

IMPROVED CALLER IDENTIFICATION**TECHNICAL FIELD**

This invention relates to telephony, and more particularly to an improved technique of utilizing caller identification information in a telephone network.

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DESCRIPTION OF THE PRIOR ART

Telephone systems utilizing caller identification (ID) have been offered by various equipment manufacturers for several years. Caller ID systems take advantage of the fact that between rings of a telephone, there is some idle time within which useful information can be sent.

10 In caller ID systems, the central office switch sends a signal to the called telephone, usually in between the first ring signal and the second ring signal, which identifies the calling party's telephone number. The customer premises equipment (CPE) can then utilize this information in a variety of manners.

One use of caller ID information is to display the calling telephone number on a small

15 display either built into the called party's telephone equipment or located nearby. Thus, the called party can determine the calling party's telephone number, and perhaps even who is calling, prior to answering the telephone.

Recently, more sophisticated uses of caller ID have become known. For example, one available caller ID apparatus, after ascertaining the calling party's telephone number, will determine

20 the name of the calling party via table look-up and display the name on a caller identification apparatus.

Recently, several caller ID systems have become available which can automatically answer the telephone if the calling party's number is on a prestored list. These systems answer the telephone and provide a predetermined greeting, with the particular greeting provided being based



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upon the calling party's telephone number. Such a system is described, for example, in U.S. Patent No. 5,517,557 to Tanaka. The Tanaka arrangement can also connect the incoming call to a fax machine or other apparatus, depending upon the telephone number of the calling party.

5 A system which fully exploits the ability to automatically answer the telephone when a call arrives from one or more predetermined numbers is not presently available. Caller ID systems are still relatively primitive when compared with the potential benefits offered by the technology.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is an exemplary caller identification arrangement, with a service bureau apparatus,
10 showing portions of the telephone network and the data network utilized with the invention as well;

Figure 2 shows a flow chart which can be utilized at a service bureau computer for implementing the present invention; and

Figure 3 is a conceptual diagram of an exemplary apparatus of the present invention.

15 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The above and other problems of the prior art are overcome in accordance with the present invention which relates to a caller ID apparatus which (i) automatically answers the telephone based upon the caller ID information, (ii) conveys information desired by a user, and (iii) then hangs up. In one embodiment, the answering of the telephone can be accomplished without any
20 ring, but only for specific calling parties.

In a preferred embodiment, a service provider may be included in the predefined list of calling parties for which the telephone is answered. In this manner, when the service provider calls, the phone will automatically go off hook without ringing. The service provider may have specified information, which it can download to the user through voice synthesis, without even ringing the

telephone. Additionally, the service provider can be connected to a data network, and programmed to gather information based upon certain events (i.e.; stock prices, company announcements, etc.) In this manner, a user's telephone can announce critical events, without ringing, as these events occur, shortly thereafter, or perhaps at user defined intervals.

5 Preferably, the events to be announced are user defined by a filter means, for example. The user specifies certain conditions which are to trigger notification. When the service provider obtains information indicating that those conditions are met, it may automatically announce the information to the user, over the telephone, without even causing the telephone to ring.

Figure 1 shows an exemplary system diagram of two networks and the component parts
10 utilized in order to implement an exemplary embodiment of the present invention. The arrangement of Figure 1 shows the public switched telephone network (PSTN) 101 and a data network 110, each connected to a plurality of users. The data network 110 is connected to a service provider computer 102 as well as a stock market computer 108. The connections between the data network 110 and computer 102 and 108 may use any of a variety of well-known techniques, but
15 preferably use standard TCP/IP protocols.

PSTN 101 is shown as interconnecting a plurality of telephones and telephone terminals, several of which are shown. Terminal 106 may be a modem for example. Telephones 104, 105, and 107 are also shown, with an exemplary caller ID unit 111 shown as being connected to telephone terminal 107. It is noted that the caller ID unit 111 can be formed as an integrated unit
20 with the telephone 107 to provide a voice terminal.

Service provider 102 includes a telephone connection 112 with a corresponding telephone number, as well as a data network connection 113. While the data network connection 113 may actually be a physical telephone dial up line, it is noted that the logical address of connection 113 is a data address on the data network, and the logical address of connection 112 is a telephone

The present invention is directed to a technique for automatically allowing an announcement to be made at a user's telephone terminal when particular events in which the user is interested occur. For example, consider a user who is interested in closely monitoring the price of a particular stock. The user would like to know if the particular stock has fallen below a certain value.

