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(54) **Title:** SYSTEMS AND METHODS FOR DIVERTING INBOUND TELEPHONE CALLS

(57) **Abstract:** The present disclosure relates to systems and methods for diverting telephone calls. The network structure is configured to (i) receive an incoming call from a calling party directed to a first user and (ii) divert said call to a second user. The diverted call includes information associated with the first user and information associated with the diversion of the call.

SYSTEMS AND METHODS FOR DIVERTING INBOUND TELEPHONE CALLS

FIELD OF THE DISCLOSURE

[0001] The present disclosure generally relates to telecommunications systems, and more specifically methods and systems for managing telecommunications information and routing such information to particular users.

BACKGROUND OF THE DISCLOSURE

[0002] Companies must devote significant attention to customer service and care, while at the same time managing costs and personnel. These considerations may be particularly important for small-businesses, micro-enterprises (e.g., businesses having five or fewer employees), and the self-employed. Technological solutions may be employed to help meet these needs.

[0003] The continuous and explosive development of new computer and telecommunications technologies to assist large and small businesses alike is very well known. As these technologies evolve, they begin to take on characteristics of one another. For example, the telephone is no longer, as in Meucci's time, a system that carries a voice from one end of the wire to another. Instead, it has become a multi-faceted apparatus capable of managing data as well as voice transmissions. Some of the services that allow telephone users to better organize their work include call waiting, call transfer, call diversion, call forwarding, and call conferencing, and telephones are now capable of connecting to the internet, downloading e-mail, accessing chat rooms and so on.

[0004] In order to manage communications from customers and suppliers, businesses and individuals may choose to utilize so-called virtual secretarial services. According to these services, incoming telephone calls are diverted to a call center at which operators informed about the call diversion may respond on behalf of the business owner using predetermined responses or instructions.

[0005] **FIG. 1** is a block diagram of a prior art call-diversion telephone system (TS) **100**. TS **100** typically includes one or more users **114** that communicate to a telephone company, though a fixed or portable telephone, an instruction to divert any incoming call from a caller **112** to a secondary number **118**. For example, during call diversion, the telephone company diverts incoming calls to user **114** to secondary telephone number **118**. Accordingly, during call diversion, calls placed by incoming caller **112** to user **114** will be directly connected to derivative telephone **118**, since the telephone company will have by-passed user **114**. The by-passing of user **114** by the telephone company makes it difficult to provide on-line answering services. That is, by completely by-passing user **114**, the person answering derivative telephone number **118** may not have adequate information to properly respond to caller **112**.

[0006] In accordance with these deficiencies, more advanced answering services are available in the prior art. **FIG. 2** further illustrates additional answering services available with prior art systems. For example, advanced telephone system (ATS) **200**, provides a user **214** with the ability to request a telephone answering service from a provider **216**. User **214** then proceeds to register for the service with **216** by means of creating an account. During registration, user **214** is assigned one or more exclusive telephone numbers to which each user may transfer their incoming calls. Each user must be assigned an exclusive telephone number to which their calls will be forwarded. However, it is difficult for provider **216** and/or user **214** to predict the total number of telephone numbers needed. Moreover, as provider **216** provides services to more and more users **214**, provider **216** will need even more telephone numbers to accommodate them. Currently many providers **216** request more telephone numbers than initially needed in order to provide for additional users **214**. That is, a provider **216** may request 999 phone numbers, while provider **216** only has four hundred users **214**. Moreover, upon customer turnover, provider **216** often cannot reassign the previous customer's numbers because of the confusion and problems caused by such reassignment. In

addition, providers **216** often do not have adequate information about users **214** or the incoming callers when answering calls on behalf of users **214**.

[0007] These types of services, while appropriate for some businesses and individuals, may not be appropriate for others in particular businesses and/or market segments. This may include small businesses or micro-enterprises, in which elaborate call answering and diversion services (including the traditional “call centers”) may be cost-prohibitive. In order to meet some of these needs, the business associate or individual may divert calls to another business associate or to a family member. In the context of the latter case, for example, the family member may be unable to recognize whether the call is coming to him or her directly or on behalf of the business. Thus, there is a need for alternative call answering and diversion systems and services.

SUMMARY OF THE DISCLOSURE

[0008] Among the various aspects of the present disclosure is the provision of various systems and methods for the processing and diversion of inbound telephone communications.

[0009] Briefly, therefore, the present disclosure is directed to a method of providing call diversion services, the method comprising diverting an incoming call from a calling party (A) originally directed to a first user (B), to a second user (C), wherein the diverted call includes information associated with the first user and information associated with the diversion of the call, the first user information and the call diversion information being displayed on communications device of the second user.

[0010] Another aspect of the disclosure is directed to a computer-implemented method to facilitate providing call diversion services, comprising the steps of: (a) associating and storing, at a call diversion service provider database, business information of a first user; (b) receiving, at a controller, an incoming call from a calling party directed to the first user, the call including information associated with the calling party and the first user; (c) using the information to access in the database the stored business information of the

first user, including call diversion information of a second user; and (d) diverting said incoming call from the controller to the second user.

[0011] Another aspect of the disclosure is directed to a computer program product including a computer-readable medium having instructions stored thereon for processing call information, such that the instructions when carried out by a processing device, enable the processing device to display, to a second user: (i) information associated with a call to a first user, and (ii) information associated with the first user and information associated with the diversion of the call from the first user to the second user.

[0012] Yet another aspect of the disclosure is directed to communications device comprising a microprocessor, a memory unit that stores instructions associated with an application executed by the microprocessor, and an interconnect coupling the processor and the memory unit, wherein the interconnect allows the communications device to execute the application and perform the operations of displaying, to a second user: (i) information associated with a call to a first user, and (ii) information associated with the first user and information associated with the diversion of the call from the first user to the second user.

[0013] Other objects and features will be in part apparent and in part pointed out hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The disclosure herein makes reference to the accompanying drawings, which show various exemplary embodiments by way of illustration. While these exemplary embodiments are described in sufficient detail to enable those skilled in the art to practice the subject matter of the disclosure, it should be understood that other embodiments can be realized and that changes (including logical and mechanical changes) can be made without departing from the spirit and scope of the instant disclosure. Thus, the detailed description herein is presented for purposes of illustration only and not of limitation. By way of example, the steps recited in any of the method descriptions can be executed in any order and are not limited to the order presented.

[0015] **FIG. 1** illustrates a call-diversion telephone system in accordance with the prior art.

[0016] **FIG. 2** illustrates an advanced telephone system in accordance with the prior art.

[0017] **FIG. 3** illustrates an exemplary call diversion system in accordance with the general embodiments described herein.

[0018] **FIG. 4** illustrates a block diagram of a telecommunications system according to the embodiments described herein.

[0019] **FIG. 5** and **6** are flow diagrams illustrating one embodiment of a method for diverting calls.

[0020] **FIG. 7** illustrates an exemplary flow signal in the presence of a phone call that has been subject to diversion, in several networks (SIP/SS7/DSS1).

[0021] **FIG. 8** illustrates an exemplary list of information involved in the establishment of a telephone connection.

[0022] **FIG. 9** illustrates exemplary information pertaining to the redirecting number.

[0023] **FIG. 10** illustrates an exemplary call diversion system in accordance with an exemplary embodiment of the present disclosure.

[0024] **FIG. 11** illustrates an exemplary registration procedure in accordance with an exemplary embodiment of the present disclosure.

[0025] **FIG. 12** illustrates various exemplary stages of profiling software for registration of customers.

[0026] **FIG. 13** illustrates various exemplary stages of billing, approval, and software download for subscribers.

DETAILED DESCRIPTION

[0027] In general, the present disclosure relates to the diversion of incoming telephone calls and information associated with such calls. According to various aspects, an incoming call directed to a user or subscriber (a first user)

of the system(s) described herein is diverted to a second user (or sub-user) when the first user line (e.g., a primary line) is busy or the first user or subscriber is otherwise unavailable to answer the call. Advantageously, information associated with the call is likewise sent to the second user. Further, information associated with the diversion of the call is also sent to the second user. Using this information, the second user (who may be, e.g., a business associate or family member of the first user) may deduce, among other things, the identity of the calling party (such as the calling party's name, business name, and the calling party number), the identity of the called (i.e., first user) party (such as the called party's name, business name, and the original called (i.e., first user) party number), the identity of any intermediate numbers through which the call was diverted (such as the redirecting number), and whether the call was subject to diversion and why (for example, the original called number was busy or went unanswered).

[0028] The embodiments described herein provide many important benefits. In particular embodiments, the systems and methods can utilize features of mobile telephony, which allow the various users to travel, visit worksites, or otherwise work remotely, etc. For instance, in the event that a party is unable to answer a call at the line associated with their primary work or mobile telephone, the call is diverted to a telephone (or mobile telephone) of another party. The user at the second (i.e., diverted-to) number has the ability to read and review information associated with the call on a display, which in certain preferred embodiments is a mobile communications device, such as a cellular phone or pager, and may thereby determine how to answer the call. In the context of small-businesses, micro-enterprises, or "family" businesses, for example, calls may be diverted from one business associate or family member to another, so that the day-to-day operations of the venture may continue unhindered by one party's temporary unavailability.

[0029] For the sake of brevity, conventional data networking, application development and other functional aspects of the systems (and components of the individual operating components of the systems) are not described in detail herein, but are readily understood by those of skill in the

pertinent art. Furthermore, the connecting lines shown in the various figures contained herein are intended to represent exemplary functional relationships and/or physical couplings between the various elements. It should be noted that many alternative and/or additional functional relationships and/or physical connections can be present in a practical system.

[0030] As those skilled in the art will appreciate, the various system computing components discussed herein can include one and/or more of the following: a host server and/or other computing systems including a processor for processing digital data; a memory coupled to said processor for storing digital data; an input digitizer coupled to the processor for inputting digital data; an application program stored in said memory and accessible by said processor for directing processing of digital data by said processor; a display device coupled to the processor and memory for displaying information derived from digital data processed by said processor; and a plurality of databases. The computing systems can include an operating system (e.g., OS/360, MVS, Windows NT, 95/98/2000/XP/Vista, OS2, UNIX, Unix-like, TPF, Linux, Solaris, MacOS, Mac OS X, AIX, Google Chrome OS, Plan 9, etc., and the like) as well as various conventional support software and drivers typically associated with computers.

[0031] The present disclosure can be described herein in terms of functional block components, screen shots, optional selections and various processing steps. It should be appreciated that such functional blocks can be realized by any number of hardware and/or software components configured to perform the specified functions. For example, the present disclosure can employ various integrated circuit components (e.g., memory elements, processing elements, logic elements, look-up tables, and the like), which can carry out a variety of functions under the control of one and/or more microprocessors and/or other control devices. Similarly, the software elements of the present disclosure can be implemented with any programming and/or scripting language such as assembler, AWK, Bourne Shell, C, C++, COBOL, CSS, HTML, Java, PERL, Visual Basic, SQL Stored Procedures, extensible markup language (XML), and the like, with the various algorithms being implemented with any combination of data structures, objects, processes, routines and/or other programming

elements. Further, it should be noted that the present disclosure can employ any number of conventional techniques for data transmission, signaling, data processing, network control, and the like. These techniques are generally understood by those of skill in the art.

[0032] It will also be appreciated that the present disclosure can be embodied as a method, a system (e.g., a data processing system), a device for data processing, a computer program product, and/or a communications device. Accordingly, the present disclosure can take the form of an entirely software embodiment, an entirely hardware embodiment, and/or an embodiment combining aspects of both software and hardware. Furthermore, the present disclosure can take the form of a computer program product on a computer-readable storage medium having computer-readable program code means embodied in the storage medium. Any suitable computer-readable storage medium can be utilized, including hard disks, CD-ROM, optical storage devices, magnetic storage devices, and/or the like.

