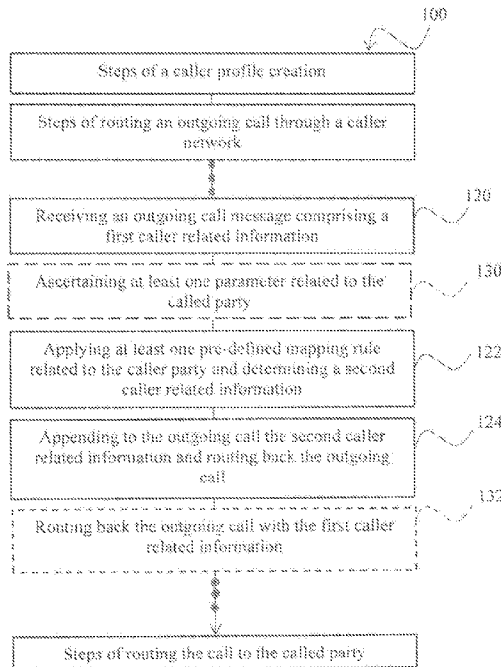
Figure 1

(57) Abstract: The present invention provides method and a designated node (200) in a telecommunication network for providing caller related information to a called party in a telecommunication network. The node (200) comprises one or more sub-components (202- 208) configured to receive an outgoing call comprising a first caller related information; applying, at least one pre-defined mapping rule related to the caller party based on the first caller related information and determining a second caller related information; and appending to the outgoing call the second caller related information and routing the outgoing call to the MSC, thereby enabling the MSC to route the outgoing call with the second caller related information to the called party.

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

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METHOD AND SYSTEM FOR PROVIDING CALLER RELATED INFORMATION TO CALLED PARTY IN TELECOMMUNICATION NETWORK

FIELD OF THE INVENTION:

The present invention relates to methods and system for communicating information, during the setting up a call but before the call is answered, in a telecommunication network.

BACKGROUND OF THE INVENTION:

With the advent of caller ID facility, the recipient of a phone call is able to track a caller's contact number. Such facility aids instant identification of the caller by the recipient only in case the recipient is acquainted with the caller's contact number, and more so when the contact number is stored as an address book name. As a result, the chances of call being answered by the recipient are quite favorable in such scenarios. However, in case of unfamiliar contact numbers displayed to the recipient during the phone call, many a times the recipient feels disinclined to answer owing to "pesky caller" menace. Such dis-inclination is more observed during odd hours, especially between 8 PM and 8 AM, when the phone users are generally confined to privacy.

As a result, many a times the recipient tends to ignore either urgent phone calls or phone calls made by acquaintances through unidentified contact numbers. A dilemma is also caused to the network operator owing to non-answering of many phone calls, as the same cuts shorts an intended revenue. In addition, non-answering of phone calls owing to disinterest shown by recipient leads to an under-utilization of allocated bandwidth in an otherwise robust communication channel.

Accordingly, there has been a long felt need to enable a caller in communicating self-details at least in the form of caller's name for display at the recipient-instrument during setting up of a phone call, so as to motivate the recipient towards call-answering.

Another need of the hour is to enable the caller in customizing the caller related information to be displayed at various recipients' end during the setting up of the call.

Yet, another need of the hour is to instantiate the existing telecommunication network with the aforesaid facility, without performing any significant upgradation/changes to the network nodes (MSC/IN/HLR/SCP).

OBJECT OF THE INVENTION:

Thus, it is an object of the present invention to enable a caller party in communicating self-details for display at the recipient's instrument, during the ringing

signal, or when the call is being set up but before the call is answered, irrespective of the address book contents of the recipient.

It is another object of the present invention to provide a method and a system for enabling the caller party to customize and control caller related information to be displayed

5   at the called party's instrument during the setting up of the call.

It is another object of the present invention to accomplish the communication of the caller information to be displayed at the called party's end during the ringing signal, with negligible changes/up gradations to the existing network nodes in a telecommunication network.

10   Yet another object of the present invention to provide an ease of deployment and rolling out of the aforesaid "caller name display" based services as provided to the caller party.

SUMMARY OF THE INVENTION:

Accordingly, the present invention provides a method for providing a caller related

15   information to a called party in a telecommunication network, the caller related information being a customized caller related information, the method comprising:

receiving, by a designated node from an MSC, an outgoing call comprising a first caller related information;

applying, by the designated node, at least one pre-defined mapping rule related to the

20   caller party based on the first caller related information and determining a second caller related information; and

appending, by the designated node, to the outgoing call, the second caller related information and routing the outgoing call to the MSC, thereby enabling the MSC to route the outgoing call with the second caller related information to the called party.

25   The present invention also provides a designated network node for providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the node comprising:

a receiver for receiving, from an MSC, an outgoing call comprising a first caller related information;

30   a selector to apply at least one pre-defined mapping rule related to the caller party based on the first caller related information and determining a second caller related information;

and

a transmitter for appending to the outgoing call the second caller related information and routing the outgoing call to the MSC, thereby enabling the MSC to route the outgoing call with the second caller related information to the called party.

The present invention also provides method of providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the method comprising:

receiving, by a network node from an MSC, an authorization request comprising a destination number in respect of an outgoing call;

appending, by the network node, an identifier to the destination number and generating an authorization message including the same, upon satisfaction of at least one predetermined criteria; and

communicating said authorization message, by the network node to the MSC, thereby enabling the MSC in routing the outgoing call to a designated node for requesting a revised caller related information.

The present invention furthermore provides a network node in a telecommunication network for providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the node comprising:

a receiver for receiving, from an MSC, an authorization request comprising a destination number in respect of an outgoing call;

a processor to append an identifier to the destination number and generate an authorization message including the same, upon satisfaction of at least one predetermined criteria; and

a transmitter for communicating said authorization message to the MSC, thereby enabling the MSC in routing the outgoing call to a designated node for requesting a revised caller related information.

To further clarify advantages and features of the present invention, a more particular description of the invention will be rendered by reference to specific embodiments thereof, which is illustrated in the appended drawings. It is appreciated that these drawings depict only typical embodiments of the invention and are therefore not to be considered limiting of its scope. The invention will be described and explained with additional specificity and detail with the accompanying drawings.

Brief Description of Figures:

These and other features, aspects, and advantages of the present invention will become better understood when the following detailed description is read with reference to the accompanying drawings in which like characters represent like parts throughout the drawings, wherein:

Figure 1 shows a flow chart corresponding to a first embodiment of the invention;

Figure 2 shows a detailed internal construction of the apparatus in accordance with first embodiment of the present invention;

Figure 3 shows a flow chart corresponding to a second embodiment of the invention;

Figure 4 shows a detailed internal construction of the apparatus in accordance with second embodiment of the present invention;

Figure 5 shows a detailed internal construction of the apparatus as described in Fig. 2 and 4;

Figure 6 shows an exemplary control flow diagram along with the overall system configuration corresponding to a first and second embodiment of the invention; and

Figure 7 shows anotherexemplary control flow diagram along with the overall system configuration corresponding to a first and a second embodiment of the invention.

Further, skilled artisans will appreciate that elements in the drawings are illustrated for simplicity and may not have been necessarily been drawn to scale. For example, the flow charts illustrate the method in terms of the most prominent steps involved to help to improve understanding of aspects of the present invention. Furthermore, in terms of the construction of the device, one or more components of the device may have been represented in the drawings by conventional symbols, and the drawings may show only those specific details that are pertinent to understanding the embodiments of the present invention so as not to obscure the drawings with details that will be readily apparent to those of ordinary skill in the art having benefit of the description herein.

Detailed Description:

For the purpose of promoting an understanding of the principles of the invention, reference will now be made to the embodiment illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated system, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

It will be understood by those skilled in the art that the foregoing general description and the following detailed description are exemplary and explanatory of the invention and are not intended to be restrictive thereof.

