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(54) Title: METHOD AND SYSTEM FOR VOICE EXCHANGE AND VOICE DISTRIBUTION

(57) Abstract: A method for voice exchange and voice distribution between users of computer networks comprises the following steps: creating a message in a voice container; contacting a central server to locate a recipient of the message; forwarding the message to the recipient if the recipient is available; storing the message at the central server when the recipient is not available for forwarding when the recipient is available. The method also allows the control of the origination, distribution and listening to these messages, and also offers the options of ringing a pre-configured phone number at the recipient's request for the delivery of the message or forwarding the message to another Internet or voice container enabled device.

1                   **METHOD AND SYSTEM FOR VOICE EXCHANGE AND VOICE**  
2                   **DISTRIBUTION**

3                   **FIELD OF THE INVENTION**

4                   This invention relates to the field of packet communications, and more  
5                   particularly to voice packet communication systems.

6                   **BACKGROUND OF THE INVENTION**

7                   Many users of on-line services utilize text-based communication systems for  
8                   the exchange of messages. Two well known text-based communication systems  
9                   techniques are e-mail, wherein text messages are placed in a central file associated  
10                  with a destination address, to be downloaded at a later time when the recipient "logs  
11                  in" and instant messaging, where text is typed and exchanged between computers  
12                  when a "buddy" address (or group address) is present in an address field. Although it  
13                  is possible to attach files to the text file for the transfer of non-text formats, including  
14                  graphic and audio files, this technique is greatly limited. When an audio file is  
15                  attached, the technique lacks a method for convenient recording, storing, exchanging,  
16                  responding and listening to voices between one or more parties, independent of  
17                  whether or not they are logged in to their network.

18                  **SUMMARY OF THE INVENTION**

19                  The present invention is a system and method for voice exchange and voice  
20                  distribution utilizing a voice container. Based on states, rules and type of devices  
21                  provided, voice containers can be stored, transcoded and routed to the appropriate  
22                  recipients instantaneously or stored for later delivery. The present invention system

1 and method for voice exchange and voice distribution allows a software agent with a  
2 user interface in conjunction with a central server to send, receive and store messages  
3 using voice containers. In addition, the present invention for voice exchange and  
4 voice distribution provides the ability to store messages both locally and centrally at  
5 the server whenever the recipient is not available for a prescribed period of time.  
6 Additionally, the present invention allows manual or pre-programmed control of the  
7 origination, distribution and listening to these messages, and also offers the options of  
8 ringing a pre-configured phone number at the recipient's request for the delivery of  
9 the message or forwarding the message to another Internet or voice container enabled  
10 device.

#### 11 **BRIEF DESCRIPTION OF THE DRAWINGS**

12 A more complete understanding of the present invention may be obtained from  
13 consideration of the following description in conjunction with the drawings in which:

14 FIG. 1 is a high level functional block diagram of the system for voice  
15 exchange and voice distribution;

16 FIG. 1A is the high level functional block diagram of FIG. 1 including a voice  
17 format detection and translation system;

18 FIG. 2 is a high level overview of the system architecture;

19 FIG. 3 is an exemplary embodiment of the voice container structure;

20 FIG. 4 is a high level flow chart for PC to PC and PC to network  
21 communications utilizing the system for voice exchange and voice distribution;

1           FIG. 5 is a high level flow chart for dial in emulation from a telephone  
2           utilizing the system for voice exchange and voice distribution;

3           FIG. 6 is a high level flow chart for spot calling utilizing the method and  
4           system for voice exchange and voice distribution;

5           FIG. 7 is a flow chart of an exemplary embodiment illustrating the method and  
6           system with respect to the originator;

7           FIG. 8 is a flow chart of an exemplary embodiment illustrating the method and  
8           system with respect to the central server;

9           FIG. 9 is a flow chart of an exemplary embodiment illustrating the method and  
10          system with respect to the recipient;

11          FIG. 10 is a flow chart of an exemplary embodiment illustrating the method  
12          and system for voice exchange and voice distribution with respect to the originator of  
13          a voice spot;

14          FIG. 11 is a flow chart of an exemplary embodiment illustrating the method  
15          and system for voice exchange and voice distribution with respect to the central server  
16          for a voice spot;

17          FIG. 12 is a flow chart of an exemplary embodiment illustrating the method  
18          and system for voice exchange and voice distribution with respect to the recipient of a  
19          voice spot;

20          FIG. 13 is a flow chart of an exemplary embodiment illustrating the method  
21          and system for voice exchange and voice distribution with respect to the originator  
22          and recipient for an anonymous voice communication;

1           FIG. 14 is a flow chart of an exemplary embodiment illustrating the method  
2           and system for voice exchange and voice distribution with respect to the central server  
3           for an anonymous voice communication;

4           FIG. 15 is a flow chart of an exemplary embodiment illustrating the method  
5           and system for voice exchange and voice distribution with respect to the central server  
6           for emulation through a telephone system;

7           FIG. 16 is a flow chart of an exemplary embodiment illustrating the method  
8           and system for voice exchange and voice distribution with respect to the originator of  
9           a voice container with multimedia attachments;

10          FIG. 17 is a flow chart of an exemplary embodiment illustrating the method  
11          and system for voice exchange and voice distribution with respect to the central server  
12          for a voice container with multimedia attachments;

13          FIG. 18 is a flow chart of an exemplary embodiment illustrating the method  
14          and system for voice exchange and voice distribution with respect to the recipient of a  
15          voice container with multimedia attachments;

16          FIG. 19 is a flow chart of an exemplary embodiment illustrating the method  
17          and system for voice exchange and voice distribution with respect to preparing a voice  
18          container without a PC; and,

19          FIG. 20 is a flow chart of an exemplary embodiment illustrating the method  
20          and system for voice exchange and voice distribution with respect to playing a voice  
21          container on a non-PC based appliance.

1        **DETAILED DESCRIPTION OF VARIOUS ILLUSTRATIVE**  
2        **EMBODIMENTS**

3            Although the present invention, a method and system for voice exchange and  
4        voice distribution, is particularly well suited for use in connecting Internet users and  
5        shall be so described, the present invention is equally well suited for use in other  
6        network communication systems such as an Intranet, Extranet and interworking with  
7        traditional PSTN (Public Switched Telephone Network). While the present invention  
8        is particularly well suited for voice exchange it is equally well suited for any form of  
9        audio message exchange.

10           When the present invention, a method and system for voice exchange and  
11        voice distribution is accessed by a communication device through a non-packet link,  
12        the voice packet (voice container) is converted into the corresponding protocol and  
13        form necessary for communication with the communication device as well as to cross  
14        through the non-packet link.

15           Transaction Control Protocol/Internet Protocol (TCP/IP) is the  
16        communications standard between hosts on the Internet. TCP/IP defines the basic  
17        format of the digital data packets on the Internet allowing programs to exchange  
18        information with other hosts on the Internet.

19           Domain names direct where e-mail is sent, files are found, and computer  
20        resources are located. They are used when accessing information on the World Wide  
21        Web (Web or WWW) or connecting to other computers through Telenet. Internet  
22        users enter the domain name, which is automatically converted to the Internet Protocol

1 address by the Domain Name System (DNS). The DNS is a service provided by  
2 TCP/IP that translates the symbolic name into an IP address by looking up the domain  
3 name in a database.

4 E-mail was one of the first services developed on the Internet. Today, e-mail  
5 is an important service on any computer network, not just the Internet. E-mail  
6 involves sending a message from one computer account to another computer account.  
7 E-mail is used to send textual information as well as files, including graphic files,  
8 executable file, word processing and other files. E-mail is becoming a popular way to  
9 conduct business over long distances. Using e-mail to contact a business associate  
10 can be faster than using a voice telephone, because the recipient can read it at a  
11 convenient time, and the sender can include as much information as needed to explain  
12 the situation.

13 Simple Mail Transfer Protocol (SMTP) was developed to provide for reliable  
14 and efficient transfer of e-mail between different communication environments.  
15 SMTP is independent of a particular transmission subsystem and requires only a  
16 reliable data stream channel. The ability to relay e-mail between different  
17 communication environments is an important feature. SMTP is described in Internic  
18 RFC #821, entitled "Simple Mail Transfer Protocol" dated August 1982  
19 (<http://ds.internic.net/rfc/rfc821.txt>), which is incorporated herein by reference.

20 A transport service provides an interprocess communication environment  
21 (IPCE). An IPCE may cover one network, span several networks, or a subset of a  
22 network. IPCEs are not one-to-one connections, but may communicate through  
23 another process, such as a mutually known IPCE. E-mail is a use of interprocess

1       communications. E-mail can be communicated between processes in different IPCEs  
2       by relaying them through a process connecting two or more IPCEs. Therefore e-mail  
3       can be relayed between hosts on different transport systems by a host on both  
4       transport systems.

5             The interconnection between different systems requires a standard for the  
6       format of e-mail messages. One such standard is described in Internic RFC #822,  
7       entitled "Standard For The Format Of ARPA Internet Text Messages" dated August  
8       13, 1982 (<http://ds.internic.net/rfc/rfc822.txt>), which is incorporated herein by  
9       reference.

10            In 1989, researchers at CERN (The European Laboratory for Particle Physics)  
11       wanted to provide a better method for widely dispersed groups of researchers to share  
12       information. The researchers needed a system that would enable them to quickly  
13       access all types of information with a common interface. By the end of 1990,  
14       researchers at CERN had a textual browser and a graphical browser developed.

15            A browser is an application which knows how to interpret and display  
16       hypertext documents that are located on the Web. Hypertext documents contain  
17       commands, references and links to other text and documents. This allows a reader to  
18       quickly access related text. In addition to text, many documents contain graphics,  
19       audio and animation.

20            HTTP (HyperText Transfer Protocol) is an application-level protocol for  
21       distributed, collaborative, hypermedia information systems. It is a generic, stateless,  
22       object-oriented protocol which can be used for many tasks, such as name servers and



1 distributed object management systems, through extension of its request methods  
2 (commands). A feature of HTTP is the typing and negotiation of data representation,  
3 allowing systems to be built independently of the data being transferred. HTTP is  
4 described in a working document of the Internet Engineering Task Force (IETF),  
5 entitled "HyperText Transfer Protocol -- HTTP/1.1" dated November 22, 1995, which  
6 is incorporated herein by reference.

7 HyperText Markup Language (HTML) is an authoring software language used  
8 to create Web pages. HTML is basically ASCII text surrounded by HTML commands  
9 in angle brackets, which are then interpreted by a browser. Standard Generalized  
10 Markup Language (SGML) is a text-based language for describing the content and  
11 structure of digital documents. SGML documents are viewed with transformers,  
12 which render SGML data the way Web browsers render HTML data. Extensible  
13 Markup Language, is a pared-down version of SGML, designed especially for Web  
14 documents. It enables designers to create their own customized tags to provide  
15 functionality not available with HTML.

16 A Uniform Resource Locators (URLs) is a pointer or link to a location. The  
17 URL contains a transmission protocol, such as HyperText Transfer Protocol (HTTP),  
18 a domain name of the target computer system, a page identifier and a bookmark.

19 The WWW is the graphical data transfer area of the Internet. This is the area  
20 of the Internet Home Pages and web sites are found. The WWW has become a  
21 popular place to advertise businesses, but it can also be used as a front end for  
22 electronic commerce (e-commerce). Many companies have on-line ordering on their  
23 web sites. While this segment of the web is not growing as fast as many analysts

1 predicted, it is still gaining wide acceptance as the public's trust of web security  
2 grows.

3 An Intranet is similar to the Internet except it is used to disseminate  
4 information within a company's network and is protected from the general public  
5 through the use of a Firewall. Sometimes, the users on an Intranet will have access to  
6 sites on the Internet, but unregistered users on the Internet do not have access to the  
7 Intranet.

8 An Internet Browser is a program that is able to read HTML and follow  
9 Hyperlinks in order to present the information included on a World Wide Web site. In  
10 addition, a browser has the capability of entering data on forms included on those web  
11 sites and has the capability to download information off of a web site. Most Internet  
12 browsers increase the speed of data transmission by sending downloaded data to a  
13 cache directory, where it can be accessed again the next time the data is requested  
14 rather than downloading it off the web site again.

