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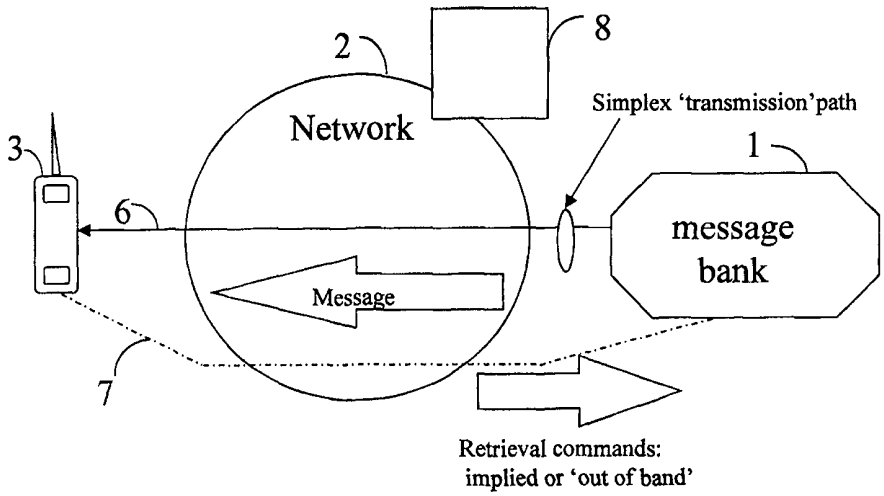
(54) Title: TELECOMMUNICATIONS MESSAGING SYSTEMS



(57) Abstract

A message retrieval system is arranged to allow control functions to be carried in out-of-band signalling channels, thereby allowing a reduced bandwidth to be required for message storage and retrieval. In particular, storage or retrieval can be carried over a simplex broad bandwidth link, as no broad bandwidth signal is transmitted in the reverse direction. When a user (3) accesses the message facility (1), a signalling connection (7) is first set up. The message facility (1) may use calling line identity to identify which messaging address is required, and whether the calling terminal has the out-of-band signalling capacity. A simplex voiceband connection (6) is then set up from the message banck (1) to the terminal (3), and prompts are transmitted over this connection to the user. The user, on receiving such prompts responds with signals entered on the keypad or other data entry device of his terminal (3), and these are transmitted over the signalling connection (7) to control the further operation of the message bank, and in particular to cause it to transmit selected messages (step 78) over the wide bandwidth link (6) to be received by the user (3).

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Telecommunications Messaging Systems

The invention relates to voicebank and other messaging applications in telecommunications systems. Such applications are now becoming commonplace, allowing communication to be made between a calling party and a called party without the need for both to be available simultaneously. A called party may be unable or unwilling to answer the telephone when a call is made, for example because he does not wish to be disturbed, or he is not present. In such circumstances a voicebank system can be used to divert incoming calls to a messaging service, which comprises a data store in which a message can be left for subsequent retrieval by the party for whom the call was intended.

Some voicebank systems are provided as part of the telephone terminal equipment, (so-called "telephone answering machines") but, increasingly, network operators are providing the facility as part of the network itself. This reduces terminal complexity, and allows messages to be left even when connection to the destination terminal is not possible, for example because it is engaged on another call or, (if it is a mobile terminal) because it is out of radio range of a base station or is switched off.

Systems operating on the same basic principles are also known for storing data messages (for example facsimile transmissions) when the destination terminal is unavailable, for subsequent retrieval by the called party. In the following specification, the term "message bank" will be used to cover any such service, whether storing voice or data messages. It is envisaged that any type of message, for example data or video, may be sent according to the system of the invention, according to the capabilities of the terminal equipment used.

In a typical message bank system, a calling party, on being connected to the message bank system, receives a prompt inviting the caller to leave a message. In a voicebank system, the prompt is generally a spoken message, which may be a recording or may have been generated synthetically. For a facsimile message the prompt is the "handshake" code transmitted by the receiving machine to prompt the calling facsimile machine to transmit at a rate which does not exceed the capabilities of the receiving machine. Any message transmitted by the calling party is stored in the message bank. The message may be stored in any suitable form. Network-based systems generally store the messages in digital form,

as do some terminal-based systems, but many terminal-based voicebank systems use magnetic tape to record an analogue signal.

When the called party wishes to access his message bank, he transmits a command to the message bank system. For a terminal-based system, this merely requires appropriate keypad commands on the terminal equipment. If the system is network-based, the command must include information to identify which user is calling. For many network-based systems this information is generated automatically, using calling line identity (CLI), or identification codes such as the user identity code (IMSI) which identifies the SIM (subscriber identity module) of a mobile terminal operating according to the GSM (Global System for Mobile communications) standard. Control of the system requires specific commands, such as "play next message", "repeat this message", "delete message" to be transmitted. These are generally transmitted to the network functionality using key-entry commands, which are transmitted using DTMF (dual tone multiple frequency) codes or the like.

It is known for example from International Patent Specification WO96/32802 (Siemens) to provide a communications system comprising

transmission means for transmitting a message from a remote terminal for storage in a message storage means, and/or transmitting a message retrieved from a message storage means to a remote terminal,

transmission means for transmitting, over a relatively narrow bandwidth communications link, control signals for controlling the operation of the message storage means, and

network control means for establishing a relatively broad bandwidth communications link for transmission of the message to or from the message storage means.

Network capacity is a scarce resource, particularly with the increasing demand for high-bandwidth services such as high-speed data and real-time video services. Analogue speech channels also require a wide bandwidth. It is therefore desirable to avoid the unnecessary allocation of bandwidth when it is not required for the service requested.

According to the invention, a communications system of this type is characterised in that the network control means is arranged to establish a one-way

broad bandwidth communications link in the direction in which the message is to be transmitted.

The invention may be used with network-based message banks or terminal-based message banks.

In a preferred arrangement the relatively broad bandwidth communications link is a traffic channel suited to the nature of the message to be stored (voice, data etc) whilst the relatively narrow bandwidth communications links are out-of-band signalling channels. This arrangement reduces the network resources required to operate the system. Separation of the control signals from the channel carrying the message itself allows the use of a simplex (one-way) channel for the relatively broad bandwidth message-carrying channel. By eliminating the need for the return channel, network capacity can be improved. The one-way channel may also carry any control signals to be transmitted in the same direction, which in turn allows the use of a simplex narrow-bandwidth channel to be used for control signals in the reverse direction.