The user accesses the service provider via the touchtone telephone and telephone connection 112 or via his computer terminal over data network 110. The Internet for example, could easily be utilized as a technique for accessing service provider computer 102.

The user enters the particular stock quote in which he is interested, perhaps by typing in the stock exchange symbol for that company, as well as the particular price. The user then specifies that it is desired that he be notified should the stock price go below the specified value. Various user interfaces for permitting the user to make such entry into service provider 102 will be apparent to those of ordinary skill in the art. For example, one could design a WINDOWS based system where the user clicks on particular company symbols, particular prices, as well as conditions such as "notify if below," "notify if above," etc. A variety of templates can be designed for the user to enter such information and send it over the Internet to service provider 102, and the particular technique utilized is not critical.

Alternatively, the entire user interface may take place over the telephone, with Dual Tone Multi-Frequency (DTMF) signals being entered to specify stock symbols. This way, a user may specify what items in which he is interested from any telephone. Moreover, the user may input the number to which the announcements should be directed, or the system could, by default, use the number from which the input is entered by ascertaining its called identification signal.

Service provider 102 is periodically or perhaps continuously in communication with stock

market computer 108 over the data network 110. Numerous hardware and software arrangements for periodically accessing information from the computer over a data network such as the Internet are already in existence. If, for example, the information is on a web server, then the server can be accessed automatically and periodically at predetermined intervals.

5 Each time the relevant information is obtained from stock market computer 108, service provider 102 checks the user specified condition to determine if it is met. If so, connection 112 is utilized to call the user's telephone 107. Caller ID unit 111 determines that the calling party's telephone number is that of the service provider and causes an off hook condition at telephone 107, before the telephone rings. The automatic answering of the telephone prevents the phone from
10 ringing each time the information is to be announced.

It is noted that while caller ID is discussed, other information regarding the source and/or characteristics of an incoming call may be used. For example, if the incoming call involves Integrated Services Digital Network (ISDN) or Internet telephony, a variety of further information regarding the source may be available. Digital protocols may include a plethora of information
15 regarding the calling party identity.

After the telephone apparatus goes off-hook, an announcement of the information is made, and the telephone hangs up. Thus, by utilizing the techniques of the present invention, a user can automatically and audibly be alerted when particular specified events occur.

In a preferred embodiment, an exemplary caller ID box 111 delays the ring signal from
20 reaching telephone 107 until the caller ID is checked. If the caller ID indicates that the calling party is a service provider on a prestored list, then the telephone line is taken off hook and an announcement made, preferably through a speaker in Caller ID unit 111. Otherwise, the call is simply passed to telephone 111 as normal.

It is important that the called party's telephone equipment is promptly put back on hook

after the announcement is complete. This can be accomplished by a variety of methods, including for example, having the service provider transmit a predetermined tone at the end of the message, and having the caller ID unit and/or called telephone recognize the tone as the hang up signal. Alternatively, the called party's telephone could simply hang up upon recognition of a silence
5 period of a predetermined duration.

While the above example utilizes a stock quote, it is apparent to those of ordinary skill in this art that other variations are possible as well. For example, an attorney could be interested to know of all bankruptcy filings in a particular court. If a courthouse computer is connected to the data network, then the attorney's telephone could simply announce, at 12 noon everyday, "The
10 following bankruptcy cases were filed in the New Jersey Federal Court today." A text to speech algorithm could then be used by the service provider to read the names of the cases via telephone to the user, and to promptly hang up the telephone.

When the user specifies in which information he is interested and when, several options exist for conveying the information when appropriate. For example, the user could specify that the
15 service provider is to make an audible announcement of particular stock prices every two hours. Alternatively, the user could specify that such quote is to be given only if stock prices vary by a predetermined amount.

Fig. 3 shows exemplary functional block diagram of an implementation of the Caller ID Unit 111 to be utilized in the present invention. The diagram of Fig. 3 includes interfaces 312, 314,
20 and 330, and the processor 310. The table 311 may be stored in memory in accordance with well-known techniques.

In operation, an incoming call is received over line 320 and the calling party ID is extracted by interface 330. A compare processor, which may be implemented as a general purpose microprocessor, examines the extracted identification information and compares it with values

stored in a table 311. In performing such a comparison, standard table hook-up or binary search function may be utilized in order to locate within the table 311 the information extracted by the interface 330.

In the simplest form, the extracted information would include simply the phone number of the calling party. However, in more sophisticated digital networks such as the integrated services digital network (ISDN) or Internet telephony interfaces, the calling party identification number may include a variety of other information such as name, location, status information, etc.

