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(54) **THUNDERCALL, THE CALL BEFORE THE STORM**

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Publication Classification

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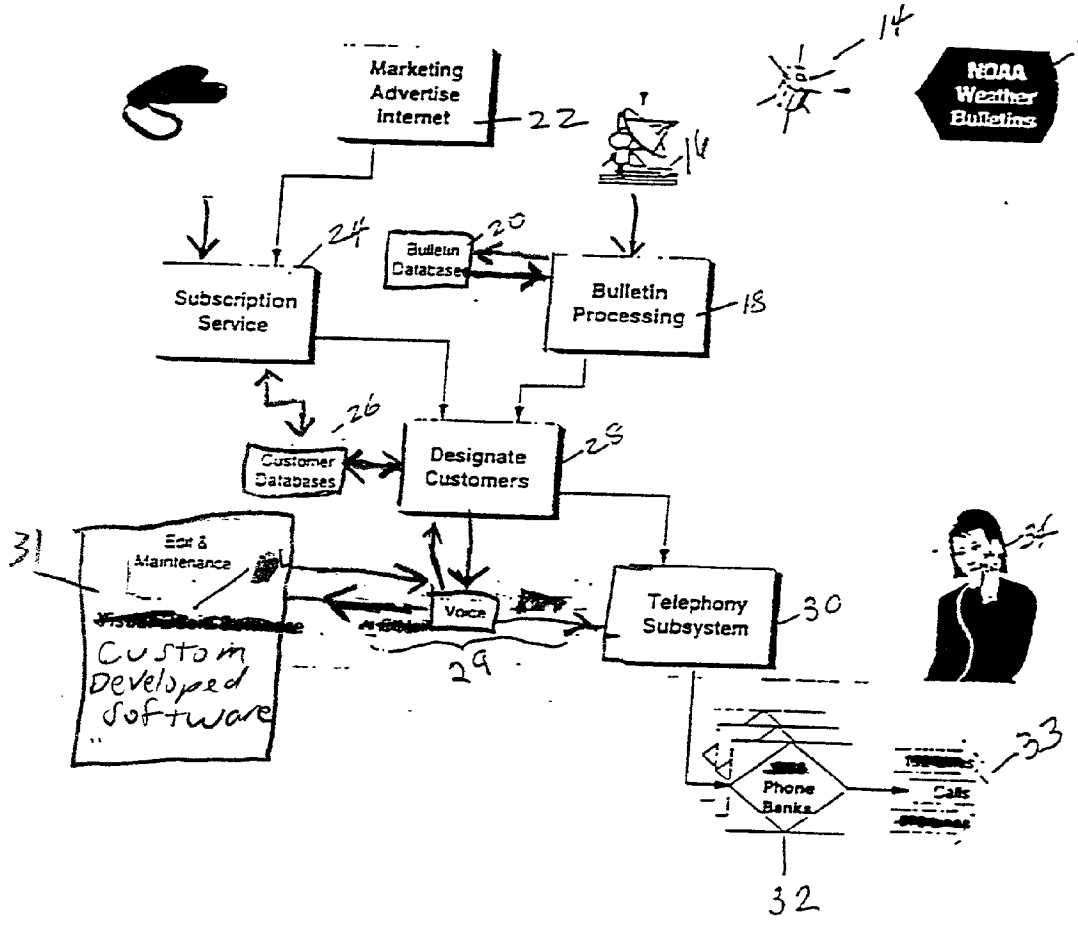
(57) **ABSTRACT**

ThunderCall is a computer based system for delivering NWS(National Weather Service) severe weather warnings as a message (personalized information, if desired) via an automated dialing system to live persons and to automated recorders comprising the steps of: forming a database of names with their respective geographic locations; capturing a NWS Bulletin reciting the location of a severe storm; validating a relevant Bulletin into a Valid Bulletin by determining from the storm's location that it represents an imminent severe storm danger to at least one person of said database (capable of 10,000,000 or more persons) recording, if desired, an individual personal urgent warning to the name of the intended recipient of the Valid Bulletin; combining, if desired, said personal warning with a generic severe storm warning for said recipient; and, sending said Valid Bulletin with said combined warnings to said person whereby he is alerted within seconds of the release time of said National Weather Service bulletin to the danger of said storm. The storms can include but are not limited to warnings for tornados, severe storms, hurricanes, winter storms, and other impending storms, and the like, and can be delivered to answering machines, live telephone recipients, PC screens, and can further shut down electrical equipment such as PCs.



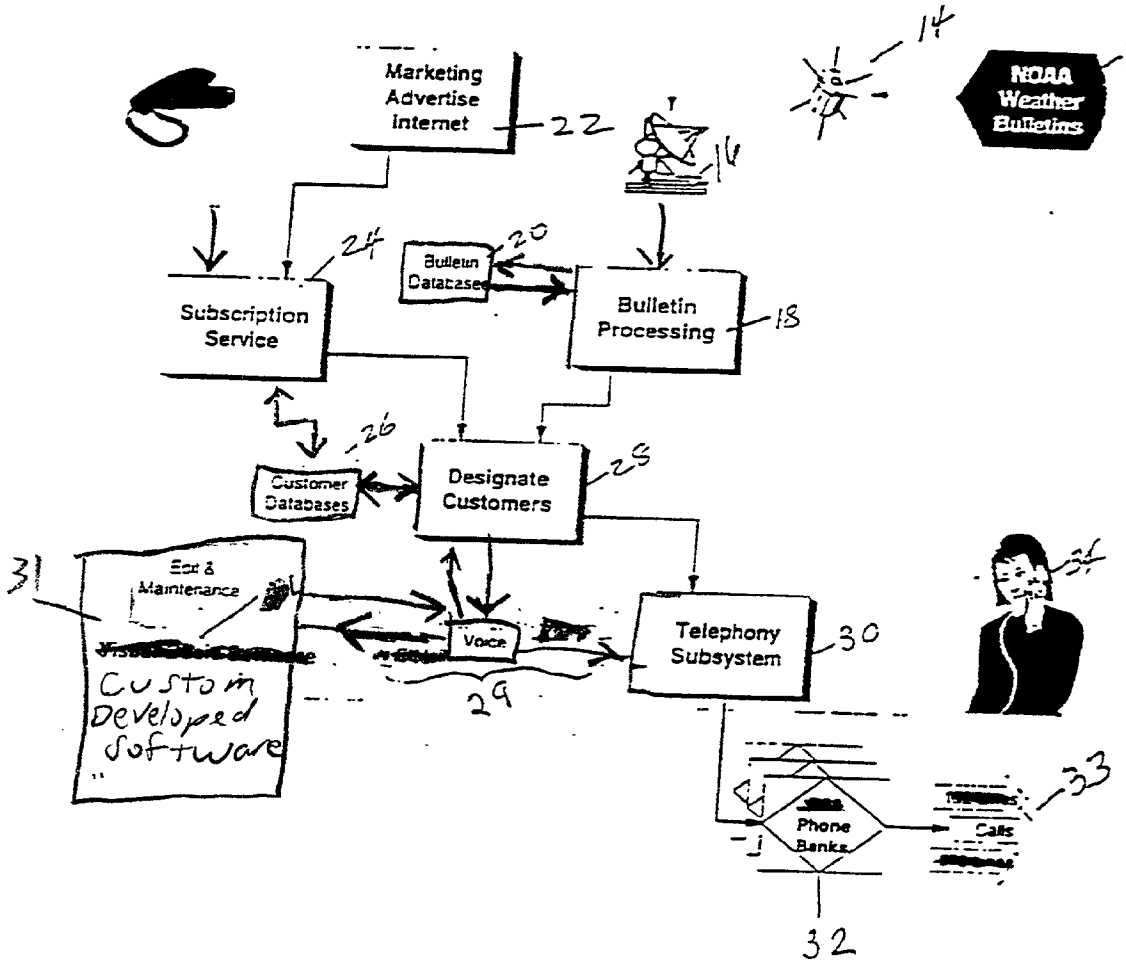

Marketing
Advertise
Internet
22
14
NOAA
Weather
Bulletins
12
16
24
Bulletin
Database
20
Subscription
Service
Bulletin
Processing
18
26
Customer
Databases
Designate
Customers
28
31
Edit &
Maintenance
Custom
Developed
Software
Voice
29
Telephony
Subsystem
30
34
Phone
Banks
Calls
33
32

Fig. 1

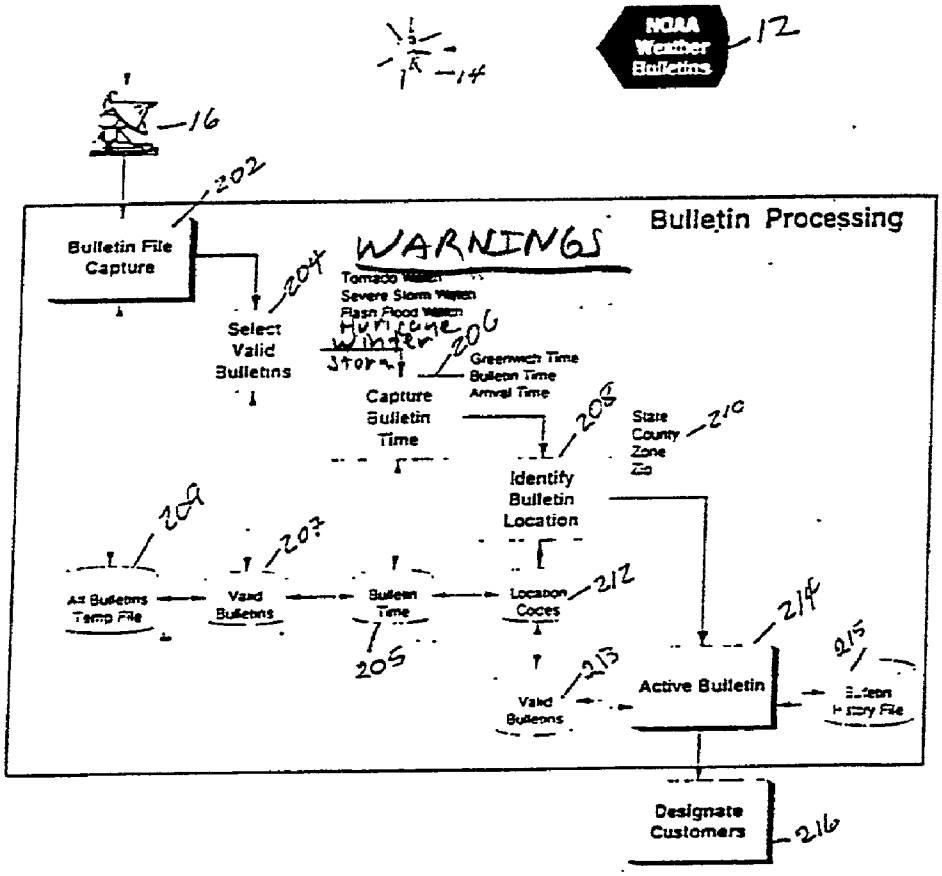

NOAA Weather Bulletins
12
14
16
202
Bulletin Processing
Bulletin File Capture
WARNINGS
Tornado Watch
Severe Storm Watch
Flash Flood Watch
Hurricane
Winter
Storm
204
Select Valid Bulletins
206
Greenwich Time
Bulletin Time
Arrival Time
Capture Bulletin Time
208
State
County
Zone
Zip
210
Identify Bulletin Location
209
207
All Bulletins Temp File
Valid Bulletins
Bulletin Time
205
Location Codes
212
213
Valid Bulletins
214
Active Bulletin
215
Bulletin History File
Designate Customers
216