[0033] As noted elsewhere herein, the present disclosure is described herein with reference to block diagrams and flowchart illustrations of methods, apparatus (e.g., systems), and computer program products according to various aspects of the disclosure. It will be understood that each functional block of the block diagrams and the flowchart illustrations, and combinations of functional blocks in the block diagrams and flowchart illustrations, respectively, can be implemented by computer program instructions. These computer program instructions can be loaded onto a general purpose computer, special purpose computer, mobile phone, smart phone, handset, PDA, and/or other programmable data processing apparatus to produce a machine, such that the instructions that execute on the computer and/or other programmable data processing apparatus implement the functions specified in the flowchart block and/or blocks.

[0034] These computer program instructions can also be stored in a computer-readable memory that can direct a computer and/or other programmable data processing apparatus (e.g., a mobile communications device) to function in a particular manner, such that the instructions stored in the

computer-readable memory produce an article of manufacture including instruction means which implement the function specified in the flowchart block and/or blocks. The computer program instructions can also be loaded onto a computer and/or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer and/or other programmable apparatus to produce a computer-implemented process such that the instructions which execute on the computer and/or other programmable apparatus provide steps for implementing the functions specified in the flowchart block and/or blocks. This may include, for example, the programming of communications devices such as cellular phones to receive and display certain information as described herein. Thus, other aspects of the disclosure include communications devices containing or executing the software, programs, and/or methods described herein. In one embodiment, the device is a cellular phone.

[0035] Accordingly, functional blocks of the block diagrams and flowchart illustrations support combinations of means for performing the specified functions, combinations of steps for performing the specified functions, and program instruction means for performing the specified functions. It will also be understood that each functional block of the block diagrams and flowchart illustrations, and combinations of functional blocks in the block diagrams and flowchart illustrations, can be implemented by either special purpose hardware-based computer systems which perform the specified functions and/or steps, and/or suitable combinations of special purpose hardware and computer instructions.

COMMUNICATIONS AND NETWORKS

[0036] In general, the network(s) described herein can include any electronic communications means which incorporates both hardware and software components of such. Communication among the components and/or parties in accordance with the present disclosure can be accomplished through any suitable communication channels, such as, for example, a telephone network, an extranet, an intranet, internet, point-of-interaction device (point-of-sale device, personal digital assistant, cellular phone, kiosk, Automatic Teller

Machine (ATM), etc.), online communications, off-line communications, wireless communications, transponder communications, local area network (LAN), wide area network (WAN), networked and/or linked devices and/or the like. With respect to telephone networks, communication among the components and/or parties in accordance with the present disclosure can be accomplished through any type of telephone network, including, but not limited to, POTS, PSTN, ISDN, GSM, UMTS, GPRS, VOIP, and/or any video telephone networks or the like. Moreover, aspects of the disclosure can be implemented using a variety of communications protocols and combinations thereof, including, for example, IPX, IAX, QSIG, Appletalk, IP-6, NetBIOS, OSI, TCP/IP, ATM, SS7, DSS1, SIP, H323 and/or any number of existing and/or future protocols. If the network is in the nature of a public network, such as the internet, it can be advantageous to presume the network to be insecure and open to eavesdroppers; in some embodiments, therefore, security measures such as passwords and recognition methods may be employed. Specific information related to the protocols, standards, and application software utilized in connection with the communications and networking systems mentioned herein and elsewhere are generally known to those skilled in the art and, as such, need not be detailed herein.

[0037] The telephone network is managed by supranational bodies and is governed by standards and protocols that are generally agreed upon internationally. In a few particular cases, phone network operators manage their network according to national regulations or their trade policies. In any event, it will be appreciated that the systems and methods described herein will comply with and follow international standards, including TIA, ETSI, IETF, CITELE, IEEE, ISO/IEC, 3GPP, W3C, and ITU. In the interest of brevity, the disclosure herein avoids a lengthy description of the various telephone networks, but instead provides the characteristic points that may be relevant to the operation. This disclosure will be sufficient to allow the skilled person to understand the functionality and application of the methods and systems described herein.

[0038] Additionally, the telephone lines described herein can include any type of telephony or data communications lines, for example, voice

telephone lines, data lines, internet networks, radio-frequency channels and/or the like. The telephone numbers described herein can include any type of telephone number or identification code, including an IP address, standard telephone number, cellular telephone number, voice-over IP (VOIP) numbers and/or the like.

CALL DIVERSION SYSTEMS AND METHODS

[0039] A general aspect of the present disclosure is illustrated in **FIG. 3** with a block diagram. By convention, (A) **310** corresponds to the calling party, (B) **320** corresponds to the called party (and is the party that authorizes the diversion of the call and its associated information), and (C) **330** corresponds to the receiver of the diverted call (e.g., so that (C) can answer the call on behalf of (B)). In general, these parties may be customers of the same or different incumbent operator(s) or the same or different OLOs (other licensed operators) (e.g., OLO₁, OLO₂, OLO₃, and so on). In a particular embodiment, for example, in the context of a small-business or micro-enterprise, party (A) is a customer, party (B) is a business owner/employee; and party (C) is a business associate or family member of party (B). In such a scenario, during a call from (A) to (B) in which (B) cannot answer and thus has diverted incoming calls to (C), (C) receives the call from (A) but is not informed that the call had been diverted on the account of (B) unless (C) is informed about the reasons and ways in which (B) had diverted calls to their ultimate destination. This problem is solved as described below.

[0040] Users of the call diversion systems and methods described herein (including first and second users) can be any type of user, such as, for example, a private user, a mail-order business, a customer service center, a user of a toll-free number, a user of an informational line, a business, a government entity, and the like. In addition, the user can involve one or more communications devices, described below.

[0041] According to the present disclosure, call information may be safely collected and organized in such a way that upon receipt of any telephone call, the diverted-to party (e.g., party (C) or other sub-user) can recognize one or

(preferably) more of: whether the incoming call is subject to diversion, the original called party (i.e., party (B)'s phone number), and/or the redirecting party (e.g., in the case of multiple sub-users, discussed below), why it was diverted, and the identity of the person from which the call was diverted, optionally (but preferably) in addition to the identity of the calling party. The party to whom the call is diverted may receive any or all of this information.

[0042] In one embodiment, one or more of the calling party (e.g., party (A)), the original called party (e.g., party (B)), the redirecting party, and the party to whom the call is diverted (e.g., party (C)) are using mobile telephony technology. The use of the phone has become a common practice and is so widespread that nearly every person has at least one mobile phone. Mobile phones are simple to use, flexible, and practical. They have reached a level of service comparable to the best transmission on ISDN fixed voice and have also become cheaper with the advent of new commercial solutions that allow you to avoid the cost of the diversion if the diversion is made to a number belonging to a virtual network of the customer. It will be understood that, in mobile telephone embodiments, technologies may be deployed that are necessary to manage the encryption of communications, allocation of radio channels of transmission, and to manage the movement of the mobile phone from one cell to another, and that these elements will not affect the implementations described herein.

[0043] In **FIG. 4**, a block diagram of a telecommunications system **400** is shown. The various apparatus described herein, e.g., CCS, SSP, SCP et al., are part of a mobile net system, a fixed net system, or a combination of the two systems. The system **400** generally includes a signalling switching point (SSP) **410**, a service control point (SCP) **412**, a called communication station (CCS_B) **414**, and a calling communication station (CCS_A) **416**.

[0044] In operation, as shown for example, in **FIG. 4**, calling party (A) **418** calls party (B) **420**. The call progresses through calling communication station (CCS_A) **416**, signal switching point **410**, called communication station (CCS_B) **414**. Signal switching point **410** checks the network and finds that party (B) **420** is triggered to divert the call to party (C) **422**. Signal switching point **410** also checks whether the phone number or identifier associated with party (B) is

stored in the communications device of party (C) (e.g., in software installed on the device (discussed below)) and thus authorizes party (C) to receive the information associated with the diversion and the reasons for diversion. If the comparison of the number or identifier of party (B) (directory number (DN)) and the number authorized in connection with the device of party (C) is positive (i.e., a match), then service control point (SCP) **412** communicates with the terminating communication station (TCS) **408**, that the incoming call is on behalf of the original called party (B) **420**, along with information associated with the call and the reasons for diversion (e.g., party (B) did not answer or the line was busy). In the event that the comparison is negative, the diverted-to party (C) will receive only calling party (A)'s information, and will not receive any information informing party (C) that the call was diverted from party (B) or the reasons for such diversion.

[0045] In various embodiments, the system may employ intelligent network system components, commonly referred to as advanced intelligent network (AIN) components, suitable for implementing various embodiments described herein. These system components are commercially available from several vendors and are known to those skilled in the art. For instance, AIN components can implement computer readable program code as known to those skilled in the art. Vendors of AIN components typically have a preferred programming language and operating platform as known to those skilled in the art.

[0046] SSP **410** typically includes an AIN switch that routes calls, recognizes and responds to triggers, generates queries to obtain call information and responds to returned call information. SSP **410** connects with called telephone station **414** to enable calls to be placed between called telephone station **414** and calling telephone station **416**. SSP **410** preferably communicates with SCP **412** by utilizing a signaling protocol. One such signaling protocol that may be utilized is Signaling System 7 (SS7), but other such signaling protocols as presently known to those skilled in the art (such as X.25, SIP, and DSS1) or developed in the future may be employed. Depending on the scenario, combinations of signaling protocols may also be employed. In addition, some

SSPs known in the art as mobile switching centers (MSCs) provide service to cellular telephones using selected radio frequency channels. **SSP 410** preferably generates queries to **SCP 412** and receives and responds to responses to the queries returned from **SCP 412**. In one embodiment, communication between the **SSP 410** and the **SCP 412** employs Transaction Capabilities Applications Protocol or TCAP.

[0047] The network may also include a signal transfer point (STP) (not shown) which generally comprises a network element that transfers signaling communications in response to signaling protocols such as SS7 or other such signaling protocols as presently known to those skilled in the art or developed in the future. The STP may transfer queries from **SSP 410** to **SCP 412** and transfers responses to the queries from **SCP 412** to **SSP 410**.

[0048] **SCP 412** may comprise an AIN element that stores account information, call information and receives and responds to queries. **SCP 412** can store account information about a called party's account as well as call control information in one or more databases and can access the stored information. **SCP 412** may also store call identification information (such as described herein) in the databases and can access the call identification information. **SCP 412** receives queries generated by **SSP 410** and responds to the queries by performing searches (e.g., database searches) to locate the requested call control or account information or caller identification information as will be understood by those skilled in the art. **SCP 412** then forwards the call control or account information or caller identification information to **SSP 410**.

[0049] Communication links between the various network elements provide data communication between the elements according to a predefined data transmission protocol. In one embodiment, for example, the data transmission protocol is transmission control protocol/internet protocol. In other embodiments, other data transmission protocols or formats may be substituted.

[0050] Databases may be used as data storage elements for use with **SCP 412** as known in the art. For instance, one or more databases may generally store account and call control information that can be implemented by

SSP **410** to control calls. One such database generally comprises a call identification/name database. When the information is available in the system, the database typically includes the name of the person associated with CCS_A **416**, along with the telephone number that is associated with CCS_A **416**. Additionally or alternatively, the database can comprise a caller assistance database as known to those skilled in the art. In general, databases can comprise any suitable databases containing information adapted for use in the present embodiment and are not limited to databases located within a telecommunications network.

[0051] Telephone equipment utilized by one or more of the calling party (A) **418**, the original called party (B) **420**, and/or the diverted-to party (C) **422** may comprise analog telephone sets as known to those skilled in the art POTS, ISDN, or may comprise wireless, UMTS, 3G, 4G LTE or any other form of communication station known to those skilled in the art. The communications equipment used by parties (A), (B), and (C) need not be the same type of communication station (e.g., calling party (A) and (C) may be wireless, while original called party (B) is analog, and vice versa). In one preferred embodiment, the original called party (B) and diverted-to party (C) includes customer premises equipment ("CPE") for use with caller identification services as known to those skilled in the art.