Reference throughout this specification to "an aspect", "another aspect" or similar language means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, appearances of the phrase "in an embodiment", "in another embodiment" and similar language throughout this specification may, but do not necessarily, all refer to the same embodiment.

The terms "comprises", "comprising", or any other variations thereof, are intended to cover a non-exclusive inclusion, such that a process or method that comprises a list of steps does not include only those steps but may include other steps not expressly listed or inherent to such process or method. Similarly, one or more devices or sub-systems or elements or structures or components proceeded by "comprises... a" does not, without more constraints, preclude the existence of other devices or other sub-systems or other elements or other structures or other components or additional devices or additional sub-systems or additional elements or additional structures or additional components.

Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. The system, methods, and examples provided herein are illustrative only and not intended to be limiting.

Embodiments of the present invention will be described below in detail with reference to the accompanying drawings.

In today's world, a caller ID system facilitates display of the contact details of a calling subscriber at the called party's end during a ringing signal or when the dialled call is being set up but before being answered by the called party. Such caller ID is functionality is further assisted by the locally stored records within the called party's address book or phone book, wherein the same enables flashing of a caller party's name at the display of the called party's phone instrument, provided the caller party's contact details are stored within the address book of the called party under a particular name.

However, a major drawback of the caller ID functionality as also pointed out in the background section is the non-display of caller's name or any other resembling identifier at the called party's instrument, when the caller party is not associated within the phone-book

or address book of the called party. In some instances, the called party may make up for such drawback by personally remembering a contact number for some of the caller parties, rather than storing the same in the address books. However, such instances are substantially lesser in number owing to limited memory of a human being.

5   As a result, the unidentified caller party's calls to a called party many a times either do not get answered on time or remain non-answered. As a compensatory measure, even if the called party resorts to call back the unidentified caller party after a time delay, such delayed response severely disregards the sensitivity of an urgent caller's phone call. Also, in such a scenario, even close acquaintances like family members are unable to reach the called

10   party on time or sometimes are never able to reach, in case the un-identified number is used to execute a call.

        Off late, mechanisms have been in place that attempt to solve the aforesaid drawbacks by performing caller number to name translations through the telecommunication network nodes. Such mechanisms have been briefly discussed below:

15   EP2144478 describes translations for number to name carried by a called MSC using subscription profiles of HLR using CAP/IN messages. Translations are done by the called MSC for all calls of the caller and per call basis control of name display is within the hands of called person.

        US20070211873 describes a called terminal based approach, wherein a called

20   terminal on receiving calls, queries network for the name.

        US6061560 and US6826270 describe a caller MSC based approach to translate numbers to name. The said mechanism accordingly prescribes up gradations and changes to the MSC for the purposes of querying databases for accomplishing number to name translations.

25   US 5864612 andUS20040196966 describes usage of INAP to query SCP for retrieving the caller name details, wherein INAP is used to query the SCP and the SCP in turn queries a database.

        However, the conventional arts in turn suffer from a number of drawbacks. One of the foremost draw-back is that the major control of communicating and displaying the

30   callerparty's name is performed at the network node associated with the called party. Accordingly, a caller party in such instances cannot afford to display a customized name or a preferred caller name related information to the called party's. Rather, it is the called party's preference that defines the display of the caller party' name.

Moreover, the caller party is rendered incapable of exclusively rendering the "number to name translation" based service, as there is a huge dependency on the called party network. Accordingly, there always remains a substantial amount of "incapacity" at the caller party's end towards rendering such services.

Nonetheless, based upon teachings provided by the arts, even if the called party is attempted to be given control, by enabling any of the existing caller party network node in communicating a caller-name related information to the called party for display, the same requires massive up-gradation and infrastructural changes within the caller party network for compatibility. In other words, the caller party network's MSC /Intelligent Network/SCP/HLR are required to be substantially upgraded for instantiation of the services.

Moreover, in case the "caller name display" related services need to be rolled out with respect to one or more customers by the network operator, the effort requires a massive overhaul of the existing network nodes owing to the fact that the core network nodes i.e. MSC/Intelligent Network/SCP/HLR, have been used for instantiation of the services. As a result, such problem proves to be a major roadblock for any network operator, considering the now-a-days culture of telecommunication subscribers frequently availing and discarding various value added services.

Now referring to figure 1, it can be seen that the present invention provides a method of providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the method comprising:

receiving, by a designated node from an MSC, an outgoing call comprising a first caller related information; (step 120)

applying, by the designated node, at least one pre-defined mapping rule related to the caller party based on the first caller related information and determining a second caller related information; and (step 122)

appending, by the designated node, to the outgoing call the second caller related information and routing the outgoing call to the MSC, thereby enabling the MSC to route the outgoing call with the second caller related information to the called party. (step 126)

In an embodiment, wherein the first and second caller related information comprises a caller MSISDN and a caller name, respectively.

In another embodiment of the invention, the invention further comprises routing the outgoing call to the MSC without appending to the outgoing call the second caller related

information, if no mapping rule is found, thereby enabling the MSC for routing the outgoing call with the first caller related information to the called party. (Step 132)

In still another embodiment, the invention further comprises ascertaining at least one parameter related to the called party in respect of at least one of a MSISDN, location, time zone, profile, age, gender, and type of subscription availed by the called party.(Step 130)

In a further embodiment of the invention, wherein ascertaining at least one parameter related to the called party comprises sending at least one of a MAP ATI and a MAP SRI for a SM message from the designated node to query a network subscriber database.

In yet another embodiment, wherein the second caller related information is determined based on at least one ascertained parameter

In another embodiment, wherein the routing the outgoing call to the called party by the MSC comprises sending at least one of the second caller related information and a caller MSISDN through an ISUP IAM message to another MSC associated with the called party network.

In yet another embodiment, the invention further comprises maintaining a caller profile comprising a plurality of mapping rules linking the caller MSISDN to a plurality of called party MSISDN, wherein the caller profile is created by the caller party through at least one of SMS and USSD based interfaces or any other analogus interface. (Step 100)

In a further more embodiment of the invention, wherein applying the at least one pre-defined mapping rule comprises selection of at least one mapping rule from the plurality of mapping rules in the caller profile based at least on the first caller related information and a called party related information associated with the outgoing call.

Referring to figure 2, the present invention also provides a designated network node (200) for providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the node (200) comprising:

a receiver (202) for receiving, from an MSC, an outgoing call comprising a first caller related information in respect of an outgoing call;

a selector (204) to apply at least one pre-defined mapping rule related to the caller party based on the first caller related information and determining a second caller related information; and

a transmitter (206) for appending to the outgoing call the second caller related information and routing the outgoing call to the MSC, thereby enabling the MSC to route the outgoing call with the second caller related information to the called party.

Now referring to figure 3, it can be seen that the present invention provides a method of providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the method
5   comprising:

receiving, by a network node from an MSC, an authorization request comprising a destination number in respect of an outgoing call; (step 320)

appending, by the network node, an identifier to the destination number and generating an authorization message including the same, upon satisfaction of at least one
10   predetermined criteria; and (step 322)

communicating said authorization code, by the network node to the MSC, thereby enabling the MSC in routing the outgoing call to a designated node for requesting a revised caller related information. (step 324)

In an embodiment, wherein prior to determining the authorization message for the
15   MSC, the invention further comprises:

communicating, by the network node to the MSC, at least one of an approval or disapproval based indication based on the caller party's subscription; and (step 330)

performing the steps (322-324) by the network node, upon communicating the approval based indication. (step 332)

20   In another embodiment of the invention, the invention further comprising communicating, a non-identifier based authorization message by the network node to the MSC, thereby enabling the MSC in routing the outgoing call to the called party without having to communicate with the designated node, (step 334)

wherein said communication of non-identifier based authorization code is preceded by at
25   least one of following conditions:

receipt of a service de-activation based command by the network node from the caller party; and

determining the caller party to be a non-subscriber of a pre-defined service.