Fig. 2

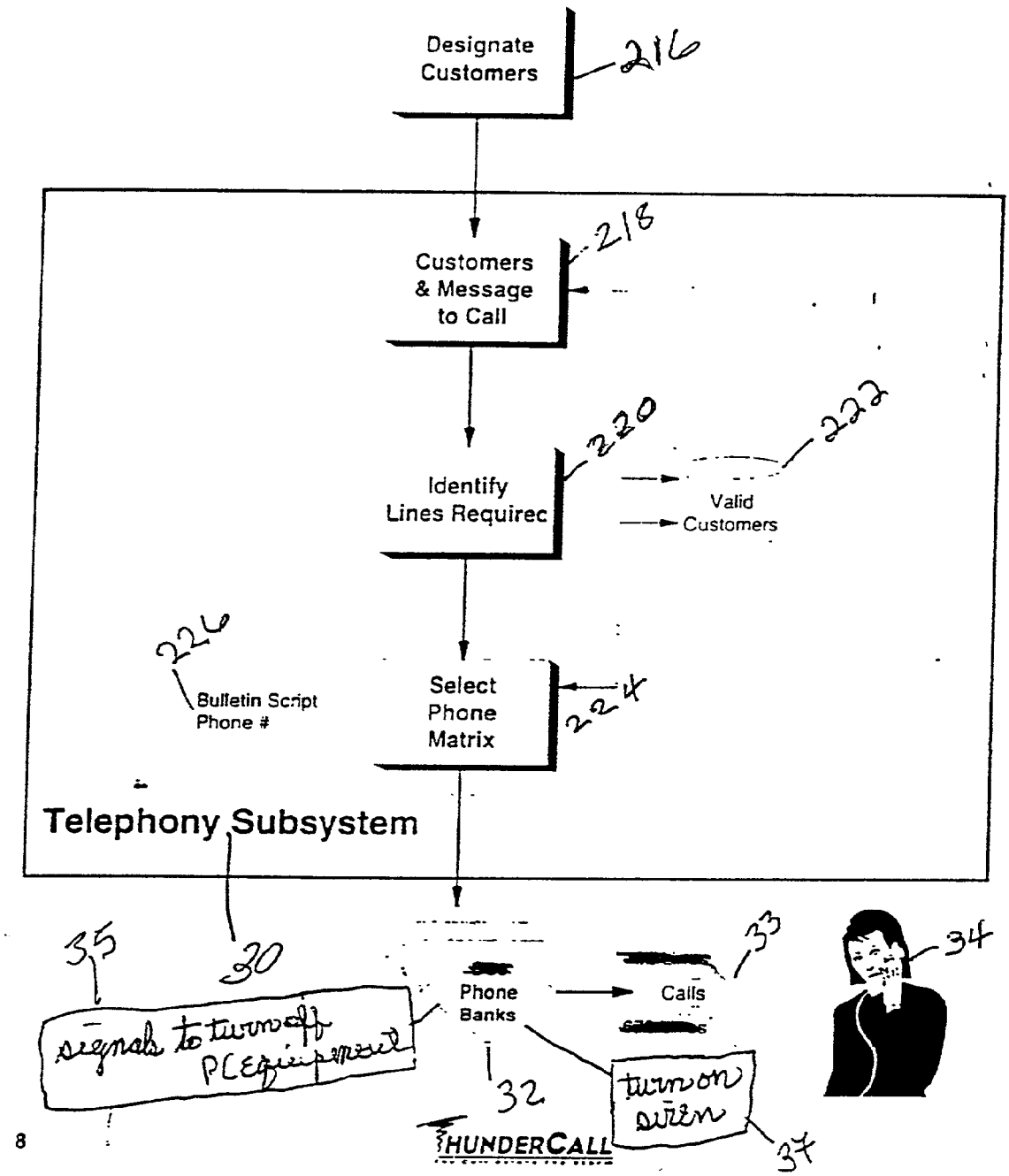

Designate Customers
216
Customers & Message to Call
218
Identify Lines Requirec
220
222
Valid Customers
224
Bulletin Script Phone #
Select Phone Matrix
224
Telephony Subsystem
35
30
signals to turn off PC equipment
Phone Banks
Calls
33
34
32
turn on siren
37
THUNDERCALL
8

Fig. 3

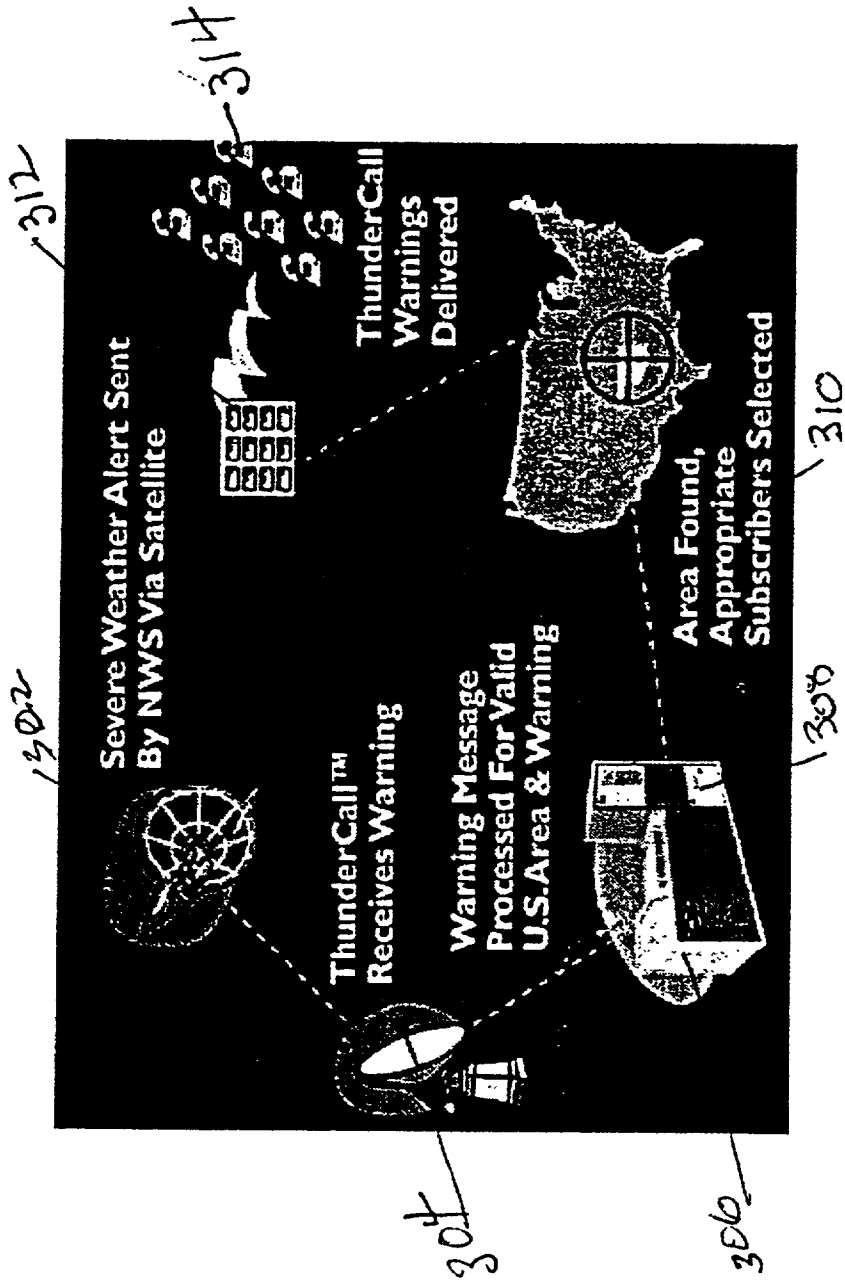

Severe Weather Alert Sent By NWS Via Satellite
ThunderCall™ Receives Warning
Warning Message Processed For Valid U.S. Area & Warning
Area Found, Appropriate Subscribers Selected
ThunderCall Warnings Delivered
302
304
306
308
310
312
314