[0052] In **FIG. 5**, the method begins at block **500**. With continued reference to **FIG. 4**, at block **510**, a call is received in the network. The call is placed by a calling party (e.g., party (A)) at a calling communication station (CCS_A) **416** and intended for a called party (e.g., party (B)) at a called communication station (CCS_B) **414** and derived at the terminating communication station TCS **408**. The call is routed through the network to a terminating SSP (or equivalent in another system) associated with the called communication station **414**. At the SSP, the call encounters a termination attempt trigger associated with the Directory Number (DN) (see **FIG. 4**) of the called communication station. In response thereto, the SSP transmits a query message to the SCP (or equivalent in another system) towards the terminating communication station **408**.

[0053] The query is processed, typically at the SCP **412**. If the called party is available to answer the call and/or has not activated automatic diversion of incoming calls, the called party simply answers the call (not shown). If, on the other hand, the called party does not (or cannot) answer the call, or has directed calls to be diverted, then the call proceeds to blocks **512**, **514**, and so on, where the call is forwarded to the SCP of the party to whom the call is to be diverted (e.g., the diverted-to party or party (C)). At block **512**, it is determined if the DN of the called party (e.g., party (B)), contained in the query message, corresponds to a subscriber to the call diversion systems described herein. As described below, this determination is generally performed by software (e.g., installed on the second user's phone), that records or saves the called party's preferences with respect to call diversion, including the authorization to release or transmit information associated with the called party (and information associated with the call) to the diverted-to party's phone. If, at block **512**, the called party has not activated the subscription and/or has not authorized the release of the call information to the diverted-to party, the diverted call proceeds as normal and the diverted-to party receives the call without the called party information and typically only receives the calling party information (e.g., by conventional caller ID protocols). Otherwise, the diverted-to party receives the information associated with the called party as described herein (e.g., whether the incoming call is subject to diversion, the original called party, why it was diverted, the identity of the person from which the call was diverted, in addition to the identity of the calling party. Similarly, at block **514**, if the comparison between the number or identifier (directory number (DN)) associated with party (B) and the number or identifier authorized in connection with party (C) is a match, then the diverted call to party (C) includes party (B) information associated with the call, including reasons for the diversion. If the numbers or identifiers do not correspond, then the diverted-to party (C) receives only the information associated with the calling party (A).

[0054] In certain embodiments, it may additionally be determined at block **514** whether standard caller identification information can be provided for the calling communication station (not shown), so that this information can be

passed along with the diverted call. In some instances, the standard caller identification information cannot be provided. This happens, for example, if the caller has blocked this information or because elements of the telecommunication network do not pass along this information. Also at block **514**, the SCP (or equivalent) may determine whether the calling directory number (DN) is on a blocking list of the called party (not shown). The blocking list corresponds to directory numbers or other identifying information for originating or calling telephone numbers which should be blocked from completing calls to the subscriber or which should be blocked from being diverted to another party. In addition, the blocking list may include information about authorized numbers which may receive diverted calls originally directed to the subscriber according to the invention described herein. If a DN is on the blocking list, the system automatically prevents all subsequent calls from completing to the called party. The calling directory number is retrieved from the query message received, e.g., by the SCP, and compared against the blocking list for the called party. The blocking list may be stored in a database or other suitable network location. If the calling directory number is on the subscriber's blocking list, the SCP (for example) transmits message directing the terminating SSP to transmit an announcement to the calling party announcing the handling of the call. For instance, the announcement may report to the calling party that the called party is not available to receive calls.

[0055] At block **516** the SCP (or the like) transmits a Forward_Call response message to the SSP. Control then proceeds to block **610** in **FIG. 6**.

[0056] **FIG. 6** illustrates aspects of the technical implementation of the call diversion services described herein for completing a call from a SSP or SN/IP (or the like) to the diverted-to party or second user, and configuring caller and called party identification information. At block **610**, the call information is routed from the terminating SSP to the node, based on the called directory number (DN) received in the Forward_Call response message and stored in the device of party (C). At block **612**, the call is received at the node and the setup message (or related message) prepared by the SSP is interpreted. The incoming call is not answered immediately at this time, but rather is left in a

ringing state (i.e., the calling party hears ringing). The incoming setup message (or related messages, such as the initial address message (IAM) or the (SIP) INVITE message) received from the terminating communication station (TCS) which contains various elements, including the redirecting number, the diversion reason, the original called number information, and calling party information, among other things. Typically, the call information is provided between the first and the second ring and received at the node.

[0057] As noted elsewhere herein, the information associated with the diverted call may include the original called number and the redirecting number. It will be understood that the original called number and the redirecting number may be the same or different depending on the subscription settings and permissions authorized by the first user, including, for example, whether the first user has authorized multiple sub-users to receive diverted call information. For example, where calling party (A) calls original called party (B), who is unavailable, the call is diverted to party (C). Assuming party (C) is authorized to receive and view party (B)'s call information (discussed elsewhere herein), party (C) receives such information, including the original called number and the redirecting number which, in this scenario, are identical. If, for example, party (B) has authorized two or more sub-users, the original called number and the redirecting number may not necessarily be the same in the event that party (C) is likewise unavailable and the call is diverted further to party (D); here, the original called number will be party (B)'s number, but the redirecting number will be party (C)'s (or other sub-user's) number.

[0058] At block **614**, the node transfers the call to the diverted-to party's number found in the elements of the call setup message (or other message) received from the SSP and matched with the called party (B) DN stored on party (C)'s communications device. Thus, party (C) is authorized to receive and review the diversion information within the various signalling messages (e.g., INVITE, SETUP, IAM, etc.). The signalling message (e.g., setup message (or the like)) including the calling party identification, the called party identification (e.g., the original called number), the redirecting number, identification that the call is a diverted call, and the reasons for the diversion.

Reading the call setup element(s) in this manner will allow the SCP service logic to determine that the call is from the node and should be presented to the diverted-to party's line designated by the subscriber, rather than forwarded back to the node. Through the subscriber and registration process described herein, customized software and/or programs are created and installed onto (or accessible by) the communications device of party (C) to recognize the calls diverted from party (B).

[0059] At block 616, the call including the setup message (or other message) formatted by the node is diverted to the designated party.

[0060] During the telephone connection described above, in addition to linking the two (or more) parties, signaling messages are sent to oversee the mechanisms linking these protocols (e.g., SS7, SIP, DSS1). These protocols provide the necessary information at various locations in the network, including (but not limited to) the following general points: the routing of communications; methods of connection; methods for the recognition of IDs; the billing service; routing information; and supplementary services. The interaction of these protocols provide the information necessary to implement the systems and methods of the present disclosure. This may include, SS7 signaling between operators, DSS1 signaling a mobile party user (such as the party to which the call is diverted), and/or SIP signaling for voice VOIP used by one or more of the calling party, the called party, and the party to which the call was diverted (i.e., the diverted-to party).

[0061] According to various embodiments, the information transferred to and from the calling party, called party, and the diverted-to party are exchanged on the appropriate network in accordance with conventional methods known to those skilled in the art, such as described, for example, in the following technical specifications: ETSI TS 100 605, ETSI TS 100 606, ETSI TS 100 974 V7.15.0, 3GPP TS 24,008 V9.1.0, ETSI TS 300 952 v7.0.2, ITU -T Q.931, ITU-T Q.952, including like descriptions in other international standards references, each of which is incorporated by reference herein in its entirety.

[0062] As noted elsewhere, the methods and systems described herein are not limited to a particular signaling convention. For example, the present disclosure can be utilized with a Common Channel Signaling system, such as Signaling System 7 (SS7), having separate voice/user data and signaling channels. In addition, the present disclosure can be used with other signaling methods, such as the following trunk-side signaling interfaces: ISDN-PR1; Advanced Intelligent Network; and/or Service Node architectures. Preferably, the selected signaling system provides a suite of call presentation information to the second user, including one or more of: ANI--Automatic Number Identification: phone number and privacy indicator of the calling party ("Caller-ID"); OCN--Original Called Number Identification: phone number of the original called party; Call Type--Forwarded call due to a particular (e.g., supplementary service) condition.

[0063] In one embodiment, an outgoing call and an incoming call transfers the setup message from a mobile switching center to a mobile communications device of a second user. Communication and transfer of call information is generally understood by those skilled in the art and, in the interest of brevity, is not described in detail herein. Further, the various stages of terminating call flow from an incoming call to a mobile communications device are likewise understood by those skilled in the art, in addition to the transfer of an outgoing call from the mobile communications device to the network. For example, the setup message may carry the information that is necessary to the establishment of a telephone call and the call information associated therewith, including its transfer or diversion. In one embodiment, the setup message carries information associated with one or more of a calling party, an original called number, a redirecting number, an intermediate number, and the reasons for the diversion of the call.

[0064] This is generally the case in more complex scenarios involving interworking between different networks as well, including those in the presence of so-called supplementary services. **FIG. 7**, for example, illustrates, in a complex scenario composed of several networks (SIP/SS7/DSS1), the flow signal in the presence of a phone call that has been subject to diversion; that is,

for example, caller (A) called (B) that has been diverted to (C). Here, the information that is referred to as the setup message (as seen in **FIG. 8**) contains a list of information required for the establishment of a telephone connection. It will be understood, however, that the disclosure in **FIG. 7** is not limited to only the setup message in a DSS1 architecture, but rather that particular protocol is by way of example. For instance, the setup message and related data elements in the SS7 architecture (e.g., the IAM (initial address message) and/or the SIP architecture (e.g., the INVITE message) contain information useful in determining the identification of one or more of the calling party (e.g., party (A) in **FIG. 3**) the original called party (e.g., party (B) in **FIG. 3**), the redirecting number, and the reason for the diversion.

[0065] These examples show the derivation of information that may be obtained concerning the elements of information contained in the SETUP (or related) message that arrives at the receiver of the diverted call (e.g., (C)) in the form of binary (or other) code (e.g., the original called number or the redirecting number, or supplementary services (see, e.g., **FIG. 9**). In certain embodiments, the redirecting number, for instance, provides information regarding the individual and/or number that requested the diversion and describes the reason for diversion. In certain other embodiments, the original called number may provide information regarding the individual and/or number that requested the diversion and describes the reason for diversion. Information regarding the reasons for the diversion may additionally or alternatively be provided in connection with supplementary services such as, for example: call deflection (CD), call forwarding unconditional (CFU), call forwarding busy (CFB), call forwarding no reply (CFNRy), call forwarding not reachable (CFNRc) and call forwarding no answer (CFNA), call forwarding all (CFA), call forwarding on failure (CFF), among others. In some telecommunications systems, only licensed operators connected to the public network are allowed to access the information transmitted in the SS7 protocol. Depending on the system policies of the licensed operator, not all of the information that are transmitted in the SS7 protocol, such as the redirecting number and the diversion reason, may be communicated to users in the DSS1 protocol. In such circumstances, it may be

necessary for the licensed operator to manually override that operator's system policies in order to allow such information to be communicated in the DSS1 protocol.

COMMUNICATIONS DEVICES AND SOFTWARE

[0066] As noted above, the information sent to the diverted-to party or second user (e.g., party (C)) allows the user to recognize whether the call is subject to diversion, to know the identity of the original called number (e.g., party (B)), and the reason why the diversion was triggered. This is generally performed using a communications device capable of processing this information and displaying it, in some form, to the user.

[0067] Accordingly, another aspect of the present disclosure is directed to a computer program product that includes a computer readable medium having instructions stored thereon. The instructions, when carried out by a processor of a respective device, cause the processor to perform the steps of displaying, to a second user: (i) information associated with a call to a first user, and (ii) information associated with the first user and information associated with the diversion of the call from the first user to the second user. Other embodiments of the present application include software programs to perform any of the method embodiment steps and operations described in detail herein.