In still another embodiment, wherein the network node is an intelligent network (IN)
30   based node.

In a further embodiment of the invention, wherein communicating the authorization message by the network node to the MSC enables the MSC to provide an original caller related information to the designated node.

In yet another embodiment, wherein communicating the authorization message comprises addition of said identifier to a called party MSISDN.

In yet another embodiment, wherein appending the identifier to the destination number by the network node is based on determining a type of subscription profile of the caller party.

In yet another embodiment, wherein appending the identifier to the destination number by the network node comprises modifying a service key associated with the outgoing call based on a pre-paid subscription profile of the caller party.

In yet another embodiment, wherein appending the identifier to the destination number by the network node comprises creating a service key associated with the outgoing call based on a post-paid subscription profile of the caller party.

Referring to figure 4, the present invention also provides network node (400) in a telecommunication network for providing a caller related information to a called party in a telecommunication network, wherein the caller related information is a customized caller related information, the node comprising:

a receiver (402) for receiving, from an MSC, an authorization request comprising a destination numberin respect of an outgoing call;

a processor (404) to append an identifier to the destination number and generate an authorization message including the same, upon satisfaction of at least one predetermined criteria; and

a transmitter (406) for communicating said authorization message to the MSC, thereby enabling the MSC in routing the outgoing call to a designated node in a home network for requesting a revised caller related information.

Referring to figure 5, yet another typical hardware configuration of the designated node 200 and the network node 400 in the form of a computer system 200, 400 is shown. The computer system 200, 400 can include a set of instructions that can be executed to cause the computer system 200, 400 to perform any one or more of the methods disclosed. The computer system 200, 400 may operate as a standalone device or may be connected, e.g., using a network, to other computer systems or peripheral devices.

In a networked deployment, the computer system 200, 400 may operate in the capacity of a server or as a client user computer in a server-client user network environment, or as a peer computer system in a peer-to-peer (or distributed) network environment. The computer system 200, 400 can also be implemented as or incorporated into various devices, such as a personal computer (PC), a tablet PC, a personal digital assistant (PDA), a mobile device, a

palmtop computer, a laptop computer, a desktop computer, a communications device, a wireless telephone, a land-line telephone, a web appliance, a network router, switch or bridge, or any other machine capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that machine. Further, while a single computer system 200, 400 is illustrated, the term "system" shall also be taken to include any collection of systems or sub-systems that individually or jointly execute a set, or multiple sets, of instructions to perform one or more computer functions.

The computer system 200, 400 may include a processor 502 e.g., a central processing unit (CPU), a graphics processing unit (GPU), or both. The processor 502 may be a component in a variety of systems. For example, the processor 502 may be part of a standard personal computer or a workstation. The processor 502 may be one or more general processors, digital signal processors, application specific integrated circuits, field programmable gate arrays, servers, networks, digital circuits, analog circuits, combinations thereof, or other now known or later developed devices for analysing and processing data The processor 502 may implement a software program, such as code generated manually (i.e., programmed).

The computer system 200, 400 may include a memory 504, such as a memory 504 that can communicate via a bus 508. The memory 504 may be a main memory, a static memory, or a dynamic memory. The memory 504 may include, but is not limited to computer readable storage media such as various types of volatile and non-volatile storage media, including but not limited to random access memory, read-only memory, programmable read-only memory, electrically programmable read-only memory, electrically erasable read-only memory, flash memory, magnetic tape or disk, optical media and the like. In one example, the memory 504 includes a cache or random access memory for the processor 502. In alternative examples, the memory 504 is separate from the processor 502, such as a cache memory of a processor, the system memory, or other memory. The memory 504 may be an external storage device or database for storing data. Examples include a hard drive, compact disc ("CD"), digital video disc ("DVD"), memory card, memory stick, floppy disc, universal serial bus ("USB") memory device, or any other device operative to store data. The memory 504 is operable to store instructions executable by the processor 502. The functions, acts or tasks illustrated in the figures or described may be performed by the programmed processor 502 executing the instructions stored in the memory 504. The functions, acts or tasks are independent of the particular type of instructions set, storage media, processor or processing strategy and may be performed by software, hardware, integrated circuits, firm-ware, micro-

code and the like, operating alone or in combination. Likewise, processing strategies may include multiprocessing, multitasking, parallel processing and the like.

As shown, the computer system 200, 400 may or may not further include a display unit 510, such as a liquid crystal display (LCD), an organic light emitting diode (OLED), a flat panel display, a solid state display, a cathode ray tube (CRT), a projector, a printer or other now known or later developed display device for outputting determined information. The display 510 may act as an interface for the user to see the functioning of the processor 502, or specifically as an interface with the software stored in the memory 504 or in the drive unit 516.

Additionally, the computer system 200, 400 may include an input device 512 configured to allow a user to interact with any of the components of system 200, 400. The input device 512 may be a number pad, a keyboard, or a cursor control device, such as a mouse, or a joystick, touch screen display, remote control or any other device operative to interact with the computer system 200, 400.

The computer system 200, 400 may also include a disk or optical drive unit 516. The disk drive unit 516 may include a computer-readable medium 522 in which one or more sets of instructions 524, e.g. software, can be embedded. Further, the instructions 524 may embody one or more of the methods or logic as described. In a particular example, the instructions 524 may reside completely, or at least partially, within the memory 504 or within the processor 502 during execution by the computer system 200, 400. The memory 504 and the processor 502 also may include computer-readable media as discussed above.

The present invention contemplates a computer-readable medium that includes instructions 524 or receives and executes instructions 524 responsive to a propagated signal so that a device connected to a network 526 can communicate voice, video, audio, images or any other data over the network 526. Further, the instructions 524 may be transmitted or received over the network 526 via a communication port or interface 520 or using a bus 508. The communication port or interface 520 may be a part of the processor 502 or may be a separate component. The communication port 520 may be created in software or may be a physical connection in hardware. The communication port 520 may be configured to connect with a network 526, external media, the display 510, or any other components in system 200, 400, or combinations thereof. The connection with the network 526 may be a physical connection, such as a wired Ethernet connection or may be established wirelessly as discussed later. Likewise, the additional connections with other components of the system

200, 400 may be physical connections or may be established wirelessly. The network 526 may alternatively be directly connected to the bus 508.

The network 526 may include wired networks, wireless networks, Ethernet AVB networks, or combinations thereof. The wireless network may be a cellular telephone network, an 802.11, 802.16, 802.20, 802.1Q or WiMax network. Further, the network 526 may be a public network, such as the Internet, a private network, such as an intranet, or combinations thereof, and may utilize a variety of networking protocols now available or later developed including, but not limited to TCP/IP based networking protocols.

In an alternative example, dedicated hardware implementations, such as application specific integrated circuits, programmable logic arrays and other hardware devices, can be constructed to implement various parts of the system 200, 400.

Applications that may include the systems can broadly include a variety of electronic and computer systems. One or more examples described may implement functions using two or more specific interconnected hardware modules or devices with related control and data signals that can be communicated between and through the modules, or as portions of an application-specific integrated circuit. Accordingly, the present system encompasses software, firmware, and hardware implementations.

The system described may be implemented by software programs executable by a computer system. Further, in a non-limited example, implementations can include distributed processing, component/object distributed processing, and parallel processing. Alternatively, virtual computer system processing can be constructed to implement various parts of the system.

The system is not limited to operation with any particular standards and protocols. For example, standards for Internet and other packet switched network transmission (e.g., TCP/IP, UDP/IP, HTML, HTTP) may be used. Such standards are periodically superseded by faster or more efficient equivalents having essentially the same functions. Accordingly, replacement standards and protocols having the same or similar functions as those disclosed are considered equivalents thereof.

