(12) STANDARD PATENT (11) Application No. **AU 2009230763 B1**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
Dynamic routing of reply calls and messages

(51) International Patent Classification(s)
H04W 88/18 (2009.01) ***H04M 3/50*** (2006.01)
H04L 12/66 (2006.01)

(21) Application No: **2009230763** (22) Date of Filing: **2009.10.27**

(43) Publication Date: **2010.05.20**
(43) Publication Journal Date: **2010.05.20**
(44) Accepted Journal Date: **2010.05.20**

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(56) Related Art
US 2004/0242211
US 6195418
US 7376226

2009230763 27 Oct 2009

Abstract

DYNAMIC ROUTING OF REPLY CALLS AND MESSAGES

Disclosed is a method of handling a reply voice call received from a caller. The method comprises the steps of: answering the reply voice call; identifying an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and making a second voice call to the identified intended recipient.

S&F Ref: 920917

AUSTRALIA

PATENTS ACT 1990

COMPLETE SPECIFICATION

FOR A STANDARD PATENT

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Invention Title:	Dynamic routing of reply calls and messages

The following statement is a full description of this invention, including the best method of performing it known to me/us:

DYNAMIC ROUTING OF REPLY CALLS AND MESSAGES

Technical Field

The present invention relates generally to mobile telephony and, in particular, to the dynamic routing of reply calls and messages from mobile phones.

Background

The rise of portable personal communication devices such as mobile phones has made possible new marketing strategies for companies and other entities with products or services to promote ("marketers"). Instead of the previous "broadcast" strategies, in which marketers sent broadly targeted messages to potential customers via such one-way media as newspapers, radio, and television, the new strategies involve more specific targeting of potential customers via the mobile phones associated with those customers. The Short Message Service (SMS) standard, which allows messages up to twelve hundred (1200) characters in length, is suitable for conveying marketing messages in campaigns using such strategies.

Importantly, mobile phones, being two-way devices, allow rapid replies by customers to the received messages, thereby confirming their participation in the marketing campaign. Third party "exchanges" can lease reply numbers in bulk from carriers, and hire them out on demand to marketers at competitive rates for the purpose of message-based marketing campaigns. Such an exchange often has dealings with multiple marketers conducting simultaneous message-based campaigns. Allocating a unique reply number to each marketer can quickly exhaust the supply of reply numbers available to the exchange. However, allowing reply numbers to be shared between marketers raises the problem of how to identify the marketer to which a reply message or voice call is directed. Further,

reply numbers are often not set up to handle reply voice calls, with the undesirable result that a customer's reply voice call is never connected or is swiftly cut off.

Summary

It is an object of the present invention to substantially overcome, or at least ameliorate, one or more disadvantages of existing arrangements.

According to a first aspect of the present disclosure, there is provided a method of handling a reply voice call received from a caller. The method comprises the steps of: answering the reply voice call; identifying an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and making a second voice call to the identified intended recipient.

According to a second aspect of the present disclosure, there is provided an exchange server adapted to handle a reply voice call received from a caller. The exchange server comprises a memory, and a processor adapted to answer the reply voice call, identify an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and make a second voice call to the identified intended recipient.

According to a third aspect of the present disclosure, there is provided a computer program being executable by a computer apparatus to make the computer apparatus perform a method of handling a reply voice call received from a caller. The computer program comprises code for answering the reply voice call; code for identifying an intended recipient of the reply voice call, using a first number on which the reply voice call

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arrived, and a second number, obtained from the reply voice call, identifying the caller; and code for making a second voice call to the identified intended recipient.

According to a fourth aspect of the present disclosure, there is provided a computer readable medium having a computer program recorded therein for handling a reply voice call received from a caller. The computer program comprises code for answering the reply voice call; code for identifying an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and code for making a second voice call to the identified intended recipient.

According to a fifth aspect of the present disclosure, there is provided a system for handling a reply voice call received from a caller. The system comprises one or more marketing servers; one or more customer mobile phones; and an exchange server. The exchange server comprises a memory, and a processor adapted to answer the reply voice call; identify an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and make a second voice call to the identified intended recipient.

According to a sixth aspect of the present disclosure, there is provided a method of handling a reply voice call received from a caller, the method comprising the steps of: answering the reply voice call; identifying an intended recipient of the reply voice call, using: a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and making a second voice call to the identified intended recipient, wherein the identifying comprises locating an entry a database with a first field value equal to the first number and a second field value equal to

the second number, the third field value of the located entry indicating the intended recipient of the reply voice call.

According to a seventh aspect of the present disclosure, there is provided a computer program being executable by a computer apparatus to make the computer apparatus perform a method of handling a reply voice call received from a caller, said computer program comprising: code for answering the reply voice call; code for identifying an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and code for making a second voice call to the identified intended recipient, wherein the code for identifying comprises code for locating an entry a database with a first field value equal to the first number and a second field value equal to the second number, the third field value of the located entry indicating the intended recipient of the reply voice call.

According to an eighth aspect of the present disclosure, there is provided a computer readable medium having a computer program recorded therein for handling a reply voice call received from a caller, said computer program comprising: code for answering the reply voice call; code for identifying an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and code for making a second voice call to the identified intended recipient, wherein the code for identifying comprises code for locating an entry a database with a first field value equal to the first number and a second field value equal to the second number, the third field value of the located entry indicating the intended recipient of the reply voice call.

Description of the Drawings

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At least one embodiment of the present invention will now be described with reference to the drawings, in which:

Fig. 1 shows a system within which the embodiments of the invention may be practised;

Figs. 2A and 2B form a schematic block diagram of a general purpose computer system on which the servers in the system of Fig. 1 may be implemented;

Fig. 3 is a flow diagram illustrating a method of handling a reply message from a customer mobile phone in a marketing campaign conducted in the system of Fig. 1;

Fig. 4 is a flow diagram illustrating a method of handling a reply voice call from a customer mobile phone in a marketing campaign conducted in the system of Fig. 1 according to one embodiment of the invention;

Fig. 5 illustrates the sequence of messages passing between the entities in the system of Fig. 1 according to the method of Fig. 3; and

Fig. 6 illustrates the sequence of messages and calls passing between the entities in the system of Fig. 1 according to the method of Fig. 4.

Detailed Description

Where reference is made in any one or more of the accompanying drawings to steps and/or features, which have the same reference numerals, those steps and/or features have for the purposes of this description the same function(s) or operation(s), unless the contrary intention appears.

Fig. 1 shows a system 100 within which the embodiments of the invention may be practised. The system 100 comprises an exchange server 110 associated with an exchange, *I* marketing servers 120-1 to 120-*I*, each associated with a marketer, and *J* mobile phones 130-1 to 130-*J*, each associated with a customer. The exchange server 110, marketing servers 120-*i*, and mobile phones 130-*j* are all adapted to communicate with each other in bidirectional fashion via the network 140. The exchange server 110 controls a pool of *K* reply numbers denoted as N_1 to N_K on which the exchange server 110 receives messages and voice calls from the network 140. Each mobile phone 130-*j* and marketing server 120-*i* receives messages and voice calls from the network 140 on a unique number, denoted as

C_j and M_i respectively. A recipient of a message or a voice call on the network 140 can identify the origin of the voice call or message by decoding "caller ID" information accompanying the call or message in conventional fashion, unless that information is actively disabled by the originator of the voice call (known as "calling privately"). Thus, each voice call or message may be thought of as having a "from:" field identifying the originator of the voice call or message, as well as a "to:" field identifying its destination.

Figs. 2A and 2B collectively form a schematic block diagram of a general purpose computer system 200, upon which the servers 110 and 120-*i* of the system 100 of Fig. 1 may be implemented.