The invention may comprise means for identifying whether the remote terminal requires transmission and/or receipt of control signals over a relatively broad bandwidth communications link in the direction contrary to that in which the message is to be transmitted, and can be arranged to establish a one-way broad bandwidth link if the said terminal does not require such a broad bandwidth link in the reverse direction, and to establish a two-way broad bandwidth link if the said terminal requires such a broad bandwidth link. The invention may further comprise means to convert the two-way broad bandwidth link to a one-way broad bandwidth link during the course of a call should the requirement for a broad bandwidth link in the reverse direction cease. The invention may alternatively comprise means to reverse the sense of the one-way broad bandwidth communications link during the progress of a call.

The invention also extends to telecommunications terminal equipment for use with the system defined above, comprising means for receiving said control signals over a relatively narrow band channel, and converting said control signals into prompt signals readable by the person or machine transmitting or receiving the message. Such terminal equipment may be the message storing terminal, or the terminal by which the message storing service is accessed to send or retrieve messages.

According to a further aspect, the invention comprises a method of transmitting a message from a remote terminal to a message storage means, or retrieving a message from a message storage means, over relatively broad bandwidth communications links, wherein signals for controlling the operation of the message bank system are transmitted over relatively narrow bandwidth communications links, characterised in that a one-way broad bandwidth communications link is established in the direction in which the message is to be transmitted.

The invention is suitable for message deposit and for message retrieval, provided in each case that the terminal used allows the processing of out-of-band signalling. For message retrieval the relatively broad bandwidth link used for transmitting the requested messages can also be used for transmitting voice prompts and the like. However, for message deposit to be carried out in this way, the originating terminal requires a facility for processing and displaying prompts and other signals received from the network in the out-of-band format. As the system is preferably compatible with existing terminals and networks (including the traditional Public Switched Telephone Network (PSTN)) it will not always be possible to operate message deposit in this way. In appropriate circumstances the invention may be used to support only message deposit, or only message retrieval. It may also be used selectively, operating in a mode according to the invention only in respect of suitable terminals, and/or only in respect of message retrieval, being used in a second, conventional, mode otherwise.

Embodiments of the invention will now be described, by way of example only, with reference to the drawings, in which:

Figure 1 is a schematic diagram showing the general arrangement of a message-bank system in which messages are stored in a conventional manner;

Figure 2 is a schematic diagram showing the general arrangement of a message-bank system in which messages are stored in a manner operating according to the invention

Figure 3 is a diagram illustrating the operation of the system of Figure 2.

Figure 4 is a diagram illustrating an alternative method of operation of the system of Figure 2.

Figure 5 is a schematic diagram showing the general arrangement of a message-bank system in which messages are retrieved in a conventional manner;

Figure 6 is a schematic diagram showing the general arrangement of a message-bank system in which messages are retrieved in a manner operating according to the invention.

Figure 7 is a diagram illustrating the operation of the system of Figure 6.

In Figures 1, 2, 5 and 6 there is shown a message bank 1. In the preferred embodiment this is a network-based message bank, but in Figures 1 and 2 it may instead be a terminal-based system, more commonly known as an "answering machine". In such systems, of course, retrieval takes place at the user's terminal, without the use of the network. The messaging system is connected through a telecommunications network 2 to a terminal 3. In Figures 1 and 2 this is the terminal used by the calling party to leave a message, whereas in Figures 5 and 6 it is the terminal used by the called party to retrieve the message. The connection 4, 5 is capable of supporting the message in the format in which it is transmitted (speech, broadband data, etc) and is a conventional duplex link 4 in Figures 1 and 5. In Figure 2 it is a simplex (one-way) link 5 from the terminal 3 to the message bank 1, whilst in Figure 6 it is a simplex (one-way) link 6 in the converse direction. An "out-of-band" signalling channel 7 is also shown in the Figures. This signalling channel 7 may in practice be the signalling channel used in initially setting up the call; however in Figures 2 and 6 separate simplex signalling channels (operating in the sense indicated) may be employed for the additional signalling to be discussed with reference to those figures. The network 2 is controlled by a network control system 8 which is typically an "Intelligent Network" (IN) platform.

In the prior art arrangement shown in Figure 1, the voice messaging system operates as follows. When a call is set up over a telecommunications system, the network control system 8 first sets up a signalling connection 7, which provides the various call set-up functions including the provision of ringing tone, etc. When the called party answers, this is recognised by the network control system 8 which sets up a full telephone connection 2. In the arrangement of Figure 1, when a caller 3 attempts to make a telephone call, the network control system 8 diverts the call through the network 2 to the message bank 1. This may occur because the called party has set up the diversion manually. Alternatively, the settings of the network control system 8 may cause automatic diversion if the called party's telephone does not respond, is busy on another call, is switched off or (for a mobile telephone) is out of range of the base station network. Network-

based message banks 1 have separate addresses for each telephone served by the network, and calls to the message bank 1 are routed to the address corresponding to the called number.

The network control system 8, on connection of a telephone 3 to an address in the message bank 1, first establishes a signalling link 7. If the call is connected, a conventional telephone connection 4 is set up over the network, over which prompts are sent to the caller 3 from the message bank 1, inviting the caller 3 to leave a message. These prompts are conventionally in the form of synthesised or recorded speech, suitable for the telephone connection. The calling party 3 can then transmit a spoken message over the connection 4 for storage in the appropriate address of the message bank 1, for subsequent retrieval.

If the calling party 3 is a facsimile machine or computer modem, the nature of the signals to be stored in the message bank 1 will be different, and in order to correctly co-operate with the calling party 3, the prompts transmitted from the message bank have to be appropriate. For example, a human listener cannot interpret or generate the speech-band signals used to control facsimile machines. Similarly, facsimile machines and modems will not respond to voice prompts. The selection of the appropriate prompt can be achieved by having separate message bank facilities for speech and data, requiring diversion to different numbers. Alternatively, a single message bank 1 may be made capable of identifying the various "handshake" signals generated by different types of calling device, and transmitted over the telephone connection 2 when first set up. In response, the message bank 1 transmits a prompt of the type appropriate to the type of caller.

Figure 5 shows the message retrieval process for a conventional message bank system. When a user 3 wishes to access the message bank, he dials a number to establish a conventional telephone connection 4 to the message accessing function of the message bank 1. The message bank 1 may identify the user's individual address within the message bank 1 by using calling line identity (CLI) signals transmitted over the signalling connection 7 during call set-up. The message bank 1 next transmits a prompt to the user over the newly-established telephone connection 4. The format of this prompt may be a voice message, or a facsimile or modem "handshake", depending on the nature of the messages stored in the message bank, and/or the nature of the terminal 3 making the call. If the desired message bank address has not already been identified by CLI, as described

above, this prompt may request the user 3 to identify the address required. This allows a user to access his message bank. Password protection may be used to avoid unauthorised access.