In the following paragraphs a detailed description about implementation of the aforesaid method is provided. It should however, be understood every implementation of the method need not follow the scenario as mentioned in the following paragraphs. Thus, the scope of the claims is intended to be restricted only on the basis of the claims and their equivalents and not on the basis of the examples provided herein below.

TECHNICAL METHOD OF EXAMPLE 1:

The present example depicts a technical implementation of the present invention, where the caller (who may be either a pre-paid or post-paid caller subscriber) has not availed
5   a regular subscription of the service to display caller names at the called subscriber's end, and rather avails the service on a discrete basis.

Referring to Figure 6, a caller party registers "a caller party profile" with a name call system 602 (which corresponds to the designated node 200 described in Fig. 1-4) present within the home network vide step 6002, using SMS and USSD based interfaces or any
10   other analogus interfaces. More particularly, the caller party profile can include a mapping of names to specific numbers. For example, the caller party can indicate that the Name1 is to be displayed to M1 and M2 numbers; Name2 is to be displayed to M3 and M4 numbers; Name3 is to be displayed to rest of the numbers or no change of "number to name" done for rest of the numbers.

15   In addition, the caller party profile may also define various user preferences of depicting different particular caller names to a called party depending upon MSISDN, location, time zone, age , gender, nature of availed subscription (prepaid or post-paid type) of party B. In an example, the caller party may wish to display different names with respect to the same called party number at different time zones. Moreover, in case a called party
20   number belongs to a subscriber of particular age group (say teenager), the caller party may wish to depict a preferred caller name. Likewise, the caller party's discretion may be adopted in case the called party is a senior citizen, female, pre-paid subscriber or post-paid subscriber.

All of the aforesaid number to name mapping as well as caller party's defined
25   "preferences" with respect to "genre" of the called party may be stored within a name call system database (as shown later).

Further, vide step 6004, the caller party (say party A) initiates the call with another party (say party B) by some identifier (say "#"). An MSC 604 (say MSC A) of the home network routes a "#" prefix based call to the Name Call system 602 vide step 6006. In a
30   preferred implementation, the outgoing call is accompanied with an IAM comprising the caller party A's MSISDN, and the called party B MSISDN is prefixed with the identifier "#". The Name call system 602 determines a location, time zone, and profile related parameters of the called party B. In a preferred implementation, such determination is performed by using MAP ATI message or MAP SRI for SM message and queries a

network subscriber database (not shown in the figure) for finding other specific details such as age, gender, nature of availed subscription (prepaid or post-paidtype) of the party B.

After that, vide step 6008, the Name Call system 602 queries a name call system data base 606 for extracting any name mapping in respect of the party B. More specifically, the Name call System 602 searches the name call system database 606 to locate any name mapping (or attempts to locate a caller name) on the basis of called party B number as well as the just extracted party B details (through using MAP ATI message or MAP SRI for SM message and the network subscriber database). As aforesaid, the database 602 stores a caller party profile of the caller party A.

In case the name is located, the name call system database 606 communicates the same to the name call system 602 vide step 6010. Accordingly, vide step 6012, name call system 602 routes the call back to the MSC A 604 and appends to the outgoing call, the located name. In a preferred implementation, the name call system appends to the IAM associated with the outgoing call, the located name. Now, the updated IAM additionally includes the located name of the caller party A. Accordingly, the outgoing call accompanied with such updated IAM is routed to the MSC A 604.

Vide step 6014, the MSC A 604 forwards the outgoing call to an MSC 608 (say MSC B) corresponding to the home network of party B. In a preferred implementation, such forwarding of the outgoing call is accompanied with the updated IAM, which comprises the called party A's MSISDN, the called party B's MSISDN and the located name of the caller party A. Eventually, the MSC 608 further transmits the call to the party B with the mapped name.

Going back to the step 6008 again, in case no name related mapping is achieved, then the name call system database 606 communicates a "failure message" to the name call system 602 vide step 6010. Accordingly, vide step 6012, the name call system 602 routes back the outgoing call to the MSC A 604 without updating the associated IAM. Vide step 6014, the MSC A 604 forwards the call to the MSC B 808 with the original IAM message. Thereafter, the MSC 608 further transmits the call to the party B without the mapped name vide step.

A combination of conjoined actions performed by the Name call system 602 and the name call system database 606 have also been depicted in a text box 6016.

TECHNICAL METHOD OF EXAMPLE 2:

The present example depicts a technical implementation of the present invention, where a pre-paid or post-paid caller subscriber has availed a regular subscription of the service to display caller names at the called subscriber's end.

Referring to Figure 7, a user registers a caller party profile with a name call system 702 (that corresponds to the designated node 200 described in Fig. 1-4) present within the home network vide step 7002, using SMS and USSD based or any other like interfaces. As already described under the description of Fig. 6, the caller party profile includes name to specific number mappings and user defined preferences for displaying the caller name based on MSISDN, age, gender, location, time zone and other attributes of the called subscriber.

Further, vide step 7004, the caller party (say party A) initiates the call with another party (say party B). Now, as elaborated, an MSC 704 (say MSC A) of the home network generates a communication to the IN 706, instead of routing the outgoing call to the Name call system 702.

Accordingly, as a part of step 7006, the MSC 704sends an authorization request comprising a called party B's MSISDN (a destination number) to the IN 706for authorizing the outgoing call. In a preferred implementation, such request for authorization is communicated through an INAP based request message "CAP INIT DP" comprising the called party B's MSISDN. The IN 706 in turn checks the caller party A's credentials like sufficient amount of balance (pre-paid connection), non-pendency of unpaid phone bills till date (post-paid connection), among other similar parameters. If the caller party A is not eligible for the outgoing call, then IN 706 instructs the MSC 704 to abort the outgoing call and the process terminates at this point itself.

However, upon finding the caller party A eligible for the outgoing call, the IN 706 appends an identifier to the called party B's MSISDN and generates an authorization message including the same for sending to the MSC 704, upon satisfaction of a pre-determined criteria. Such criterion is based on the fact whether the caller party A has subscribed to "caller name display" service. If the caller party A is indeed such subscriber, the IN (or HLR, as the case may be) 706 generates the authorization message code comprising the called party B's MSISDN and an identifier (say #) and sends the same to the MSC 704. In a preferred implementation, such authorization message is communicated in the form of a "CAP CONNECT" message, vide step 7008. In case the caller party A is a non-subscriber of the "caller name display" service, i.e. the pre-determined criteria is not

satisfied, then the authorization message as generated and communicated vide step 7008 does not include the identifier. In other implementation, even if the caller party A is a regular subscriber of "caller name display service", the pre-determined criteria may remain non-satisfied in case the caller party A has requested for a temporary suspension/de-activation of such service.

As a part of the step 7008, where the called party A is indeed the subscriber to the "caller name display" service, the IN 706 may be specifically configured to perform certain procedural changes on a general subscriber profile of the caller party A depending on whether the caller party A is a pre-paid customer or post-paid customer. Accordingly, in case of a pre-paid customer, a service key is changed at the IN 706. However, in case of the post-paid customer, the service key is created at the IN 704. Accordingly, as foresaid in respect of the step 7008, the IN 706 prefixes "#" to a destination number and replies, in a preferred implementation, with the "CAP CONNECT" message as the authorization message to the MSC 704.

Subsequently, the MSC 704 routes an outgoing call with an IAM to the Name Call system 702, vide step 7010. Thereafter, the forthcoming steps 7012-7020 as depicted in the present figure correspond to the steps 6008-6016 of Fig. 6.