Fig. 4

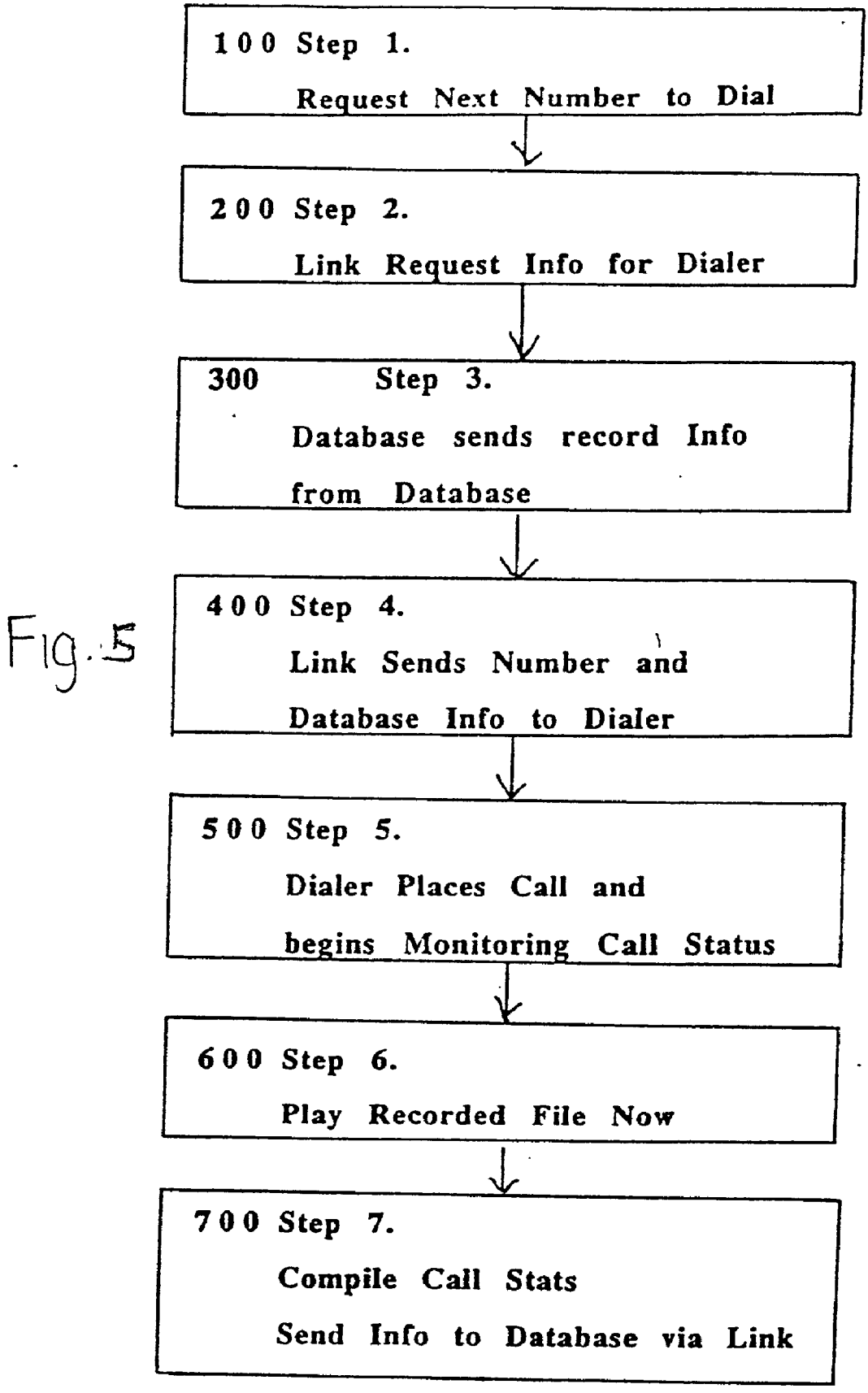

100 Step 1.
Request Next Number to Dial
200 Step 2.
Link Request Info for Dialer
300 Step 3.
Database sends record Info from Database
400 Step 4.
Link Sends Number and Database Info to Dialer
500 Step 5.
Dialer Places Call and begins Monitoring Call Status
600 Step 6.
Play Recorded File Now
700 Step 7.
Compile Call Stats
Send Info to Database via Link

Fig. 5

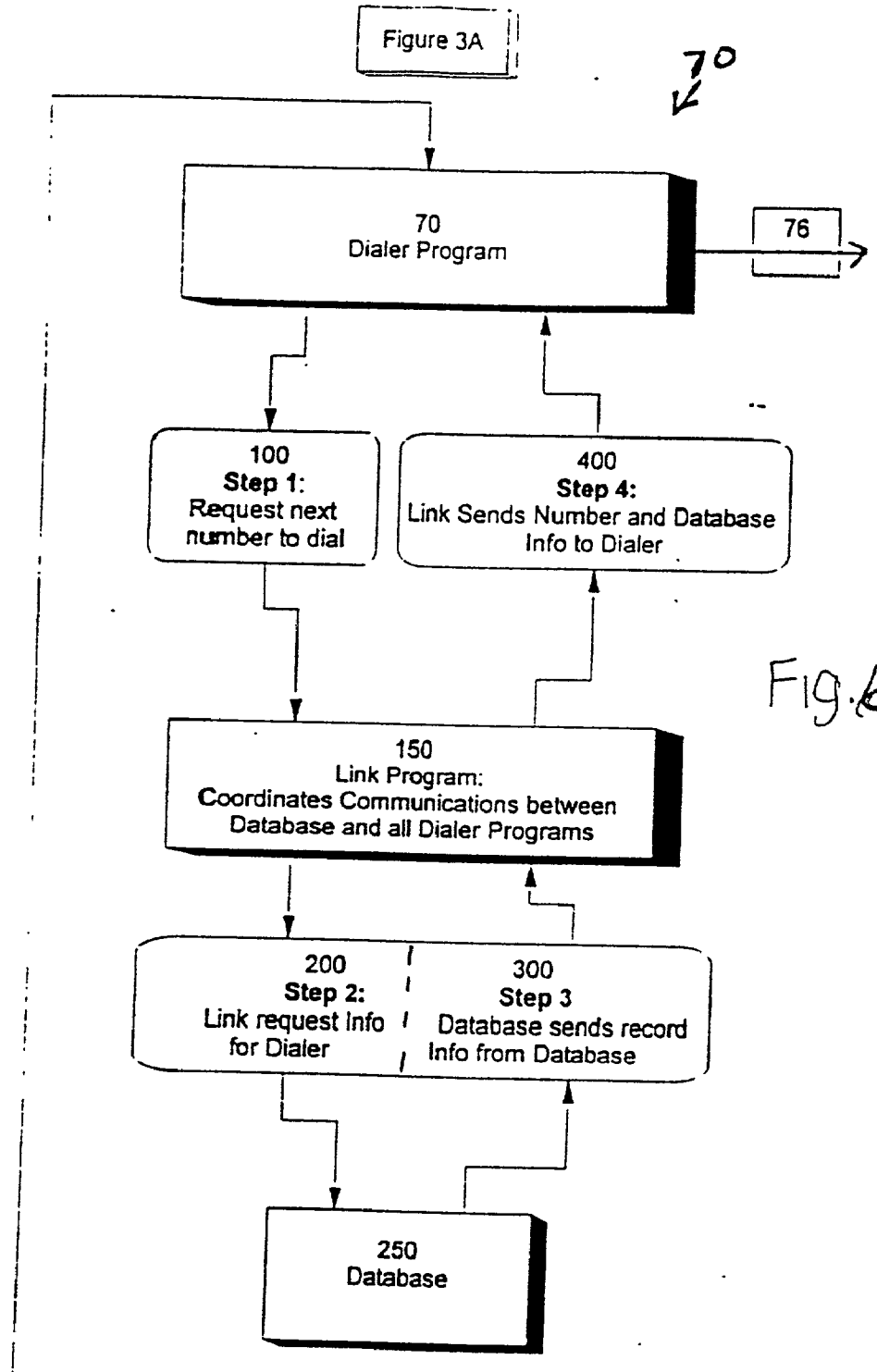


Figure 3A
70
70
Dialer Program
76
100
Step 1:
Request next number to dial
400
Step 4:
Link Sends Number and Database Info to Dialer
150
Link Program:
Coordinates Communications between Database and all Dialer Programs
200
Step 2:
Link request Info for Dialer
300
Step 3
Database sends record Info from Database
250
Database