The user may control the playback of messages stored in the message bank 1 using commands transmitted from his terminal 3 over the telephone connection 4. For example a user may wish to list the messages (by time, calling number, or other characteristics), play a message from the list (next, previous etc), or delete a message. The control commands are typically transmitted as DTMF (dual tone multiple frequency) signals over the telephone connection 4.

The system according to the invention will now be described with reference to Figures 2, 3, 4, 6 and 7. As has been described above, the invention is primarily concerned with message retrieval, but it may also be used for message deposit and this will be described first, with reference to Figures 2 and 3.

When an incoming call is routed to the message deposit function of the message bank 1, (step 31, Figure 3) the network control system 8 identifies that the called party is a message bank (step 32) and establishes a one-way (simplex) telephone connection 5 to the message bank (step 33). No channel is established in the reverse direction, apart from the signalling connection 7 established during the initial call set-up process 31/32. Since channels are generally allocated in pairs (e.g. frequency pairs in radio communications, wire pairs in fixed networks), simplex operation releases the partner channel for other purposes. If the calling party 3 is a mobile telephone, it may be connected to the radio base station using an uplink radio channel which would otherwise be unusable, for example because the signal quality on the corresponding downlink channel is below acceptable limits. In the more general case, where both paths are usable, they may be used to provide two independent simplex links. In particular, there are network paths which, if used as conventional duplex paths, would suffer from echo (the return on one path of a signal transmitted on the other, resulting from acoustic or electrical feedback between the two channels). Parts of these paths may nevertheless be usable as independent simplex links, as the connection from which the feedback would have originated would not form part of both links.

Unlike the prior art arrangement of Figure 1, the prompts that are sent from the message bank 1 to the user 3 (step 34) are carried in out-of-band signalling using the signalling channel 7. This requires that the calling party 3 is

able to read and process such signals (step 35). This may be achieved by using specialised terminal equipment 3 capable of operating with such signalling. Alternatively, the out-of-band signals may be converted to conventional in-band prompts at some intermediate point in the network. This intermediate point may be the local exchange (or mobile switching centre for a mobile telephone) to which the user terminal 3 is connected - in this case the connection between that intermediate point and the user 3 would then be by conventional duplex link.

The network control system 8 may recognise whether the terminal 3 is of a type suitable for handling such out-of-band prompts, and establish a link 4,5 of appropriate type (simplex or duplex) accordingly, either between the user terminal 3 and the intermediate point (the rest of the link to the message bank being simplex), or throughout between the user terminal 3 and the message bank 1.

The prompts may control a display to give instructions to the user of the terminal 3. The terminal 3 may convert the prompts into instructions (voice or visual display), for example telling the user when to speak. In the case of a facsimile or computer modem connection, the prompt may control the machine at the terminal 3 to cause it to transmit its data, for example using "Internet Protocol" (IP). The message to be stored can then be transmitted (step 38) over the simplex link 5 to be stored (step 39) in the message bank 1.

The message bank 1 may be customer-provided terminal equipment, or it may be associated with the network equipment 2.

In an alternative arrangement, illustrated in Figure 4, the network control system 8 initially sets up a conventional duplex broad bandwidth link 4 (step 42) in response to the call set-up request (41). The message bank 1 sends the "prompt" message (step 44) over the "down" (message bank to caller) leg of this duplex link 4. The message bank 1 then sends a command 46 to the network control system 8 to drop the "down" leg, (step 47) to leave only the "up" leg, thereby forming a simplex link 5 in the "up" direction. The caller, on receiving the prompt (step 45), responds to it by sending his message (step 48) over the simplex link 5 to be received by the message bank 1 (step 49).

Instead of establishing a full duplex link 4 and then dropping one leg of it, a time division duplex arrangement may be employed, as also illustrated in Figure 4. In this process the network control system 8 initially sets up (step 42) a simplex link 6 from the message bank 1 to the user terminal 3. This is used to send the

prompt (step 44), and then the direction of the simplex link is reversed (step 47) to create a simplex link 5 over which the message can be transmitted.

Message retrieval operates in the manner illustrated in Figures 6 and 7. When a user 3 accesses the message facility 1 (step 71), the network contro, system 8 first sets up a signalling connection 7. The message facility 1 may use calling line identity to identify which messaging address is required, and whether the calling terminal has the out-of-band signalling capacity (step 72). A simplex voiceband connection 6 is then set up from the message bank 1 to the terminal 3 (step 73), and prompts are transmitted over this connection to the user (step 74). The user, on receiving such prompts (step 75) responds with signals entered on the keypad or other data entry device of his terminal 3 (step 76), and these are transmitted over the signalling connection 7 to control the further operation of the message bank 1 (step 77), and in particular to cause it to transmit selected messages (step 78) over the wide bandwidth link 6 to be received by the user 3 (step 79).

Although messages may be sent from any terminal for deposit in the message bank, the terminal 3 used to retrieve messages is generally the user's own terminal, which can be designed to be compatible with the network with which it operates. In particular, it can be provided with the means to generate out-of-band signals. However, as already mentioned, a user may use other terminals 3 to access his message facility 1 (subject to password control, etc), and such other terminals may not all have the out-of-band signalling facility. In such cases conventional duplex provision may need to be provided for all or part of the connection through the network 2. This may take the form of conversion at some point in the network 2 between DTMF tones and out-of-band signals. The selection of simplex or duplex operation may be made by the network control system 8 during the call set-up process, by monitoring the signals sent over the signalling channel 7 by the terminal 3 (step 72). This may be done either by identifying the terminal as simplex-compatible from its calling line identity, or by assessing whether it responds to the first prompt sent to it by transmitting an in-band signal (thereby signifying a duplex connection is required) or an out-of-band signal (signifying it is suitable for operation in simplex mode)

As discussed above, the message bank 1 may be customer-provided terminal equipment, or it may be associated with the network equipment 2, for

example at a switch. In the former case, of course, network facilities are only required for retrieval if the messages are being accessed remotely, from another terminal 3.

The out-of-band signals used may be according to any suitable protocol, such as "CLASS" or "Internet Protocol" (IP). The invention is particularly suited for use in multi-media networks, which have advanced add/drop bearer capabilities to allow asymmetric data transfer.