Further, in case of the pre-paid customers, the caller party A is charged for the availing the "Caller name display" service before the MSC 704 routes the call to the Name call system 702. Whereas, in case of the post-paid customers, the caller party A is charged for the service after the MSC A routes the call to the Name Call system 702. However, it may be understood that billing of the voice based calls (incoming or outgoing) is accomplished by known means in the art and irrespective of the "caller name display" service.

It is envisaged that the present invention may not require any upgrade/changes of the existing network nodes (like MSC/IN/SCP/HLR) for providing "caller name display" service, and rather it is only the routing/configuration changes that have been made on the existing network nodes to route the call between the existing network nodes and additionally deployed "designated node" or "a name call system" based node. As an example, the existing nodes are merely configured to create/change service keys (as performed by IN) and route only calls having prefix "#" or any other identifier (as performed by MSC) to the designated node 200.

The designated node 200 is the one upon which the core tasks (e.g. profile creation, profile database maintenance and adding caller name to the message, etc.) associated with

the "caller name display" have been centralized. Accordingly, the same facilitates an ease of rolling in and rolling out of the "caller name display" services.

Further, it is envisaged that the present invention will add up to the revenue of the network operator owing to the fact the probability of a call being answered is more even during odd hours (say 8 PM till 8 AM) and even while the called subscriber is roaming, owing to the display of the caller name. Further, subscription or availing of "caller name display" services by the subscriber, either in a regular or discrete manner, adds further revenue for the network operator.

Last but not the least, the present invention provides more control to a caller party by enabling a customized name to be displayed as per the user discretion. Such discretion based caller name display may be attributed to the "profile creation" based provision (as elaborated in Fig. 5) as provided to the caller party.

Moreover, in case the caller is a regular subscriber of the "caller name display" based service, the caller may choose to selectively skip availing the service by deactivating it, whenever the caller does not wish to avail the same. For such purposes, a deactivation based command may be sent through USSD or SMS based user interfaces or any other like interface to the IN (SCP) 706. Under such scenario, where the service has been temporarily deactivated, the IN (SCP) while sending the CAP CONNECT message to the MSC A 704 prohibits the MSC A 704 from sending any IAM message to the Name call system 702, and maintains such restriction, till the called party sends a reactivation request to the IN (SCP) 706.

While specific language has been used to describe the disclosure, any limitations arising on account of the same are not intended. As would be apparent to a person in the art, various working modifications may be made to the method in order to implement the inventive concept as taught herein.

The drawings and the forgoing description give examples of embodiments. Those skilled in the art will appreciate that one or more of the described elements may well be combined into a single functional element. Alternatively, certain elements may be split into multiple functional elements. Elements from one embodiment may be added to another embodiment. For example, orders of processes described herein may be changed and are not limited to the manner described herein. Moreover, the actions of any flow diagram need not be implemented in the order shown; nor do all of the acts necessarily need to be performed. Also, those acts that are not dependent on other acts may be performed in parallel with the other acts. The scope of embodiments is by no means limited by these specific examples.

Numerous variations, whether explicitly given in the specification or not, such as differences in structure, dimension, and use of material, are possible. The scope of embodiments is at least as broad as given by the following claims.

Benefits, other advantages, and solutions to problems have been described above with regard to specific embodiments. However, the benefits, advantages, solutions to problems, and any component(s) that may cause any benefit, advantage, or solution to occur or become more pronounced are not to be construed as a critical, required, or essential feature or component of any or all the claims.

WE CLAIM:

1. A method of providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the method comprising:

5   receiving (step 120), by a designated node from an MSC, an outgoing call comprising a first caller related information;

           applying (step 122), by the designated node, at least one pre-defined mapping rule related to the caller party based on the first caller related information and determining a second caller related information; and

10   appending (step 126), by the designated node, to the outgoing call, the second caller related information and routing the outgoing call to the MSC, thereby enabling the MSC to route the outgoing call with the second caller related information to the called party.

2.   The method as claimed in claim 1, wherein the first and second caller related
15   information comprises a caller MSISDN and a caller name, respectively.

3.   The method as claimed in claim 1, further comprising:

           routing (step 132) the outgoing call to the MSC without appending to the outgoing call the second caller related information if no mapping rule is found, thereby enabling the
20   MSC for routing the outgoing call with the first caller related information to the called party.

4.   The method as claimed in claim 1, further comprising ascertaining (step 130) at least one parameter related to the called party in respect of at least one of a MSISDN, location, time zone, profile, age, gender, and type of subscription availed by the called party.

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5.   The method as claimed in claim 5, wherein ascertaining at least one parameter related to the called party comprises sending at least one of a MAP ATI and a MAP SRI for a SM message from the designated node to query a network subscriber database.

30   6.   The method as claimed in claim 5, wherein the second caller related information is determined based on at least one ascertained parameter.

7.   The method as claimed in claim 1, wherein the routing the outgoing call to the called party by the MSC comprises sending at least one of the second caller related information

and a caller MSISDN through an ISUP IAM message to another MSC associated with the called party network.

8.   The method as claimed in claim 1, further comprising:

maintaining a caller profile comprising a plurality of mapping rules linking the caller MSISDN to a plurality of called party MSISDN, wherein the caller profile is created by the caller party through at least one of SMS , USSD based interfaces and any other analogus interface. (step 100)

9.   The method as claimed in claims 1 and 8, wherein applying the at least one pre-defined mapping rule comprises selection of at least one pre-defined mapping rule from the plurality of mapping rules in the caller profile based at least on the first caller related information and a called party related information associated with the outgoing call.

10.   A designated network node (200) for providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the node (200) comprising:

a receiver (202) for receiving, from an MSC, an outgoing call comprising a first caller related information in respect of an outgoing call;

a selector (204) to apply at least one pre-defined mapping rule related to the caller party based on the first caller related information and determining a second caller related information; and

a transmitter (206) for appending to the outgoing call the second caller related information and routing the outgoing call to the MSC, thereby enabling the MSC to route the outgoing call with the second caller related information to the called party.

11.   A method of providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the method comprising:

receiving (step 320), by a network node from an MSC, an authorization request comprising a destination number in respect of an outgoing call;

appending (step 322), by the network node, an identifier to the destination number and generating an authorization message including the same, upon satisfaction of at least one predetermined criteria; and

communicating (step 324) said authorization message, by the network node to the MSC, thereby enabling the MSC in routing the outgoing call to a designated node for requesting a revised caller related information.

12.   The method as claimed in claim 11, wherein prior to determining the authorization message, the method further comprises:

communicating, by the network node to the MSC, at least one of an approval or disapproval based indication based on the caller party's subscription; and (step 330)

performing the steps (322-324) by the network node, upon communicating the approval based indication. (step 332)

13.   The method as claimed in claim 11, further comprising:

communicating, a non-identifier based authorization message by the network node to the MSC, thereby enabling the MSC in routing the outgoing call to the called party without having to communicate with the designated node, (step 340)

wherein said communication of non-identifier based authorization code is preceded by at least one of following conditions:

receipt of a service de-activation based command by the network node from the caller party; and

determining the caller party to be a non-subscriber of a pre-defined service.

14.   The method as claimed in claim 11, wherein the network node is an intelligent network (IN) based node.

15.   The method as claimed in claim 11, wherein communicating the authorization message by the network node to the MSC enables the MSC to provide an original caller related information to the designated node.

16.   The method as claimed in claim 11, wherein communicating the authorization message comprises addition of said identifier to a called party MSISDN.

17.   The method as claimed in claim 11, wherein appending the identifier to the destination number by the network node is based on determining a type of subscription profile of the caller party.

18.   The method as claimed in claim 11, wherein appending the identifier to the destination number by the network node comprises modifying a service key associated with the outgoing call based on a pre-paid subscription profile of the caller party.