As seen in Fig. 2A, the computer system 200 is formed by a computer module 201, input devices such as a keyboard 202, a mouse pointer device 203, a scanner 226, a camera 227, and a microphone 280, and output devices including a printer 215, a display device 214 and loudspeakers 217. An external Modulator-Demodulator (Modem) transceiver device 216 may be used by the computer module 201 for communicating to and from the communications network 140 via a connection 221. Where the connection 221 is a telephone line, the modem 216 may be a traditional "dial-up" modem. Alternatively, where the connection 221 is a high capacity (eg: cable) connection, the modem 216 may be a broadband modem. A wireless modem may also be used for wireless connection to the network 140.

The computer module 201 typically includes at least one processor unit 205, and a memory unit 206 for example formed from semiconductor random access memory (RAM) and semiconductor read only memory (ROM). The module 201 also includes an number of input/output (I/O) interfaces including an audio-video interface 207 that couples to the video display 214, loudspeakers 217 and microphone 280, an I/O interface 213 for the

keyboard 202, mouse 203, scanner 226, camera 227 and optionally a joystick (not illustrated), and an interface 208 for the external modem 216 and printer 215. In some implementations, the modem 216 may be incorporated within the computer module 201, for example within the interface 208. The computer module 201 also has a local network interface 211. The interface 211 may be formed by an EthernetTM circuit card, a BluetoothTM wireless arrangement or an IEEE 802.11 wireless arrangement.

The interfaces 208 and 213 may afford either or both of serial and parallel connectivity, the former typically being implemented according to the Universal Serial Bus (USB) standards and having corresponding USB connectors (not illustrated). Storage devices 209 are provided and typically include a hard disk drive (HDD) 210. Other storage devices such as a floppy disk drive and a magnetic tape drive (not illustrated) may also be used. An optical disk drive 212 is typically provided to act as a non-volatile source of data. Portable memory devices, such optical disks (eg: CD-ROM, DVD), USB-RAM, and floppy disks for example may then be used as appropriate sources of data to the system 200.

The components 205 to 213 of the computer module 201 typically communicate via an interconnected bus 204 and in a manner which results in a conventional mode of operation of the computer system 200 known to those in the relevant art. Examples of computers on which the described arrangements can be practised include IBM-PC's and compatibles, Sun Sparcstations, Apple Macs™ or alike computer systems evolved therefrom.

The methods of Figs. 3 to 4, to be described below, may be implemented as one or more software application programs 233 executable within the computer system 200 in its capacity as the exchange server 110. In particular, the steps of the methods of Figs. 3 to 4

are effected by instructions 231 in the software 233 that are carried out within the computer system 200. The software instructions 231 may be formed as one or more code modules, each for performing one or more particular tasks. The software may also be divided into two separate parts, in which the code modules in the first part perform the methods and the corresponding code modules in a second part manage a user interface between the first part and a user of the computer system 200.

The software 233 is typically loaded into the computer system 200 from a computer readable medium, and is then typically stored in the HDD 210, as illustrated in Fig. 2A, or the memory 206, after which the software 233 can be executed by the computer system 200. In some instances, the application programs 233 may be supplied to the user encoded on one or more CD-ROM 225 and read via the corresponding drive 212 prior to storage in the memory 210 or 206. Alternatively the software 233 may be read by the computer system 200 from the network 140 or loaded into the computer system 200 from other computer readable media. Computer readable storage media refers to any storage medium that participates in providing instructions and/or data to the computer system 200 for execution and/or processing. Examples of such storage media include floppy disks, magnetic tape, CD-ROM, a hard disk drive, a ROM or integrated circuit, USB memory, a magneto-optical disk, or a computer readable card such as a PCMCIA card and the like, whether or not such devices are internal or external of the computer module 201. Examples of computer readable transmission media that may also participate in the provision of software, application programs, instructions and/or data to the computer module 201 include radio or infra-red transmission channels as well as a network connection to another computer or networked device, and the Internet or Intranets including e-mail transmissions and information recorded on Websites and the like.

The second part of the application programs 233 and the corresponding code modules mentioned above may be executed to implement one or more graphical user interfaces (GUIs) to be rendered or otherwise represented upon the display 214. Through manipulation of typically the keyboard 202 and the mouse 203, a user of the computer system 200 and the application may manipulate the interface in a functionally adaptable manner to provide controlling commands and/or input to the applications associated with the GUI(s). Other forms of functionally adaptable user interfaces may also be implemented, such as an audio interface utilizing speech prompts output via the loudspeakers 217 and user voice commands input via the microphone 280.

Fig. 2B is a detailed schematic block diagram of the processor 205 and a "memory" 234. The memory 234 represents a logical aggregation of all the memory devices (including the HDD 210 and semiconductor memory 206) that can be accessed by the computer module 201 in Fig. 2A.

When the computer module 201 is initially powered up, a power-on self-test (POST) program 250 executes. The POST program 250 is typically stored in a ROM 249 of the semiconductor memory 206. A program permanently stored in a hardware device such as the ROM 249 is sometimes referred to as firmware. The POST program 250 examines hardware within the computer module 201 to ensure proper functioning, and typically checks the processor 205, the memory (209, 206), and a basic input-output systems software (BIOS) module 251, also typically stored in the ROM 249, for correct operation. Once the POST program 250 has run successfully, the BIOS 251 activates the hard disk drive 210. Activation of the hard disk drive 210 causes a bootstrap loader program 252 that is resident on the hard disk drive 210 to execute via the processor 205. This loads an operating system 253 into the RAM memory 206 upon which the operating

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system 253 commences operation. The operating system 253 is a system level application, executable by the processor 205, to fulfil various high level functions, including processor management, memory management, device management, storage management, software application interface, and generic user interface.

The operating system 253 manages the memory (209, 206) in order to ensure that each process or application running on the computer module 201 has sufficient memory in which to execute without colliding with memory allocated to another process. Furthermore, the different types of memory available in the system 200 must be used properly so that each process can run effectively. Accordingly, the aggregated memory 234 is not intended to illustrate how particular segments of memory are allocated (unless otherwise stated), but rather to provide a general view of the memory accessible by the computer system 200 and how such is used.

The processor 205 includes a number of functional modules including a control unit 239, an arithmetic logic unit (ALU) 240, and a local or internal memory 248, sometimes called a cache memory. The cache memory 248 typically includes a number of storage registers 244 - 246 in a register section. One or more internal buses 241 functionally interconnect these functional modules. The processor 205 typically also has one or more interfaces 242 for communicating with external devices via the system bus 204, using a connection 218.

The application program 233 includes a sequence of instructions 231 that may include conditional branch and loop instructions. The program 233 may also include data 232 which is used in execution of the program 233. The instructions 231 and the data 232 are stored in memory locations 228-230 and 235-237 respectively. Depending upon the relative size of the instructions 231 and the memory locations 228-230, a particular

instruction may be stored in a single memory location as depicted by the instruction shown in the memory location 230. Alternately, an instruction may be segmented into a number of parts each of which is stored in a separate memory location, as depicted by the instruction segments shown in the memory locations 228-229.

In general, the processor 205 is given a set of instructions which are executed therein. The processor 205 then waits for a subsequent input, to which it reacts to by executing another set of instructions. Each input may be provided from one or more of a number of sources, including data generated by one or more of the input devices 202, 203, data received from an external source across the network 140, data retrieved from one of the storage devices 206, 209 or data retrieved from a storage medium 225 inserted into the corresponding reader 212. The execution of a set of the instructions may in some cases result in output of data. Execution may also involve storing data or variables to the memory 234.