[0068] Yet another aspect of the present disclosure is directed to a communications device comprising a microprocessor, a memory unit that stores instructions associated with an application executed by the microprocessor, and an interconnect coupling the processor and the memory unit. The interconnect allows the communications device to execute the application and perform the operations of displaying, to a second user: (i) information associated with a call to a first user, including the number of the calling party, the identity of the calling party, and (ii) information associated with the diversion of the call from the first user to the second user, including the original called number, the identity of the user associated with the original called number (i.e., the called party information), and the reason for the call diversion. In addition, the application

may allow the communications device to query the databases of the service provider for information associated with the first user and display that information on the communications device of the second user.

[0069] Many different types of communications devices may utilize the systems and methods disclosed herein. Depending on the functionality provided by the device, the device may be referred to a cellular telephone, a data messaging device, a pager or two-way pager, a wireless internet appliance, or other data communications device, preferably with telephony capabilities. The device may also be a standard telephone, a switchboard, a computer, and the like. In one embodiment, the communications device is a cellular telephone or a pager; more preferably in this embodiment, the communications device is a cellular telephone. The communications device can include an operating system, such as Bada, Symbian OS, Palm OS, Android, iPhone OS, Blackberry OS, iOS, Maemo, MeeGo, Java, S60, Windows Mobile, Mobile Linux, WebOS, and MXI.

[0070] As described in further detail below, in addition to the subscription systems described herein, the user(s) may also subscribe to a messaging service. This may include an instant messaging system, a pager service, or other message delivery system, including those currently in use, currently in development, and those that will be developed in the future, can be used as a messaging network in accordance with the present disclosure. One or more of the communications devices utilized in the methods and systems described herein may also be text message enabled, Worldwide Web browser enabled, or both, permitting the exchange of short message service (SMS) messages, Instant Messages, and the like. These and other messaging systems may provide additional or alternative functionality to the provision of the call information described herein. Messages may work in conjunction with more elaborate applications supported through Java applications in the Web environment or WAP applications provided by cellular phones. These are only examples of mechanisms for delivering interactive applications that could be used in conjunction with the service(s) described herein.

[0071] In general, the device is capable of acquiring or generating secure and sensitive information through its interaction with cellular networks and the services the networks provide. Representative cellular networks and the services they provide include, for instance, Code Division Multiple Access (CDMA) and Global Service Mobile (GSM) networks which provide for the most part voice and some data services. Voice services for the devices are typically compatible with plain old telephone service (POTS). Short Messaging Service (SMS) and Wireless Application Protocol (WAP) are available on some cellular networks. Data networks, such as MobiTex™, Datatac™, as well as advanced networks such as General Packet Radio Service (GPRS), and Universal Mobile Telecommunications System (UMTS), Long Term Evolution 4G (LTE), among others, may allow an appropriately configured wireless mobile device to offer data services such as e-mail, web browsing, SMS, WAP, as well as PIM. Still other networks may also offer video services.

[0072] Network access requirements will generally vary depending upon the type of network. For example, mobile devices in the Mobitex and DataTAC networks are typically registered on the network using a unique personal identification number or PIN associated with each device. In GPRS networks, on the other hand, network access is associated with a subscriber or user of a device. Thus, a GPRS device typically requires a subscriber identity module, commonly referred to as a SIM card, in order to operate on a GPRS network. Without a SIM card, a GPRS device will not be fully functional. Local or non-network communication functions (if any) may be operable, but the device will be unable to carry out any functions involving communications over the network. Once the standard network registration or activation procedures have been completed, a device may send and receive communication signals over the network. Signals received by the antenna through a communication network are input to the receiver, which may perform such common receiver functions as signal amplification, frequency down conversion, filtering, channel selection, analog to digital conversion, and so on. Analog to digital conversion of a received signal, for instance, allows more complex communication functions such as demodulation and decoding to be performed. In a similar manner,

signals to be transmitted are processed, including modulation and encoding for example, and input to a transmitter for digital to analog conversion, frequency up conversion, filtering, amplification and transmission over the communication network via an antenna. Various controls for the receiver and transmitter, and algorithms for communication signal gains are also standard.

[0073] The device typically also includes a microprocessor, which controls the overall operation of the device. Communication functions, including at least data and voice communications, may be performed through a one or more communication subsystem(s). The microprocessor also interacts with further device subsystems such as a display, flash memory, random access memory (RAM), auxiliary input/output (I/O) subsystems, port(s) (e.g., serial and/or USB ports), keyboard, speaker, microphone, short-range communications subsystems, among other device subsystems. Some of the subsystems may perform communication-related functions, whereas other subsystems may provide "resident" or on-device functions. Some subsystems, such as keyboard and display for example, may be used for both communication-related functions, such as entering a text or other message for transmission over a communication network, and device-resident functions such as a calculator or task list.

[0074] Operating system software used by the microprocessor is commonly stored in a persistent store such as flash memory, which could additionally or alternatively be a read only memory (ROM) or similar storage element. Those of skill in the art will appreciate that the operating system, specific device applications, or parts thereof, may be temporarily loaded into a volatile store such as RAM. Received communication signals may also be stored to RAM. Flash memory typically also includes modules for both data and voice communications.

[0075] The microprocessor, in addition to its operating system functions, preferably enables execution of software applications on the device. A predetermined set of applications which control basic device operations, including at least data and voice communication applications and the call diversion systems described herein, for example, may be installed on the device during manufacture. Further applications, such the call diversion systems

described herein, may also be loaded onto the device through a network, an auxiliary I/O subsystem, port(s) (e.g., serial or USB ports), short-range communications subsystem or any other suitable subsystem and installed by a user in the RAM or a non-volatile store for execution by the microprocessor.

[0076] Another aspect of the disclosure, therefore, is directed to software to be installed on a communications device (such as a mobile communications device (e.g., a cellular phone, pager, etc.)). This software allows the device to collect the aforementioned call and diversion information of the first user and electronically display (or announce) it to the second user. In this way, the second user (e.g., party (C)) can be prepared to answer a call from a party (e.g., a customer or other party (A)) originally directed to a first user (e.g., party (B)). In addition, in one preferred embodiment, the software installed on the communications device allows the device to ring with a specific ring tone for diverted calls that is different than the ring tone for normal calls made directly to the second user. In another preferred embodiment, the ring tone may vary depending on the reason for the diversion, such that each type of call diversion corresponds to a different ring tone. In this way, the second user will immediately recognize whether the incoming call is a diverted call and may also be able to recognize the reason for the diversion.

[0077] In general, the software programs perform the steps and operations described herein. One such embodiment comprises a computer program product that has a computer-readable medium including computer program logic encoded thereon that, when performed in a computerized device having a coupling of a memory and a processor and a display, programs the processor to perform the operations disclosed herein. Such arrangements are typically provided as software, code and/or other data (e.g., data structures) arranged or encoded on a computer readable medium such as an optical medium (e.g., CD-ROM), floppy or hard disk or other a medium such as firmware or microcode in one or more ROM or RAM or EPROM chips or as an Application Specific Integrated Circuit (ASIC). The software or firmware other such configurations can be installed onto a communications device as described herein to cause the communications device to perform the techniques explained

herein. It will be understood that installation of the software onto a communications device of a user will comply with various privacy regulations and will be equipped with the appropriate control elements to find and display only those numbers that wish to be accessed (e.g., based upon the subscription services described herein). In general, the provision of the software serves and functions as an express authorization, by the original called party, that allows the second user (or further sub-users) to read its call identification information along with the reasons for the call diversion.

REGISTRATION, PROFILING, AND CONNECTION

[0078] In certain embodiments, the systems and methods described herein may be used independently or in coordination with a responsive service via call centers (e.g., in the event that neither the original called party nor the diverted-to party answer the call (i.e., party (B) and party (C) are unavailable). There may also be a profiling procedure that is carried out in order to program the communications device(s) in compliance with the requirements of the subscriber (i.e., the first user). The coordination of these resources and the software allow, for example, calls to be diverted to a call center or a mailbox in the event that the second user (the designated party to whom calls are should be diverted) is unable to respond to the diverted call. In this way, calls to the original called number are not lost. By way of example, a first user may subscribe to the call diversion services described herein. As party of the subscription and registration process, the first user designates a second user to be the regular party to whom calls should be diverted in the event that the first user cannot answer. The first user provides the relevant registration information about the second user (e.g., phone number, address, etc.) to allow the system and phone services to divert calls and communicate information to the second user. This preferably includes the provision of the software describe herein to the communications device of the second user. It is also possible to designate one or more back-up or further sub-users (e.g., party (D), party (E), and so on) to receive diverted calls in the event that the second user is also unavailable.

[0079] **FIG. 10** illustrates a block diagram of an exemplary call diversion service **1300** in accordance with an exemplary embodiment of the present disclosure. Call diversion service **1300** comprises a diversion service provider **1310** configured for facilitating call diversion services for one or more users **1312**. Provider **1310** is configured to communicate with one or more controllers **1314**, described in detail herein. Provider **1310** can communicate with controller **1314** via a network, a telephone line, a fiber optics line, radio-frequency, blue tooth, and the like. Controller **1314** facilitates communication between one or more callers **1316**, users **1312**, and one or more sub-user(s) **1318**. In the case of telephony, it is understood by those skilled in the art that controller **1314** can include, but is not limited to, the hardware and software associated with telecommunications and internet switches and routers, such as those from Cisco, Nortel, Lucent, Siemens, and the like.

[0080] Call diversion services generally include management of telephone data and information associated with the diversion of telephone calls, as described in detail above. The services may also include, but are not limited to, call waiting, three-way calling, multi-party conferencing, and the like. For example, in one exemplary embodiment in accordance with the present disclosure, provider **1310** is configured to store information about user **1312** and information for user **1312** (including information regarding the designated party or parties to whom calls should be diverted) on one or more provider **1310** databases.

[0081] As noted above, user **1312** may be a private user, a mail-order business, a customer service center, a user of a toll-free number, a user of an informational line, a business, a government entity, and the like. User **1312** gains access to provider **1310** by registering with provider **1310**. By registering, user **1312** of service **1300** contacts provider **1310** and provides the same with business information. As noted above, User **1312** also provides information regarding the sub-user(s) **1318** to which calls will be diverted and provides authorization to provider **1310** to display ID's and business information of User **1312** to the sub-user(s) **1318** when calls directed to User **1312** are diverted to the sub-user(s) **1318**. In particular, User **1312** may provide authorization to

provider **1310** to display information to sub-user(s) **1318** regarding the calls directed to User **1312** but diverted to sub-user(s) **1318**. Such information, that may be subject to multiple diversion hops, may include the number of the calling party, the telephone number and other information of the User **1312**, the redirecting number, and the reason for the call diversion.

[0082] Provider **1310** can include one or more computers or computing systems, a local database, a remote database, a portable storage device, an employer, a financial institution, a non-financial institution, a company, the military, the government, a school, a travel entity, a transportation authority, a security company, and/or any other system or entity that is authorized to receive and store user identifying information and associate the identifying information with user **1312** and sub-user(s) **1318**. While provider **1310** is described herein as providing call diversion services for user **1312**, provider **1310** can additionally or alternatively be configured to provide any type of service to user **1312**, such as, for example, call answering, ticketing services, booking services, and the like. These and other additional and/or alternative embodiments are described, for example, in PCT Publication No. WO2008/008303, which is hereby incorporated by reference in its entirety, including the specification, figures, and claims.

[0083] **FIG. 11** illustrates an exemplary registration procedure **1400** in accordance with an exemplary embodiment of the present disclosure. During registration, user **1312** can contact service provider **1310** (step **1401**) to submit business information to service provider **1310** (step **1403**). User **1312** can contact service provider **1310** and submit business information in person, through a computer and/or internet, through software and/or hardware, through a third-party, through a kiosk and/or registration terminal, and/or by any other direct or indirect means, communication device or interface for user **1312** to contact service provider **1310**.