CLAIMS

1. A communications system comprising

transmission means (2) for transmitting a message from a remote terminal (3) for storage in a message storage means (1), and/or transmitting a message retrieved from a message storage means (1) to a remote terminal (3),

transmission means (2) for transmitting, over a relatively narrow bandwidth communications link (7), control signals for controlling the operation of the message storage means (1), and

network control means (8) for establishing a relatively broad bandwidth communications link (5) for transmission of the message to or from the message storage means (1)

characterised in that the network control means (8) is arranged to establish a one-way broad bandwidth communications link (5) in the direction in which the message is to be transmitted.

2. A communications system according to claim 1, the network control means (8) being arranged to identify whether the remote terminal (3) requires transmission and/or receipt of control signals over a relatively broad bandwidth communications link in the direction contrary to that in which the message is to be transmitted: and arranged to establish said one-way broad bandwidth link (5) if the said terminal does not require such a broad bandwidth link in the reverse direction, and to establish a two-way broad bandwidth link (4) if the said terminal (3) requires transmission of control signals over such a broad bandwidth link.

3. A communications system according to claim 2, the network control means (8) further comprising means to convert the said two-way broad bandwidth link (4) to a one-way broad bandwidth link (5) during the course of a call when the requirement for a broad bandwidth link in the reverse direction ceases.

4. A communications system according to claim 3, wherein the control means (8) comprises means to reverse the sense of the one-way broad bandwidth communications link (5) during the progress of a call.

5. Telecommunications equipment (1,3) for use with the system of claims 1 to 4, comprising means for receiving said control signals over a relatively narrow band channel (7), and converting said control signals into visible or audible prompt signals readable by the human or machine transmitting or receiving the message.

6. Telecommunications equipment according to Claim 5, being a message storing terminal (1).

7. Telecommunications equipment according to Claim 5, being a terminal (3) by means of which a message storing service can be accessed to send or retrieve messages.

8. A method of transmitting a message from a remote terminal (3) to a message storage means (1), or retrieving a message from a message storage means (1), over relatively broad bandwidth communications links (5), wherein signals for controlling the operation of the message bank system are transmitted over relatively narrow bandwidth communications links (7) and characterised in that a one-way broad bandwidth communications link (5) is established in the direction in which the message is to be transmitted.

9. A method according to claim 8, wherein it is determined whether the remote terminal requires transmission and/or receipt of control signals over a relatively broad bandwidth communications link in the direction contrary to that in which the message is to be transmitted; and said one-way broad bandwidth link (5) is established if the said terminal does not require such a broad bandwidth link in the reverse direction, and a two-way broad bandwidth link (4) is established if the said terminal requires such a broad bandwidth link.

10. A method according to claim 9, wherein said two-way broad bandwidth link (4) is converted to a one-way broad bandwidth link (5) during the course of a call when the requirement for a broad bandwidth link in the reverse direction ceases.

11. A method according to claim 8, wherein the sense of the one-way broad bandwidth communications link (5) is reversible during the progress of a call.

12. A method according to any of claims 8 to 11, wherein said control signals received over a relatively narrow band channel (7) are converted into visible or audible prompt signals readable by the human or machine transmitting or retrieving the message.