The methods of Figs. 3 to 4 use input variables 254, that are stored in the memory 234 in corresponding memory locations 255-258. The methods of Figs. 3 to 4 produce output variables 261, that are stored in the memory 234 in corresponding memory locations 262-265. Intermediate variables may be stored in memory locations 259, 260, 266 and 267.

The register section 244-246, the arithmetic logic unit (ALU) 240, and the control unit 239 of the processor 205 work together to perform sequences of micro-operations needed to perform "fetch, decode, and execute" cycles for every instruction in the instruction set making up the program 233. Each fetch, decode, and execute cycle comprises:

(a) a fetch operation, which fetches or reads an instruction 231 from a memory location 228;

(b) a decode operation in which the control unit 239 determines which instruction has been fetched; and

(c) an execute operation in which the control unit 239 and/or the ALU 240 execute the instruction.

Thereafter, a further fetch, decode, and execute cycle for the next instruction may be executed. Similarly, a store cycle may be performed by which the control unit 239 stores or writes a value to a memory location 232.

Each step or sub-process in the methods of Figs. 3 to 4 is associated with one or more segments of the program 233, and is performed by the register section 244-247, the ALU 240, and the control unit 239 in the processor 205 working together to perform the fetch, decode, and execute cycles for every instruction in the instruction set for the noted segments of the program 233.

The methods of Figs. 3 to 4 may alternatively be implemented in dedicated hardware such as one or more integrated circuits performing the functions or sub functions of Figs. 3 to 4. Such dedicated hardware may include graphic processors, digital signal processors, or one or more microprocessors and associated memories.

The exchange server 110 in the system 100 acts as an intermediary in the marketing campaigns being conducted between the participating marketers and their target customers. The exchange server 110, through which all calls and messages in the system 100 are routed, dynamically assigns a reply number from the pool of reply numbers N_k to each outbound marketing message before forwarding the marketing message on to the mobile phone 130-*j* of the intended customer. Rather than maintain a unique reply number

for each participating marketer, marketing messages from different marketers can be assigned the same reply number. Customer replies arrive on the shared reply numbers arrive at the exchange server 110, which needs to identify which customer reply message relates to which marketer before forwarding the reply message to the marketing server 120-*i* of the identified marketer. The need is accentuated when the reply is a voice call rather than an SMS message, because a reply voice call demands a near-immediate response.

To identify which marketing server 120-*i* is associated with a reply message or reply voice call received from a mobile phone 130-*j* on a reply number N_k, the exchange server 110 maintains and looks up a database, for example in the hard disk drive 210 of the computer system 200 when acting as the exchange server 110, as will now be described in detail with reference to Fig. 3.

Fig. 3 is a flow diagram illustrating a method 300 of handling a reply message from a customer mobile phone 130-*j* in a marketing campaign conducted in the system 100. The method 300 is performed by the exchange server 110 in the system 100. One or more steps of the method 300 may be implemented as software resident on the hard disk drive 210 and being controlled in its execution by the processor 205 of the computer system 200 acting as the exchange server 110. The method 300 will be described with reference to Fig. 5, which illustrates a sequence 500 of messages passing between entities in the system 100. Those entities are: the exchange server 110; two marketing servers 120-1 and 120-2; and two mobile phones 130-1 and 130-2. Associated with the exchange server 110 is a database 590. The database 590 may be configured within the hard disk drive 210 of the computer system 200 acting as the exchange server 110. Each entry in the

database contains three fields: a customer mobile phone number C_i, a reply number N_k, and a marketing server number M_j.

The method 300 commences at the step 305, at which the exchange server 110 receives from the marketing server 120-1 a marketing message 532, for example an SMS message, intended for the mobile phone 130-1. The marketing message 532 contains marketing material, e.g. text, graphics, or images, in the body of the message, and indicates its intended destination in a "to:" field containing the number C_1 of the mobile phone 130-1 and its origin in a "from:" field containing the number M_1 of the marketing server 120-1.

In response, at step 310, the exchange server 110 assigns a reply number N_1 from the pool of reply numbers to the marketing message 532. To assign a reply number, the exchange server 110 looks at all the entries in the database 590 whose customer mobile phone number is the number C_1. If such an entry exists whose marketer number is the number M_1, the exchange server 110 assigns the reply number N_1 in the reply number field of that entry to the marketing message 532. If no such entry exists whose marketer number is the marketer number M_1, the exchange server 110 assigns a reply number N_1 from the pool that is different from all the reply numbers in database entries whose customer mobile phone number is the number C_1, and generates a new database entry whose customer mobile phone number is the number C_1, marketing server number is M_1, and reply number is N_1. Reply numbers are chosen from the pool so as to keep an approximately even number of customers on each reply number, i.e. to balance the expected load of reply calls among the reply numbers.

This strategy, by assigning a different reply number to each marketing server targeting a particular customer mobile phone, ensures that the exchange server 110 can identify the marketing server to which a reply message is directed. If the pool is

exhausted, i.e. a reply number that has not previously been used for the customer mobile phone 120-1 cannot be found, the pool may be increased by the addition of new reply numbers, at some expense to the operator of the exchange server 110. Alternatively, the reply number from the earliest database entry whose customer mobile phone number is the number C_1 may be used, at some slight risk of confusion between the different marketing servers.

The exchange server 110 then (still at step 310) forwards the marketing message 534, whose content is the same as that of the marketing message 532 and whose "reply-to:" field is set to the assigned reply number N_1, to the mobile phone 130-1.

At the next step 320, the exchange server 110 receives a reply message 536, for example an SMS message, from the mobile phone 130-1. The reply message 536 is received on the reply number N_1 that was assigned to the marketing message 534, and indicates its origin in a "from:" field containing the number C_1 of the mobile phone 130-1.

Next, in step 330, the exchange server 110 identifies which marketing server 120-1 sent the marketing message 532 to which to the reply message 536 is in reply. In other words, the exchange server 110 identifies an intended recipient of the reply message 536. The exchange server 110 does this by looking up the entry in the database 590 whose mobile phone number is the number C_1 identifying the sending mobile phone 130-1, and whose reply number is the reply number N_1 on which the reply message 536 was received. The marketing server number of that entry, in this case M_1, identifies the intended recipient 120-1 of the reply message 536.

In the final step 340, the exchange server 110 sends a message 538 to the identified marketing server 120-1. The message 538 is sent to the number M_1 of the identified marketing server 120-1, has the same content as the reply message 536, and

identifies the mobile phone 130-1 from which the reply message 536 originated by having the number C_1 in a "from" field. The method 300 then concludes.

Fig. 5 also shows a marketing message 542 being sent from a second marketing server 120-2, whose number is M_2, also intended for the mobile phone 130-1. Using the method 300, the exchange server 110 receives the message 542 (step 305), assigns a reply number to it, and forwards it on as the message 544 to the mobile phone 130-1 (step 310). Since there is no entry in the database 590 whose customer mobile phone number is C_1 and whose marketer number is M_2, a new reply number needs to be assigned. The reply number that is assigned cannot be N_1 because of the existing entry (generated at the previous iteration of step 310) whose customer mobile phone number is C_1 with that reply number. The exchange server 110 therefore assigns a reply number N_2 from the pool, and generates a new database entry whose customer mobile phone number is the number C_1, marketing server number is M_2, and reply number is N_2.