19.   The method as claimed as claimed in claim 11, wherein appending the identifier to the destination number by the network node comprises creating a service key associated with the outgoing call based on a post-paid subscription profile of the caller party.

20.   A network node (400) in a telecommunication network for providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the node comprising:

        a receiver (402) for receiving, from an MSC, an authorization request comprising a destination number in respect of an outgoing call;

        a processor (404) to append an identifier to the destination number and generate an authorization message including the same, upon satisfaction of at least one predetermined criteria; and

        a transmitter (406) for communicating said authorization message to the MSC, thereby enabling the MSC in routing the outgoing call to a designated node for requesting a revised caller related information.
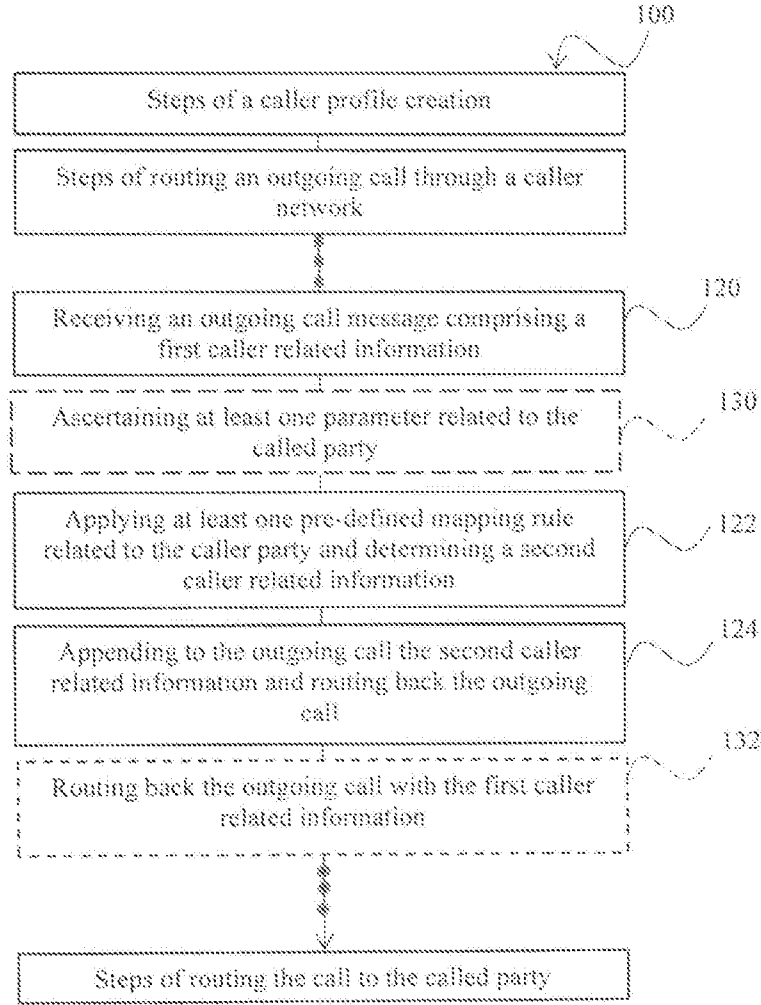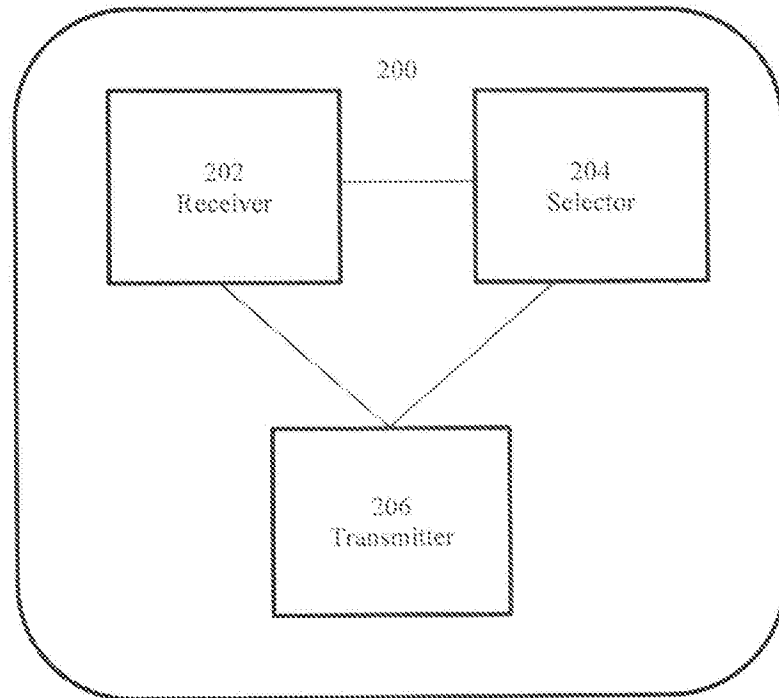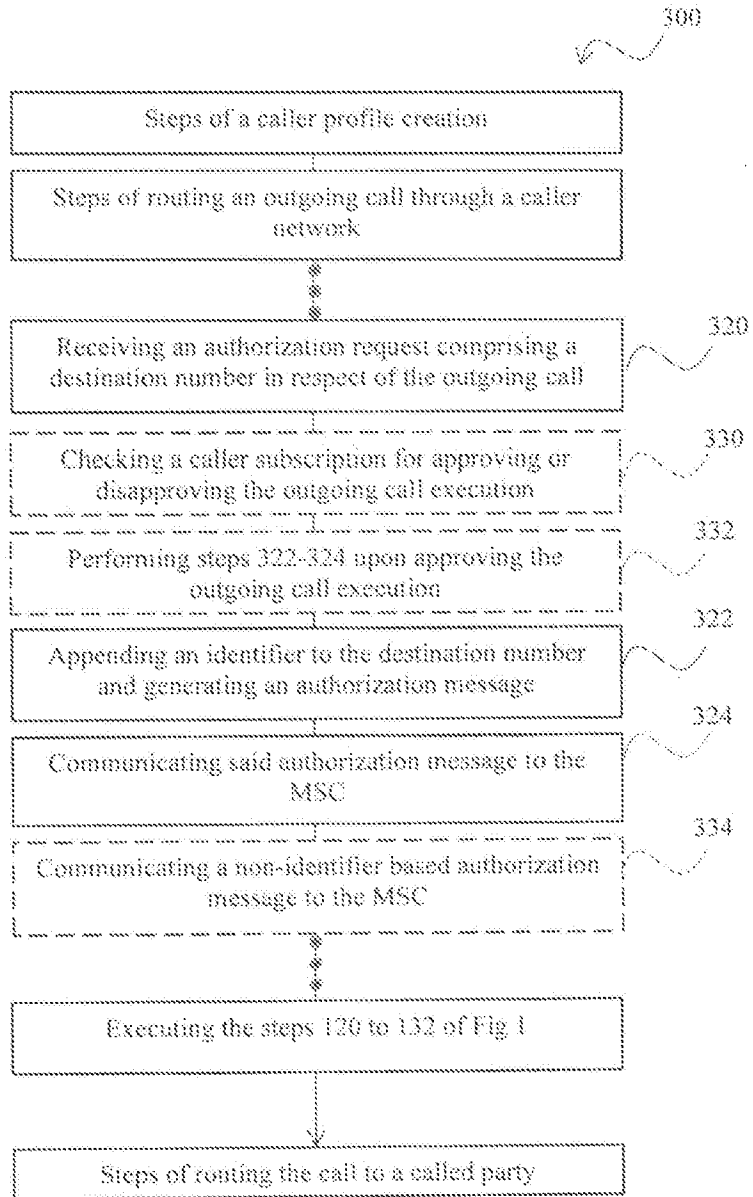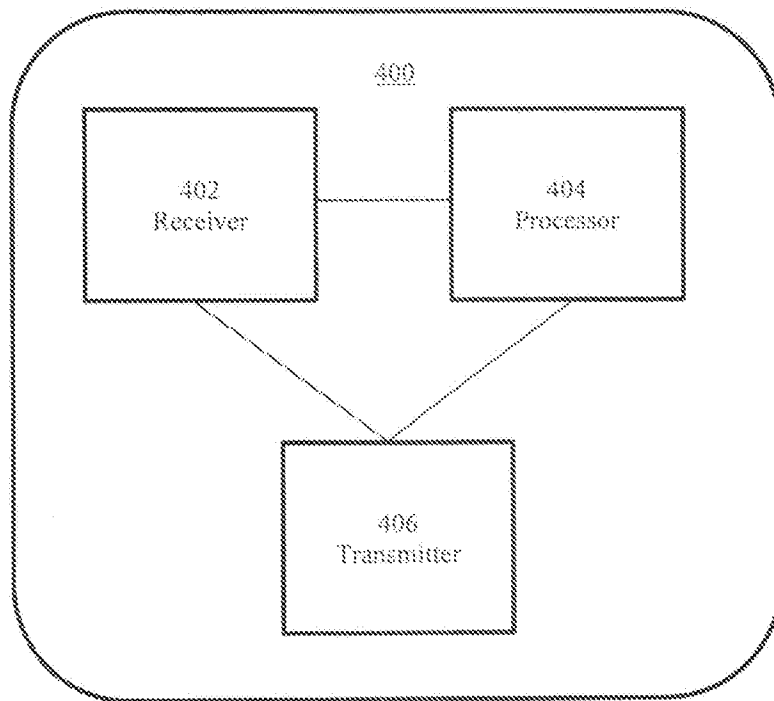
Figure 1