Fig. 6A

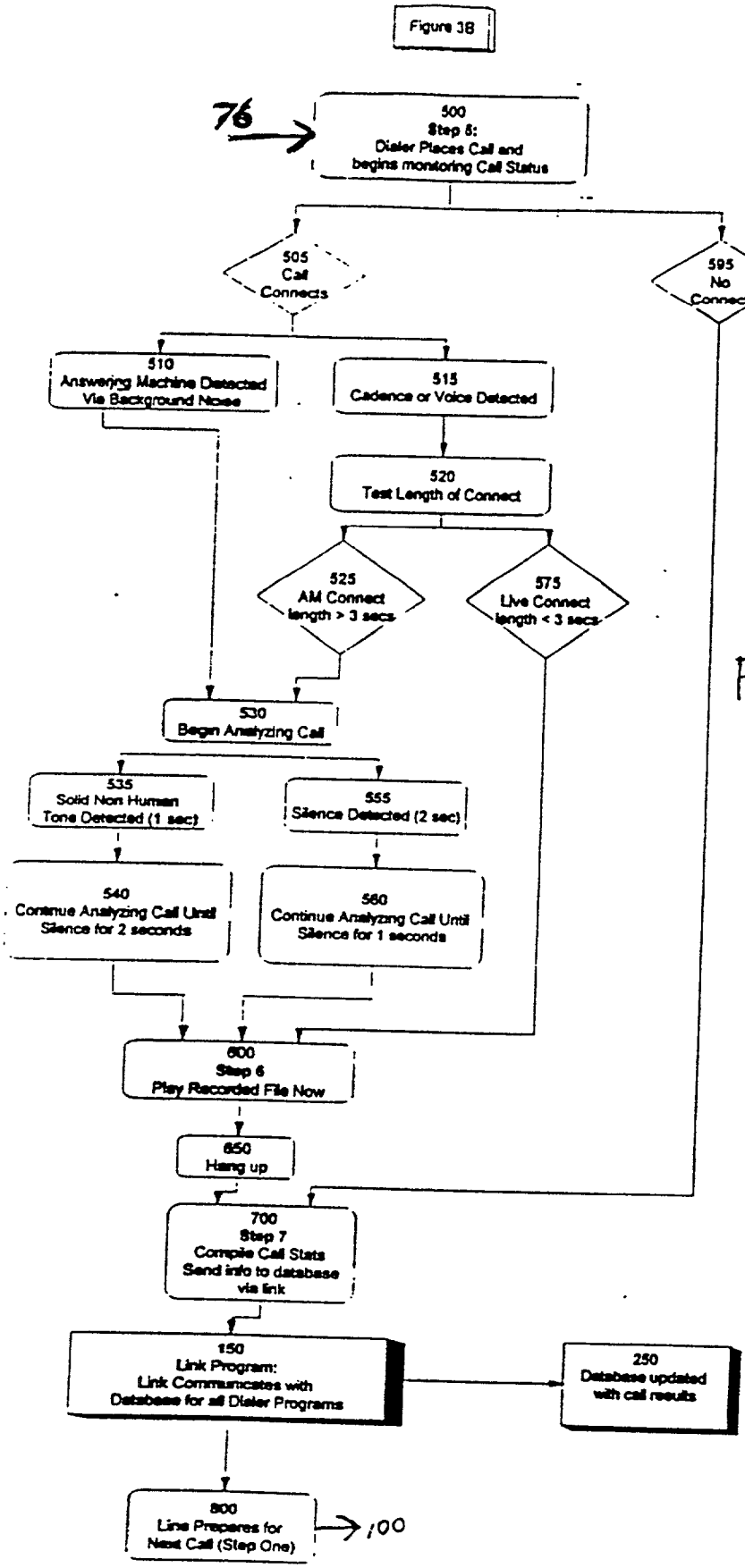


Figure 3B
76
500
Step 6:
Dialer Places Call and
begins monitoring Call Status
80
505
Call
Connects
595
No
Connect
510
Answering Machine Detected
Via Background Noise
515
Cadence or Voice Detected
520
Test Length of Connect
525
AM Connect
length > 3 secs
575
Live Connect
length < 3 secs
530
Begin Analyzing Call
535
Solid Non Human
Tone Detected (1 sec)
555
Silence Detected (2 sec)
540
Continue Analyzing Call Until
Silence for 2 seconds
560
Continue Analyzing Call Until
Silence for 1 seconds
600
Step 6
Play Recorded File Now
650
Hang up
700
Step 7
Compile Call Stats
Send info to database
via link
150
Link Program:
Link Communicates with
Database for all Dialer Programs
250
Database updated
with call results
800
Line Prepares for
Next Call (Step One)
100

Fig. 6B

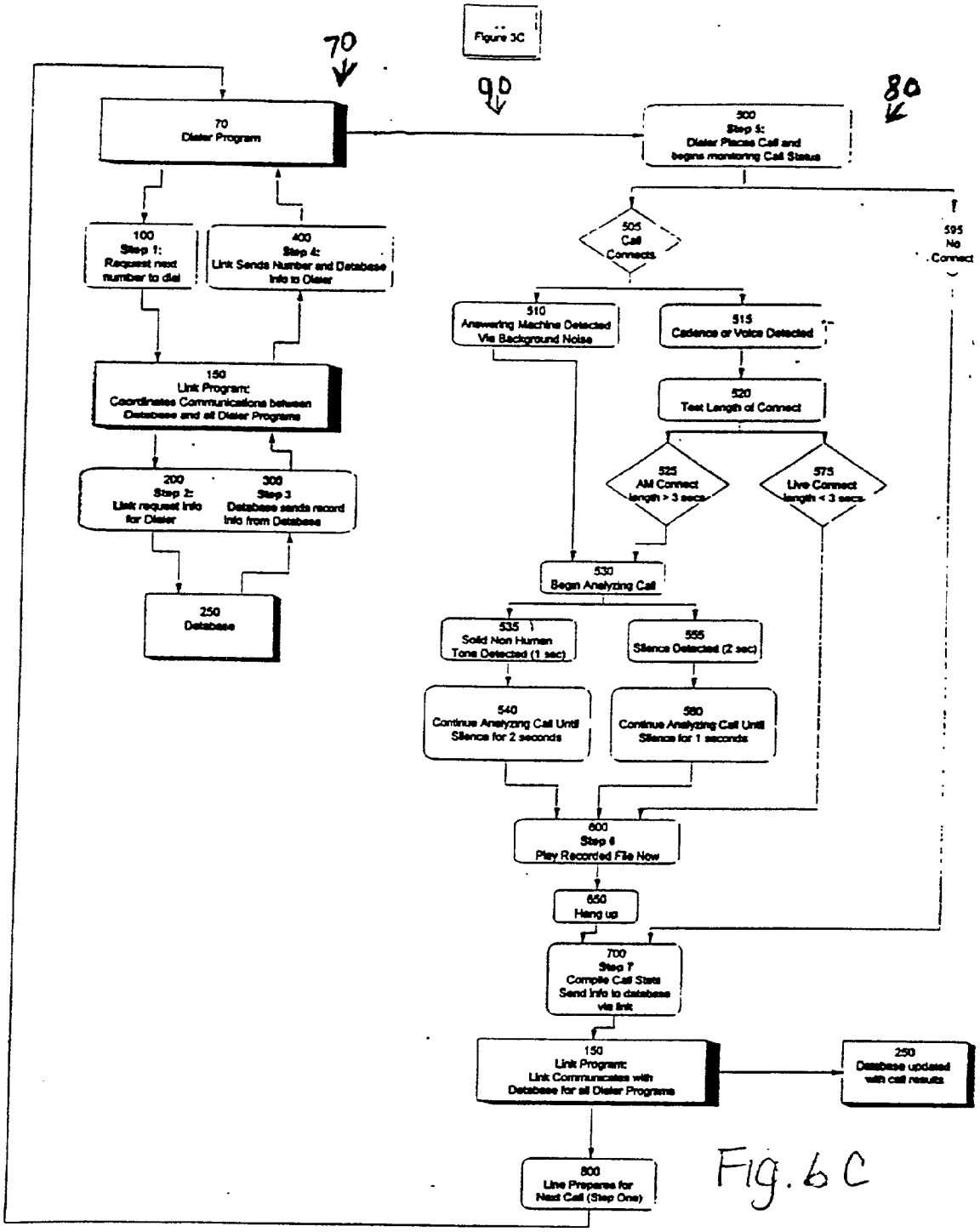


Figure 3C
70
90
80
70
Dialer Program
100
Step 1:
Request next number to dial
400
Step 4:
Link Sends Number and Database Info to Dialer
150
Link Program:
Coordinates Communications between Database and all Dialer Programs
200
Step 2:
Link request info for Dialer
300
Step 3
Database sends record info from Database
250
Database
300
Step 5:
Dialer Places Call and begins monitoring Call Status
505
Call Connects
595
No Connect
510
Answering Machine Detected Via Background Noise
515
Cadence or Voice Detected
520
Test Length of Connect
525
AM Connect length > 3 secs
575
Live Connect length < 3 secs
530
Begin Analyzing Call
535
Solid Non Human Tone Detected (1 sec)
555
Silence Detected (2 sec)
540
Continue Analyzing Call Until Silence for 2 seconds
580
Continue Analyzing Call Until Silence for 1 seconds
600
Step 6
Play Recorded File Now
650
Hang up
700
Step 7
Compile Call Stats
Send Info to database via link
150
Link Program:
Link Communicates with Database for all Dialer Programs
250
Database updated with call results
800
Line Prepares for Next Call (Step One)

Fig. 6C

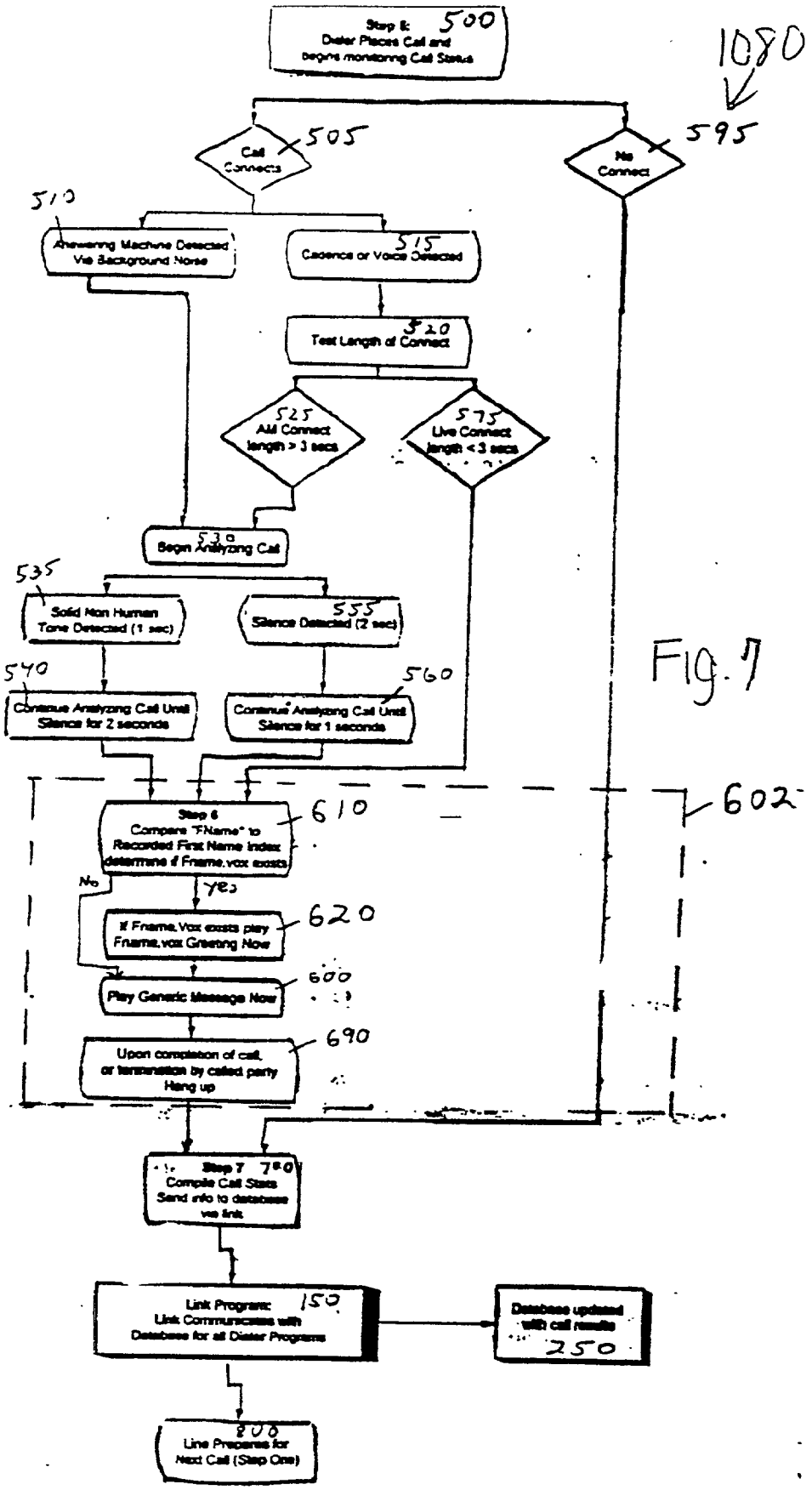

Step 5: Dialer Places Call and begins monitoring Call Status
500
1080
Call Connects
505
No Connect
595
Answering Machine Detected Via Background Noise
510
Cadence or Voice Detected
515
Test Length of Connect
520
AM Connect length > 3 secs
525
Live Connect length < 3 secs
575
Begin Analyzing Call
530
Solid Non Human Tone Detected (1 sec)
535
Silence Detected (2 sec)
555
Continue Analyzing Call Until Silence for 2 seconds
540
Continue Analyzing Call Until Silence for 1 seconds
560
602
Step 6 Compare "FName" to Recorded First Name Index determine if Fname.vox exists
610
No
Yes
If Fname.Vox exists play Fname.vox Greeting Now
620
Play Generic Message Now
600
Upon completion of call, or termination by called party Hang up
690
Step 7 Compile Call Stats Send info to database via link
700
Link Programs Link Communicates with Database for all Dialer Programs
150
Database updated with call results
250
Line Prepares for Next Call (Step One)
800