The exchange server 110 then (step 320) receives a reply message 546 from the mobile phone 130-1. The reply message 546 is received on the reply number N_2 that was assigned to the marketing message 544, and indicates its origin in a "from:" field containing the number C_1 of the mobile phone 130-1. The exchange server 110 then (step 330) identifies the marketing server 120-2 that sent the marketing message 542 to which to the reply message 546 is in reply, by looking up the entry in the database 590 whose mobile phone number is the number C_1 and whose reply number is the reply number N_2 on which the reply message 546 was received. The marketing server number of that entry, in this case M_2, identifies the intended recipient 120-2 of the reply message 546. Finally, the exchange server 110 (step 340) sends a message 548 with the same content as the reply

message 546 to the identified marketing server 120-2, identifying the mobile phone 130-1 from which the reply message 546 originated by having the number C_1 in a "from" field.

Fig. 5 also shows a marketing message 562 being sent from the second marketing server 120-2, intended for the mobile phone 130-2 whose number is C_2. Using the method 300, the exchange server 110 receives the message 562 (step 305), assigns a reply number to it, and forwards it on as the message 564 to the mobile phone 130-2 (step 310). Since there is no entry in the database 590 whose customer mobile phone number is C_2 and whose marketer number is M_2, a new reply number needs to be assigned. In fact, there is no entry at all in the database 590 whose customer mobile phone number is C_2. The exchange server 110 therefore assigns the reply number N_1 from the pool, and generates a new database entry whose customer mobile phone number is the number C_2, marketing server number is M_2, and reply number is N_1. The reply number N_1 is now shared between the marketing server 120-2 and the marketing server 120-2.

The exchange server 110 then (step 320) receives a reply message 566 from the mobile phone 130-2 on the reply number N_1, containing the number C_2 of the mobile phone 130-2. The exchange server 110 then (step 330) identifies the marketing server 120-2 that sent the marketing message 562 to which to the reply message 566 is in reply, by looking up the entry in the database 590 whose mobile phone number is the number C_2 and whose reply number is the reply number N_1. The marketing server number of that entry, in this case M_2, identifies the intended recipient 120-2 of the reply message 566. Finally, the exchange server 110 (step 340) sends a message 568 with the same content as the reply message 566 to the identified marketing server 120-2, identifying the mobile phone 130-2 from which the reply message 566 originated by having the number C_2 in a "from" field.

The method 300 cannot handle replies that are voice calls, since a voice call cannot simply be "copied" and forwarded like a message can, and furthermore a voice call requires an instant response which a marketing server 120-*i* typically cannot provide. Reply voice calls from customers are therefore simply lost unless specific provision is made to handle them.

Fig. 4 is a flow diagram illustrating a method 400 of handling a reply voice call from a customer mobile phone 130-*j* in a marketing campaign conducted in the system 100. The method 400 is performed by the exchange server 110 in the system 100. One or more steps of the method 400 may be implemented as software resident on the hard disk drive 210 and being controlled in its execution by the processor 205 of the computer system 200 acting as the exchange server 110. The method 400 will be described with reference to Fig. 6, which illustrates a sequence 600 of messages and calls passing between the entities in the system 100. Those entities are: the exchange server 110; a marketing server 120-1; and a mobile phone 130-1. Associated with the exchange server 110 is the database 590, as in Fig. 5.

The method 400 commences at the step 405, at which the exchange server 110 receives from the marketing server 120-1 a marketing message 632, for example an SMS message, intended for the mobile phone 130-1. The marketing message 632 contains marketing material, e.g. text, graphics, or images, in the body of the message, and indicates its intended destination in a "to:" field containing the number C_1 of the mobile phone 130-1 and its origin in a "from:" field containing the number M_1 of the marketing server 120-1. In response, at step 410, the exchange server 110 assigns a reply number N_1 from the pool of reply numbers to the marketing message 632 in similar fashion to step 310 of the method 300. The exchange server 110 then (still at step 410) forwards the marketing

message 634, whose content is the same as that of the marketing message 632 and whose "reply-to:" field is set to the assigned reply number N_1, to the mobile phone 130-1.

At the next step 420, the exchange server 110 receives a reply voice call 636 from the mobile phone 130-1. The reply call 636 is received on the reply number N_1 that was assigned to the marketing message 634, and indicates its origin in a "from:" field containing the number C_1 of the mobile phone 130-1. The reply call 636 is illustrated in Fig. 6 using a double-headed arrow to indicate its bidirectional nature.

Next, in step 430, having answered the reply voice call 636, the exchange server 110 identifies which marketing server 120-1 sent the marketing message 632 to which to the reply call 636 is in reply, in similar fashion to step 330 of the method 300. However, if the reply call 636 was made "privately", the "from:" field of the reply call 636 is effectively blank, so the marketing server 120-1 that sent the marketing message 632 cannot be identified. In this instance, the exchange server 110 plays a recorded audio message asking the caller to enter their phone number via the keypad of the mobile phone 130-1. The identification can then be made as described above with reference to step 330.

In the next step 440, the exchange server 110 plays a recorded audio message, typically thanking the customer for the call and promising to call them back immediately. Optionally, the recorded audio message is customised to mention the name of the marketer corresponding to the marketing server identified in step 430, e.g. "Thank you for calling [name of marketer]..." The reply voice call 636 is then terminated. This arrangement is advantageous to the customer, since the customer is possibly being charged according to the length of the reply call 636.

In the next steps 460 and 470, which are substantially simultaneous, the exchange server 110 makes a voice call 638 to the mobile phone 130-1, using the number C_1, and a

second voice call 640 to an operator at the marketer corresponding to the identified marketing server 120-1, using the number M_1 of the identified marketing server 120-1. Either or both of the voice calls 638 and 640 may optionally have a recorded preamble. In the case of the voice call 640, the recorded message could notify the operator of the existence of the reply call 636, e.g. by stating "You have a reply call from a customer; please prepare to be connected." In the final step 480, the exchange server 110 connects the two voice calls 638 and 640, as shown by the dashed line 650, and disconnects itself, leaving the marketer 120-1 connected to the mobile phone 130-1 to follow up the reply call 636 as promised in the recorded message answering that call. The method 400 then concludes.

In an alternative approach, the reply voice call 636 is not terminated at step 440, so step 460 is not needed. Rather, at step 480 the reply voice call 636 is connected directly to the voice call 640 made at step 470 to an operator at the marketer corresponding to the identified marketing server 120-1.

The arrangements described have been described with specific reference to marketing campaigns. However, it is not intended that the described arrangements be limited to marketing campaigns. The described arrangements may have application to any situation where multiple originating entities are sending bulk telephone messages to overlapping sets of recipient entities in the expectation of replies. In the application described, the originating entities are the marketers, the messages are marketing messages, and the recipient entities are potential customers. However, in other applications, the originating entities could be managers of a sales force, while the recipient entities could be sales staff; or the originating entities could be operators of a technical support facility, while the recipient entities could be customers.

The foregoing describes only some embodiments of the present invention, and modifications and/or changes can be made thereto without departing from the scope and spirit of the invention, the embodiments being illustrative and not restrictive.

The claims defining the invention are as follows:

1. A method of handling a reply voice call received from a caller, the method comprising the steps of:

answering the reply voice call;

identifying an intended recipient of the reply voice call, using:

a first number on which the reply voice call arrived, and

a second number, obtained from the reply voice call, identifying the caller; and

making a second voice call to the identified intended recipient.

2. A method according to claim 1, further comprising connecting the reply voice call and the second voice call.

3. A method according to claim 1, further comprising:

terminating the reply voice call;

making a third voice call to the caller; and

connecting the third voice call and the second voice call.

4. A method according to claim 1, wherein the second voice call notifies the identified intended recipient of the reply voice call.

5. A method according to claim 1, wherein the answering answers the reply voice call with a recorded audio message.

6. A method according to claim 5, wherein the recorded audio message is customised to the identified intended recipient of the reply voice call.