15 On-line commerce, or e-commerce, uses the Internet, of which the World  
16 Wide Web is a part, to transfer information about goods and services in exchange for  
17 payment or customer data needed to facilitate payment. Potential customers can  
18 supply a company with shipping and invoicing information without having to tie up  
19 sales staff. The convenience offered to the customer is that they don't have to drive  
20 around town all day looking for the product they want.

21 An intelligent agent must have the capability to take actions leading to the  
22 completion of a task or objective, such as accessing security databases for validation

1 of credit card information, reading e-mail, determining status of a recipient of a  
2 message, validation of message addressing, etc., without trigger or input from an end-  
3 user. The details of the programming of the intelligent agent are known to those  
4 skilled in the art. The functioning and design of intelligent software agents are  
5 described in "Software Agents: An Overview" by Hyacinth S. Nwana, Knowledge  
6 Engineering Review, Vol. 11, No. 3 pp 1-40, September 1996 and "Intelligent  
7 Agents: A Technology And Business Application Analysis" by Kathryn Heilmann et  
8 al., URL: <http://www-iiuf.unifr.ch/pai/users/chantem/heilmann>, 1998, which are  
9 herein incorporated by reference.

#### 10 Description of the Method

11 The present invention system and method for voice exchange and voice  
12 distribution between computers, telecommunication devices and Internet appliances  
13 provides the ability to communicate spontaneously, in the user's own voice, without  
14 the limitations of written communications for natural expression. In a broad  
15 overview, the present invention for voice exchange and voice distribution provides a  
16 voice intercom system with instant messaging, distributed over the Internet. The  
17 present invention is like a voice intercom system in that one of the parties in the  
18 conversation may speak or listen, but not both at once.

19 Referring to FIG. 1 there is illustrated a high level functional block diagram of  
20 the system for voice exchange and voice distribution. The present invention system  
21 and method for voice exchange and voice distribution 20 allows a software agent 22  
22 with a user interface in conjunction with a central server 24 to send, receive and store  
23 messages using voice containers illustrated by transmission line 26 in a pack and send

1 mode of operation to another software agent 28. A pack and send mode of operation  
2 is one in which the message is first acquired, compressed and then stored in a voice  
3 container 26 which is then sent to its destination(s). In addition, the present invention  
4 for voice exchange and voice distribution provides the ability to store messages 30  
5 both locally and centrally at the server whenever the recipient is not available for a  
6 prescribed period of time. Additionally, the present invention allows users to send and  
7 receive voice messages via convention analog phones 32 and 34 in which case the  
8 user's agent 36 is located remote to the user and preferably proximate to or integrated  
9 with the server. In this the remote agent allows manual or pre-programmed control of  
10 the origination, distribution and listening to these messages, and also offers the  
11 options of ringing a pre-configured phone number at the recipient's request for the  
12 delivery of the message or forwarding the message to another Internet or voice  
13 container enabled device.

14 With reference to FIG. 1A, the present invention is designed to adapt to the  
15 voice and data compression capabilities of the user's existing hardware and software  
16 platform. More specifically, the agent of the present invention may be adapted to  
17 work on a personal computer, wireless handheld computer such a personal data  
18 assistant (PDA), digital telephone, or beeper. In each case different voice and  
19 compression applications and data formats may be available as dictated by the  
20 hardware platform and software residing thereon. The present invention includes a  
21 voice/compression software detector 38 and 40 that communicates the format of the  
22 voice data to be transmitted and/or received.

1           Voice data is transmitted to the server in the format provided by the agent .  
2           Where the Personal Computer includes several voice compressions formats the agent  
3           may include a hierarchical list of preferred formats in which the most preferred format  
4           is selected. Criteria for selecting the format may include transmission bandwidth,  
5           lossy versus lossless compression and voice quality parameters such as sampling rates.  
6           The voice data is transmitted in a voice container. The term "voice containers" as  
7           used throughout this application refers to a container object that contains no methods,  
8           but contains voice data or voice data and voice data properties. In the latter case,  
9           voice data properties may be tailored to the use desired by the user or may be inherent  
10          from the voice data and/or hardware platform upon which the agent is reusing. For  
11          example, the agent when reusing from a PDA may only have one voice data format  
12          available. In later versions of the Windows 95, 98, 2000 and NT operating system by  
13          Microsoft, the GSM data compression or codec is included. The server is adapted to  
14          recognized the voice format of voice data contained in the voice containers, this  
15          information may be communicated by the agent prior to a voice container  
16          transmission, included in the voice container or provided to the server from the agent  
17          when polled by the server.

18          In the presently preferred embodiment, the data format available is provided to  
19          the server upon the initial session communication between the agent and the server.  
20          Voice containers transmitted from a sending agent to a receiving agent have different  
21          data formats are routed through the server in which a translator 42 converts the voice  
22          data in the voice containers from the sender's data format to the receiver's data  
23          format.

1 Referring to FIG. 2 there is illustrated a high level overview of the system  
2 architecture. A Software Agent utilized by the sender of the voice container provides  
3 the following functionality: log on to a central server 46; authenticate to the central  
4 server 48; address the recipient(s) and pack message into a voice container or multiple  
5 voice containers 50; and, enable transport 52 of the voice container to the recipient or  
6 the central server.

7 A central server is made up of several sub-components including an  
8 authentication server 54, a message server 56, a notification server 58, a registration  
9 server 60, a proxy server 62, an OA&M Server 64, a capabilities exchange 66, a  
10 compression engine 68, a transcoding server (translator) 70 and transport server 72.  
11 Those structures are discussed in further detail below.

12 The Central Server provides the following functionality: register and  
13 authenticate the senders and receivers; control the identifiers of software agents;  
14 maintain and provide the status of all software agents; store the voice container if the  
15 recipients are not available; converts the voice container for PSTN (Public Switched  
16 Telephone Network); and, generate outgoing calls and emulate the software agent  
17 when the sender or recipient is a traditional phone or other voice container enabled  
18 device.

19 A Software Agent utilized by the recipient provides the following  
20 functionality: log on to the central server; authenticate to the central server; retrieve  
21 any undelivered voice containers; and, unpack the voice container and play the  
22 message.

1       The Connection Service Description

2               Software Agent - Sender: With a simple software agent loaded on a Personal  
3       Computer (PC) or other Internet compatible appliance, the sender will log on,  
4       authenticate, and notify the central server of its status. To create a message, the  
5       software agent will address, pack and send the message in a voice container.

6               Central Server: The central server in conjunction with the software agent  
7       controls, stores and switches the voice containers to the appropriate recipients. The  
8       server will initially register and authenticate the software agent. It will track and  
9       maintain the status of all software agents. It will notify the software agent to send the  
10      voice container directly to the recipient if the recipient is available or it will store the  
11      voice container for the intended recipient if the recipient is not available. In addition,  
12      it will also convert the voice container for delivery over traditional phone networks if  
13      the recipient is a phone or to other voice container enabled devices.

14              Software Agent – Recipient: If the recipient is not on-line, the messages will  
15      be transported to them when they log on to a network. The software agent will open  
16      the voice container upon arrival and play the message to the user.

17              To use the present invention system and method for voice exchange and voice  
18      distribution, the originator selects one or more intended recipients from a list of names  
19      that have been previously entered into the software agent. The agent permits a number  
20      of distinct modes of communication based on the status of the recipient. The status of  
21      all recipients entered into the software agent is frequently conveyed to the software  
22      agent by the central server. This includes whether the core states of whether the  
23      recipient is online or offline, but also offers related status information, for example

1 whether the recipient does not want to be disturbed. For online recipients, the  
2 software agent is also notified on the recipient's Internet Protocol (IP) address.  
3 Considering just the two core states, the software agent offers the originator  
4 alternative ways to communicate with the recipient. This choice can either be dictated  
5 by the originator or automatically selected by the software agent, according to rules  
6 that are stored. More than two choices are available when all the status information is  
7 considered.

8 If online, the originator can either begin a real-time "intercom" call which  
9 simulates a telephone call or a voice instant messaging session, which allows for an  
10 interruptible conversation. The choice of these modes depends on the activities of  
11 both parties, the intended length of conversation and the quality of the  
12 communications path between the two individuals, which is generally not controlled  
13 by either party. The previously stored IP address is used to enable direct, peer-to-peer  
14 communications.

15 If off line, the originator can either begin a voice mail conversation that will be  
16 delivered the next time the recipient logs in or can be delivered to the recipient's e-  
17 Mail as a digitally encoded MIME attachment. Again, the choice of delivery options is  
18 based on the interests of both parties and whether the recipient is sufficiently mobile  
19 that access to the registered computer is not always available. For these cases, the  
20 voice containers are delivered to the central server to manage the ultimate delivery to  
21 the recipient.



1           Once the delivery mode has been selected, the originator digitally records  
2           messages for one or more recipients using a microphone-equipped device and the  
3           software agent. The software agent compresses the voice and stores the file  
4           temporarily on the PC if the voice will be delivered as an entire message. If the real  
5           time "intercom" mode has been invoked, a small portion of the digitized voice is  
6           stored to account for the requirements of the Internet protocols for retransmission and  
7           then transmitted before the entire conversation has been completed. Based on status  
8           information received from the central server, the agent then decides on whether to  
9           transport the voice containers to a central file system and/or sends it directly to  
10          another software agent using the IP address previously stored in the software agent. If  
11          the intended recipient has a compatible active software agent on line after log on, the  
12          central server downloads the voice recording almost immediately to the recipient. The  
13          voice is uncompressed and the recipient can hear the recording through the speakers  
14          or headset attached to their computer. The recipient can reply in a complementary  
15          way, allowing for near real-time communications. If the recipient's software agent is  
16          not on line, the voice recording is stored in the central server until the recipient's  
17          software agent is active. In both cases, the user is automatically notified of available  
18          messages once the voice recordings have been downloaded to storage on their  
19          computer. The central server coordinates with software agents on all computers  
20          continuously, updating addresses, uploading and downloading files and selectively  
21          retaining voice recordings in central storage.

22           In all cases, the originator can include and reference other Internet and file  
23          based information, by including that in the data elements of the format. For example,

1 an e-Mail recipient could choose to reference the e-Mail but respond with voice to one  
2 or more addressees of the e-Mail. The forwarded recipients could either receive this in  
3 the software agent, which can portray the original e-Mail, or as a standard MIME  
4 attachment to e-Mail, or in both ways depending on administrative settings.

5 Limited by current dial-up bandwidth, voice containers are exchanged to  
6 enable users to experience a comfortable, but somewhat delayed, conversation.  
7 However, as bandwidth deployment increases via cable modems, high-speed  
8 subscriber lines, and other techniques, the conversational gaps are reduced and an  
9 even more natural sounding conversation results.

#### 10 Interworking with other services

11 Telephone connections, using Touch Tone control codes, can emulate the  
12 basic service, allowing users on any telephone connection to send voice recordings to  
13 others or to receive their own recordings. Calls may be originated from the central  
14 server to one or more telephones, based on rules and preferences provided by the  
15 recipient, when a voice container is completed. The central server will transcode the  
16 voice component to commonly used network formats. It will then ring (or otherwise  
17 alert) the distant telephone and allow the individual who answers to either listen to the  
18 voice container or let it remain in storage. Moreover, the answerer can be given the  
19 option of speaking a voice destined for the originator, which will again be transcoded  
20 and returned to the subject system, for delivery to the originator. Finally, mobile users  
21 can call into the central server and request to hear messages pending delivery to their  
22 system address. The addresses may be assigned by individuals based on their

1 own choice of "name", allowing anonymous voice communications to occur.  
2 Similarly, voice recordings may be exchanged based on personal profiles of people  
3 with similar interests.

4 Interworking with other services the customer utilizes can be provided. This  
5 includes converting the present invention system and method for voice exchange and  
6 voice distribution voice containers to and from conventional voice mail services;  
7 attaching voice containers to e-mail messages; and converting e-mail text to voice for  
8 delivery by the present invention.

9 Example: Group Consultation

10 An important application of the present invention system and method for voice  
11 exchange and voice distribution includes the ability for large numbers of people to  
12 voice communicate with one person or others in a large group with high voice fidelity  
13 and either local or centralized control. A single person, such as a seller in an on line  
14 auction, can communicate with others in a controlled bidding group in natural voice  
15 communications. A visual presentation of messages from bidders allows the listener to  
16 hear them in any order, to repeat them to others participating in the conversation, or to  
17 flow the messages to one or more of the other participants. Either through manual  
18 means or through programmed means, this allows a near real-time dynamic exchange  
19 of information. Conventional telephonic solutions require both complex hardware and  
20 careful sound adjustments. They also offer limited control of who can hear and be  
21 heard. By using the address list and the rely function, the sender can select one or  
22 multiple recipients for the message.