Fig. 7

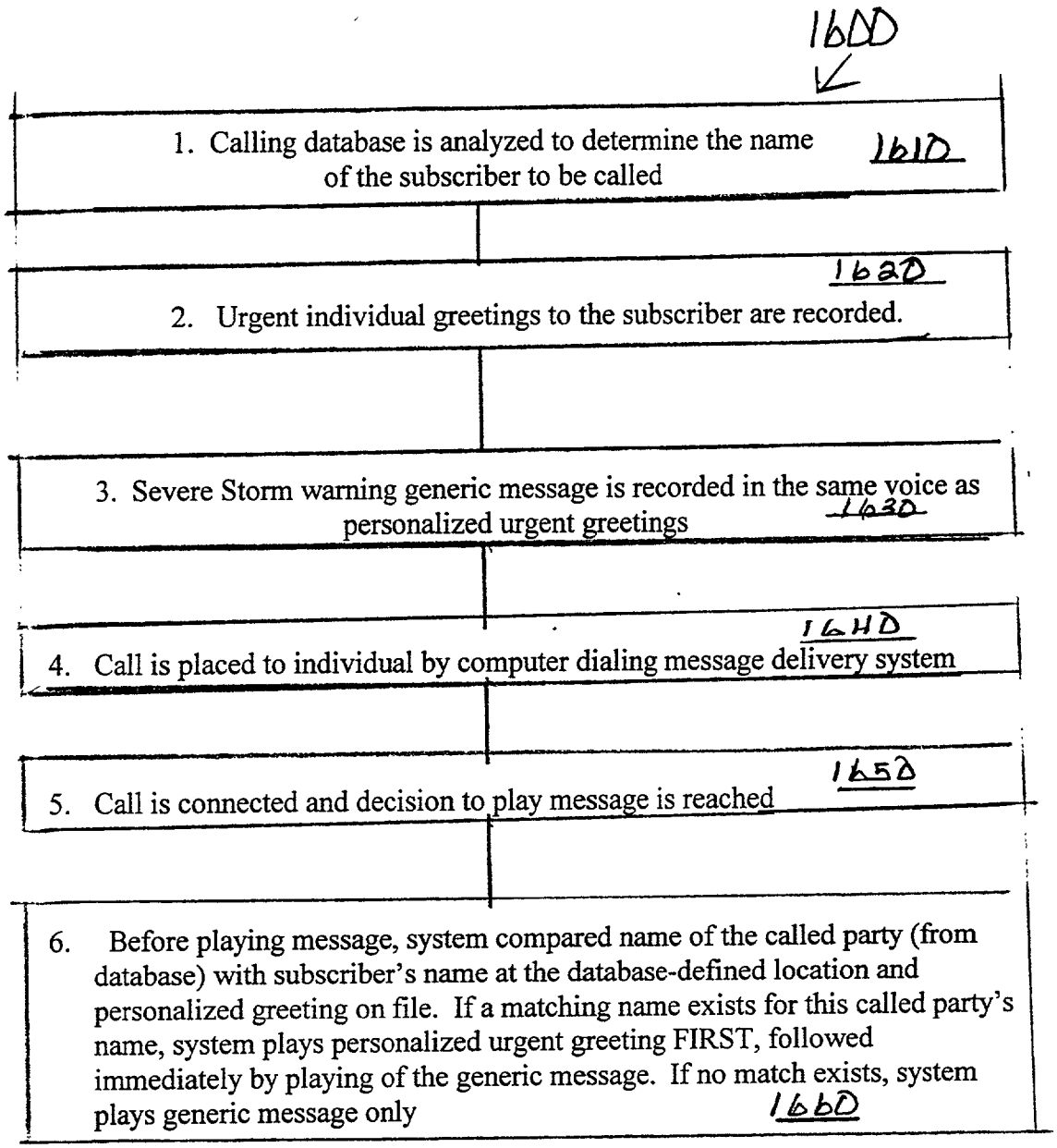

160
1. Calling database is analyzed to determine the name of the subscriber to be called
161
162
2. Urgent individual greetings to the subscriber are recorded.
3. Severe Storm warning generic message is recorded in the same voice as personalized urgent greetings
163
164
4. Call is placed to individual by computer dialing message delivery system
165
5. Call is connected and decision to play message is reached
6. Before playing message, system compared name of the called party (from database) with subscriber's name at the database-defined location and personalized greeting on file. If a matching name exists for this called party's name, system plays personalized urgent greeting FIRST, followed immediately by playing of the generic message. If no match exists, system plays generic message only
166

Fig. 8

SAMPLE BULLETIN

This is an automated ThunderCall weather warning. Moments ago, the National Weather Service issued a tornado warning for your area. Again, within the last few seconds, a tornado warning has been issued for your area. Please take immediate action and move to a secure location for your protection. This tornado warning is a service of ThunderCall, 1-888-THUNDER.

Fig. 9

THUNDERCALL, THE CALL BEFORE THE STORM

[0001] This invention relates to telephone message systems, and in particular to computer system where severe weather conditions are automatically communicated to subscriber telephones whereby safety procedures can be undertaken before the weather reaches the subscriber's area and is a Continuation-In-Part of U.S. application Ser. No. 09/124,697 filed on Jul. 29, 1998 which claims the benefit of U.S Provisional Application 60/079,454 filed on Mar. 26, 1998 and further claims the benefit of U.S. Provisional Application 60/189,234 filed on Mar. 14, 2000 all of which are by the same assignee and the same inventors of the subject invention.

BACKGROUND AND PRIOR ART

[0002] Group emergency call systems are intended for use by volunteer fire personnel, civil defense, or other groups requiring quick and simultaneous distribution of a message from a single individual to a number of other individuals. This service has historically been used in rural areas to provide one-way communication from a control position to a reselected group or groups of individuals. The traditional method of providing this service has been to install an adjunct switching system in the central office exchange that is cross-connected to lines dedicated for emergency use by the group emergency call system. Examples of such prior art cross-connected adjunct or add-on systems are the 291 Emergency Reporting System by Tellabs Inc., and the Emergency Out Dial System manufactured by Message Processing System, Inc. Such prior art systems suffer from the disadvantages of being expensive and complex, and requiring external maintenance terminals and sophisticated electronic equipment. Furthermore, such add-on emergency group call systems are incapable of providing standard central office or PBX call functions such as automatic call forwarding from an emergency hunt group subscriber set to a further set in the exchange. For example, the aforementioned 291 Emergency Reporting System utilizes a siren for notifying subscribers whose sets have been placed in call forward or do-not-disturb modes as well as rural areas and small towns who have been devastated in recent years by severe weather conditions.

[0003] Communicating messages by telephone has increased tremendously in the past decade. Communicating information such as advertisements and public announcements has become very important. Leaving pre-recorded messages to subscribers has become a popular technique for communicating information to thousands of individuals and businesses. There have many problems associated with leaving pre-recorded messages. For example, many pre-recorded messages are not noted immediately because the recipients do not quickly respond to the pre-recorded message and/or the pre-recorded messages are not correctly received by the answering machines. Thus, it has become more popular than ever in the communicating of messages to use computers, which will detect conditions that an answering machine is receiving the call.

[0004] Attempts have been made over the years to overcome the problems with delivering messages to telephone answering machines. See for example U.S. Pat. No. 4,667,065 to Bangerter; U.S. Pat. No. 4,941,168 to Kelly, Jr.; U.S. Pat. No. 5,371,787 to Hamilton; U.S. Pat. No. 5,430,792 to Jesurum et al.; and U.S. Pat. No. 5,581,602 to Szlam et al. However, these patents are generally limited to sensing audio signals generated by the answering machines and do not cover all the types of answering machines which start recording after different selected delay times. For example, many of these devices commence playing a recorded message based on mistakenly detecting when the "beep" has occurred. The false "beep" signal is a common problem for real callers trying to leave messages on answering machines. Furthermore, these patents do not fully analyze the connected calls in order to utilize preselected delay times to deliver and fully play recorded messages which is of vital importance when delivering emergency messages warning of the approach of severe weather conditions which can endanger human life.

[0005] Message delivery systems, which deliver a recorded message to an answering machine, must solve the problem of determining when to "Launch" (begin playback of) the prerecorded message. Conventional systems rely on a timer to determine the moment to begin playback of the recorded message which systems experience a high percentage of truncation of the recorded message. Other serious problems includes: the called answering machine may disconnect the call due to prolonged silence before the message playback begins; failure to listen to the message since pre-recorded messages oftentimes do not personally address the individuals being called; and generally ignoring important messages such as when the message is dealing with imminent dangerous weather conditions and other imminent dangers, and the like.

[0006] Other patents of general message communication interest include, U.S. Pat. No. 5,404,400 to Hamilton; U.S. Pat. No. 5,444,767 to Goetcheus et al.; U.S. Pat. No. 5,652,784 to Blen et al.; and U.S. Pat. No. 5,787,151 to Nakatsu et al. However, none of these patents solve all of the above problems.