[0084] As used herein, business information can include information regarding the business and/or services of user **1312**, such as, for example, telephone numbers, alternate telephone numbers, business hours, accounting procedures, internal business information, general business information such as

maps, hotels, ticketing, booking and/or reservation information, the number of sub-users, and/or sub-user information of user **1312** and/or any other type of business information. Preferably, the business information provided by the first user includes information (e.g., name, address, phone numbers, communications device identifiers) regarding the second (or sub-) user that will receive diverted calls on behalf of the first user. For example, business information may also include the manner in which user **1312** would like its phone calls automatically diverted at particular times and days, the type of music, recorded information, or radio the user **1312** would like to be played while a caller is on hold or is being diverted; lists of callers (and/or phone numbers of callers) to which provider **1310** should always attempt to divert or connect user **1312**, never attempt to divert or connect user **1312**, or attempt to directly connect user **1312** during regular business hours; the information which user **1312** would like to be included in messages taken from callers who are not connected to user **1312** or sub-user(s) **1318**; the manner by which user **1312** would like to be notified of messages (such as, for example, telephone, pager, facsimile, SMS, MMS, voicemail, text message, email, internet website posting, etc.); information which user **1312** would ordinarily provide to certain types of callers (such as, for example, locations, business hours, account information, service availability, etc.); the manner in which user **1312** expects to be billed for answering services (such as, for example, invoice, credit card, automatic account debit, wire transfer, etc.); and when and under what conditions (such as, for example, the identity of the caller) user **1312** would like its calls diverted to sub-user(s) **1318**. User **1312** can review and/or modify the business information submitted to provider **1310** at any time. For example, in one embodiment, the business information of user **1312** is submitted and available through a computer and/or internet webpage, such that user **1312** can directly trigger or turn on the service, review and/or modify the business information in real time and in a convenient manner. The manner in which user **1312** would like its phone call to be answered may include a script for the operator of the provider **1310** in the event of a failed diversion, music or other information to be played at the beginning of the call or during the diversion process, or any other response to be directed by the provider **1310** to the caller.

[0085] Upon receiving the business information, provider **1310**, user **1312**, and/or sub-user **1318** can correlate and/or register the business information and one or more user identification codes (step **1405**), such as, for example the telephone number and/or IP address that a telecommunications entity (i.e. AT&T, Verizon, etc.) has assigned to user **1312** and/or sub-user **1318** to create a data packet (step **1407**). For example, the identification code can be any number or code (i.e. a serial number, alphanumeric number, or other type of code), such as the telephone number of user **1312** or sub-user **1318**, that is unique to each.

[0086] While **FIG. 11** is described with respect to correlating the business information with one or more user identification codes generally, provider **1310**, user **1312**, and/or sub-user **1318** can correlate the business information and/or identification code with the telephone number of user **1312** and/or sub-user **1318**. As used herein, a data packet may include the information relating to at least one type of user information, business information, and/or any other information. After correlating the identification code with the data packet, provider **1310** can store the data packet in a database, digital format and/or any storage medium known in the art (step **1409**).

[0087] For example, provider **1310** is configured with one or more local, remote or other databases used for data packet storage and retrieval. The provider databases can be a graphical, hierarchical, relational, object-oriented or other database. The databases are configured such that each data packet can be suitably retrieved from the databases and provided to provider **1310** and/or user **1312** using the identification code of user **1312**. In addition, the database may be configured such that each data packet can be suitably retrieved from the databases and provided to sub-user(s) **1318** upon receipt of a diverted call originally directed to user **1312**.

[0088] Various exemplary stages of the registration/profiling software and its installation are shown in **FIG. 12**. Here, the subscriber can decide on various options, and execute the appropriate range of services, including, for example, entering the International Mobile Equipment Identity (IMEI) of a mobile communications device to be linked to the subscriber as a recognized recipient

of a diverted call (the second user or further sub-user). Upon complete or partial completion of these registration procedures, the subscriber may be directed to a payment stage (see, e.g., **FIG. 13**) where a transaction may occur according to conventional commercial procedures. At or prior to this point, the subscriber may be granted an approval to download the aforementioned software to one or more communications device(s). Alternatively, the software or a link thereto may be sent to the second user or sub-user's communications device via SMS or similar data channel (described elsewhere herein) to self-install or direct the installation of the software on the device. After completion of these procedures, optionally further including an approval of the subscriber service(s), the communications device will be able to receive diverted calls on behalf of the original called party and the sub-users who are utilizing the communications device may then respond in the appropriate manner.

[0089] With reference to **FIG 12**, for example, the subscriber accesses the website to organize and/or register their profile and identify and register the software to be installed on the phone of the second or sub-user (e.g., a colleague or assistant, or other business associate or family member) who will answer calls on the subscriber's behalf when calls are diverted. During the registration phase, the subscriber will insert their identifying number's and/or the business information as discussed above, and will also insert the second or sub-user's identifying information (such as the IMEI code of the second user's mobile device and the ID number's). In this way, for example, the second user will be authorized to receive and recognize calls and associated information that are diverted from the first user/subscriber. The subscriber may further enter other numbers (e.g., other lines or office numbers) that will may be subject to diversion of incoming calls to the second user. In addition, the subscriber can choose to have calls answered by the call diversion service provider (or other answering service provider) in the event that the second user cannot answer the call, thus further minimizing the likelihood that a call will go unanswered or lost. With these operations, the system will create the package of information that can be used to create the software to be installed on the communications device (e.g., mobile phone) of the second user. Once prepared or developed, the software

can be installed via a self-installing SMS or similar methods known in the art. Alternatively, the first and/or second user can download the software or related programs to a computer or similar terminal, and the second user's phone or device can be synchronized with the software placed on the computer in accordance with conventional techniques.

[0090] **FIG. 13** illustrates an exemplary embodiment of an available payment formula or structure for the subscription systems and methods described herein. The various formula(e) can be based, for example, on the number of user and/or sub-user phone numbers involved with the call diversion services, the subscription length, and so on, to name a few. Once the selections and transactions are completed, the system can be activated and can send or download the above-described program or software to the device, or execute the download procedures to install the software on the appropriate phone(s) or device(s) (e.g., the second user's mobile phone) or computer(s).

[0091] The present disclosure has been described above with reference to various exemplary embodiments. However, those skilled in the art will recognize that changes in modifications can be made to the exemplary embodiments without departing from the scope of the present disclosure. As used herein, the terms "comprises," "comprising," and/or any other variation thereof, are intended to cover a non-exclusive inclusion, such that a process, method, article, and/or apparatus that comprises a list of elements does not include only those elements but can include other elements not expressly listed and/or inherent to such process, method, article, and/or apparatus. Further, no element described herein is required for the practice of the disclosure unless expressly described as "essential" and/or "critical."

WHAT IS CLAIMED IS:

1. A method of providing call diversion services, the method comprising diverting an incoming call from a calling party (A) originally directed to a first user (B), to a second user (C), wherein the diverted call includes information associated with the first user and information associated with the diversion of the call, the first user information and the call diversion information being displayed on communications device of the second user.

2. The method of claim 1 wherein the communications device is a mobile communications device.

3. The method of any one of claims 1-2 wherein the first user information is selected from the name and/or business of the first user, the original called number, the name and/or business of the calling party, and the calling party number.

4. The method of any one of claims 1-3 wherein the call diversion information includes whether the call was subject to diversion and the reasons for the diversion.

5. The method of any one of claims 1-4 wherein the second user is a business associate or a family member of the first user.

6. The method of any one of claims 1-5 wherein the first user information and the call diversion information are provided to the second user from information contained in a SETUP message, an IAM (initial address message), or an INVITE message created by a telecommunications network.

7. The method of any one of claims 1-6 wherein the mobile communications device is a cellular phone or pager.

8. The method of any one of claims 1-7 wherein the first user information and the call diversion information is provided to the second user so that the second user may determine one or more of: the identity of the calling party, the identity of the called party, the original called number, the identity of the first user, whether the call is subject to diversion, and/or the reason(s) for the diversion.

9. The method of any one of claims 1-8 wherein a call diversion service provider is configured to associate and store business information of the first and second user and facilitate, by way of a controller, the diversion of the incoming call from the first user to the second user.

10. The method of claim 9 wherein the call diversion service provider stores the business information in one or more databases.

11. The method of claim 10 wherein the call diversion service provider uses the first user information to access from the database(s) the stored information.

12. The method of any one of claims 9-11 wherein the call diversion service provider is configured to receive business information of the first and second users via an internet website upon registration of the first user with the call diversion service provider.

13. The method of claim 10 wherein the stored business information includes a list of second user(s) which are authorized to receive a diverted call from the first user.

14. The method of claim 13 wherein whether said diverted call is authorized depends on the time at which said call is placed to the first user.

15. The method of claim 14 wherein the stored business information is displayed on an electronic display used by one or both of the second user and the call diversion service provider.

16. The method of claim 15 wherein the stored business information displayed depends on at least one of: the time at which said call is placed to the first user and identity of the caller.

17. The method of any one of claims 1-16 wherein the incoming call is a video telephone call.

18. The method of any one of claims 9-17 wherein the controller provides the first user information to the call diversion service provider, and the second user and the call diversion service provider provides the call diversion information to the controller.

19. The method of claim 18 wherein the first user information and the call diversion information are provided from a SETUP message and include one or more of: the original called number, the called number, the redirecting number and the diversion reasons.

20. The method of any one of claims 1-19 wherein the second user is alerted to the existence of the diverted call by a ring tone that is different than the ring that alerts the second user of a call placed directly to the first user.

21. The method of any one of claims 1-19 wherein the diverted call is directed again to the call diversion service provider when the second user is not available to answer the diverted call.

22. The method of any one of claims 1-19 wherein the diverted call is directed again to the other sub-user, and subsequently, when the sub-user/s is/are not available to answer the diverted call.

23. A computer-implemented method to facilitate providing call diversion services, comprising the steps of: (a) associating and storing, at a call diversion service provider database, business information of a first user; (b) receiving, at a controller, an incoming call from a calling party directed to the first user, the call including information associated with the calling party and the first user; (c) using the information to access in the database the stored business information of the first user, including call diversion information of a second user; and (d) diverting said incoming call and information associated with the call and information associated with the first user from the controller to the second user.

24. A computer program product including computer-readable medium having instructions stored thereon for processing call information, such that the instructions when carried out by a processing device, enable the processing device to display, to a second user: (i) information associated with a call to a first user, and (ii) information associated with the first user and information associated with the diversion of the call from the first user to the second user.

25. A communications device comprising a microprocessor, a memory unit that stores instructions associated with an application executed by the microprocessor, and an interconnect coupling the processor and the memory unit, wherein the interconnect allows the communications device to execute the application and perform the operations of displaying, to a second user: (i) information associated with a call to a first user, and (ii) information associated with the first user and information associated with the diversion of the call from the first user to the second user.