1 Example: Multimedia Attachments

2 Another important application of the present invention system and method for  
3 voice exchange and voice distribution is attaching other media to the voice containers  
4 to provide a richer communications environment. For example, voice containers may  
5 have digitized greeting cards appended to them to present a personalized greeting.

6 The voice container has the ability to have other data types attached to it and  
7 thus be transported to the recipient. In one implementation example, , the voice  
8 container can formatted using industry standards such as Multipurpose Internet Mail  
9 Extension (MIME) format. This extension allows non-textual messages and multipart  
10 message bodies attachments to be specified in the message headers. MIME was  
11 developed and adopted by the Internet Engineering Task Force (IETF). The MIME  
12 protocol which is an extension of SMTP, covers binary, audio and video data.

13 Extensive technical information on the MIME protocol can be found in the  
14 following documents which are incorporated by reference: RFC 1342 MIME  
15 (Multipurpose Internet Mail Extensions): Mechanisms for Specifying and Describing  
16 the Format of Internet Message Bodies. N. Borenstein, N. Freed. June 1992; RFC  
17 1344 Implications of MIME for Internet Mail Gateways. N. Borenstein. June 1992;  
18 RFC 1426 SMTP Service Extension for 8bit-MIMEtransport. J. Klensin, WG Chair,  
19 N. Freed, Editor, M. Rose, E. Stefferud & D. Crocker. February 1993; RFC 1428  
20 Transition of Internet Mail from Just-Send-8 to 8bit-SMTP/MIME. G. Vaudreuil.  
21 February 1993; RFC 1437 The Extension of MIME Content-Types to a New Medium.  
22 N. Borenstein & M. Linimon. 1 April 1993; RFC 1521 MIME (Multipurpose Internet

1 Mail Extensions) Part One: Mechanisms for Specifying and Describing the Format of  
2 Internet Message Bodies. N. Borenstein & N. Freed. September 1993; RFC 1522  
3 MIME (Multipurpose Internet Mail Extensions) Part Two: Message Header  
4 Extensions for Non-ASCII Text. K. Moore. September 1993; RFC 1523 The  
5 text/enriched MIME Content-type. N. Borenstein. September 1993; RFC 1524 A User  
6 Agent Configuration Mechanism For Multimedia Mail Format Information. N.  
7 Borenstein. September 1993; RFC 1556 Handling of Bi-directional Texts in MIME.  
8 H. Nussbacher. December 1993; and, RFC 1563 The text/enriched MIME Content-  
9 type. N. Borenstein. January 1994.

10 Example: Voice Annotated Web Pages

11 Another application of the present invention system and method for voice  
12 exchange and voice distribution is permitting the recording of one or more voice  
13 packet messages on a personal computer, voice container enabled device or by  
14 telephone emulation to be heard on a networked computer. Another computer  
15 displaying a Web page with an embedded icon for voice container, can request the  
16 delivery of an appropriate voice recording, which in turn can be played through the PC  
17 speakers. The software agent can then accept voice response from the Web page  
18 viewer and allow a live or stored conversation to be exchanged. This process is  
19 enabled by the Web page directing an HTTP-encoded message to the Web server  
20 containing the UserID of the Web page owner. To ascertain the UserID of the  
21 requestor, the Web server enquires of the machine that contains the software agent

1 using existing Web commands. This permits the proxy server to direct the Web  
2 owner's voice to the appropriate software agent.

3 An example is a real estate ad, in which an agent's voice explains important  
4 features of a property when the page is loaded on a PC. Additionally, more than one  
5 voice packet message can be tailored to the page for a visitor, based on information  
6 obtained at log in, through stored information in the personal computer, or based on  
7 dynamic information accumulated by the host service provider during a particular  
8 user's session. For example, a real estate visitor might view small and large apartment  
9 ads. At a particular site, a pre-determined filter could ask for a voice packet message  
10 emphasizing the consumer benefits of the larger apartments when they are visited.  
11 Alternatively, new messages can be quickly recorded and replace older messages if,  
12 for example, there is a price change or demand leaves only a few remaining units.

### 13 Example: Non-PC Devices

14 The voice recordings that are made via a microphone or converted by text-to-  
15 speech software can be used for many other purposes. These voice files can be played  
16 and recorded using voice container enabled devices. These devices include Personal  
17 Digital Assistants (PDAs), microprocessor based appliances, such as set-top boxes, or  
18 audio play-back devices, such as MPEG Layer-3 (MP3) audio play-back devices. The  
19 result is a connection between the Internet and voice-playback devices useful for many  
20 practical applications including but not limited to: talking road maps – an Internet-  
21 generated voice road map played through a tape player or MP3 player; talking

1 calendars – an Internet-coordinated voice calendar reminder system; and, talking  
2 schedules – an Internet-driven voice scheduler, for wake up calls or TV programs.

### 3 Opportunities for Generating Value-Added Services

4 Today, some Internet services and features are offered at no cost, once a  
5 user has reached a Web site or downloaded a plug-in or software component. The  
6 principal incentive for this is to obtain revenues from activities related to site-visitor  
7 usage, such as: association with paid advertising; commission on “click-through”  
8 sales; usage or calendar-based subscription fees for upgraded service; and, the sales of  
9 user lists. The basic capabilities of the present invention system and method for voice  
10 exchange and voice distribution can be offered to all users without charge, through the  
11 downloading of the software agent. The central server will implement a set of controls  
12 that manage capabilities associated with revenue generating offers. These capabilities  
13 include: how long voice containers are stored in the central server; how quickly voice  
14 containers are accepted and delivered; the elapsed time of any given voice container;  
15 the number of parties that may simultaneously send and receive voice containers in a  
16 session; the degree of interworking between the present invention system and method  
17 for voice exchange and voice distribution and other systems; the inclusion of system-  
18 generated messages which present audible advertising that generate revenues for the  
19 service provider; and, the number and type of attachments that can accompany a voice  
20 container message.

### 21 Systems Architecture

### 22 Voice container structural components

1 Referring to FIG. 3 there is illustrated an exemplary embodiment of the voice  
2 container having voice data and voice data properties components. Voice container  
3 components include an originator's code 302 (which is a unique identifier), one or  
4 more recipient's code 304, originating time 306, delivery time(s) 308, number of  
5 "plays" 310, voice container source 312 which may be a PC, telephone agent, non-PC  
6 based appliance, or other, voice container reuse restrictions 314 which may include  
7 one time and destroy 316, no forward 318, password retrieval 320, delivery priority  
8 322, session values 324, session number 326, sequence number for partitioned  
9 sequences, 328, repeating information 330, no automatic repeat 332, repeat times 334,  
10 and a repeat schedule 336. Additionally, the voice container will have information  
11 concerning codec type, size, sample rate, and data. The voice container will be sent  
12 using standard TCP/IP transport.

### 13 Servers

14 The central server consists of many components. These components can  
15 reside in a single physical hardware server or across multiple servers. No dependency  
16 exists on the operating system, hardware, database mechanism, or transport for the  
17 server and the server components.

18 The registration server assigns the software agent a unique address. This  
19 address is used for all communications from the software agent to the server, its  
20 components and between other software agents. The address assigned will be  
21 maintained in a data store. Each software agent may have multiple e-mail addresses,



1 telephone numbers, name aliases, or other identifiers that may be associated with the  
2 unique id of the software agent.

3 The authentication server will permit or deny access to software agents based on  
4 the unique id of the software agent and a user name and password. The protocol between  
5 the software agent and the authentication server will be sent through a proxy server. This  
6 helps insure a high degree of security.

7 Authentication is currently assumed to be through an Open Database Connectivity  
8 (ODBC) mechanism to a Structured Query Language (SQL) server. Future solutions may  
9 be using Lightweight Directory Access Protocol (LDAP) Version 3.0. Authentication will  
10 be done in the authentication server.

11 The proxy server permits software agents accesses to backend servers and to  
12 retrieve/store voice files in the backend servers. The proxy server feature provides the  
13 capability to authenticate users through authentication servers and then switch  
14 incoming requests from the authenticated users to backend servers through a Firewall.

15 Software agents will gain access to the system through the log on process  
16 which interfaces with the notification server. Once authenticated, software agents will  
17 have access to the features and functions of the rest of the system. When a software  
18 agent has been authenticated all other software agents that are in the specific group or  
19 community of the authenticated software agent will be notified that the other agent(s)  
20 are on line. Should a software agent log off the system then a notification of such will  
21 be sent to all interested software agents. The software agent will notify the server  
22 with the Internet address that they are currently using for the session to identify where  
23 the messages should be sent.

1           The message server will be the repository for messages sent to software agents  
2 that are not logged onto the system. Once a software agent has been authenticated all  
3 messages that have been stored on the message server will be sent to the appropriate  
4 software agent. If a software agent is on-line, i.e. has been authenticated with the  
5 system and has notified other software agents via the notification server that they are  
6 on-line, the messages will be sent from each software agent to the other software  
7 agent that have their status set to available for receipt of messages. Another feature of  
8 the message server is the ability for the messages to be played or retrieved from other  
9 devices such as a telephone, PDA, the Web or sound enabled devices.

10           The voice containers will contain messages that have been recorded by a  
11 codec. In one embodiment, GSM is used as the default codec used for the system.  
12 Other codecs, such as G.723 and G.729 are also supported. Other codes may be used  
13 as they may be dependent upon the platform on which the agent is running on.

14           The Operations, Administration and Maintenance (OA&M) server will  
15 communicate with the software agent, telephone devices, and other Internet based  
16 agent to manage many functions and services. These will be detailed in the below.

17           The software agent will on log-in and authentication with the system negotiate  
18 the version number of the agent with the server. If the version of the software agent is  
19 older than the version that the server sees as the most current version than the newest  
20 version will be downloaded to the software agent and dynamically be replaced. This  
21 will be done as a background process or as a response to the user permitting the  
22 download to occur.

1           The server and the software agent communicate over a set of well-known  
2 ports. These are ports are known to the server and the software agent. It may become  
3 necessary for security, load balancing, firewalls or other purposes to change the port  
4 numbers. Port numbers will be able to be changed dynamically between the software  
5 agent and the server.

6           The OA&M protocol supports the capability of a guest log-in. At the tie of a  
7 guest log-in the server will download messages for viewing at the software agent.  
8 Special processing will occur on the software agent. This will be detailed in a later  
9 section.

10          The server will maintain a unique set of lists for each software agent. These  
11 lists will contain the identifiers of the other software agents that are permitted to send  
12 and receive voice containers and other media. types. The server will maintain the  
13 current list of agents and be able to create, delete, and modify those lists based on  
14 software agent requests or web based administration. A software agent will also have  
15 the ability to block or filter unwanted messages by sending a command to the server.

16          The software agent and the server will be able to set and manage the  
17 bandwidth and the number of sessions that they can manage. This will be based on  
18 the connection that is available to the device, the transport being used, and the size  
19 and basis of the messages that are being sent.

20          The software agent and the server will be able to set on a system wide or  
21 message by message basis the various privacy features of the messages. This will  
22 include the forwarding of messages from one agent or another and the denial of  
23 forwarding of the messages.

1           Each software agent that has been loaded and registered with the system will  
2           in addition to the standard codec used for the encryption and decryption of the voice  
3           containers detail the other codecs that the software agent may have access to on the  
4           system. The information about the codecs will be retained in the server. The  
5           information that will be retained includes the codec name, associated numbers,  
6           format, sampling rate, and number of bits.

7           Other types of voice containers may be delivered from the server to the  
8           software agent. These include advertisements, administrative messages from the  
9           present invention system and method for voice exchange and voice distribution, faxes,  
10          images, and interconnection with other real time services such as H.323, SIP, and  
11          other services.

12          The server will also maintain the current address and/or priority of the delivery  
13          of the messages for the software agent and other devices that the message should be  
14          delivered to for the end user.

15          The message server will download all messages to the software agent and/or  
16          retain copies of the messages based on administrative settings from the user.