[0007] Although the above has dealt with the problems relating to pre-recorded messages introduced onto an answering machine, it is further essential that a severe weather warning of imminent danger to area where the intended recipient is present and/or has an interest in monitoring be provided. There have been extensive efforts by the United States National Weather Service to warn of emergency weather conditions. The National Weather Service broadcasts weather and weather emergencies across the United States using seven different regional weather channels. These seven channels range in frequency from 162.4 to 162.55 MHz and employ narrow band FM modulation. When a regional weather emergency exists, the weather service modulates a 1050 Hz tone on the appropriate 162 MHz weather frequencies for 10 seconds to alert the public of an impending weather emergency. However, the 1050 Hz tone will not be heard by anyone who is not listening to a radio tuned to that local weather channel at 162 MHz, at the time of the emergency. Additionally, individuals will only be warned of weather events occurring within their immediate signal broadcast range. If an individual needed to be alerted to severe weather events taking place hundreds of miles away, for example individuals with elderly relatives in a distant city or a person monitoring the conditions at a distant ranch containing livestock, the National Weather Service

broadcasts in those areas would not reach their location, and therefore no warning would be communicated.

[0008] One approach to this non-reception problem is to implements a weather radio receiver into a cordless telephone system to allow a user to hear the National Weather Service broadcast over the cordless telephone. A control allows the user to listen to the regional weather broadcast either from the base unit or from the handset unit. When a weather emergency exists, a 1050 Hz tone transmitted by the weather service will be announced through the base unit speaker as well as through the handset unit speaker regardless of whether the user is listening to the regional weather broadcast or is on the telephone at the time of the emergency (see U.S. Pat. No. 5,541,980)

[0009] There still represents a serious need to provide a rapid response system to directly alert one who is interested in protecting the lives of oneself, oneself and property from threatening severe weather conditions such as tornadoes, hurricanes, lightning, hailstorms flash floods and windstorms by a warning system which delivers a severe storm warning alertly to the personal telephone or other communication system which can protect life and/or property for 24 hours a day.

SUMMARY OF THE INVENTION

[0010] The primary object of this invention is to provide a computer based system of delivering severe weather warnings within seconds of a National Weather Service bulletin release to individuals.

[0011] The secondary object of this invention is to provide a computer based system of delivering severe weather warnings to telephones within seconds of a National Weather Service bulletin release to individuals.

[0012] The third object of this invention is to provide severe weather warnings to telephones directly to homes and businesses.

[0013] The fourth objective of the present invention is to assure subscribers all will be notified at all times whenever bad weather represents an imminent danger to their homes and businesses.

[0014] The fifth object of this invention is to provide severe weather warnings to telephones as the weather evolves directly to homes and businesses.

[0015] The sixth object of this invention is to provide a severe weather warning telephone dialing software message delivery system to subscribers having a local ZIP code identifier or other standardized geographic identifier, such as National Weather Service "Zones".

[0016] The invention encompasses three embodiments. The first embodiment encompasses delivering pre-recorded personalized severe storm warning messages. A database includes all subscribers to the Thundercall severe storm warning system and the location designation of each. The invention checks the subscriber location database to see if any severe storm area defined by the NSW release is in imminent danger, e.g. having been denoted as a "WARNING" event, (as opposed to a "Watch" event) and if found then immediately warns all subscribers within the location of danger.

[0017] The second embodiment encompasses using the RealCall invention of the parent invention for delivering pre-recorded personalized severe storm warning messages after an answering machine has been detected and launches the pre-recorded recorded warning message. RealCall replaces the pre-set timer controls of the prior art devices with an "interactive" logic, where the invention "listens" to the answering machine's outgoing message and waits for a condition suggesting that the answering machine is in "record" mode. RealCall tests for the "record" mode condition by continuing to "listen" to the call for confirmation before starting to launch. As a result, the time interval from the moment the call connects until RealCall "launches" a message is different for each call placed by the RealCall system. The novel RealCall invention is a next level that comes into play after the system has detected whether the received call in the dialer system has reached a live person or an answering machine. Such a system is described in reference to U.S. Pat. No. 5,371,787 to Hamilton, which is incorporated by reference. The RealCall portion of the invention uses dual two tier steps after determining an answering machine has been reached. One two tier approach determines if a solid non human tone of at least one second duration is detected in the connected call and then playing the recorded information message only after the tone has been followed by a preselected interval of silence The other two tier approach determines if silence of at least two seconds is detected in the connected call (in lieu of the indication of a solid non human tone of at least one second duration) and then playing the recorded information message only after another one second interval of silence has been detected. The system allows for the delivery of a complete severe storm warning message in a nontruncated form onto the answering machine within approximately two to three seconds of the start of the answering machine's recording step without allowing the machine to cut-off the complete pre-selected message during the recording. Unlike the limitations in the prior art systems, the novel invention can be used with all types of answering machines such as, but not limited to a tape machine, a digital machine, a pager, a telephone provider voice/memory call machine, and a cellular machine.

[0018] The third embodiment of the invention is a communication system where the information delivered of a severe storm warning provokes previously designated action on part of the subscriber's equipments to shutdown electronic equipment such as computers and associated equipment, all electrical power to the subscriber's power and disconnecting all telephone circuitry. In this embodiment, storm warning messages can be delivered to the active screen of the PC user, and/or warn of the impending shut down of the PC equipment and/or warn that electrical equipment, telephone connected equipment, and the like, should be shut down.

[0019] The first and second embodiments can be combined together so that the RealCall system works in conjunction with delivering personalized greetings to the person being called.

[0020] Further objects and advantages of this invention will be apparent from the following detailed description of a presently preferred embodiment which is illustrated schematically in the accompanying drawings.

BRIEF DESCRIPTION OF THE FIGURES

[0021] **FIG. 1** illustrates a system diagram illustrating the novel Thundercall telephone severe weather warning message delivery system invention.

[0022] **FIG. 2** is a chart illustrating the subsystem for processing of a severe weather warning bulletin to a customer at a designated location found to be in imminent danger of said severe weather.

[0023] FIG.**3** diagrammatically illustrates the telephony subsystem that can be used for the invention.

[0024] **FIG. 4** illustrates a preferred setup using the novel severe weather warning message delivery system of the invention.

[0025] **FIG. 5** is a chart of the seven (7) steps used in the novel telephone dialing software message delivery system invention of **FIG. 3**.

[0026] **FIG. 6A** is a flowchart of the dialer program portion steps **1-4** of the novel telephone dialing software message delivery system invention of **FIG. 5**.

[0027] **FIG. 6B** is a flowchart of the dialer placing call and monitoring portion steps **5-7** of the novel telephone dialing software message delivery system invention of **FIG. 5**.

[0028] **FIG. 6C** is an overview of the entire flowchart process of the novel telephone dialing software message delivery system invention of **FIGS. 5 and 6**A-6B.

[0029] **FIG. 7** is a second embodiment flowchart of modifying the flow play of recording step **600** of **FIGS. 6B and 6C** to personalizing a pre-face message prior to the pre-recorded message.

[0030] FIG.**8** shows the six sub-step flowchart for the novel for the personalized pre-face message step of **FIG. 7**.

[0031] **FIG. 9** illustrates a tornado warning bulletin for use in the subject invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0032] Before explaining the disclosed embodiment of the present invention in detail it is to be understood that the invention is not limited in its application to the details of the particular arrangement shown since the invention is capable of other embodiments. Also, the terminology used herein is for the purpose of description and not of limitation.

[0033] **FIG. 1** diagrammatically illustrates the system of ThunderCall by means of which the NOAA weather Bulletins **12** which are obtained from the GEOS-8 East Weather Satellite **14** by the satellite receiver **16** and thereafter processed into a bulletin by interaction with a bulletin database **20**. By advertising on the Internet **22** and obtaining there from subscriptions service **24**, the system develops a customer database **26** which holds the names and pertinent information of subscribers. The bulletin processing **18** interacts with the designate customers **28** determined by location from the database **26** and communicate the severe storm warning through the telephony subsystem **30** (shown in detail in **FIG. 10**.). Its voice output **29** is sent to the numerous phone banks **32** for transmission to the customers **34**, and the voice messages can be edited and maintained through edit and maintenance software.

[0034] Referring now to **FIG. 2**, it shown there in diagrammatic fashion of how NWS information from the satellite receiver **16** provides for bulletin file capture **202** from which the relevant valid bulletins **204** are captured at step **206** with the time noted from bulletin time module **205** and thereafter identified as relevant at step **208** by using its location (State, County, Zone, ZIP) **210** in comparison with the location codes **212** of the customers and establishment that it is a Valid Bulletin at module **213**. Having identified relevant Bulletins, the system designates it as an Active Bulletin **214** which severe storm weather bulletin **214** is sent to the designated customers **216** alerting each to imminent life endangering climatic conditions and to Bulletin History File **215** which provides information as to the likelihood of various severe storms at any of a multitude of locations. The Selected Valid Bulletins **204** are stored as Valid Bulletins **207** and also temporary stored with all Bulletins at **208** captured by Bulletin File **202**.

[0035] **FIG. 3** sets forth in block form how the telephony subsystem **30** of **FIG. 1** functions with the designated customers **216** of **FIG. 2**. When the NWS weather Bulletin **12** is transmitted to the Bulletin File Capture **202** as shown on **FIG. 2**, the identity of the Bulletin Location **208** and thereafter processed into an Active Bulletin **214** which further establishes the Designate Customers **216** which are to be advised of the imminent danger of the approaching severe storm. The customers to be called and the message to be sent to them **218** is analyzed to determine and identify the telephone lines required **220** by interrogating the database as to valid customers **222**. The next step is to select the phone matrix **224** based on input from lines required **220** and the valid customers of the database **222**. Input to matrix **224** comes from stored data of the Bulletin message script and phone number **226**. This composite information to be later discussed flows into phone banks **32** numbering **864** as seen at **33** to be subsequently communicated to customer **34**.

[0036] In addition to severe storm weather telephone messages including voice messages, there are other procedures which could take place including: the transmission of a specific sequence of DTMF tones or other signals **35** which could first alert the subscriber and a second signal to initiate an automatic shut down of the PC equipment; a signal could be sent through the line to activate a self powered siren **37** to alert anyone within hearing that a severe storm was approaching. Additionally, an interrupt page could appear on the screen of the PC user warning them of the storm warning message.

[0037] **FIG. 3** illustrates the preferred setup of the THUNDERCALL severe weather early warning service that will call your telephone and deliver a pre-recorded message within seconds after a warning is issued by the NWS for your area. A severe weather alert is sent by NWS via satellite **302** which is captured by satellite equipment **304** which alert is processed by computers having a location database **308** and if a warning is required from location of relevant customers from said database **308**, the appropriate subscribers are selected **310** and THUNDERCALL warnings are delivered **312** are rapidly delivered to customers telephones **314**.