Figure 2

Figure 3

Figure 4

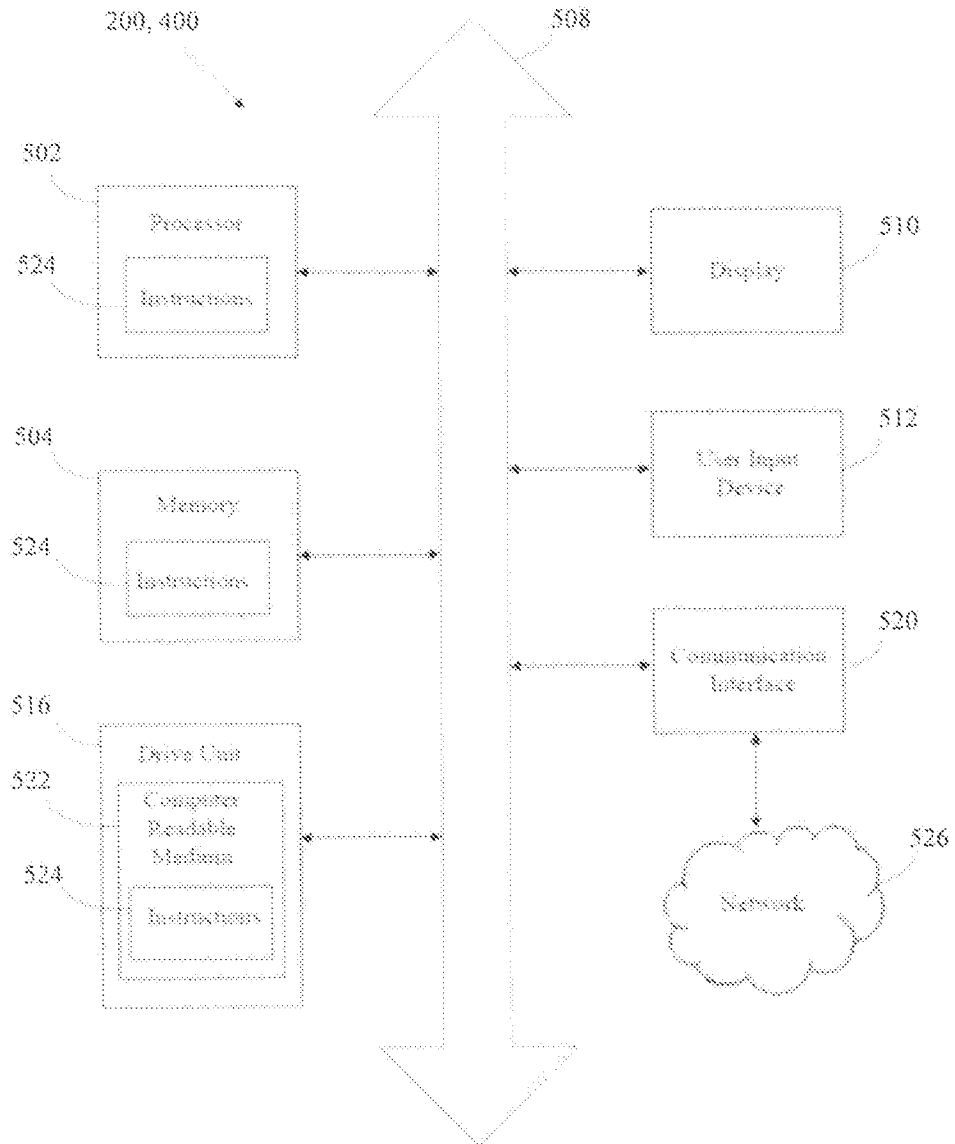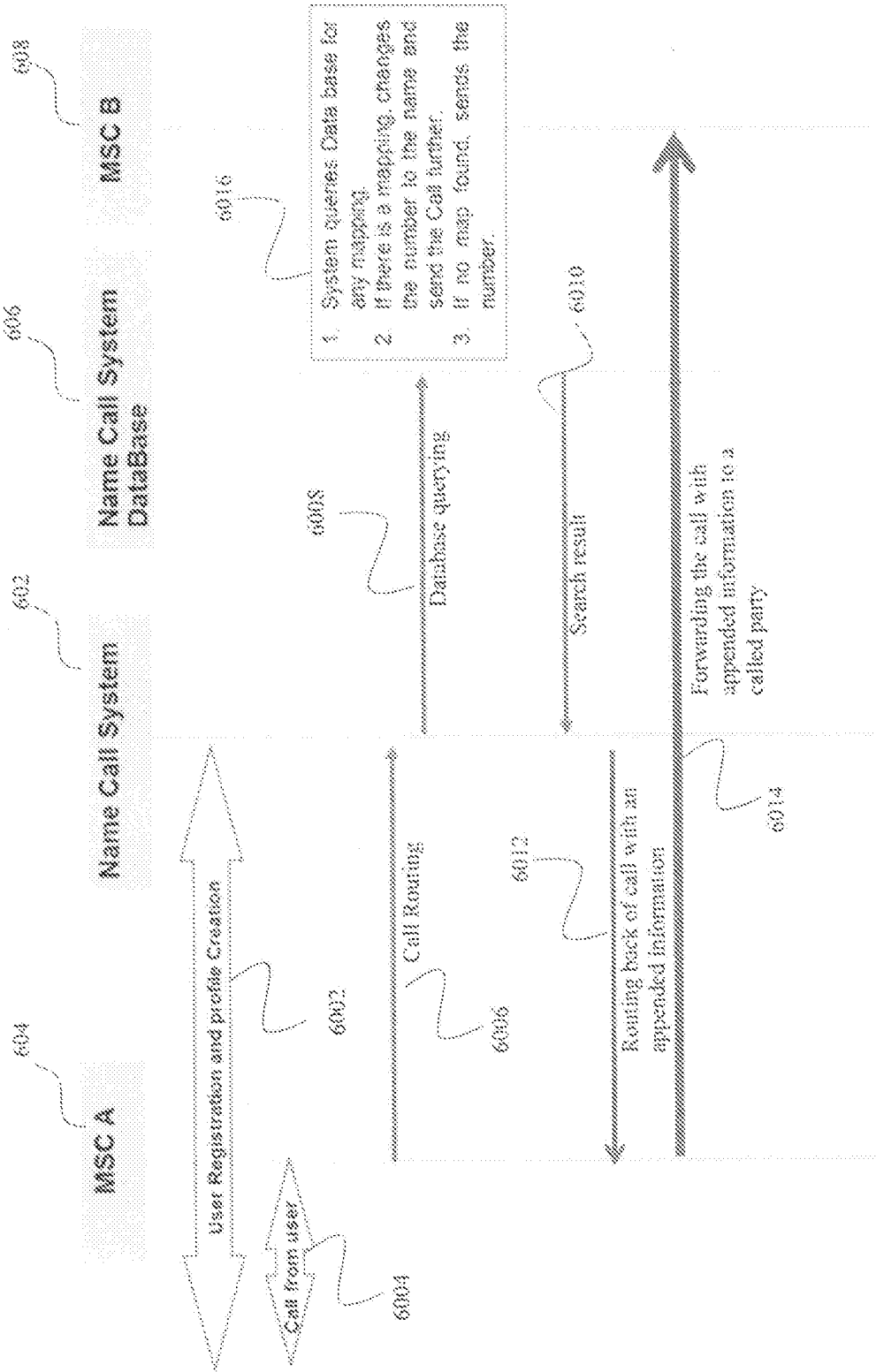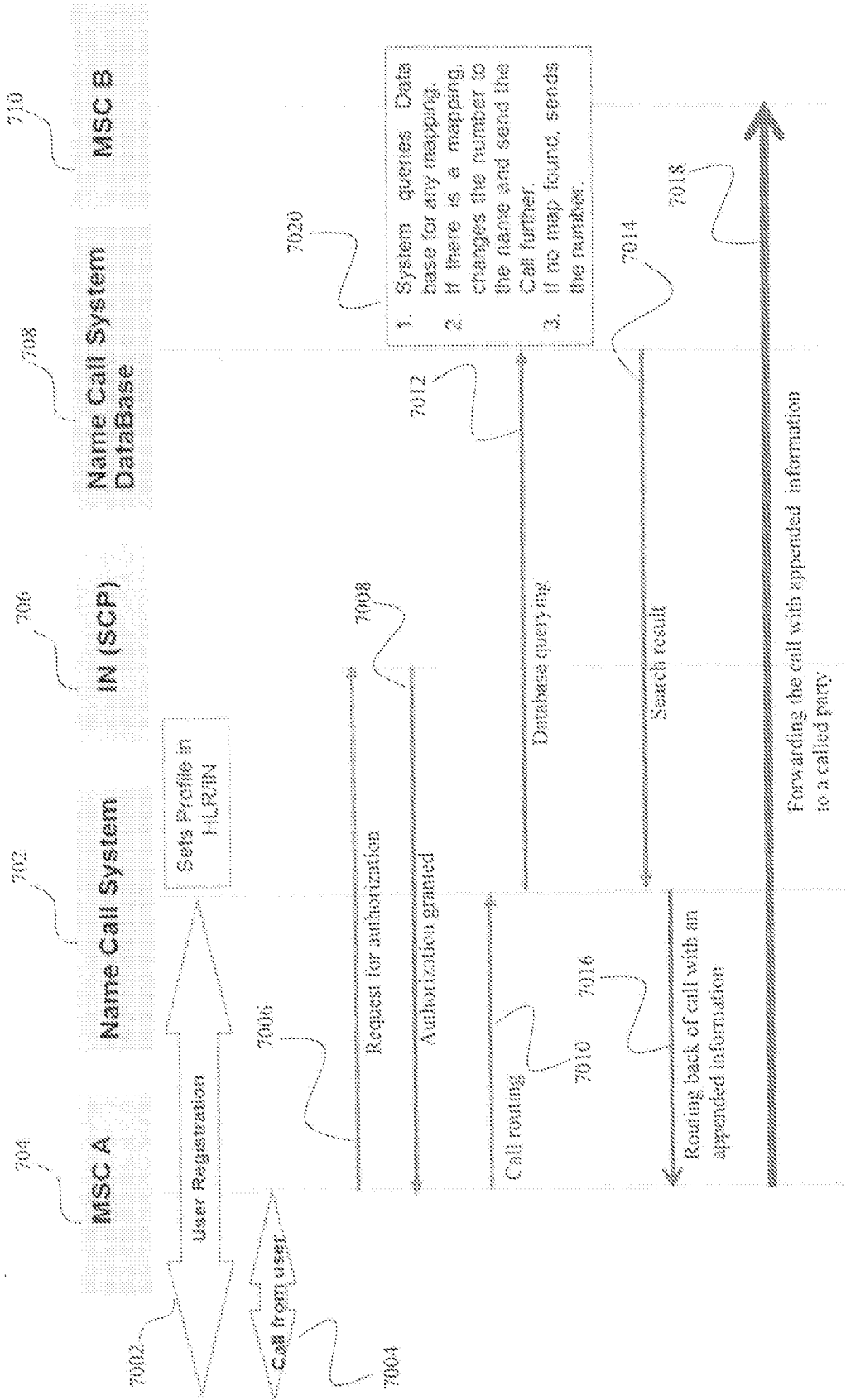Figure 5