#### 17          Capabilities Exchange

18          When the software agent registers with the server it will send information on  
19          the capabilities of the hardware and software of the system onto which it has been  
20          installed. The information will include all of the codecs, real time services, standards  
21          based services, and products that the software agent can interface and operate with on  
22          the device.

1 Transcoding Server

2 The server will have the ability to transcode the voice container that has been  
3 recorded with the default codec. Other codec formats may be supported on other  
4 devices. This will enable the other device to have the ability to play or record  
5 messages to registered user population in formats that they can decode. An example  
6 of this would be the ability to send a voice container that has been sent from the  
7 software agent to the server and then sent as an e-mail attachment to a larger end user  
8 population.

9 Software Agent

10 The software agent needs to be able to be operate under multiple operating system  
11 platforms. A user or company may want to block access to services provided by the  
12 present invention. If the service is blocked by a Firewall the security policy in place will  
13 be honored. The design should take into account potential software agents behind other  
14 firewalls and enable the software agent to communicate when a Firewall is in place with  
15 the server if permitted by the security policies of the Firewall.

16 Where the Firewall is administered to limit ports accessible to an external server,  
17 the software agent can be changed to use other available ports, most notably the ports  
18 used for generic request-response traffic for the World Wide Web.

19 The software agent-server-proxy protocol set of functions are a byte oriented,  
20 acknowledged protocol.

1           The transport mechanism for all communications will be over TCP/IP, Universal  
2           Data Protocol (UDP), and the PSTN between all software agents and the server. This will  
3           be dependent on the devices supported.

4           Software agents, proxies, and servers need to have the ability to have their ports  
5           administered.

6           Each software agent on the system will have a 32-character agentID. The  
7           emailID of the user can be the same as this agentID. If the emailID is not 32  
8           characters, the software agent should appropriately expand it to a 32-character ID.  
9           During the registration process all of the known and supported codec as well as the  
10          default codec will be interrogated and reported to the server. This will be retained for  
11          coding optimization, transcoding, system performance, and quality going forward.  
12          Data report from the software agent and the host system include capabilities such as  
13          sound enabled, microphone enabled, and other compatible software programs and  
14          utilities that may exist.

1           The software agent will start a log on process with the authentication server  
2 through the proxy server every time the system is started, re-started, or if the user logs off  
3 from the system. The log-on process will consist of the user identifier and password that  
4 was established during the initial registration process. If the user is at the device or  
5 machine where the software agent id was originated the user will be able to perform all of  
6 the functions that the system provides. A successful log-in will result in all of the user  
7 messages waiting in the message server being downloaded to the software agent. The  
8 user may have elected to retain copies on the message server. If this is the case the  
9 messages will be retained at the server until they have been aged off by administrative  
10 settings.

11           When a software agent is located behind a Firewall, the agent can be administered  
12 to repeat the login process repeatedly over Firewall ports that are normally open, such as  
13 the port for the World Wide Web. In this case, the request from the software agent will  
14 be received by the proxy server, and all notification information (such as who else is on  
15 line in the users "buddy list") as well as downloading all available messages. In exchange,  
16 all agent-stored messages will be delivered to the server. The timing for this process can  
17 be dynamically adjusted so that the user perceives little or no delays for the exchange of  
18 voice containers with other online agents.

1           The user may also be on another machine where they can perform a guest log-in.  
2           By selecting guest log-on from the software agent and then inputting their user id and  
3           password the message server will download the messages to the software agent. When  
4           the user logs off, another log-on occurs, or after a specified time period the messages for  
5           the guest account will be deleted from the local device and software agent where they  
6           were downloaded.

7           Users will also be able to log onto the system by dialing into a telephone numbers  
8           and by using voice recognition, touch-tone entry or other means be able to retrieve their  
9           voice containers.

10          Authentication server refers to a software agent connecting through a proxy to  
11          the server used for verifying the userID and password of a user trying to log onto the  
12          system. The software agent will authenticate through the proxy server using a well  
13          defined secure protocol. The software agent will send a copy of the currently logged  
14          on Internet address to the notification server for purposes of notifying other software  
15          agents of its status and receiving messages.

16          The control messages from a client machine to the proxy server (which are  
17          forwarded by the proxy server to the backend server) are encrypted. Similarly, the  
18          messages from the proxy server to the authentication server/backend servers are also  
19          encrypted.

20          The proxy server may listen on several ports for connection requests from  
21          clients. Against each port the proxy server listens on, there will be only one  
22          authentication server to which the proxy sends the client information for



1 authentication. The authentication server should keep track of which user in its  
2 database belongs to which backend server. If a user is moved from one backend server  
3 to another backend server, the backend server should update the authentication server  
4 with the new information.

5 Multiple users cannot log in from the same machine with the same  
6 authentication password. The software agent, however, can be designed to allow  
7 different parties to change the UserID and password and reuse the same machine, at  
8 different times.

9 After the software agent has logged onto the system and has been  
10 authenticated they will have access to the system. During the authentication process  
11 the Internet address of the newly authenticated software agent will be made known to  
12 all other interested software agents and retained in the proxy server. The notification  
13 process will also query the server to find out the other registered software agents that  
14 are currently logged onto the system and send the Internet address of the other logged  
15 on software agents to the authenticated, newly logged on software agent.

16 When a software agent logs off the system all remaining interested, logged on  
17 software agents will be notified that the software agent is no longer available.

18 Software agents may also be in other states that will be communicated to the  
19 other logged on software agents. These states would be the following: Available –  
20 available for messages or live talking; Do Not Disturb – available for messages but  
21 not live talking; Not Available – system is logged on but not accepting messages or  
22 live talk; Will return – Stepped out of the office and is accepting messages; Out to

1 Lunch – Stepped out to lunch and is accepting messages; Not logged on – Message  
2 will be sent to the message server

3 Forward to Telephone; Forward to PDA; and, Other states - defined as needed.

4 Messages will be created on the software agent using the default codec or  
5 another codec available on the system. This codec can be automatically selected  
6 based on service parameters. For example, less efficient codecs may be selected where  
7 they are known to have more universal support in some applications. Messages will be  
8 stored on the server until the software agent has gone on line and authenticated. Once  
9 authenticated all of the messages for that software agent will be sent to the software  
10 agent. A copy of the messages may be retained at the message server. Other software  
11 agents will be able to send messages directly to the software agent that has  
12 authenticated. This will be done on a peer-to-peer software agent basis. Multiple  
13 software agents may be sent a copy of the message. Software agents that are not  
14 logged onto the system will receive a copy in the message server.

15 Two types of messages will exist for the software agent. A delayed message  
16 that can be sent or received to/from other software agents and a live talk mode. The  
17 live talk mode will send the voice container to another software agent to be decoded in  
18 real time.

19 Both the live talk and messaging capabilities will be influenced by the state of  
20 the software agent as described in notification process section above.

21 Messages will also be able to be retrieved via the Web, telephone, set top box,  
22 and other devices. The message server can also send the voice container to a user that

1 is or is not using a registered software agent as an e-mail attachment. The recipient  
2 can be specified from within the software agent and can be part of the software  
3 agents' list without being registered as a user on the system.

4 Each message will have a unique identifier that will encode the sending  
5 software agents identifier, the destination software agents and non-registered users,  
6 the codec used, date and time of the message, the forwarding rules and permissions,  
7 body of the message, and whether the message was received, played, or deleted  
8 without listening. Since a message may go from one peer to another without the  
9 messaging server being involved a message will be sent to the server with all of the  
10 pertinent information about the message but not the body. This information will be  
11 used for monitoring of the service, guaranteeing service levels, and verifying end user  
12 software agent functions.

13 Referring to FIG. 4 there is a high level flow chart for PC to PC and PC to  
14 network communications utilizing the system for voice exchange and voice  
15 distribution. In FIG. 5 there is a high level flow chart for dial in emulation from a  
16 telephone utilizing the system for voice exchange and voice distribution. There can  
17 be seen in FIG. 6 a high level flow chart for spot calling utilizing the system for voice  
18 exchange and voice distribution. FIG. 7 shows a flow chart of an exemplary  
19 embodiment of the method and system for voice exchange and voice distribution with  
20 respect to the originator. FIG. 8 shows a flow chart of an exemplary embodiment of  
21 the method and system for voice exchange and voice distribution with respect to the  
22 central server. FIG. 9 shows a flow chart of an exemplary embodiment of the method  
23 and system for voice exchange and voice distribution with respect to the recipient.

1 FIG. 10 shows a flow chart of an exemplary embodiment of the method and system  
2 for voice exchange and voice distribution with respect to the originator of a voice  
3 spot. Referring to FIG. 11 there is shown a flow chart of an exemplary embodiment  
4 of the method and system for voice exchange and voice distribution with respect to  
5 the central server for a voice spot. FIG. 12 shows a flow chart of an exemplary  
6 embodiment of the method and system for voice exchange and voice distribution with  
7 respect to the recipient of a voice spot. Referring to FIG. 13 there is shown a flow  
8 chart of an exemplary embodiment of the method and system for voice exchange and  
9 voice distribution with respect to the originator and recipient for an anonymous voice  
10 communication. FIG. 14 shows a flow chart of an exemplary embodiment of the  
11 method and system for voice exchange and voice distribution with respect to the  
12 central server for an anonymous voice communication. FIG. 15 shows a flow chart of  
13 an exemplary embodiment of the method and system for voice exchange and voice  
14 distribution with respect to the central server for emulation through a telephone  
15 system. Referring to FIG. 16 there can be seen a flow chart of an exemplary  
16 embodiment of the method and system for voice exchange and voice distribution with  
17 respect to the originator of a voice container with multimedia attachments. FIG. 17  
18 shows a flow chart of an exemplary embodiment of the method and system for voice  
19 exchange and voice distribution with respect to the central server for a voice container  
20 with multimedia attachments. FIG. 18 shows a flow chart of an exemplary  
21 embodiment of the method and system for voice exchange and voice distribution with  
22 respect to the recipient of a voice container with multimedia attachments. FIG. 19

1 shows a flow chart of an exemplary embodiment of the method and system for voice  
2 exchange and voice distribution with respect to preparing a voice container without a  
3 PC. Referring to FIG. 20 there is shown a flow chart of an exemplary embodiment of  
4 the method and system for voice exchange and voice distribution with respect to  
5 playing a voice container on a non-PC based appliance.

6 Numerous modifications and alternative embodiments of the invention will be  
7 apparent to those skilled in the art in view of the foregoing description. Accordingly,  
8 this description is to be construed as illustrative only and is for the purpose of teaching  
9 those skilled in the art the best mode of carrying out the invention. Details of the  
10 structure may be varied substantially without departing from the spirit of the invention  
11 and the exclusive use of all modifications which come within the scope of the  
12 appended claim is reserved.

**WHAT IS CLAIMED:**

1. A method for recording and exchanging voice messages between users of digital communication networks comprising the following steps:
  - creating a message in a voice container;
  - contacting a central server to locate a recipient of said message;
  - forwarding said message to said recipient if said recipient is available;
  - storing said message at said central server when said recipient is not available for forwarding when said recipient is available.
2. The method of claim 1 for use between users having different hardware and software platforms wherein said forwarding step includes transcoding said message within said voice container.
3. The method of claim 1 for use between users having different hardware and software platforms for creating and listening to voice messages including:
  - providing said users with agents adapted to said hardware and software platform;
  - detecting the voice data format capable of being used with said hardware and software platform.
4. The method of claim 3 including providing said voice data format to said central server.
5. The method of claim 3 including transcoding said voice container data between a first voice data format and a second voice data format.

6. The method of claim 3 locating said agent remotely from said user associated with said agent.
7. The method of claim 6 wherein message creation step includes accessing by said user said remote agent through a public telephone switched network.
8. A method for recording and exchanging voice messages between users of digital communication networks compressing the steps of:
  - creating a plurality of messages by a first user using a first voice data format;
  - storing said messages on a server;
  - providing a listing of stored messages;
  - requesting by a second user at least one message from said list;
  - detecting a voice data format of said second user; and
  - selectively retrieving said messages from said list said voice data format of said second user.
9. The method for recording and exchanging voice messages further including the step of:
  - providing an agent adapted to detect said voice data format.
10. A system for recording and exchanging voice messages between users of a digital communication network comprising:
  - a server in communication with said network;
  - each of said users having a platform includes function selected from the group consisting of playing voice messages;
  - an agent for each of said platforms adapted to operate with said platform and includes a detector to determine a voice message format used by said platform;

said server being adapted to receive said voice message format from said agent and including a transcoder adapted to convert voice messages between users having platforms with different voice message formats.