7. A method according to claim 1, wherein the identifying comprises:

locating an entry a database with a first field value equal to the first number and a second field value equal to the second number, the third field value of the located entry indicating the intended recipient of the reply voice call.

8. An exchange server adapted to handle a reply voice call received from a caller, the exchange server comprising:

a memory; and

a processor adapted to:

answer the reply voice call;

identify an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and

make a second voice call to the identified intended recipient.

9. A computer program being executable by a computer apparatus to make the computer apparatus perform a method of handling a reply voice call received from a caller, said computer program comprising:

code for answering the reply voice call;

code for identifying an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and

code for making a second voice call to the identified intended recipient.

10. A computer readable medium having a computer program recorded therein for handling a reply voice call received from a caller, said computer program comprising:

code for answering the reply voice call;

code for identifying an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and

code for making a second voice call to the identified intended recipient.

11. A system for handling a reply voice call received from a caller, the system comprising:

one or more marketing servers;

one or more customer mobile phones; and

an exchange server, comprising:

a memory; and

a processor adapted to:

answer the reply voice call;

identify an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and

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make a second voice call to the identified intended recipient.

12. A method of handling a reply voice call received from a caller, the method comprising the steps of:

answering the reply voice call;

identifying an intended recipient of the reply voice call, using:

a first number on which the reply voice call arrived, and

a second number, obtained from the reply voice call, identifying the caller; and

making a second voice call to the identified intended recipient,

wherein the identifying comprises locating an entry a database with a first field value equal to the first number and a second field value equal to the second number, the third field value of the located entry indicating the intended recipient of the reply voice call.

13. A computer program being executable by a computer apparatus to make the computer apparatus perform a method of handling a reply voice call received from a caller, said computer program comprising:

code for answering the reply voice call;

code for identifying an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and

code for making a second voice call to the identified intended recipient,

wherein the code for identifying comprises code for locating an entry a database with a first field value equal to the first number and a second field value equal to the second

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number, the third field value of the located entry indicating the intended recipient of the reply voice call.

14. A computer readable medium having a computer program recorded therein for handling a reply voice call received from a caller, said computer program comprising:

code for answering the reply voice call;

code for identifying an intended recipient of the reply voice call, using a first number on which the reply voice call arrived, and a second number, obtained from the reply voice call, identifying the caller; and

code for making a second voice call to the identified intended recipient,

wherein the code for identifying comprises code for locating an entry a database with a first field value equal to the first number and a second field value equal to the second number, the third field value of the located entry indicating the intended recipient of the reply voice call.

15. A method of handling a reply voice call received from a caller, the method being substantially as hereinbefore described with reference to any one of the embodiments as that embodiment is shown in the accompanying drawings.

16. An exchange server adapted to handle a reply voice call received from a caller, the exchange server being substantially as hereinbefore described with reference to any one of the embodiments as that embodiment is shown in the accompanying drawings.

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17. A computer program being executable by a computer apparatus to make the computer apparatus perform a method of handling a reply voice call received from a caller, said computer program being substantially as hereinbefore described with reference to any one of the embodiments as that embodiment is shown in the accompanying drawings.

18. A computer readable medium having a computer program recorded therein for handling a reply voice call received from a caller, said computer program being substantially as hereinbefore described with reference to any one of the embodiments as that embodiment is shown in the accompanying drawings.

19. A system for handling a reply voice call from a caller, the system being substantially as hereinbefore described with reference to any one of the embodiments as that embodiment is shown in the accompanying drawings.

DATED this Twelfth Day of March, 2010

TRAITEL COMMUNICATIONS PTY LTD

Patent Attorneys for the Applicant

SPRUSON&FERGUSON

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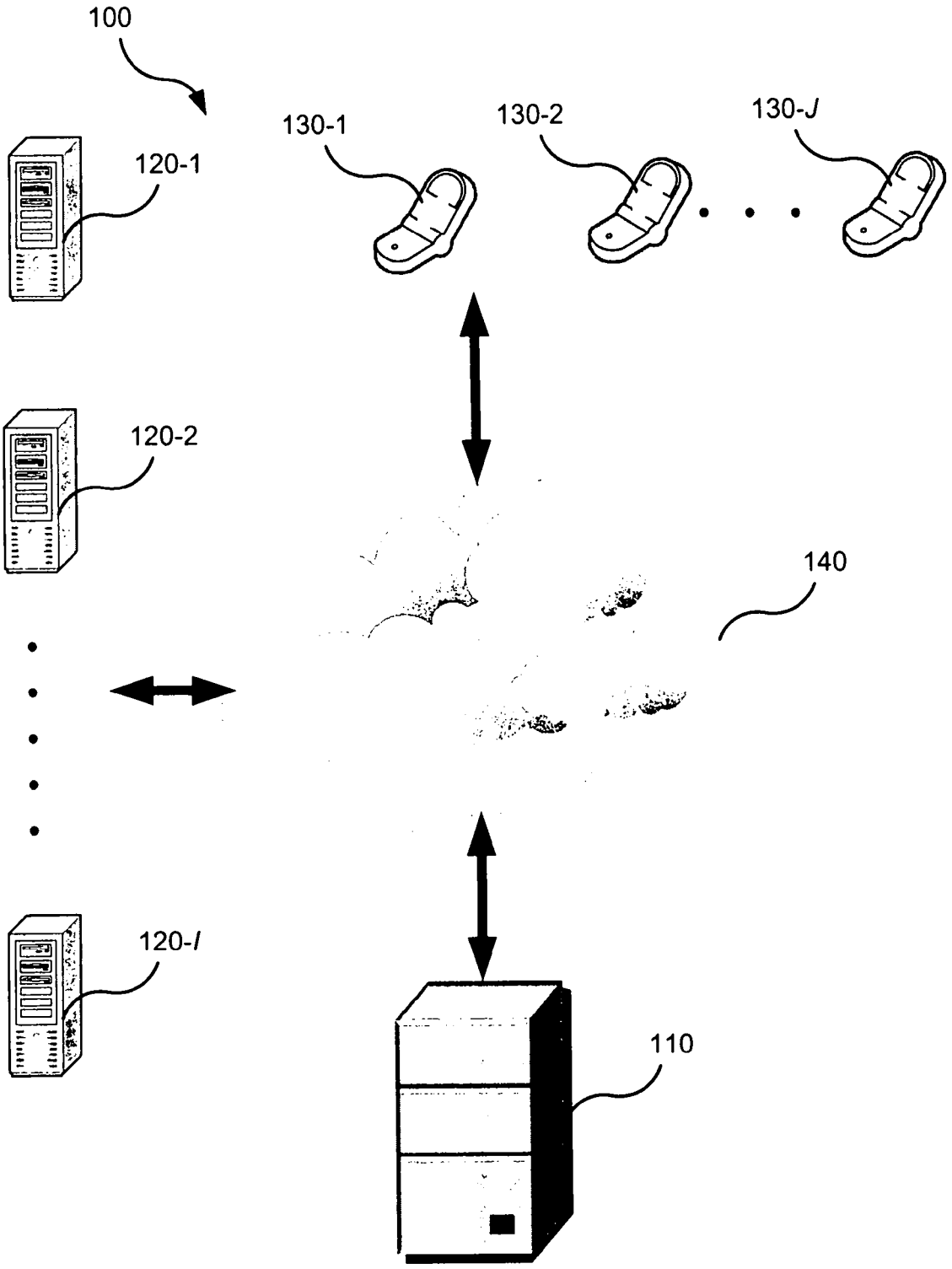