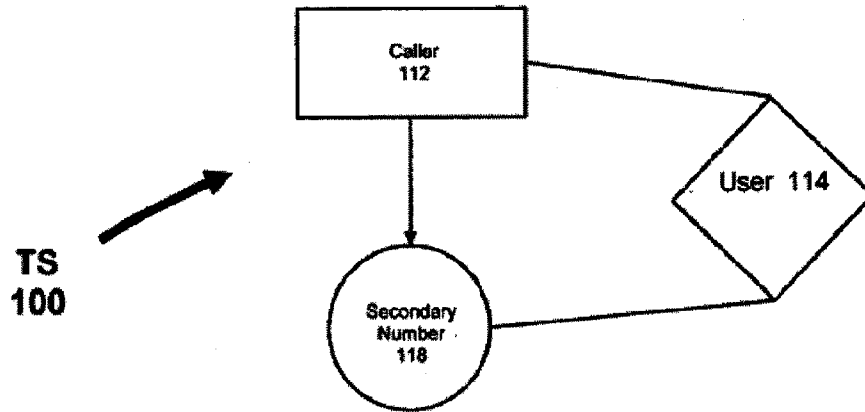


FIG. 1 (Prior Art)

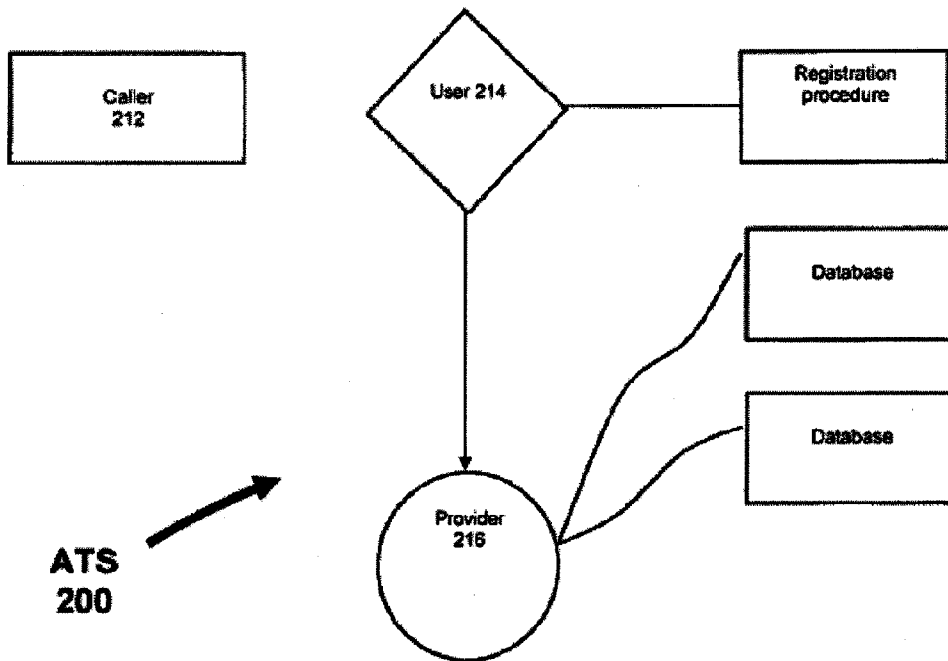


FIG. 2 (Prior Art)