11. The system of claim 10 including at least one agent and platform located remotely from said user.

12. The system of claim 11 wherein said user accessed said agent via a public telephone switched network.

13. The system of claim 10 wherein said platform is a personal computer.

14. The system of claim 10 wherein said platform is a hand-held computer.

15. The system of claim 10 wherein said platform is a wireless telephone adapted for digital data transmission.

16. The system of claim 10 wherein said platform is a wireless beeper.

17. The system of claim 10 wherein said voice message format is GSM.

18. The system of claim 10 including voice containers for transferring said messages, said voice containers including graphic and text information.

19. The system of claim 10 where said voice message format is MP3.

20. The system of claim 10 including voice containers for transferring said messages and said containers include voice data properties.

21. The system of claim 10 wherein said server includes message storage for delayed transmission of said messages.



22. The system of claim 10 wherein said server is responsive to said user to send messages to locations of the type consisting of: analog telephone, an e-mail client and said agent.

23. The system of claim 10 wherein said server is adapted to detect whether an agent is on-line or off-line.

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FIG. 1

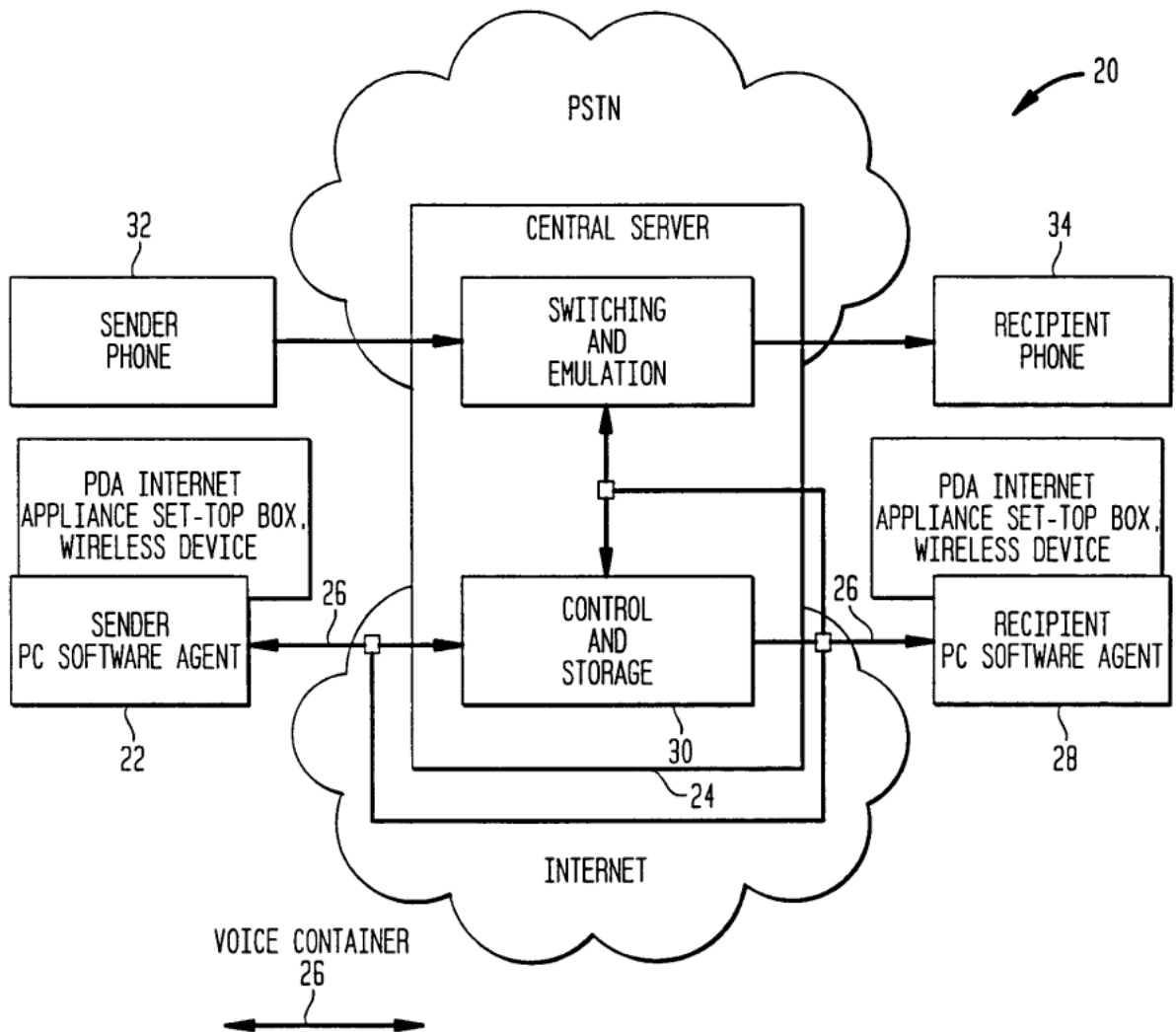


FIG. 1A

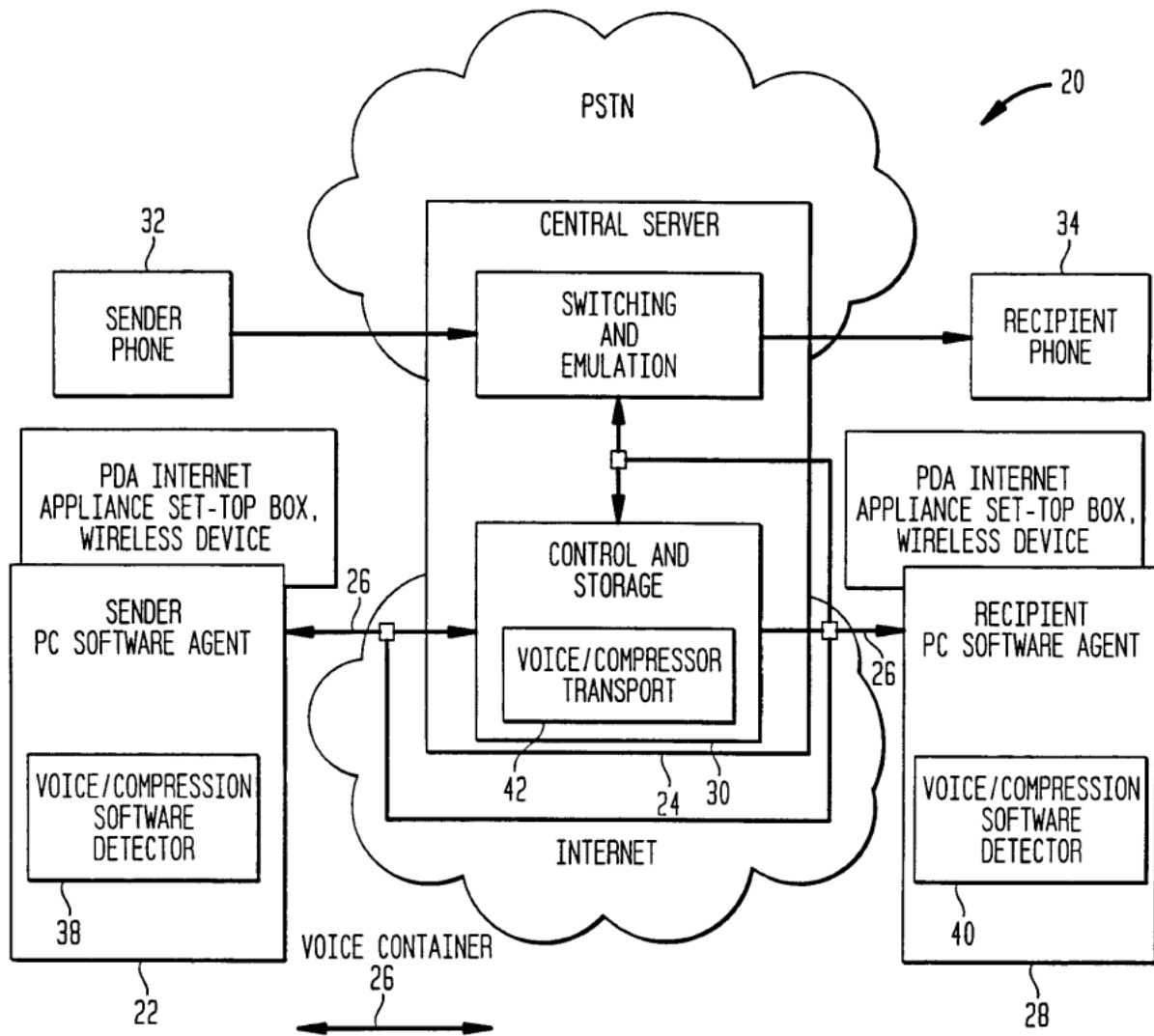
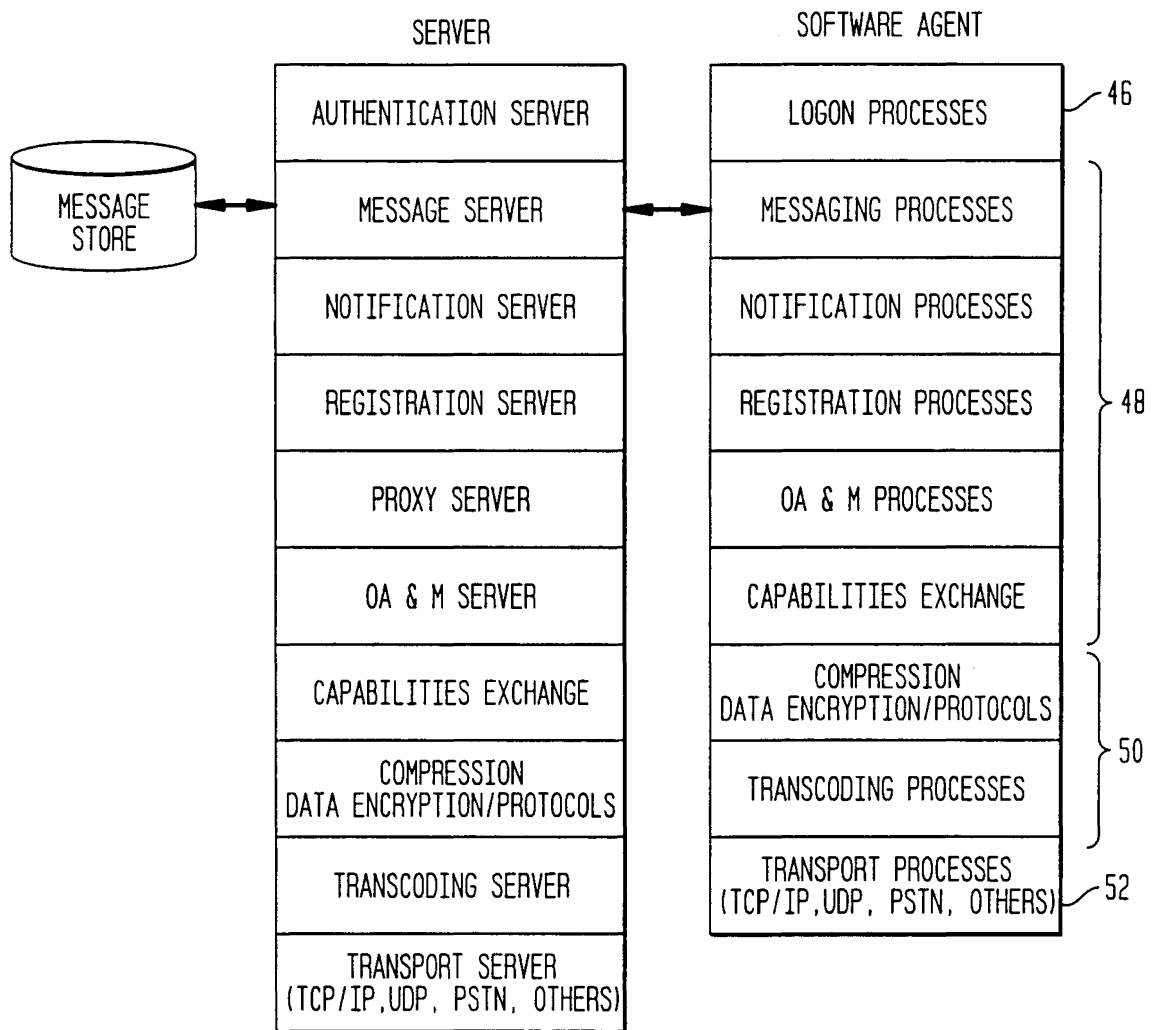