Fig. 1

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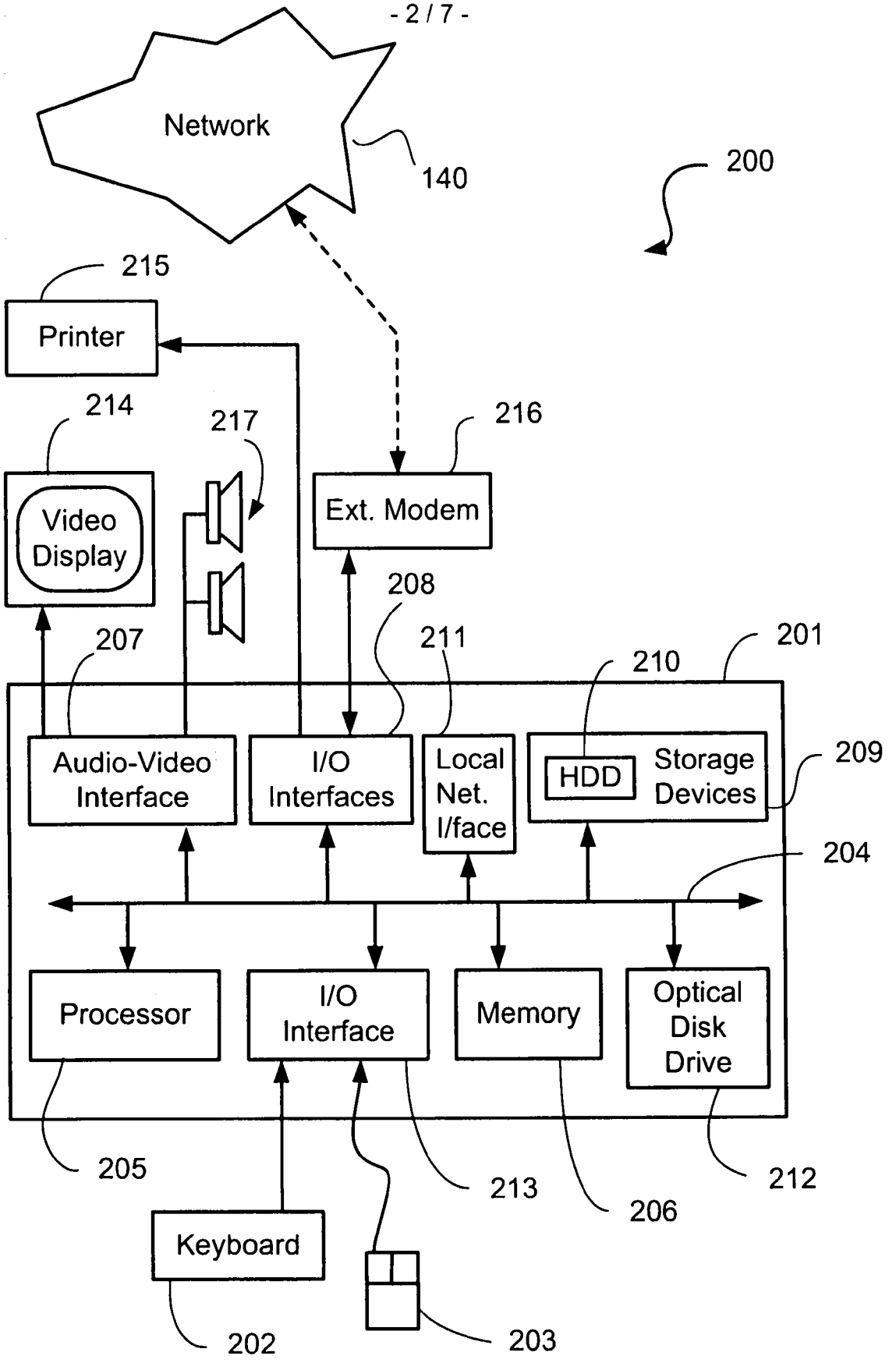

Fig. 2

2354212_1

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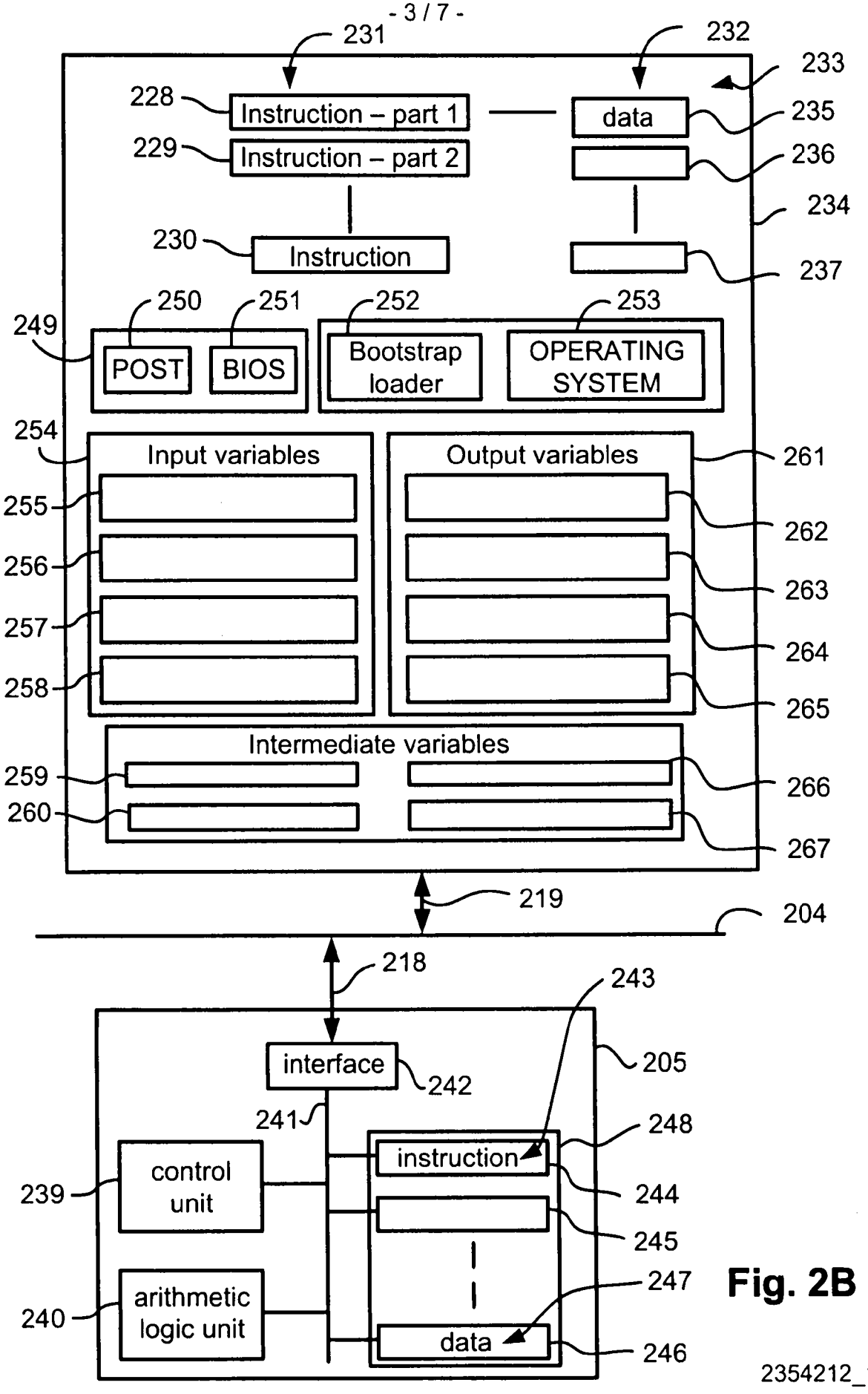