[0038] This main computer system **306** includes a PC such as an IBM compatible PC having 200 MHZ or higher, with Pentium processor and the like, including a standard hard-

drive, 14" or greater color monitor, mouse and keyboard for input. PC **15** is connected to a Telephony Hardware **20** such as but not limited to an Analog/Digital Multi Channel Telephony card such as the Dialogic D41D (Analog), D240SC-T1 and D/240SC-T2(Digital), and the like. The CT hardware can be a 12" computer card used in the computer **306** and includes the following features of playing voice messages to a caller, digitizing and recording voice signals, connecting directly to telephone lines, and placing outbound calls and reporting the results of the calls. The Dialogic Computer Telephony (CT) card model no. D/240SC-T1 and D/240SC-T2 can allow twenty-four (24) telephone lines to operate through a single digital T1 connection. The software uses multitasking OS (Windows 2000 or Windows NT or similar), and can be developed with programming language software such as but not limited to C++, Visual Basic, Delphi, and the like. Software further uses a Custom Control software for control of the CT hardware. Programming languages (i.e. Microsoft's Visual Basic) provide a conduit for programmers to access a computer's built in capabilities. Programming languages refer to code which accesses specific capabilities, such as viewing the contents of a hard drive, or playing sound files over a computer's sound card as CONTROLS. The Custom Control software **30** are controls which are not provided part of the programming language, but are typically developed by third party software developers.

[**0039**] The software further uses database software for maintaining the calling lists, such as but not limited to Microsoft Sequel Server, Dbase, Foxpro, and the like. The calling lists in the RealCall invention contain at least the following: phone number (approximately 10 digits), geographic area indicator (such as ZIP code), message file name(s), call history field, connect time field, record number(unique), date and time of call, and last call status. Although not required, the calling lists can contain additional information such as but not limited to names, addresses, past consumer behavior, and the like.

[**0040**] Along with the telephony CT hardware and software is the telephone service of the telephony subsystem **30** such as but not limited to Analog (RJ11-RJ14) interface, Digital(T1) interface and the like, which comes from the telephone service provider. The telephone service provider, such as but not limited to BellSouth and MCI, provides access to the network of telephone lines linking all telephones across the United States.

[**0041**] A telephone carrier connects automatically dialed calls from main computer system **306** to deliver messages to the remotely located answering machines **314**, and the CT hardware monitors the call status. For example, ellSouth can provide a "Dial Tone" service, (which can be required by some CT hardware) and MCI can provide digital T1 service (no dial tone). Both BellSouth and MCI can provide a "Switching" capability, wherein each call can be routed over any available wire network to deliver the call to the appropriate telephone.

[**0042**] The telephone system of this invention can successfully interpret both traditional answering machines (tape and digital) as well as answering services such as but not limited to BellSouth's "Personal Voice Mail" and "Memory Call" as well as cellular phone answering services such as "Mobile Memo" and pager messaging services. The RealCall invention can work with any answering system, which plays a voice message and then records the caller's message.

[**0043**] **FIG. 5** is a chart **7** of the seven (7) steps used in the preferred novel telephone dialing software message delivery system **30** of **FIG. 1**. The seven (7) steps cover the interaction between a novel dialer program and a link program, which is shown in greater detail in reference to FIGS. **6A-6C**. The first four steps can be accomplished by the Dialogic systems covered under U.S. Pat. No. 5,371,787 (machine answer detection); U.S. Pat. Nos. 5,638,436 & 5,450,484 (voice detection); U.S. Pat. No. 4,979,214 (speech recognition); U.S. Pat. No. 5,404,400(outcalling apparatus) and U.S. Pat. No. 5,764,759, all of which are incorporated by reference. Other dialing systems can be used which initially determine when an answering machine has been detected through step **400**.

[**0044**] An overview of the seven (7) steps will now be described. Referring to **FIG. 5**, the first Step **100**, the Dialer program requests the next (telephone) number to be dialed from the "Link program" which has access to the calling database in the main computer **306**. The "Dialer" step **100** is responsible for dialing a telephone number, determining the status of the call and delivering the recorded message of the severe storm warning at the appropriate time. For example, each phone line is monitored by the Dialer program step. In the second Step **200**, the Link requests info for the dialer step from a database of phone numbers. A novel Link program insures that individual phone numbers are dialed only once. The Link program is the only program which communicates with the database of phone numbers directly. Each dialer program submits requests for new phone numbers to the Link, which processes these requests in the order received and retrieves information from the database of phone numbers on behalf of each dialer program. In addition, the Link program updates the database with completed call statistics, which are communicated to the Link program from each Dialer program as calls are completed. The purpose of the Link program is to avoid system resource problems, which can occur when hundreds of Dialer programs attempt to simultaneously communicate with a database directly. Third Step **300** has the database send record info from the database to the Link. And the Fourth Step **400** sends the database Info to the dialer.

[**0045**] The subject invention novelty comes into play with the Fifth Step **500** in **FIG. 5**. Fifth Step **500** has the dialer place the call and begins monitoring call status. The call status can include whether the call connected to an answering machine, busy signal, reached a Facsimile tone, no answer, and the like. Sixth Step **600** plays the recorded file, and the seventh Step **700** compiles call stats (statistics) and sends the information to the database **308** in main computer **306**. After a call is completed, the novel program software updates each record with the result statistics (stats) of the call. The stats can include the disposition of the call (delivered to a live person or delivered to an answering machine), the length of connect, the call status, the time of day, and the like.

[**0046**] **FIG. 6A** is a flowchart **70** of the dialer program portion steps **1-4** of the novel telephone dialing software message delivery system invention of **FIG. 5**. **FIG. 6B** is a flowchart **80** of the dialer placing call and monitoring portion Steps **5-7** of the novel telephone dialing software

message delivery system invention of **FIG. 5**, and will be explained in greater detail later. **FIG. 6C** is an overview of the entire flowchart process **90** of the novel telephone dialing software message delivery system invention of **FIGS. 5 and 6**A-6B. FIGS. 6A-6C are further explained in detail in U.S. patent application Ser. No. 09/124,697 to the same inventor and assignee of the subject invention, which is incorporated by reference.

[**0047**] Referring to **FIGS. 6A and 6C**, the dialer program **70** initiates the first Step **100** which requests the next telephone number to dial and uses the link program **150** to communicate to the second Step **200** which is the link request for information for the dialer from the database **250** (aka **308** of **FIG. 4**). Third Step **300** has the Database **250** send record information to the Link program **150** to the fourth Step **400** which is a process that sends the telephone and Database information from the Link program to the dialer program **70** and to the flowchart shown in **FIG. 6B**. When the Dialer program **70** requests a new number to call, the Link program **150** sends the Dialer program **70** the following bits of data: a telephone number, the name of the recorded severe storm warning message(s) to play once connected, and the unique number of the subscriber. When the Dialer program **70** has completed a call it sends to the Link program **150** the following: recorded number of completed call, call length and the results of the call. The first five Steps **100, 200, 300, 400** and **500** of FIGS. 6A-65C take place in the main computer system **306** of **FIG. 4**.

[**0048**] **FIG. 6B** is a flowchart **80** of the dialer placing call and the novel monitoring portion Steps **5-7** of the telephone dialing software message delivery system of **FIG. 5**. **FIG. 6C** is an overview of the entire flowchart process **90** of the novel telephone dialing software message delivery system invention of **FIGS. 5 and 6**A-65B. Referring to FIGS. 6B-6C, the fifth Step **500** receives by line **76** the telephone number and database information from the dialer program **70** and a dialer places the severe storm warning call and begins monitoring the call status. Two outputs can be the result of the fifth Step **500**, either the call connects **505**, or the dialed call doesn't connect **595**. Any call, which does not result in the telephone being answered by either a live person or a telephone answering machine, is considered a "Non Connect". Examples of non connected calls are those resulting in Busy, No answer, No Ringand Operator Interrupts. If no connect, then the seventh Step **700** occurs where the system compiles the Call Stats and sends information to database **250** via link **150** and the line **800** prepares for the next call back to first Step **100**.

[**0049**] Referring back to both **FIGS. 6B and 6C**, if a call connects via either path **510** or **515** what occurs will now be explained in detail. Under **510**, an answering machine can be detected via background noise. The CT hardware of the computer **306** of **FIG. 4** can detect an answering machine by analyzing the frequency of the background noise present in the called party's voice response and compares it to a profile of the background noise typical of recorded messages. If the CT hardware determines the presence of an answering machine in this manner, or in any other manner proprietary to the specific CT hardware, it communicates this information to the novel system (via the Custom control software) and the novel part of the Dialer program **70** responds. If the hardware **20** does not detect an answering machine via its' built in detection, then the software in the Dialer program **70** determines whether the call is connected to a live person or an answering machine by analyzing the length (time) of the cadence of the voice which answered the telephone. The typical voice cadence of a live person is much shorter than that of an answering machine. For example a live person answers the telephone generally in one of the following ways: "Hello?" (followed by silence), "Hello, Smith Residence" (followed by silence), "ABC Enterprises . . . how can I direct your call?" (followed by silence). In all of these cases, the spoken words occur for a very brief period of time (less than three seconds), followed by a period of silence. In the case of a typical answering machine, the length of continuous human sound prior to a period of silence is much greater. An example of a typical answering machine message is "Thank you for calling the Smith Residence, we're not home right now, but if you leave a message after the tone we will call you back as soon as we can. Thank you for calling, and have a great day" (followed by silence). After analyzing the cadence the RealCall invention will have determined whether the call has reached an answering machine or reached a live person. The novel software system will then proceed to take the appropriate action.

[**0050**] From the answering machine substep **510** shown in **FIGS. 6B and 6C**, the next substep is to begin analyzing the call **530**. From analyzing call substep **530**, either a solid non human tone is detected for a minimum duration of 1 second substep **535** or silence is detected for a minimum duration of 2 seconds in substep **555**.