Once the compare processor 310 determines whether or not the extracted calling information is included within the table 311, the compare processor 310 then proceeds to process the call accordingly. The compare processor may simply forward the call through telephone interface 312, so that the telephone 107 rings in a conventional manner. The compare processor may also instruct the audio interface, a typical speaker, to announce the information being received during the telephone call. Thus, a service provider sending information would simply have the telephone answered and its information would be conveyed from an audio interface 314, without telephone 107 ever ringing.

It is also possible that table 311 may include specific parameters as to what should be done with various calls based upon the caller identification information. For example, in certain instances it may be desirable to both convey the telephone call through interface 312 to telephone 107, and to convey a separate message to an audio interface 314.

Still another mode of operation would provide that a specific audio announcement is stored in table 311 for announcement to the user instead of a ring signal. Thus, if a call is received from a particular specified calling number, rather than the phone ring, an audio announcement is read out of table 311 and conveyed through audio interface 314. The announcement could be, for example, "We are about to announce today's Supreme Court decisions." Thereafter, the caller ID unit 111

answers the telephone and the audio announcement is conveyed over line 320 and out of audio interface 314.

While the foregoing describes the preferred embodiments of the invention, it is understood that various additions or modifications will be apparent to those of skill in the art. For example, the
5 caller ID unit and telephone or similar audio unit may be part of a single personal computer or other device. Such modifications and additions are intended to be covered by the following claims.

CLAIMS:

1. A method comprising:
gathering information over a data network and storing said gathered information in a
service provider computer;
5 dialing a telephone number of a user desiring such information, to establish a
telephone connection between said service provider computer and said user terminal; and
announcing the information to the user audibly by means of said user terminal.
2. The method of claim 1 wherein said telephone connection is established without
10 said telephone ringing.
3. The method of claim 2 further comprising:
identifying a telephone number associated with said service provider upon receiving
a ring signal generated as a result of said service provider dialing; and
15 in response to said step of identifying, causing an off hook condition to occur at said
user terminal without said user terminal ringing, if said telephone number associated with said user
is identified.
4. The method of claim 3 wherein said service provider computer establishes said
20 telephone connection at predetermined intervals.
5. The method of claim 4 wherein said predetermined intervals are defined by a user
desiring to receive said information.

6. The method of claim 5 wherein said service provider computer establishes said telephone connection and announces said information upon occurrence of specified filter conditions.

5 7. Apparatus comprising:
a device for identifying a telephone number or other identifying information of a calling party at a called terminal;
a processor causing an off hook condition without ringing said called terminal if said calling party's telephone number is on a predetermined list; and
10 an audio system for conveying an audio message from a computer associated with said calling party's telephone number to said audio terminal immediately upon said off hook condition.

8. Apparatus of claim 7 wherein said means for conveying comprises text-to-speech
15 conversion means.

9. The caller identification unit of claim 7 further comprising means for causing an on-hook condition when upon completion of said audio message being conveyed.

20 10. A method comprising;
comparing incoming caller identification data (CID) information to prestored information;
responsive to said comparing, automatically answering an incoming call if said CID data meets specified conditions, without ringing a telephone;

immediately receiving and conveying an audible message in response to the incoming call being answered; and

hanging up after receipt of said audible message.

5 11. The method of claim 10 wherein said hanging up includes receiving a signal from a calling party indicating that said audible message has ended, and in response, ending a telephone connection.

12. The method of claim 11 wherein said comparing is performed in a caller identification
10 apparatus separate from the telephone, and wherein an incoming calling signal is conveyed to said telephone only upon completion of said step of comparing.

13. The method of claim 11 wherein the audible message is conveyed from a separate caller identification apparatus.

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14. A device comprising:

 a first interface to receive calling signals from a telecommunications network, and to extract caller information from said call signals;

 a second interface to communicate with an audio terminal;

20 a processor to compare said extracted caller information to stored information, and to, in response to said comparison, either produce an audio signal directly from said device, or to send said calling signal to said audio terminal via said second interface.

15. The device of claim 14 wherein said processor is configured to prevent said calling signal from

being conveyed to said audio terminal if said audio signal is produced directly from said device..

16. The device of claim 14 wherein said audio signal is a voice signal generated remotely that announces information in which a user has previously indicated an interest.

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17. The device of claim 16 wherein connected to a telephone network, and wherein at least one calling signal can be generated by repeatedly accessing a service provider over a data network to obtain information, and then calling a telephone number to convey said information.

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