Fig. 2B

2354212_1

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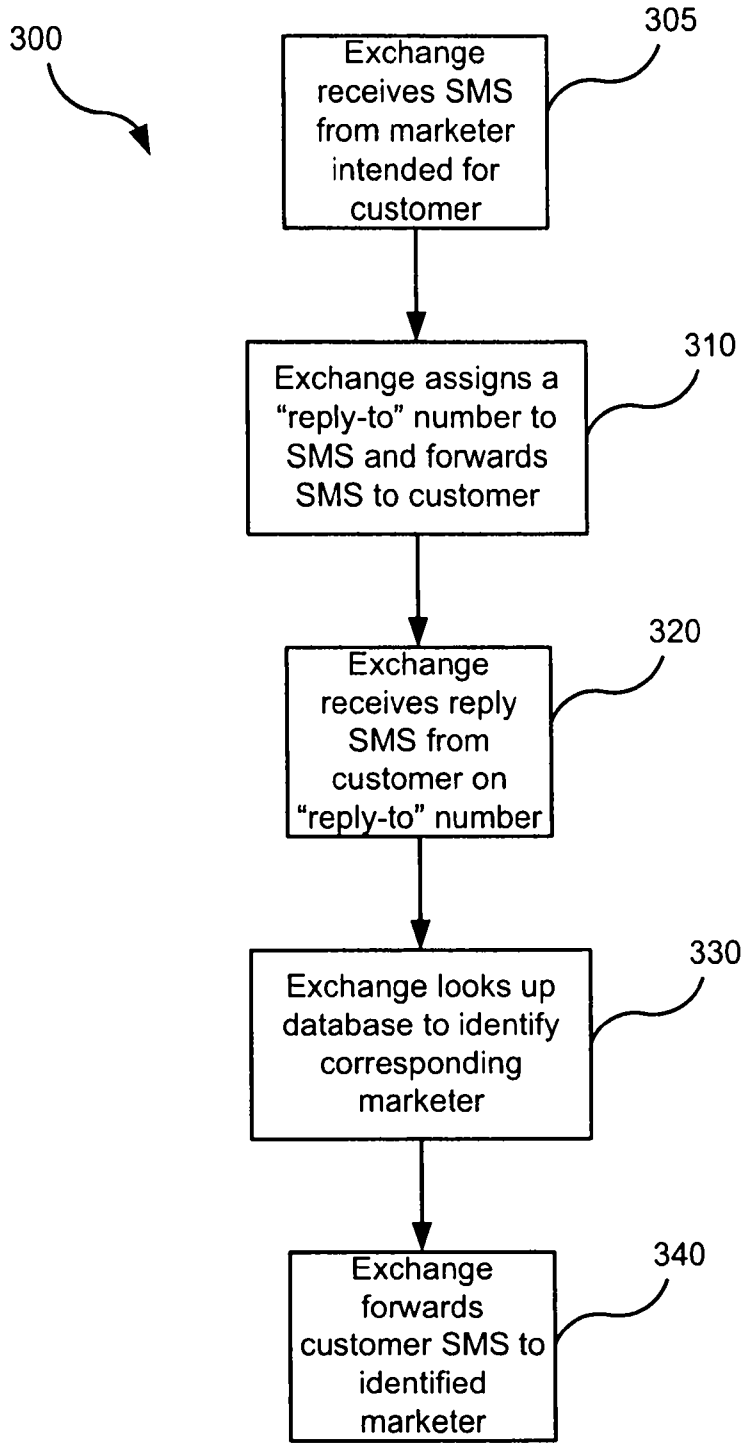

Fig. 3

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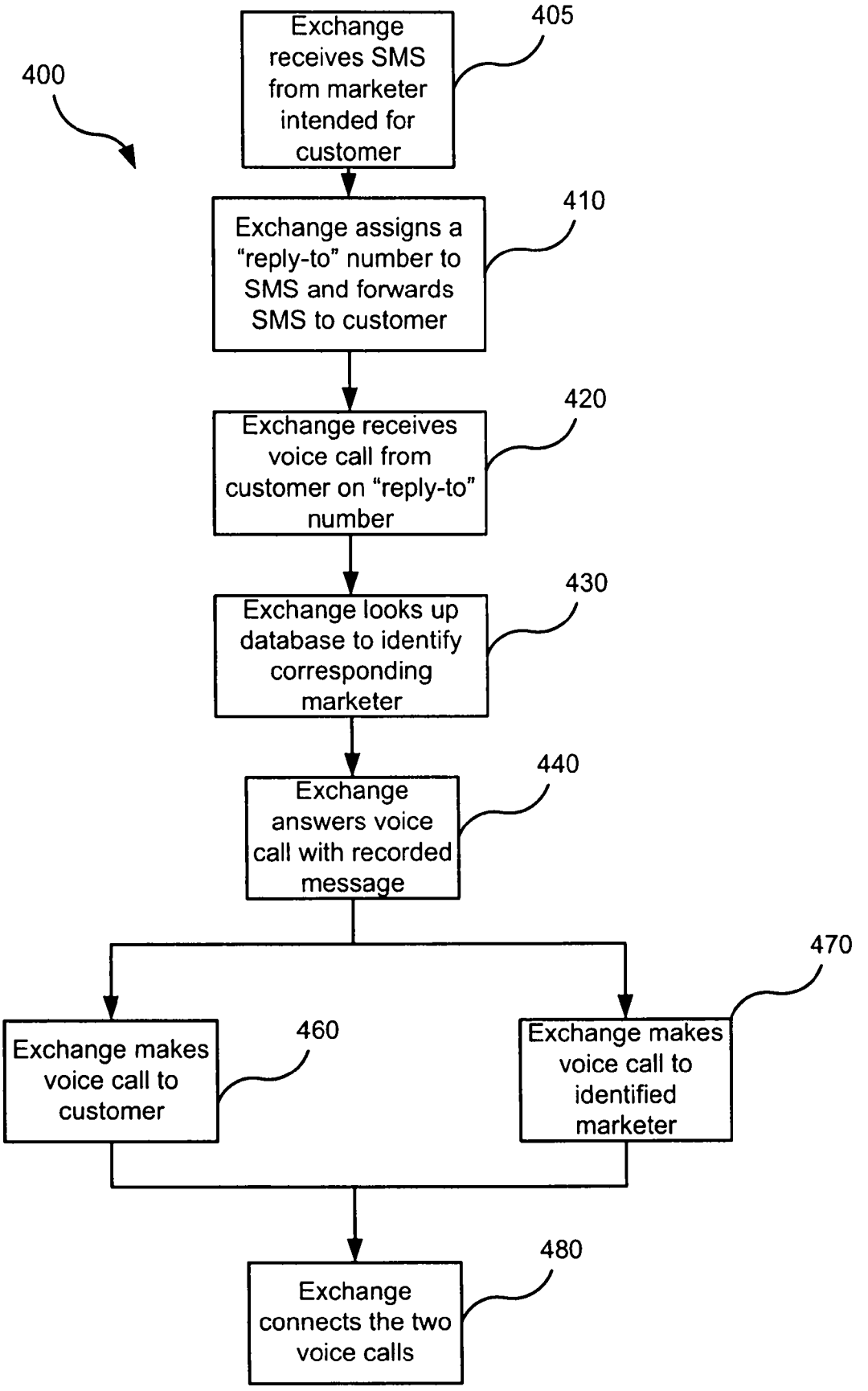