FIG. 2



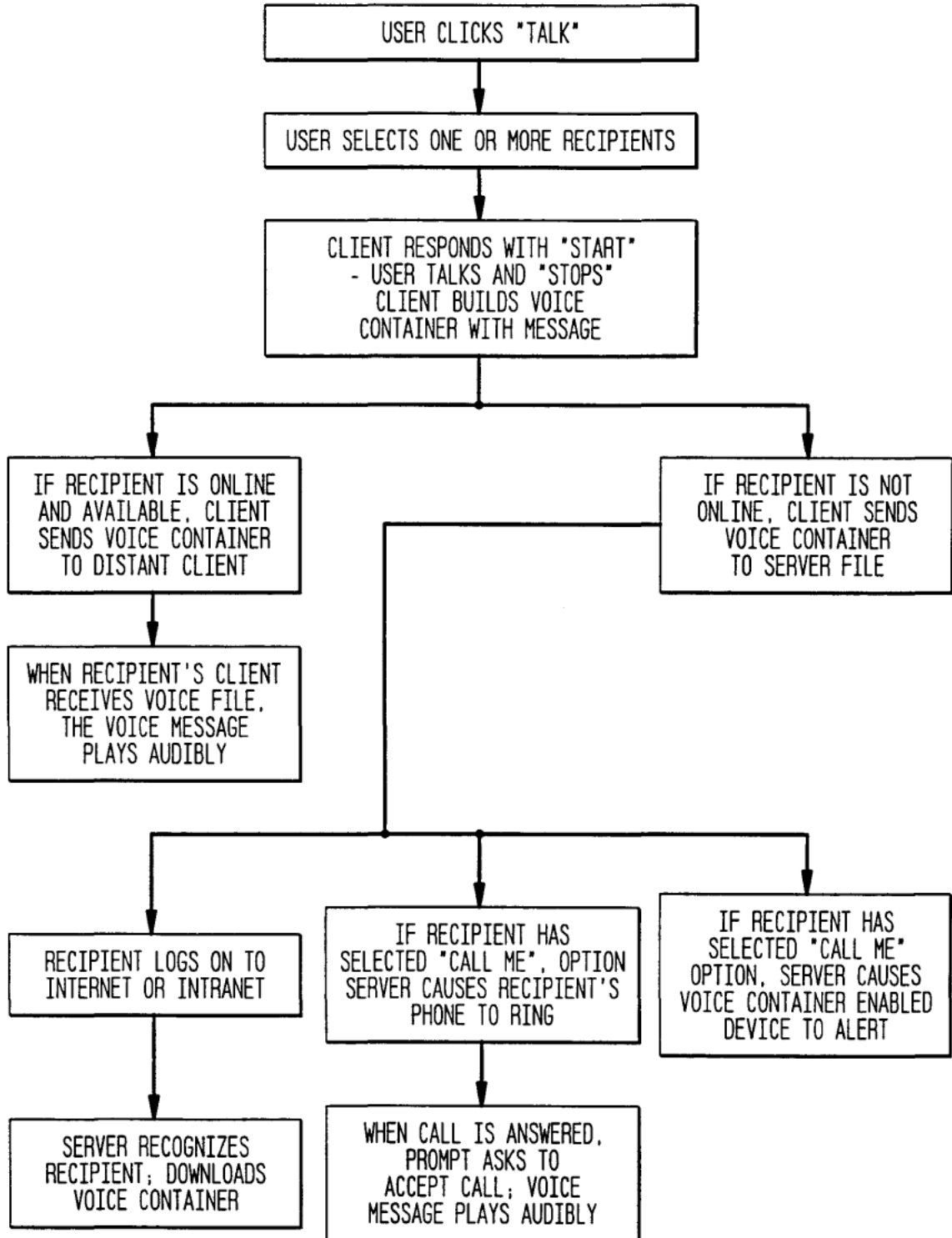
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FIG. 3

302	ORIGINATOR'S CODE
304	ONE OR MORE RECIPIENT'S CODE
306	ORIGINATING TIME
308	DELIVERY TIME(S)
310	NUMBER OF "PLAYS"
312	VOICE CONTAINER SOURCE
	PC
	TELEPHONE AGENT
	NON-PC BASED APPLIANCE
314	VOICE CONTAINER REUSE RESTRICTIONS
316	ONE TIME AND DESTROY
318	NO FORWARD
320	PASSWORD RETRIEVAL
322	DELIVERY PRIORITY
324	SESSION VALUES
326	SESSION NUMBER
328	SEQUENCE NUMBER FOR PARTITIONED SEQUENCES
330	REPEATING INFORMATION
334	NO AUTOMATIC REPEAT
336	REPEAT TIMES
338	REPEAT SCHEDULE

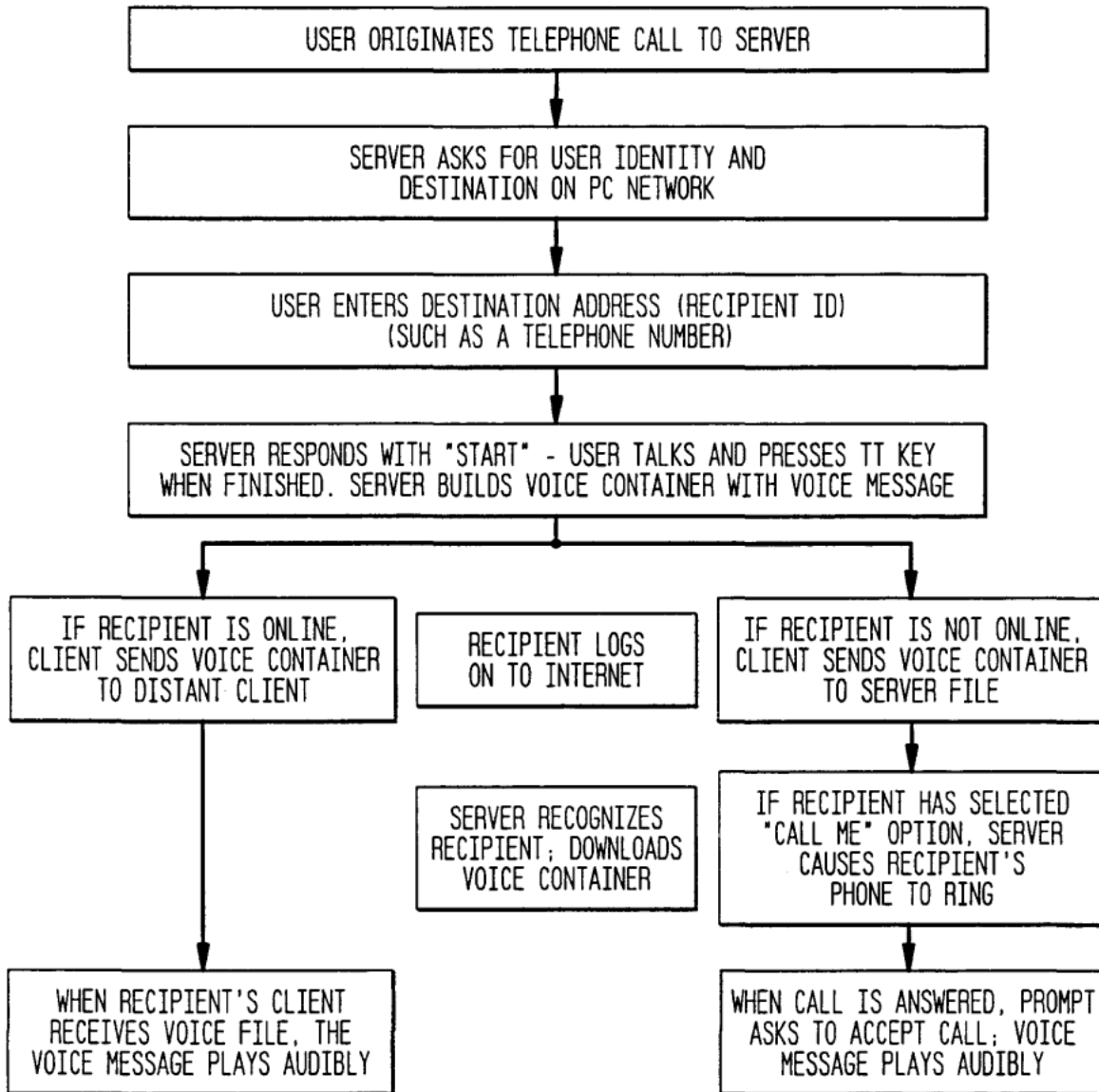
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FIG. 4



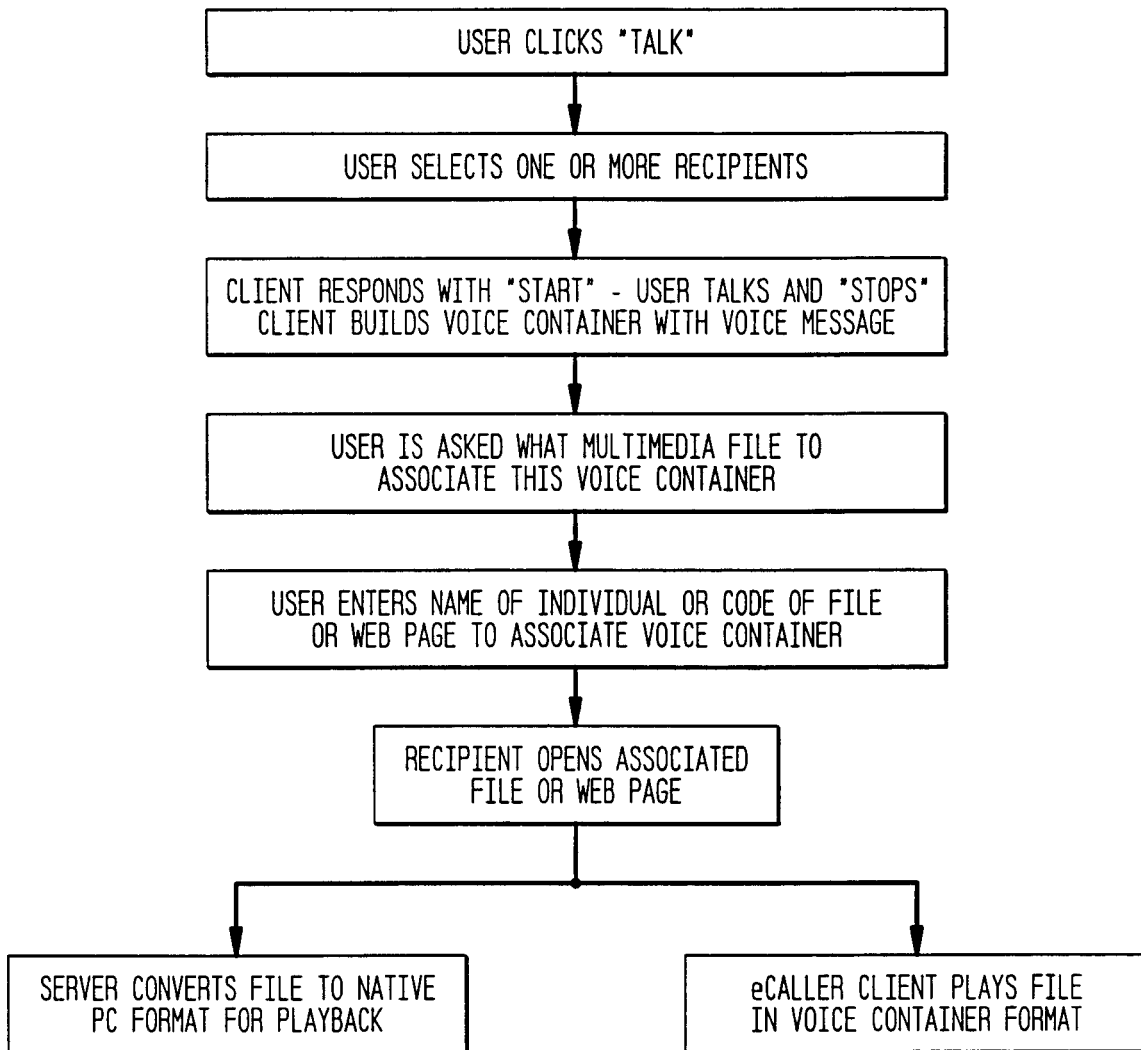
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FIG. 5