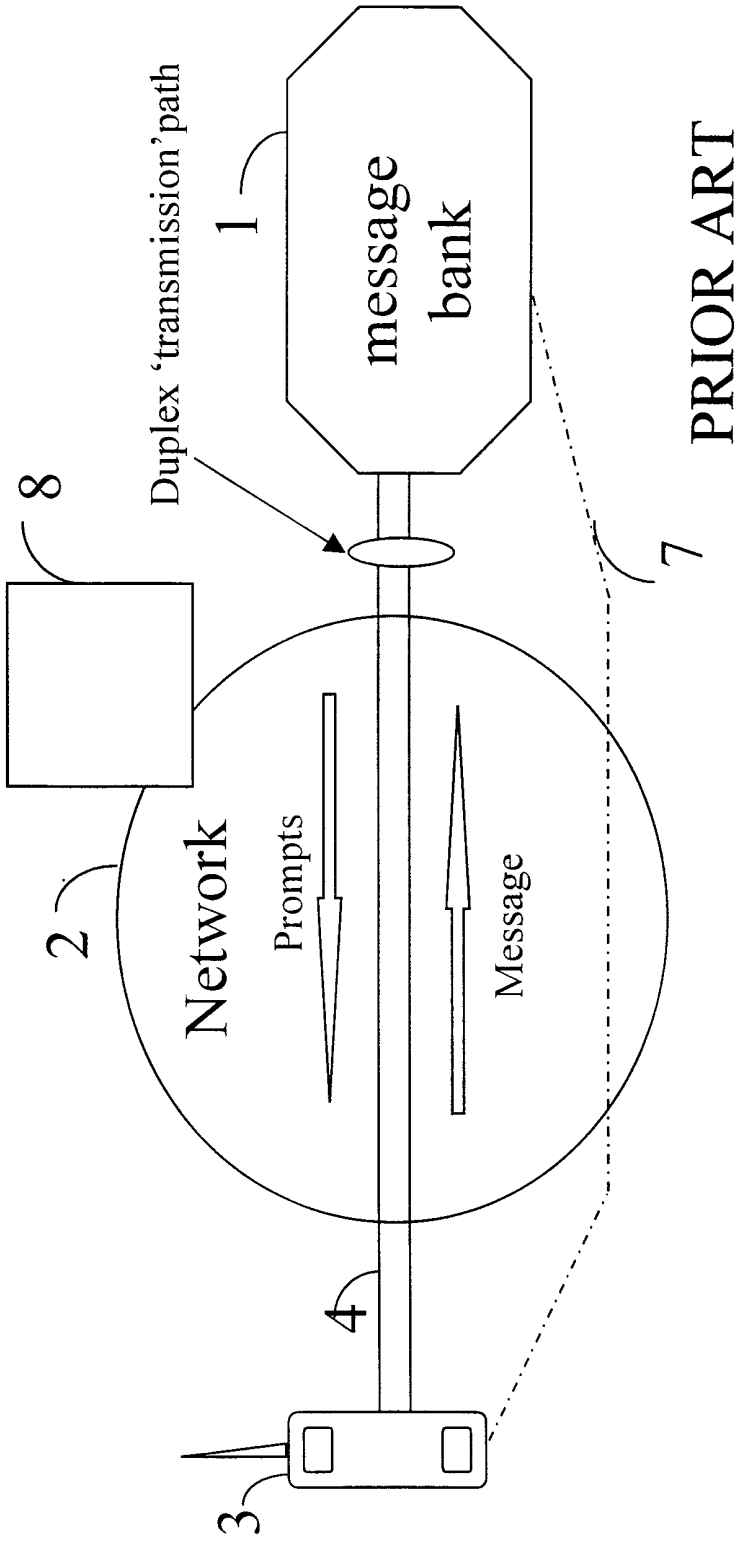
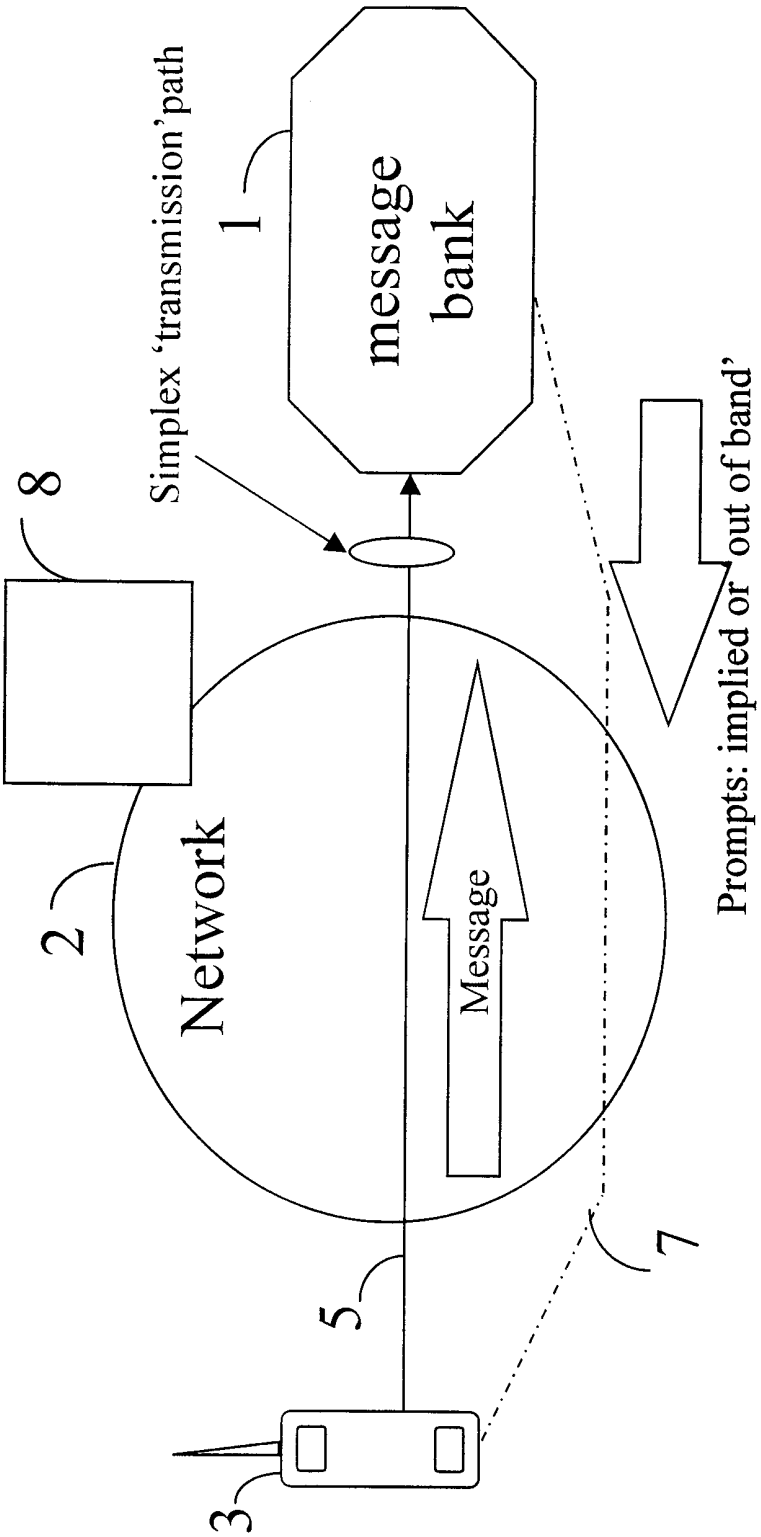

message bank
1
Duplex 'transmission' path
8
Network
2
Prompts
Message
4
3
7
PRIOR ART

Figure 1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Simplex 'transmission' path
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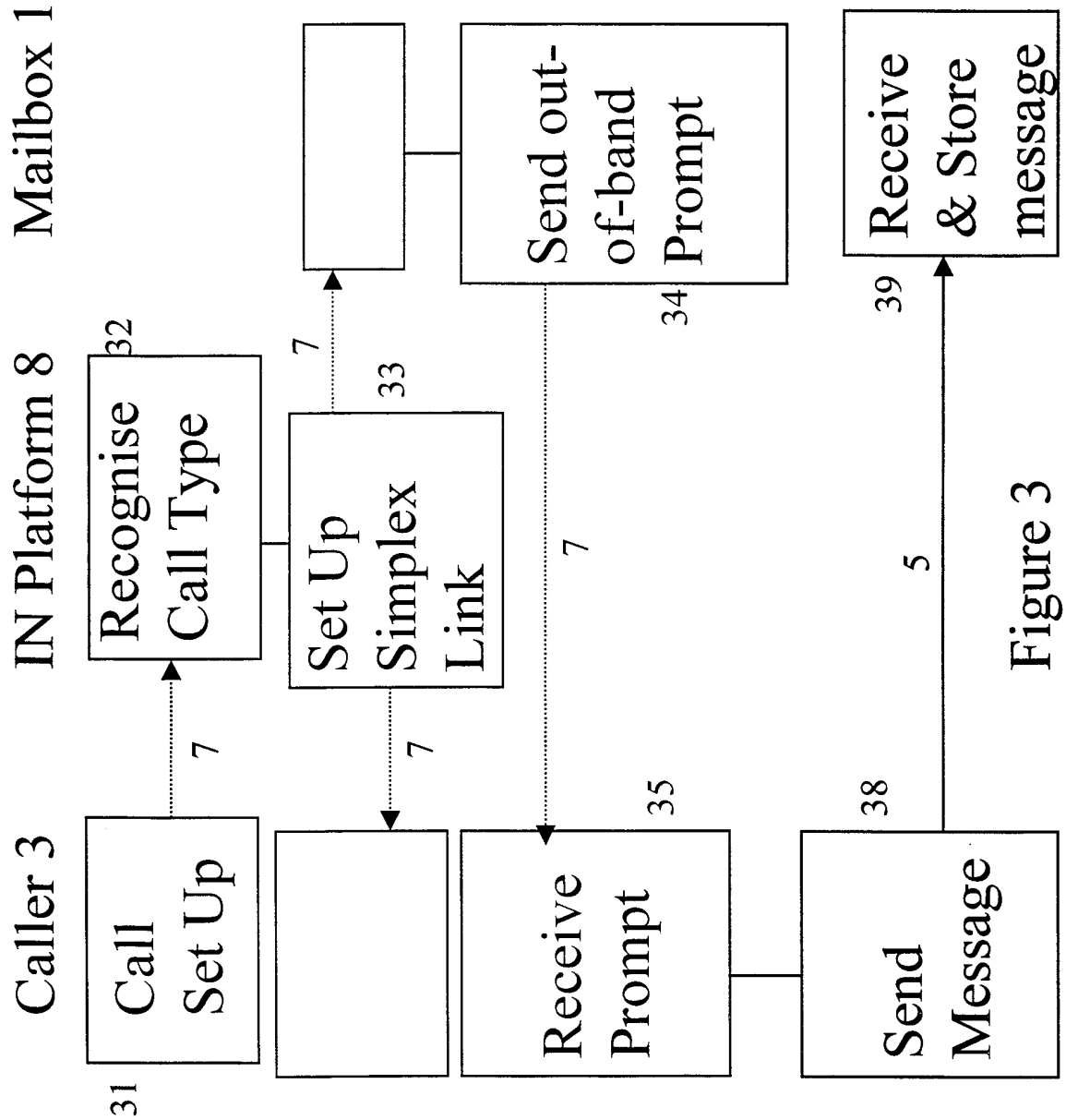
Network
2
Message
Prompts: implied or 'out of band'
5
7
3