[**0051**] Substeps **535** and **555** encompass the heart of the RealCall preferred telephone system for sending out severe storm warning messages. In order to have reached step **530**, the system must have determined it has reached an answering machine. The RealCall invention, i.e., the preferred telephony system **30** of **FIG. 1**, now must try to determine the appropriate time to launch the prerecorded message. To 'analyze' the call, the invention begins to RECORD the answering machine. The novel program only has instructions to stop recording under two conditions: (1) if it "hears" the presence of a solid, non human tone lasting at least one second in length (substep **535**), or (2) it hears no sound for at least two continuous seconds (substep **555**). A solid nonhuman tone (substep **535**) would be typical of a "BEEP" indicating that machines readiness to begin recording. However, since many answering machines play "BEEP" tones lasting less than one second, the two seconds of silence (substep **540**) will act as a safety measure to insure that playback begins if the novel software does not recognize the "BEEP" indicator (substeps **540** and **560**). Additionally, many answering machines play a succession of "beeps" to indicate the number of unplayed messages currently residing on the system. The 2nd stage of continued analysis (substep **540**) insures that the recording does not begin while the answering machine is still playing a series of "beep" tones. During testing of the - procedure described above and further defined in parent patent application Ser. No. 09/124, 697 to the same assignee and same inventor as that of the subject invention which is incorporated by reference, simply identifying a "BEEP" (**535**) or two seconds of silence (**555**) did not indicate the moment when the answering machine begins recording with any high degree of accuracy. The reasons for the inaccuracy stems from many factors including: (1) machines which play multiple "BEEPS" before recording starts, (2) machines which play onhold music (solid, non human tones) while preparing to record, (3)

Outgoing messages (OGMs) which contain periods of silence after the end of the messages but prior to the announcing of a "beep" tone indicating the start of recording (this usually is the result of the owner of the answering machine who records their OGM and then cannot stop the recording immediately after recording their script).

[0052] In order to obtain a higher degree of accuracy as to the moment recording begins, the RealCall procedure uses a dual alternative two-step tier. If the system had previously identified an initial "BEEP" (solid non-human noise (step **535**)), the invention then begins re-recording the call, this time with instructions to end recording only after a period of two continual seconds of silence (sub step **540**). This logic believes that a "BEEP" or the playing of music has already occurred, and now the system is searching for the indication of recording, which will be evidence by silence. Consequently, if the first tier analysis terminated for the presence of two seconds of silence (sub step **555**), the second tier analysis will simply test for another period of at least one second of additional silence (sub step **560**) before launching. In this situation, the second tier search for additional silence eliminates false recording detection in situations where an OGM plays a period of silence prior to playing a "BEEP". Testing of the RealCall procedure has determined that adding the second tier of analysis has increased overall accuracy in determining the proper moment to begin playback by over 75% over current systems described in the prior art section of this invention.

[0053] As mentioned above, from substep **535** (in **FIGS. 6B and 6C**), the system continues analyzing the call until there is silence for 2 seconds (substep **540**). After which from substep **540**, the sixth Step **600** occurs where the system plays the recorded information file message, followed by the system disconnects the call substep **650** and the seventh Step **700** where the system compiles Call Stats and sends information to database **250** via Link program **150** and substep **800** which prepares the system for the next telephone number and the first Step **100**.

[0054] As previously mentioned, the other path from Begin Analyzing Call substep **530**, is if silence is detected (2 sec) **555**. From substep **555**, the next sub step is to Continue Analyzing Call Until Silence for 1 second, sub step **560**. From substep **560**, the sixth Step **600** has the system play the recorded information file, followed by the system disconnect substep **650** and the seventh Step **700** where the system compiles Call Stats (previously described) and sends the Stats information to database **250** via Link program **150** and substep **800** which prepares the system for the next telephone number and the first Step **100**.

[0055] Referring to FIGS. 6B-6C, the Call Connects **505** passes through substep **515** when cadence or voice is detected. Next the system tests the length of the connect, substep **520**. If an AM (answering machine) Connect is indicated by a cadence length greater than 3 seconds, substep **525**, then the system begins analyzing the call to determine the appropriate time to play the message, substep **530**, and the substeps **535** and **555** are checked as previously described. AM connect refers to Answering Machine Connect, or a call which has connected to an answering machine, as opposed to calls which are connected to live persons.

[0056] Referring to FIGS. 6B-6C, if the test length of connect identifies a Live Connect as indicated by a cadence length of less than 3 seconds substep **575**, then the system goes to the sixth Step **600** where the system plays the recorded information message immediately, and so forth as previously described.

[0057] **FIG. 7** is a second embodiment flowchart of modifying the play the recording step **6**, (also indicated as **600** on **FIG. 5**) of the first embodiment for personalizing a message directed to the subscriber by including a personalized introduction greeting that states the call recipient's first name, followed immediately by the generic pre-recorded severe storm warning message as shown at **602**. **FIG. 7** shows an alternative step **6** to that depicted in **FIG. 6B**. New step **6** has two preliminary steps **610**, **620** before playing the generic pre-recorded message **600**. Referring to **FIG. 7**, step **610**, takes the name of the subscriber being called and compares it to an index of all personalized first name greetings available (substep **610**) from the database **308** If a personalized first name greeting message exists that matches the first name of the subscriber the personalized greeting message will be played first (substep **620**), followed immediately by the generic pre-recorded severe storm warning message, step **600**. Both messages are played in succession onto the answering machine followed by step **690**, where upon completion of the call, or termination by the called party hanging up, step **7**, **700** and the remaining steps **150**, **250** and **800** are completed. If there is no subscriber name available in the pre-recorded database at step **610**, the invention skips to step **600** and plays the generic pre-recorded message onto the answering machine, followed by step **690**, **700**, **150**, **250** and **800** as previously described.

[0058] **FIG. 8** shows the six sub-step flowchart **1600** for the novel personalized pre-face message step of **FIG. 7**. Personalized prefacing is used to enhance prerecorded message delivery systems such as the RealCall message delivery system shown and described in the first embodiment, as well other computerized prerecorded message delivery systems. Personalized prefacing allows each prerecorded message to be initiated with a personalized greeting such as but not limited to "Hello Bill . . . " followed by a generic pre-recorded severe storm-warning message recorded in the same voice as the personalized greeting such as but not limited to "This is a ThunderCall severe weather warning call". When used in conjunction with the RealCall embodiment or other systems capable of delivering and leaving recorded messages on answering machines, the personalized preface invention enhances the perception by the call recipient that the warning message was left by a live person, instead of by a computer.

[0059] Under the first substep **1** of **FIG. 8** identified as **1610**, a subscriber location database is analyzed to determine the names of all subscriber residing in the subscriber database. Under the next substep **1620**, a personalized greeting is recorded for each of the most frequently occurring first names existing in the subscriber database.

[0060] The personalized greeting should be recorded using the same human voice that records the generic information message being delivered to the call recipients, so that the two messages (the preface and the generic message) can later be seamlessly merged by the system into what appears as one continuous personalized message.

[0061] Under sub step **1630** in **FIG. 8**, once personalized greeting messages for the selected subscriber's names have

been stored, the generic message is recorded in the same voice as that of the preface personal greeting. Under sub step **1640**, calls warning of the forthcoming severe storm to subscriber's home and/or location are now placed to the subscriber by the computer dialing message delivery system. At the point in the call processing when the RealCall system is ready to play the severe storm warning message, the system determines whether a personalized message exists matching the first name of the subscriber identified for that location as indicated in step **5** (also noted as **1650**).

[**0062**] If the invention does not find a personalized greeting recording matching the subscriber's name, then the program simply launches the generic message without the personalized urgent greeting. If the invention does find a personalized greeting recording matching the subscriber's name, then the program will first play the personalized greeting message followed immediately by the generic warning message.

[**0063**] **FIG. 9** illustrates a sample generic message script sent out to subscribers warning of a tornado approaching the subscriber's location.

[**0064**] Although the preferred embodiments described under embodiment two above encompasses sending the combined personalized preface greeting and generic message to answering machines, the invention can be used with applications where the call recipient does not have an answering machine, but instead picks up their phone live.

[**0065**] While the invention has been described, disclosed, illustrated and shown in various terms of certain embodiments or modifications which it has presumed in practice, the scope of the invention is not intended to be, nor should it be deemed to be, limited thereby and such other modifications or embodiments as may be suggested by the teachings herein are particularly reserved especially as they fall within the breadth and scope of the claims here appended.

We claim:

1. A computer based system for delivering severe weather warnings comprising the steps of:

(a) forming a database of names with their respective geographic locations;

(b) capturing a NWS Bulletin reciting the location of a severe storm;

(c) validating a relevant Bulletin into a Valid Bulletin by determining from the storm's location and severity that it represents an imminent severe storm danger to at least one person of said database; and

(d) sending said Valid Bulletin to said person whereby he is is alerted within seconds of the release time of said National Weather Service bulletin to the danger of said storm.

2. The computer based system of delivering severe weather warnings of claim 1 wherein said Valid Bulletin is stored.

3. The computer based system of delivering severe weather warnings of claim 1 wherein said database contains from 10 to approximately 10,000,000 names.

4. The computer based system of delivering severe weather warnings of claim 1 to valid customers wherein said sending is by a selected phone matrix based on the input from telephone lines required and valid customers from interrogating said database.

5. The computer based system of delivering severe weather warnings of claim 1 wherein said warning is played to an answering machine.

6. The computer based system of delivering severe weather warnings of claim 5 wherein said delivering is by personalized warnings to answering machines.

7. The computer based system of delivering severe weather warnings of claim 3 wherein said warning is delivered to live persons.

8. A computer based system for delivering severe weather warnings as a personalized information message via an automated dialing system to automated recorders comprising the steps of:

(a) forming a database of names with their respective geographic locations;

(b) capturing a NWS Bulletin reciting the location of a severe storm;

(c) validating a relevant Bulletin into a Valid Bulletin by determining from the storm's location that it represents an imminent severe storm danger to at least one person of said database;

(d) recording an individual personal urgent warning to the name of the intended recipient of the Valid Bulletin;

(e) combining said personal warning with a generic severe storm warning for said recipient; and,

(f) sending said Valid Bulletin with said combined warnings to said person whereby he is alerted within seconds of the release time of said National Weather Service bulletin to the danger of said storm.

9. The computer based system of claim 1, wherein the warning is delivered to an active screen on a personal computer(PC).

10. The computer based system of claim 1, wherein the warning is used to shut down an electrical equipment.

11. The computer based system of claim 10, wherein the electrical equipment includes a personal computer(PC).

12. The computer based system of claim 11, wherein the warning is delivered to an active screen on the personal computer(PC) to warn that the PC will be shut down.

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