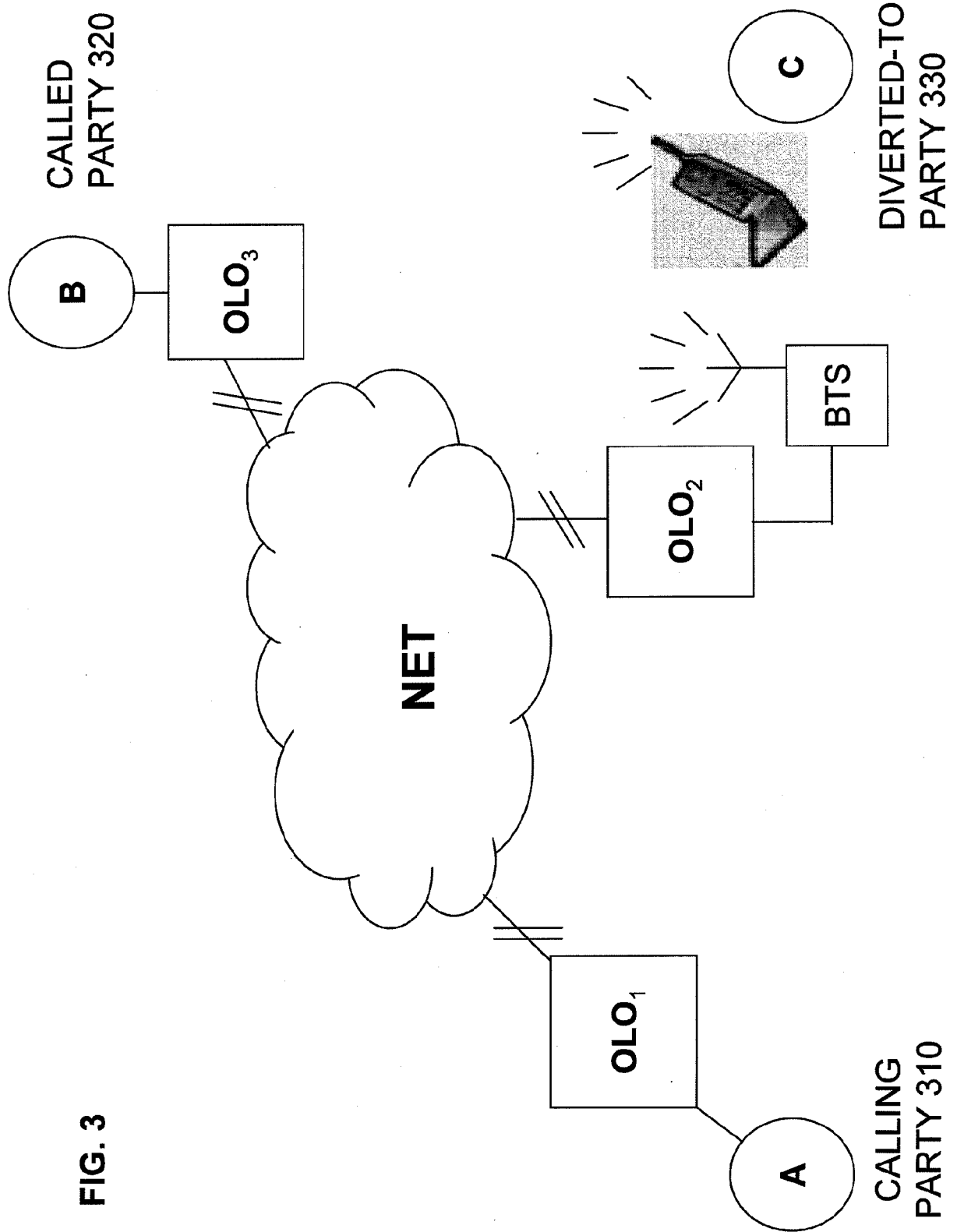


FIG. 3

FIG. 4

400

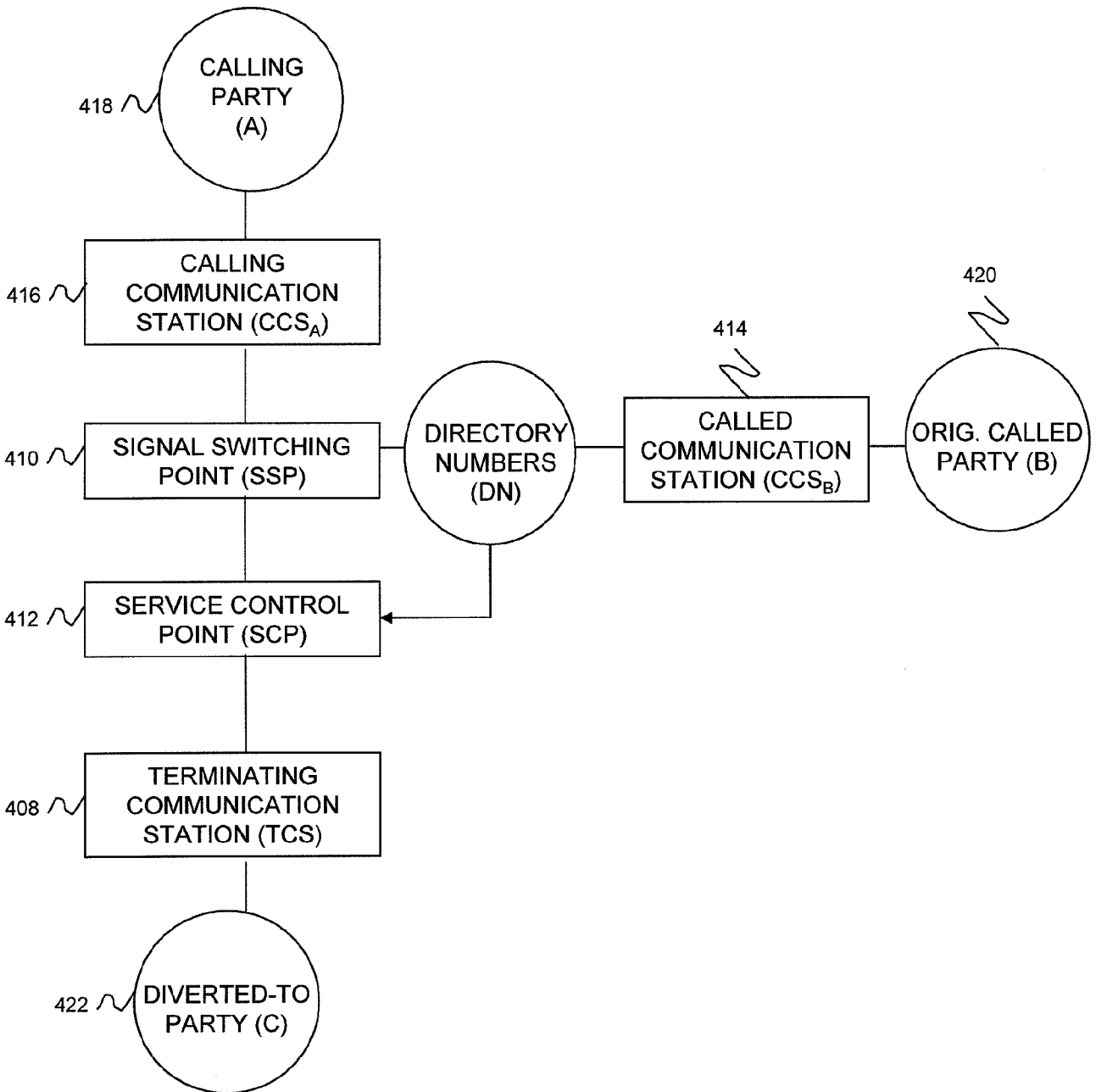


FIG. 5

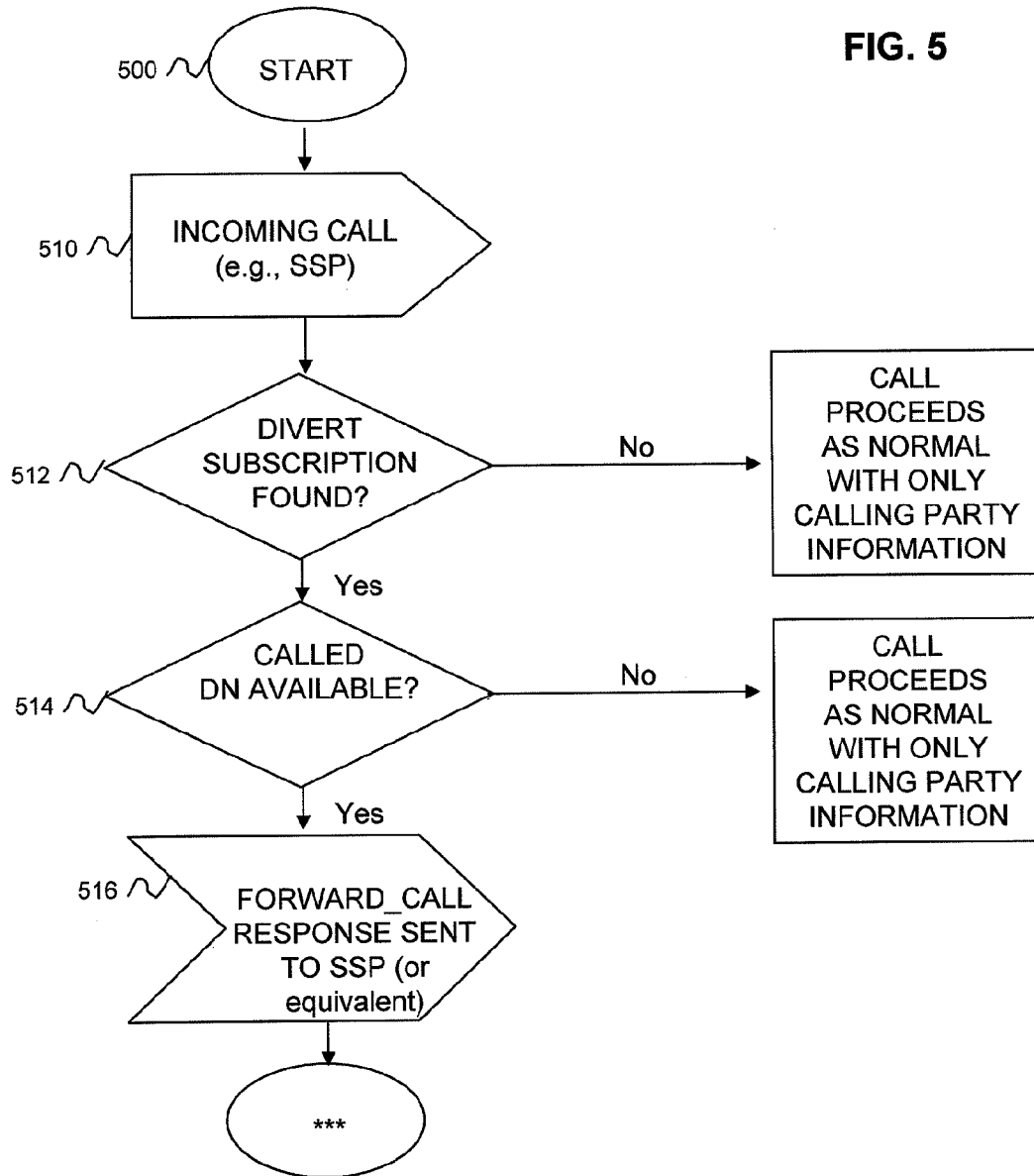


FIG. 6

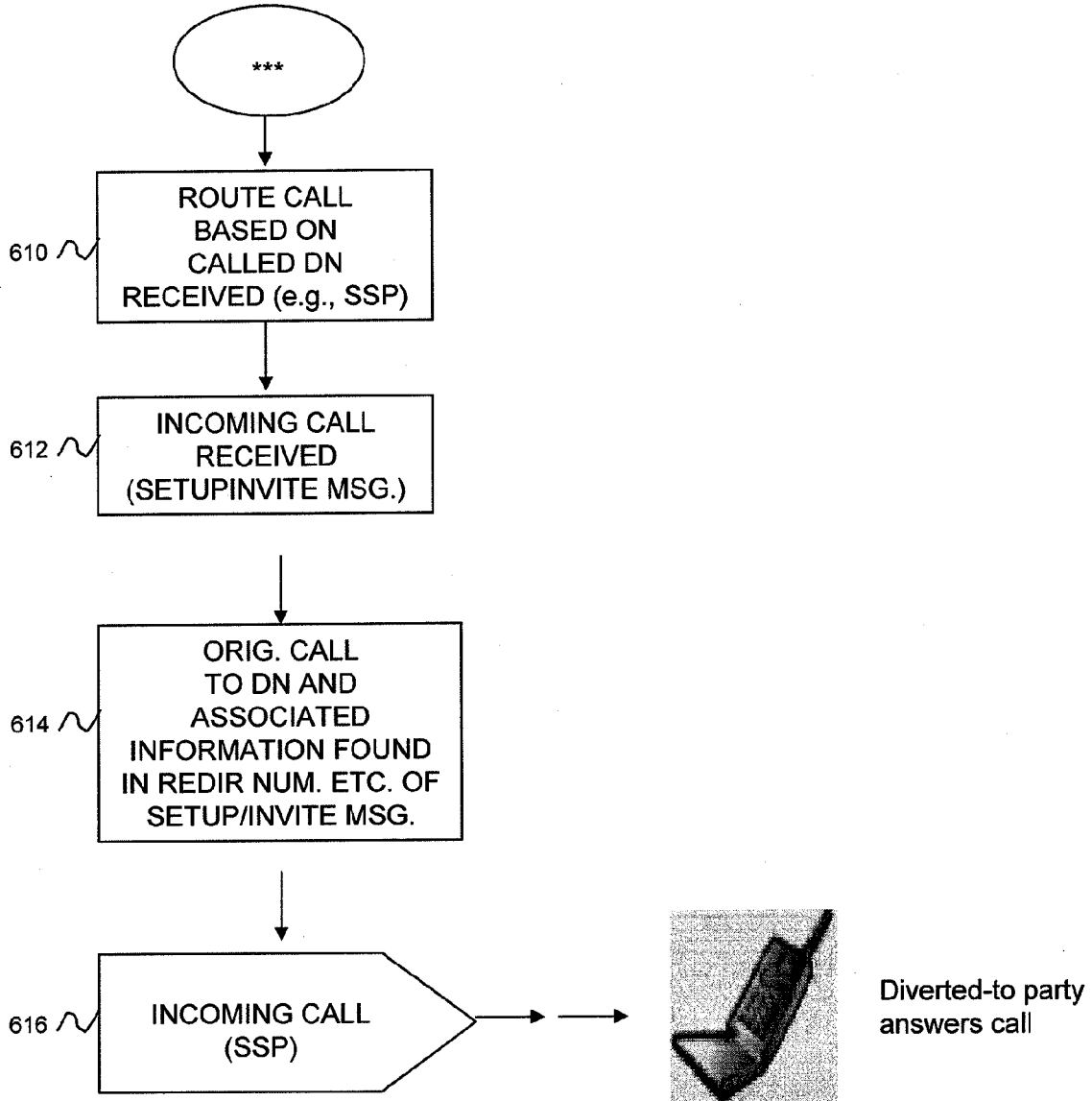
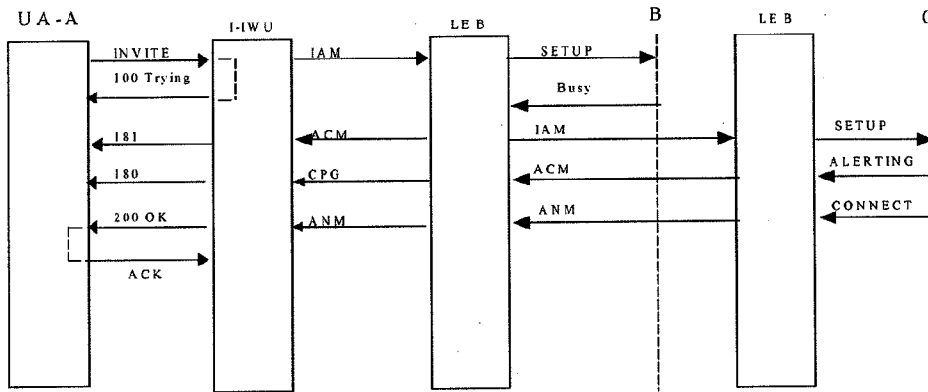


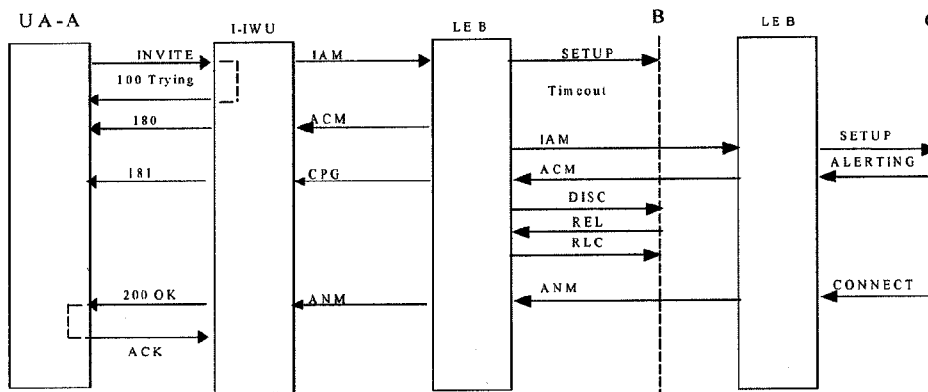
FIG. 7

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Call Forwarding Busy



Call Forwarding Non Reply



Call Forwarding Unconditional

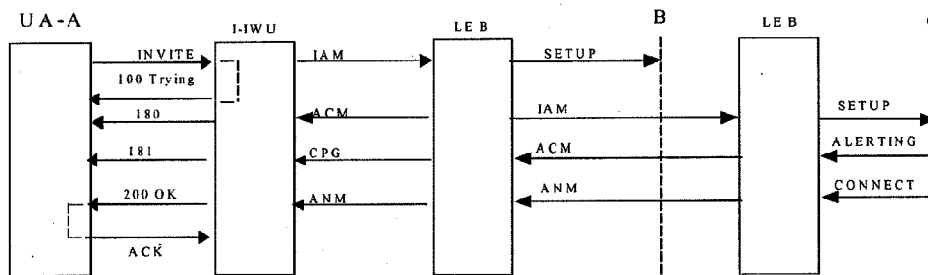


FIG. 8

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SETUP

This message is sent by the calling user to the network and by the network to the called user to initiate access connection establishment.

Q.931 – SETUP message content

Message type: SETUP Significance: Global Direction: Both				
Information element	Reference (subclause)	Direction	Type	Length
Protocol discriminator	4.2	Both	M	1
Call reference	4.3	Both	M	2-*
Message type	4.4	Both	M	1
Bearer capability	4.5	Both	M (Note 1)	4-12
Channel identification	4.5	Both	O (Note 2)	2-*
Progress indicator	4.5	u → n	O (Note 3)	2-4
Display	4.5	n → u	O (Note 4)	(Note 5)
Information rate	4.6	n → u	O (Note 6)	2-6
End-end transit delay	4.6	n → u	O (Note 8)	2-11
Transit delay selection and indication	4.6	n → u	O (Note 7)	2-5
Packet layer binary parameters	4.6	n → u	O (Note 9)	2-3
Packet layer window size	4.6	n → u	O (Note 10)	2-4
Packet size	4.6	n → u	O (Note 11)	2-4
Closed user group	4.6	n → u	O (Note 12)	4-7
Reverse charging indication	4.6	n → u	O (Note 13)	3
Calling party number	4.5	Both	O (Note 14)	2-*
Calling party subaddress	4.5	Both	O (Note 15)	2-23
Called party number	4.5	n → u	O (Note 16)	2-*
Called party subaddress	4.5	n → u	O (Note 17)	2-23
Redirecting number	4.6	n → u	O (Note 18)	2-*
User-user	4.5	n → u	O (Note 19)	(Note 20)
NOTE 1 – May be used to describe an ITU-T telecommunication service involving packet-mode access connections, if appropriate.				
NOTE 2 – Mandatory in the network-to-user direction. Included in the user-to-network direction when the user wants to indicate a channel. If not included, its absence is interpreted as "any channel acceptable".				
NOTE 3 – Included in the event of interworking within a private network.				
NOTE 4 – Included if the network provides information that can be presented to the user.				
NOTE 5 – The minimum length is 2 octets; the maximum length is network dependent and is either 34 or 82 octets.				

FIG. 9

Packet size

The purpose of the Packet size information element is to indicate the requested packet size values to be used for the call. The values are encoded log 2.

The Packet size information element is coded as shown.

The maximum length of this information element is 4 octets.

8	7	6	5	4	3	2	1	Octet
Packet size information element identifier								
0	1	0	0	0	1	1	0	1
Length of packet size contents								2
ext. 1	Forward value (Note 2)							3
ext. 1	Backward value (Note 2)							4* (Note 1)

NOTE 1 – This octet may be omitted. When omitted, it indicates a request for the default value.
 NOTE 2 – 000 0000 is reserved.

Packet size information element

Redirecting number

The purpose of the Redirecting number information element is to identify the number from which a call diversion or transfer was invoked.