Figure 2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IN Platform 8
Mailbox 1
Call Set Up
Recognise Call Type
Set Up Simplex Link
Send out-of-band Prompt
Receive Prompt
Send Message
Receive & Store message
31
32
33
34
35
38
39
7
7
7
7
5

Figure 3

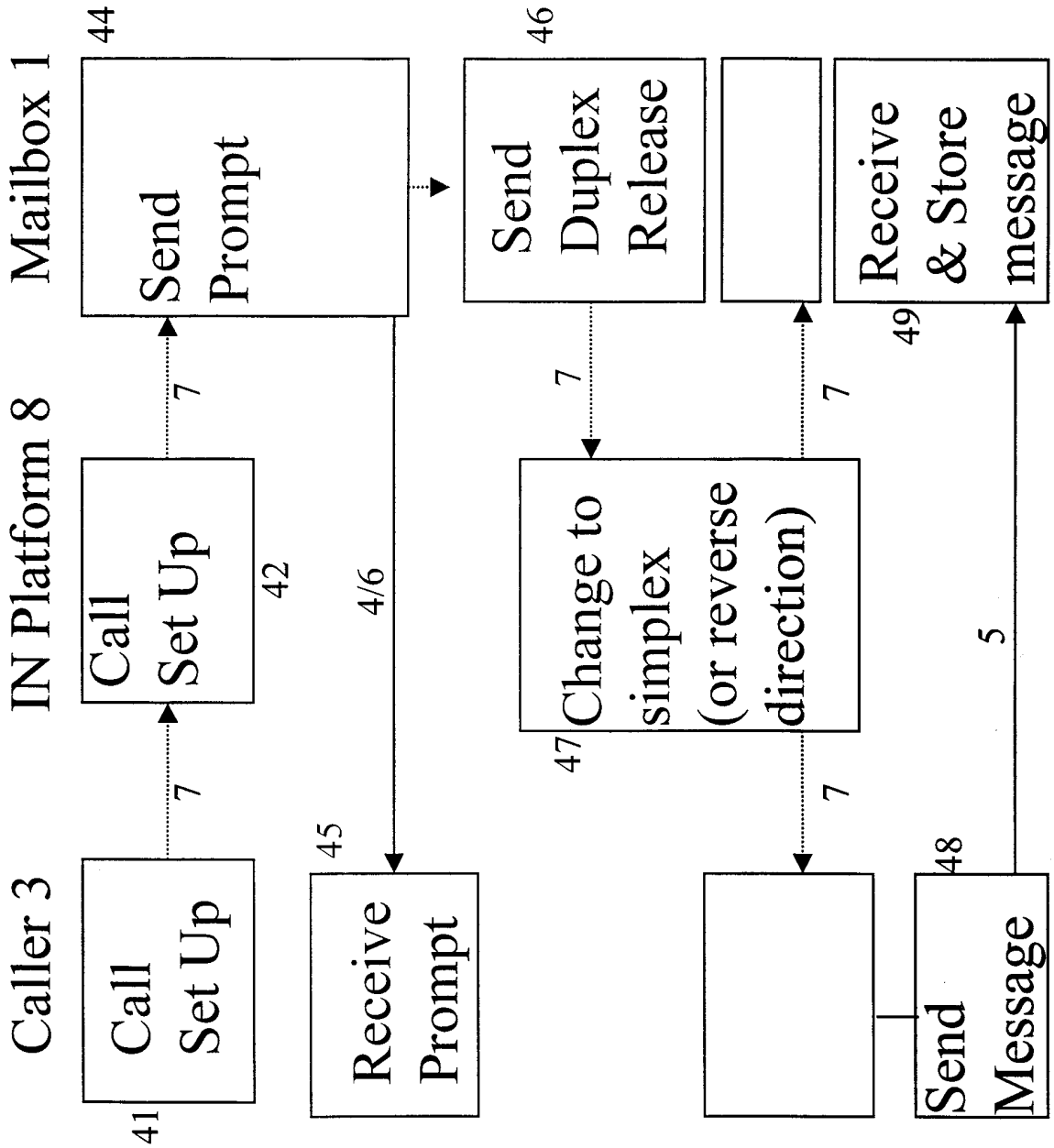
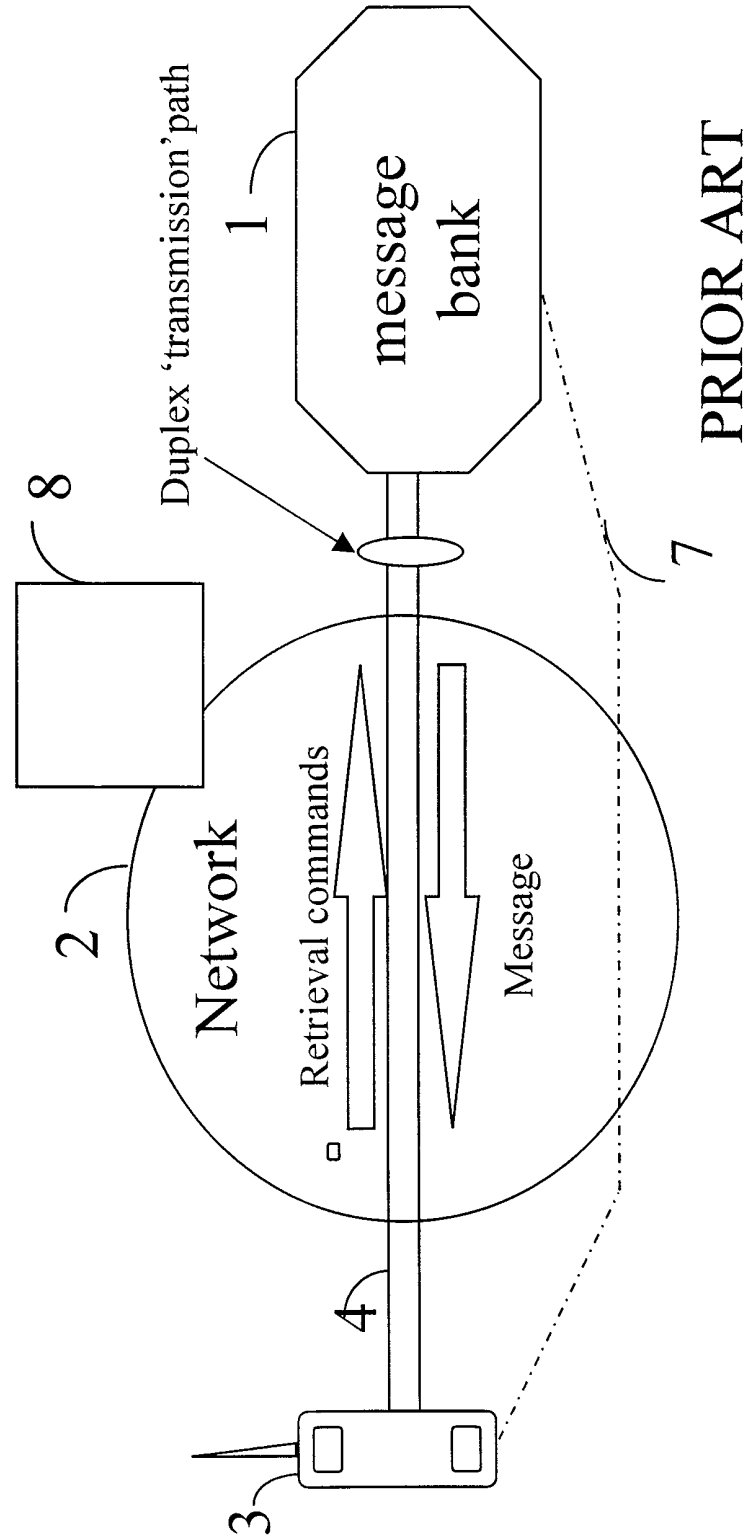