Fig. 4

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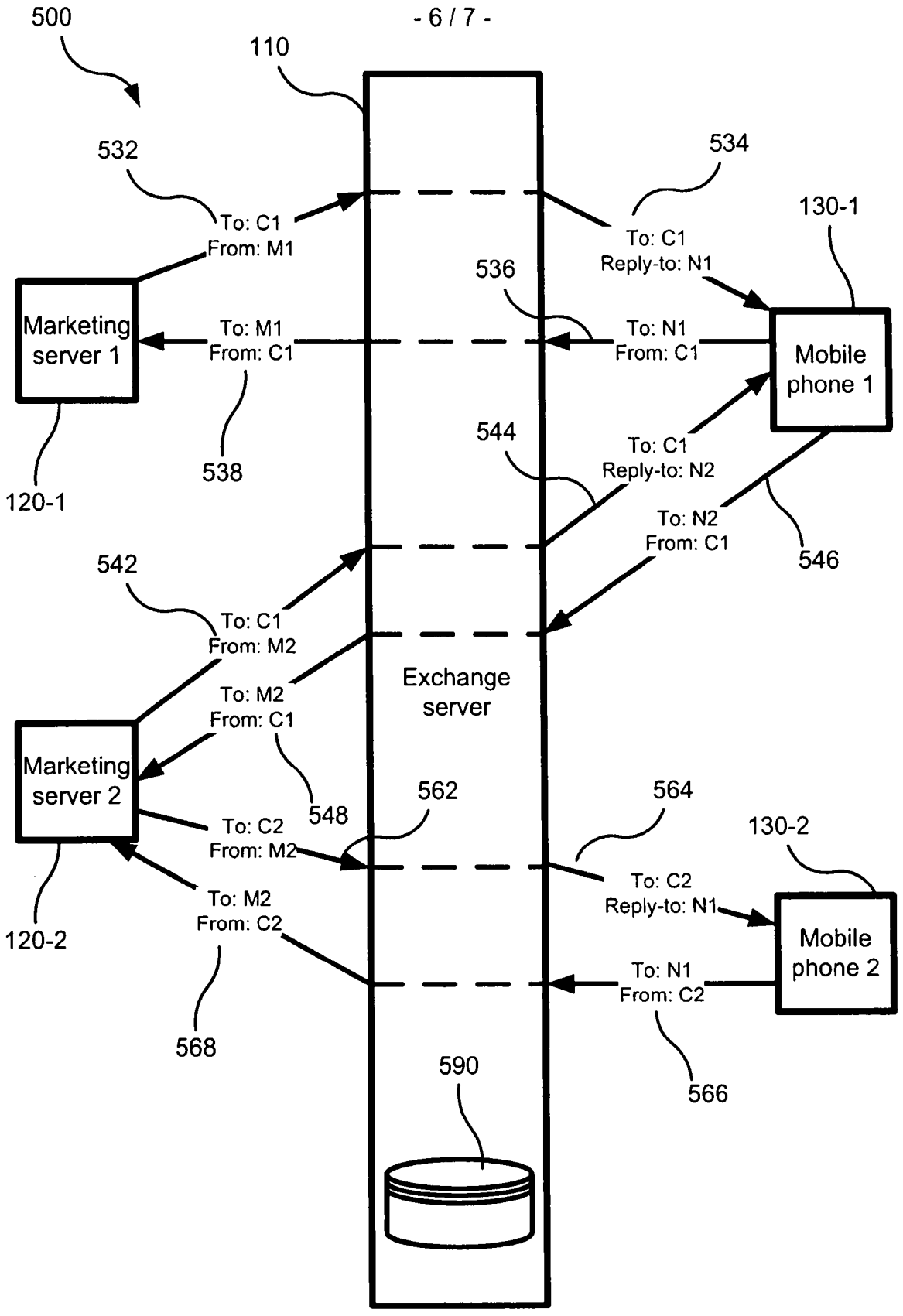

Fig. 5

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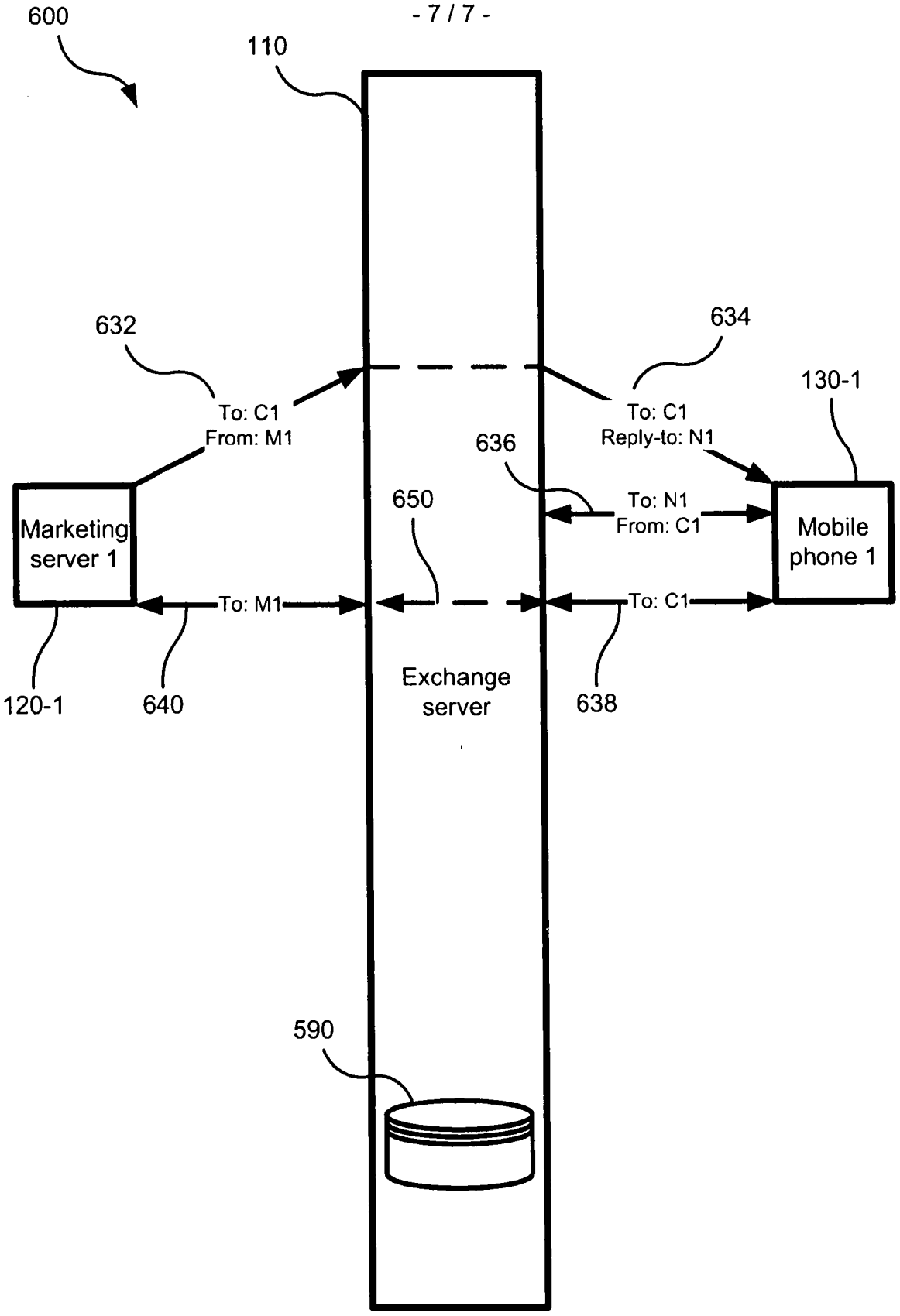

Fig. 6