Figure 6

Figure 7

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. H04M3/42
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)

H04M

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

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

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/079879 A1 (CARLSON STEVEN I [US] ET AL) 14 April 2005 (2005-04-14) paragraphs [0008], [0021], [0025], [0027] - [0030], [0032] - [0044], [0048]; figures 3-5 -----	1-10
X	US 2013/003947 A1 (FARAH JEFFREY J [US] ET AL) 3 January 2013 (2013-01-03) paragraphs [0015] - [0025]; figures 1,2 -----	1,10

☐ Further documents are listed in the continuation of Box C.   ☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 January 2016	29/03/2016

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 Sorrentino, Andrea

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2015/057856

Box No. II   Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
   because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
   because they relate to parts of the international application that do not comply with the prescribed requirements to such
   an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
   because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III   Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

   see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable
   claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of
   additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers
   only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is
   restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

   1-10

Remark on Protest   ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the
                           payment of a protest fee.

                         ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest
                           fee was not paid within the time limit specified in the invitation.

                         ☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)

FURTHER INFORMATION CONTINUED FROM   PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-10

>A method of providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the method comprising:
>receiving ,by a designated node from an MSC, an outgoing call comprising a first caller related information;
>applying, by the designated node, at least one pre-defined mapping rule related to the caller party based on the first caller related information and determining a second caller related information; and
>appending, by the designated node, to the outgoing call, the second caller related information and routing the outgoing call to the MSC, thereby enabling the MSC to route the outgoing call with the second caller related information to the called party.
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>---

2. claims: 11-20

>A method of providing a caller related information to a called party in a telecommunication network, the caller related information being a customized caller related information, the method comprising: receiving, by a network node from an MSC, an authorization request comprising a destination number in respect of an outgoing call;appending, by the network node, an identifier to the destination number and generating an authorization message including the same, upon satisfaction of at least one predetermined criteria; and communicating said authorization message, by the network node to the MSC, thereby enabling the MSC in routing the outgoing call to a designated node for requesting a revised caller related information.
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INTERNATIONAL SEARCH REPORT
Information on patent family members

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005079879 A1	14-04-2005	US 2005079879 A1 US 2010029259 A1	14-04-2005 04-02-2010
US 2013003947 A1	03-01-2013	US 2012219128 A1 US 2013003947 A1 US 2013230156 A1	30-08-2012 03-01-2013 05-09-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2005079879 A1			