The Redirecting number information element is coded as shown in Figure 4-43 and Table 4-32.

The maximum length of this information element is network dependent.

8	7	6	5	4	3	2	1	Octet
Redirecting number information element identifier								
0	1	1	1	0	1	0	0	1
Length of redirecting number contents								2
ext. 0/1	Type of number			Numbering plan identification				3
ext. 0/1	Presentation indicator	0	Spare 0 0		Screening indicator			3a* 1
ext. 1	Spare 0 0		0	Reason for redirection				3b* 1
Spare 0	Number digits (IA5 characters)							4 etc.

Redirecting number information element

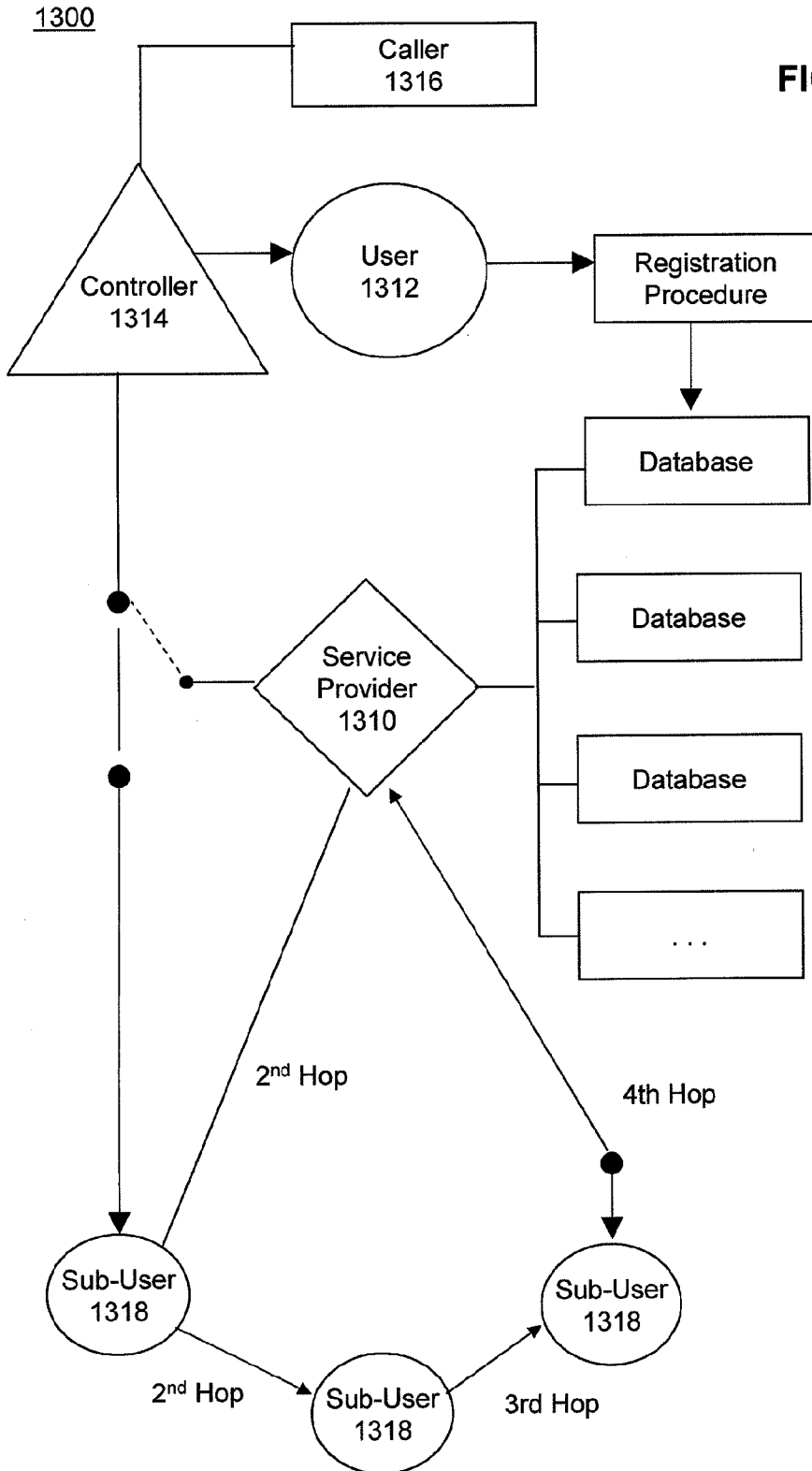


FIG. 10

1400

FIG. 11

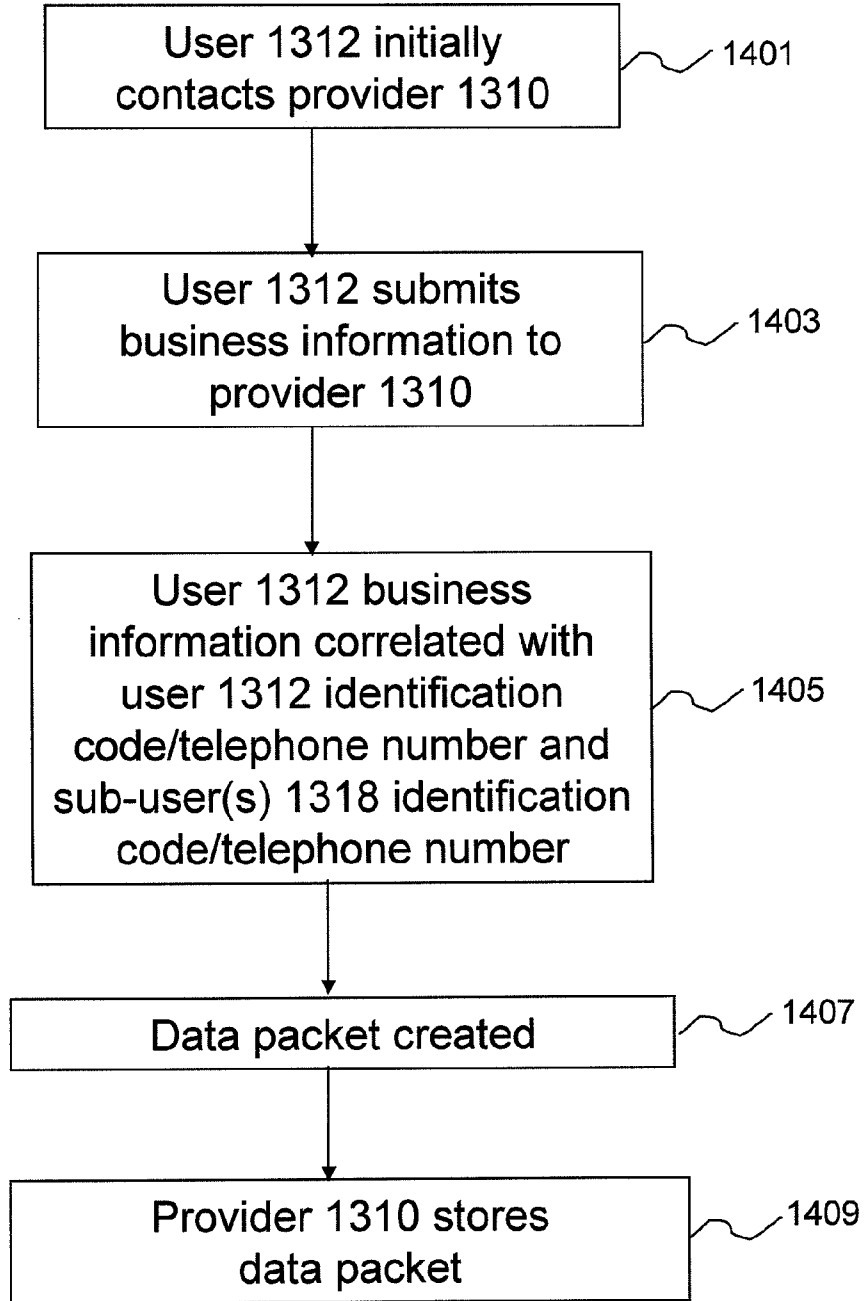


FIG. 12

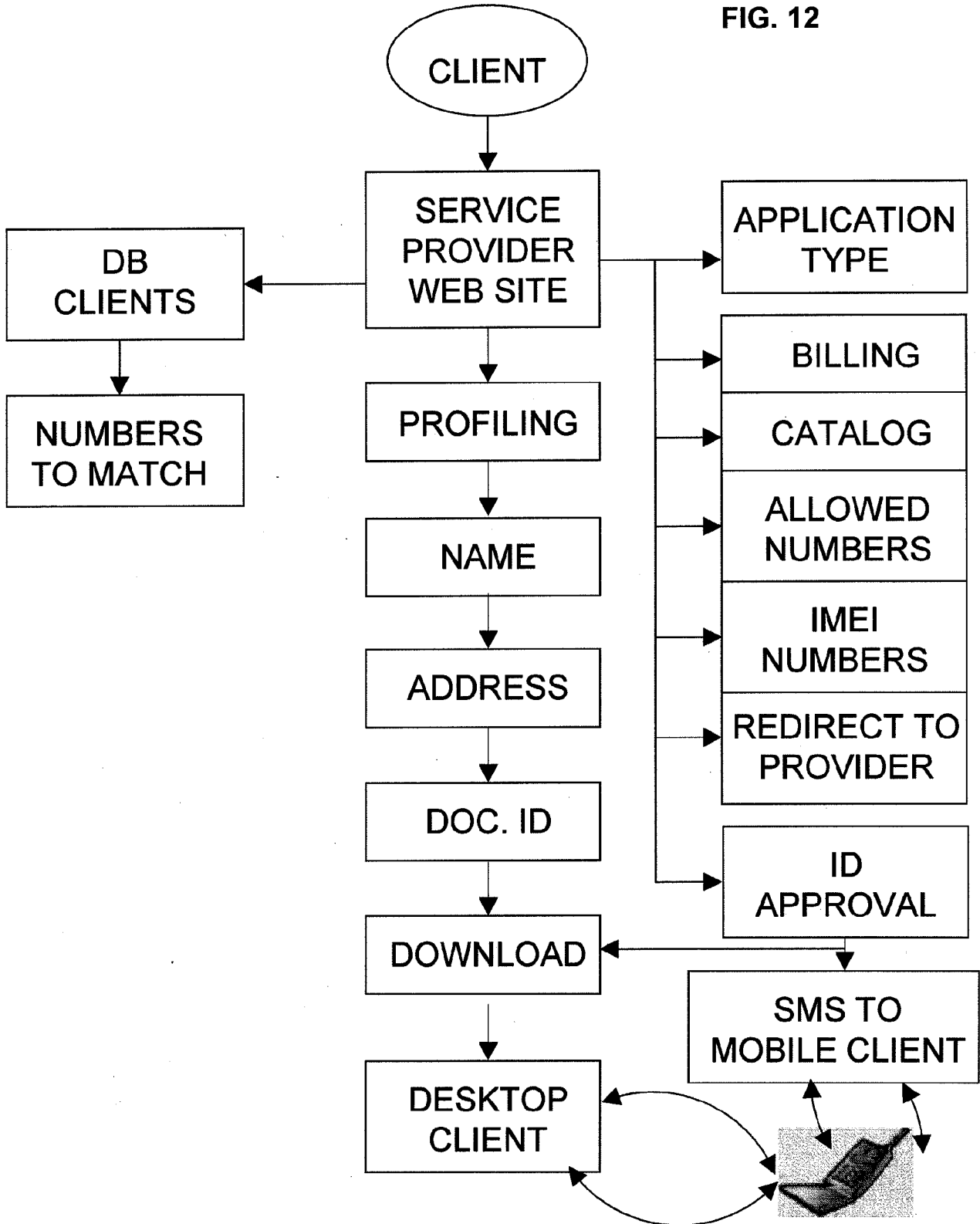


FIG. 13