Caller 3
IN Platform 8
Mailbox 1
Call Set Up
41
7
Call Set Up
42
7
Send Prompt
44
4/6
Receive Prompt
45
Send Duplex Release
46
7
Change to simplex (or reverse direction)
47
7
7
Receive & Store message
49
Send Message
48
5

Figure 4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1
Duplex 'transmission' path
8
Network
2
Retrieval commands
Message
4
3
7
PRIOR ART

Figure 5

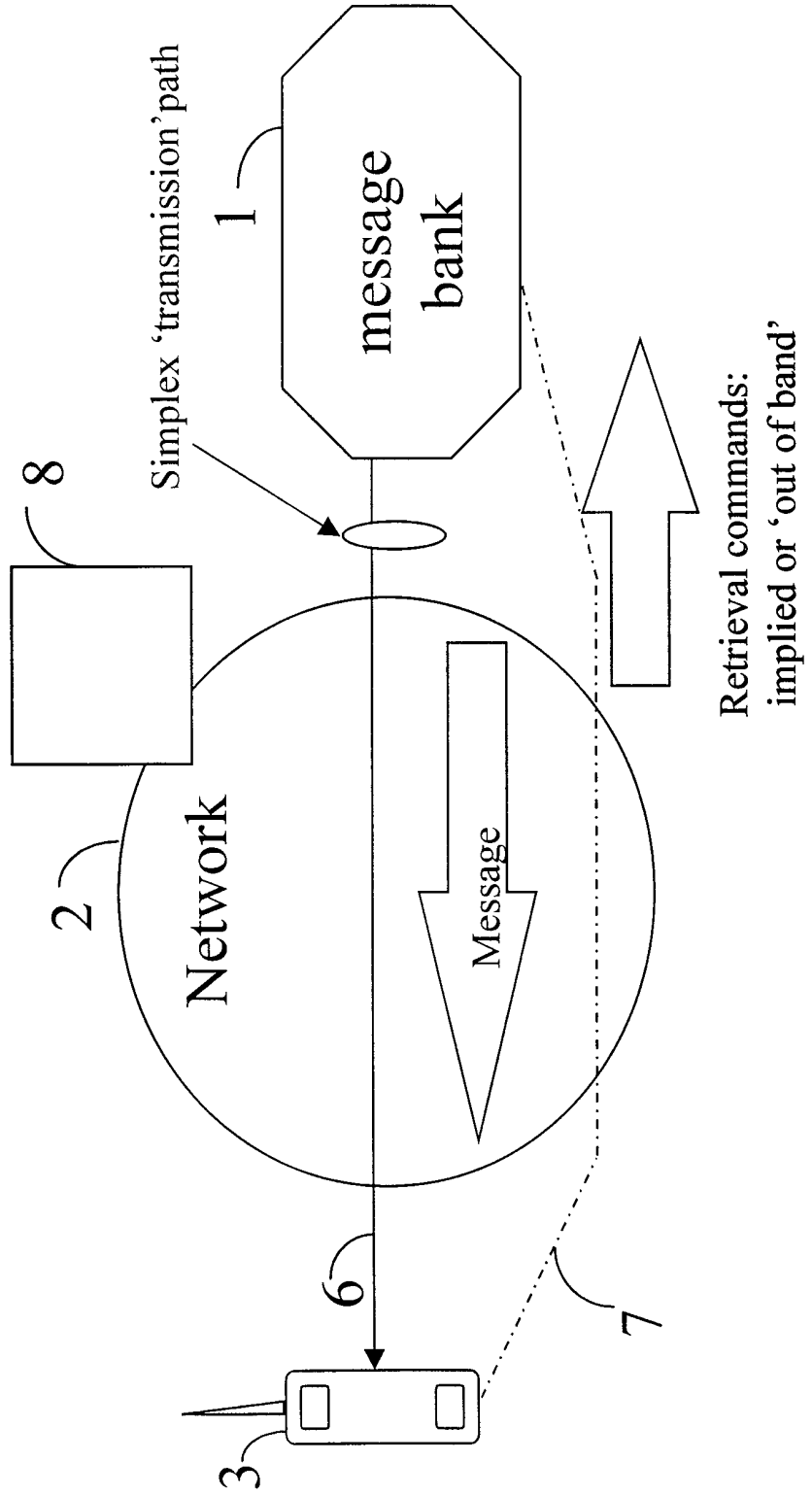
message bank
1
Simplex 'transmission' path
8
Network
2
Message
6
7
3
Retrieval commands:
implied or 'out of band'