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FIG. 6

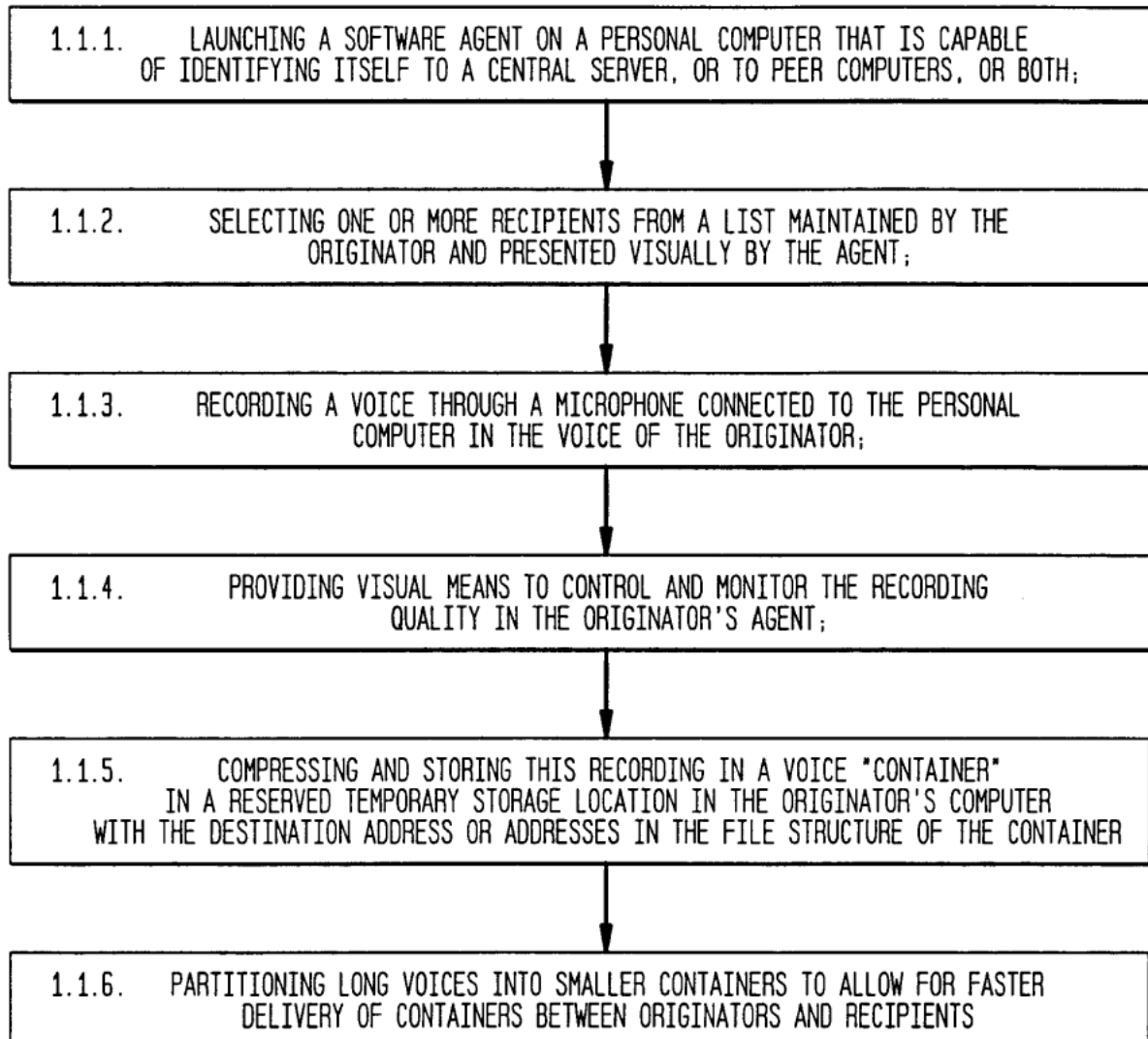




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FIG. 7

ORIGINATOR(S):



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**FIG. 8**

## 1.2. CENTRAL SERVER:

1.2.1. MANAGING THE ADDRESS LISTS USED BY ALL SOFTWARE AGENTS, INCLUDING ADDRESSES (1) OPEN TO ALL USERS, (2) CREATED BY USERS FOR REASONS OF ANONYMITY, (3) GROUPS AVAILABLE ONLY TO SELECT SOFTWARE AGENTS AND (4) PERSONAL PROFILE LISTS THAT ALLOWING MATCHING OF INDIVIDUALS WITH SIMILAR INTERESTS

1.2.2. COMMENCE POLLING OF THE USER'S COMPUTER TO DETERMINE WHETHER THERE ARE VOICE CONTAINERS IN THE RESERVED TEMPORARY STORAGE LOCATION, UPON THE LAUNCH OF THE SOFTWARE AGENT;

1.2.3. UPLOADING THE VOICE CONTAINER(S) TO A CENTRAL FILE SERVER AND RELEASING THE TEMPORARY STORAGE IN THE ORIGINATOR'S COMPUTER, WHEN A VOICE RECORDING IS COMPLETE;

1.2.4. CREATING OR ADDING THE QUEUE OF VOICE CONTAINERS FOR THE RECIPIENT BASED ON THE DESTINATION ADDRESS INCLUDED IN THE VOICE CONTAINER FILE;

1.2.5. NOTIFYING AN AVAILABLE SOFTWARE AGENT ON THE RECIPIENT'S COMPUTER OF THE ARRIVAL OF A NEW MESSAGE IN NEAR REAL-TIME OR; NOTIFYING THE SOFTWARE AGENT ON THE RECIPIENT'S COMPUTER WHEN IT FIRST BECOMES AVAILABLE OF VOICE CONTAINERS IN THE CENTRAL STORAGE;

1.2.6. DOWNLOADING THE VOICE RECORDINGS TO THE RECIPIENT'S COMPUTER UNDER THE CONTROL OF THE SOFTWARE AGENT AND SELECTIVELY REMOVING THE FILES FROM THE CENTRAL SERVER

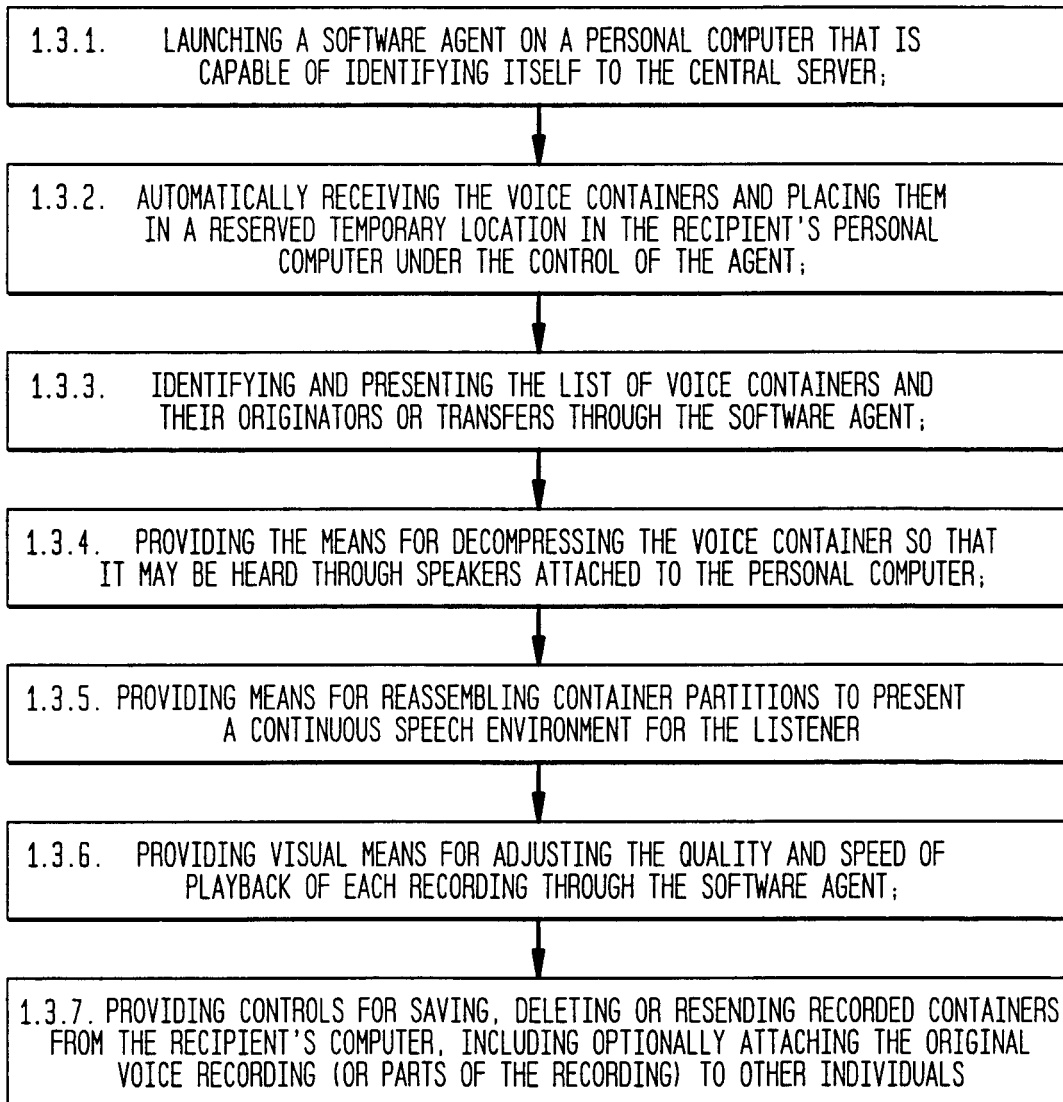
1.2.7. RESPONDING TO CONTROL MESSAGES FROM ORIGINATOR(S) AND RECIPIENT(S) TO CONTROL THE DESTINATIONS OF VOICE FILES FOR SECURITY OR BROADCAST PURPOSES

1.2.8. IMPLEMENTING CAPACITY AND QUALITY-OF-SERVICE CONTROLS CONSISTENT WITH USER-NEEDS AND REVENUE-CREATING OFFERS

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**FIG. 9**

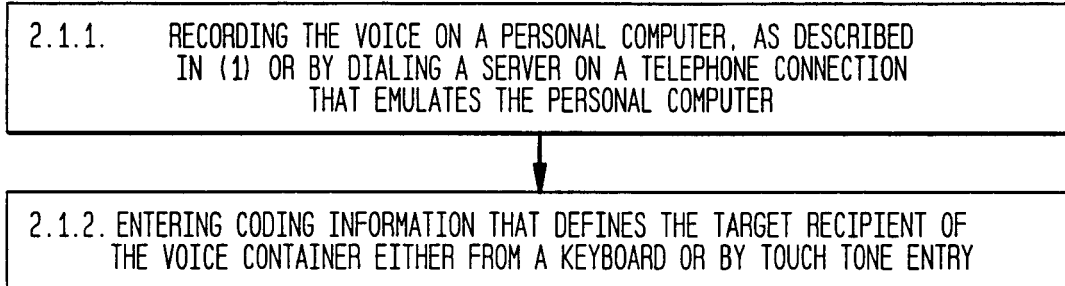
## 1.3. RECIPIENT:



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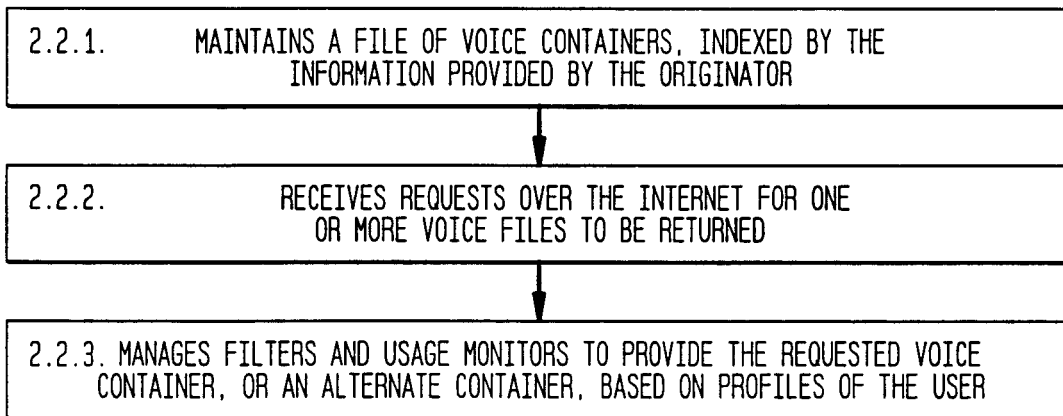
**FIG. 10**

2.1. ORIGINATOR



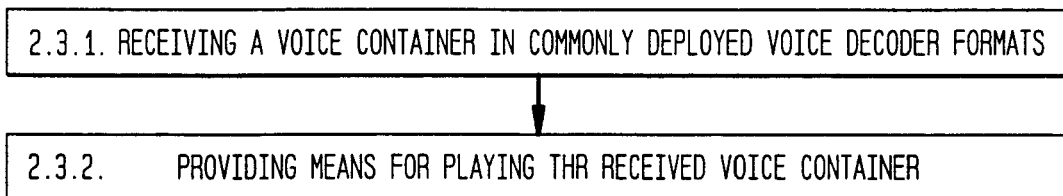
**FIG. 11**

2.2. CENTRAL SERVER



**FIG. 12**

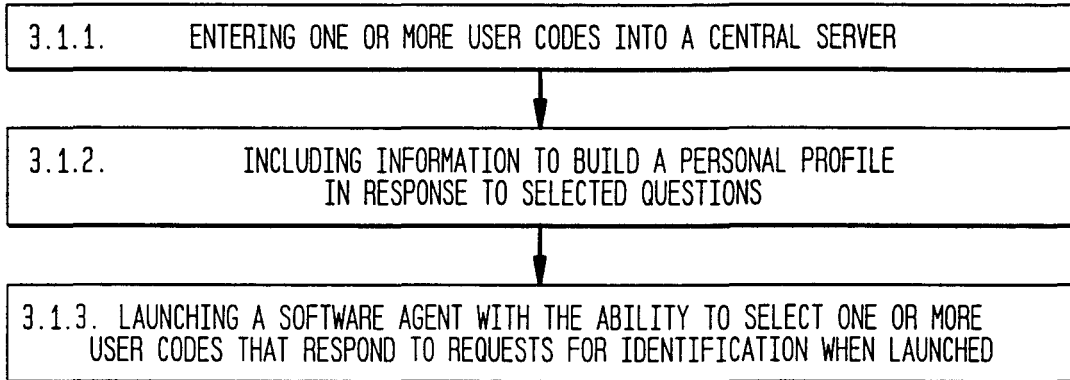
2.3. RECIPIENT



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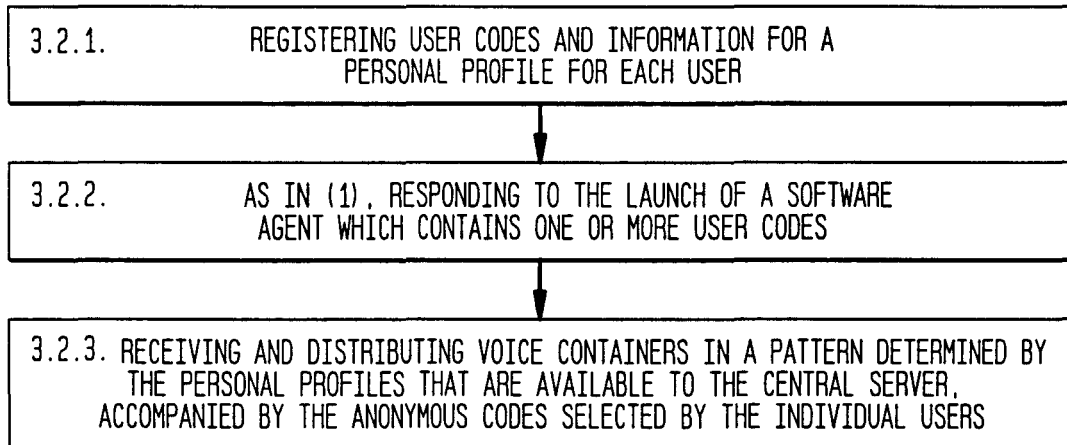
**FIG. 13**

3.1. ORIGINATOR AND RECIPIENT



**FIG. 14**

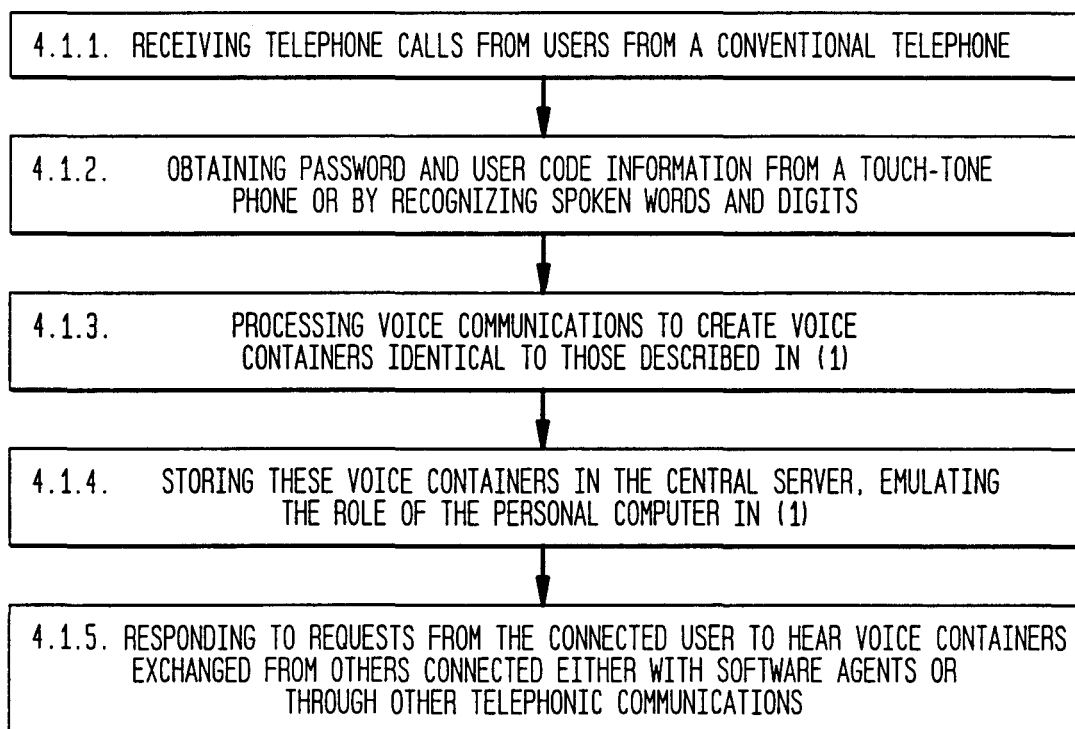
3.2. CENTRAL SERVER



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**FIG. 15**

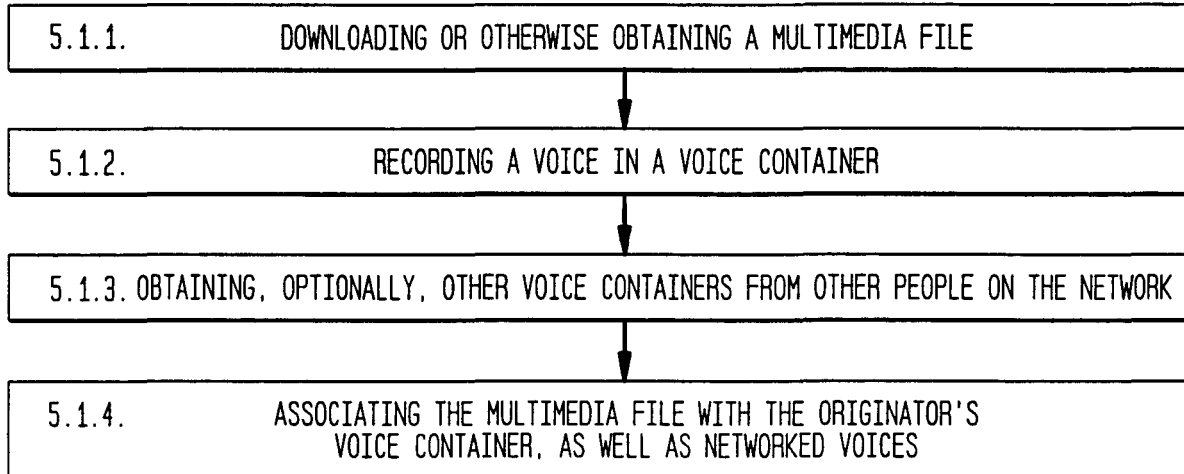
## 4.1. CENTRAL SERVER



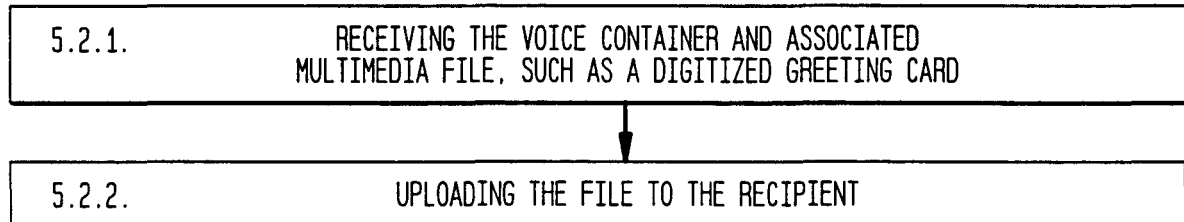
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**FIG. 16**

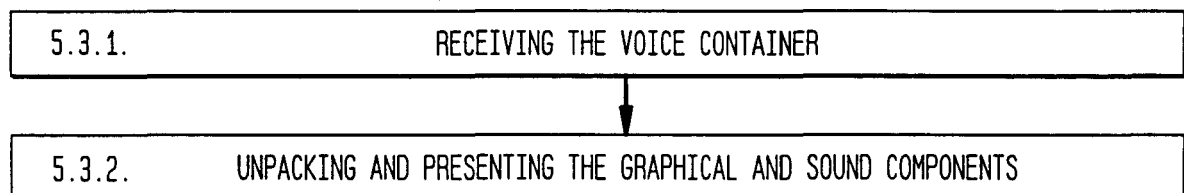
## 5.1. ORIGINATOR

**FIG. 17**

## 5.2. CENTRAL SERVER

**FIG. 18**

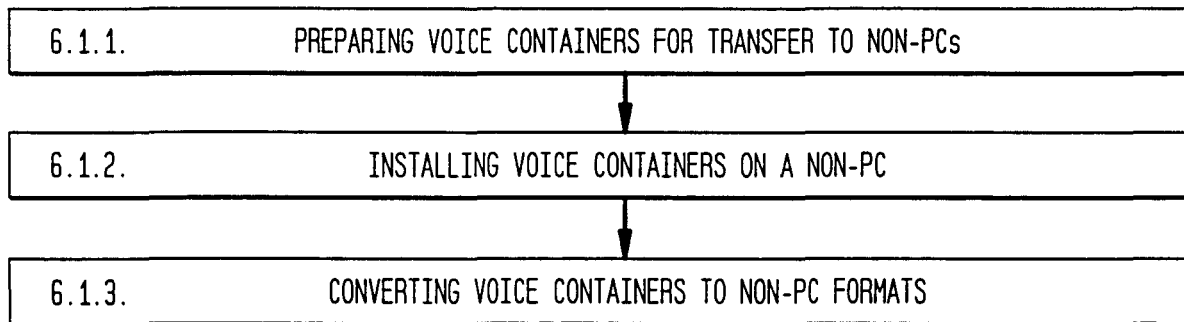
## 5.3. RECIPIENT



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**FIG. 19**

6.1. VOICE CONTAINERS WITHOUT A PC



**FIG. 20**

6.2. PLAYING VOICE CONTAINERS ON A NON-PC BASED APPLIANCE