Figure 6

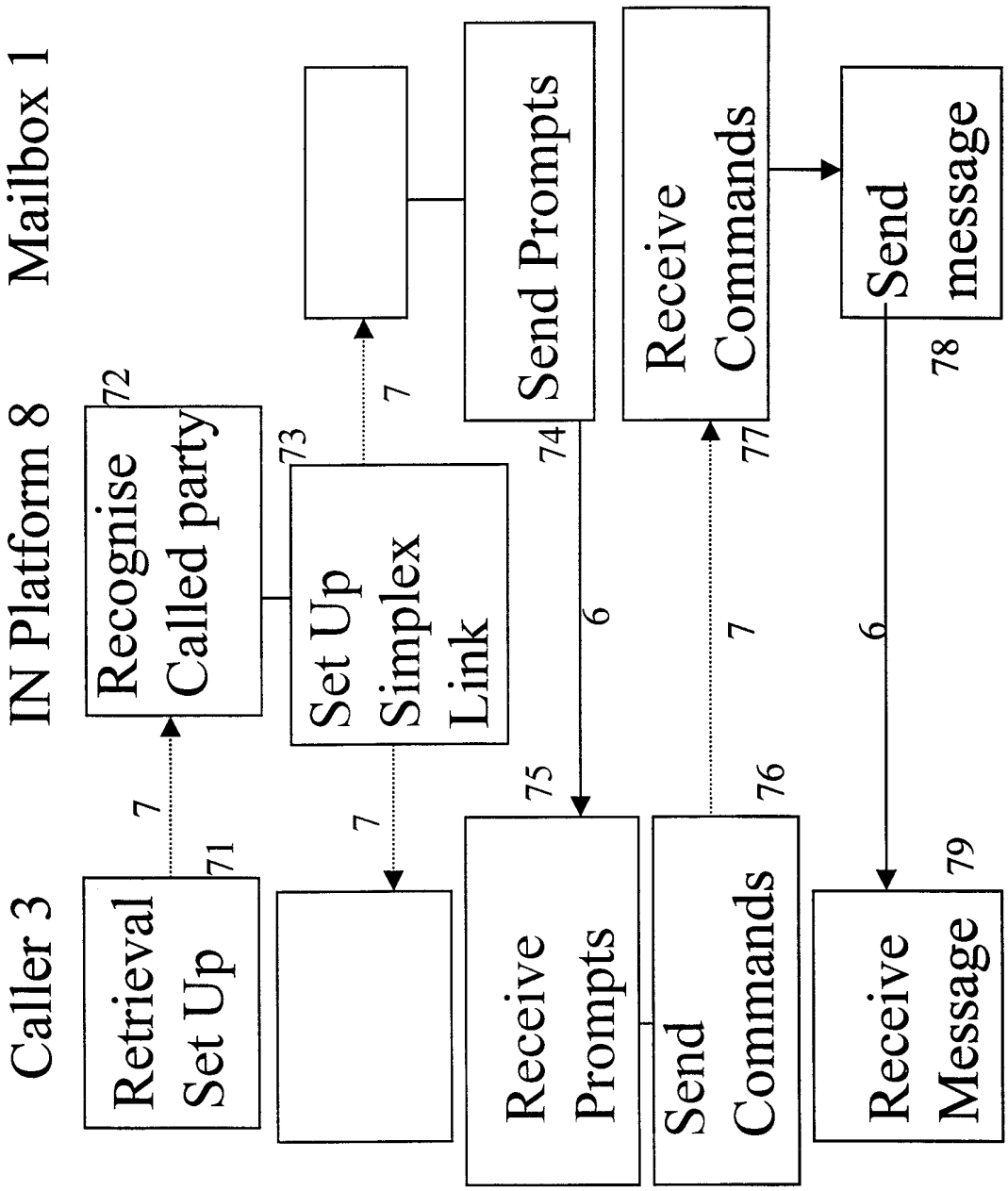
Caller 3
IN Platform 8
Mailbox 1
Retrieval Set Up
71
7
Recognise Called party
72
Set Up Simplex Link
73
7
7
Send Prompts
74
6
Receive Prompts
75
Send Commands
76
7
Receive Commands
77
6
Send message
78
Receive Message
79

Figure 7

INTERNATIONAL SEARCH REPORT

International Application No
PCT/GB 99/02242

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04M3/533

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04M H04N

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 96 32802 A (SIEMENS AG ;SEBESTYEN ISTVAN (DE)) 17 October 1996 (1996-10-17) page 3-5	1,8
A	DE 196 12 663 A (SENG ULRICH DIPL ING) 2 October 1997 (1997-10-02) claims 1,2	1,8
A	US 5 164 982 A (DAVIS RICHARD A) 17 November 1992 (1992-11-17) column 13, line 15-48; figure 6	5,12
A	EP 0 794 650 A (IBM) 10 September 1997 (1997-09-10) abstract column 9, line 24-34 column 10, line 28-32 column 12, line 26 - column 14, line 47	1,5,8,12

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

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

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

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

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

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

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
2 September 1999	27/09/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Cremer, J

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INTERNATIONAL SEARCH REPORT

Intr tional Application No
PCT/GB 99/02242

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 700 225 A (AT & T CORP) 6 March 1996 (1996-03-06) column 1, line 31 - column 2, line 14	1,8
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INTERNATIONAL SEARCH REPORT

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