The present invention allows a user (1), in a single transaction, to place a call by using the traditional DTMF dialing method to manually dial the desired destination number (300), or by using one of the following voice activated dialing methods: 1) speaking a name or reference word corresponding to the desired destination number from the user's personal dialing directory (45); 2) speaking the desired destination number (100); or 3) accessing a general directory (230) through a voice command, and thereafter speaking the name or reference word of desired person/entity he/she wishes to call. If the user (1) chooses the third method, and the system finds the destination number (300) of the desired person/entity by interacting with an automated general directory system (230), the present invention allows the user to simply instruct the system to place the call and to place the retrieved name and destination number from the general directory (230) into the user's personal directory (45). Furthermore, regardless of which method was chosen to place the call, if the user (1) receives a busy signal or no answer at the destination number (300), the present invention allows the user to leave a message for later delivery.
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METHOD AND SYSTEM FOR TOTALLY VOICE ACTIVATED DIALING

Field Of The Invention

The present invention relates to the field of telecommunications. More particularly, the present invention relates to a totally voice activated method and system for dialing over a telecommunications network.

Background Information

Several conventional dialing systems exist for placing a call over a telecommunications network. In the most common dialing system, the conventional dual tone multi-frequency ("DTMF") dialing system, the user manually selects and dials a desired destination number by, for example, pressing numeric keypads on a telephone handset.

In another conventional dialing system, the user may have the system dial a destination number by speaking the digits of the destination number. This system requires the user to remember the destination number. In still another conventional dialing system, the user manually dials into his/her voice-driven personal dialing directory system located, for example, on the telephone network provider's network, speaks the name or other reference word for the person he/she wishes to call, and the system retrieves and dials the number by looking up the number corresponding to the spoken name or reference word in the personal dialing directory. However, in this system, the user is limited to the destination numbers in his/her own personal dialing directory in this system.

And in yet another conventional dialing system, the user must manually dial into an automated voice-driven general directory look-up service (which may contain, for example, all residential destination numbers for the city of San Antonio, Texas), speak the name of a person to search for in the directory, and then the system will look up and provide the requested number, and may offer to place the call to the destination number it has found. However, this conventional dialing system is not totally voice driven, requiring the user to use DTMF dialing to dial the number to gain access to the
general directory look-up service.

Additionally, some conventional dialing systems have the capability to respond to a busy or no answer condition by allowing the user to record a message for later delivery to the destination number after the busy or no answer condition ends.

Summary Of The Invention

Two common shortcomings of conventional dialing systems is their lack of integration and their lack of a totally voice activated interface with the user. For example, in conventional dialing systems, the user cannot, in a single transaction, access a voice-driven general directory look-up service, receive a destination number, place the name and corresponding destination number in his/her personal dialing directory, have the system connect to the destination number, and leave a message for later delivery if a busy signal or no answer is received.

The present invention addresses these shortcomings by providing a totally voice activated dialing system using commonly known speech recognition methods. In a preferred embodiment, the system would provide a totally voice activated interface through which the system would receive necessary information from the user, and then provide this received information to existing automated dialing services. In another embodiment, the system would integrate the totally voice activated interface with the existing automated dialing services into a single consolidated system.

A system according to the present invention would therefore allow a user, in a single transaction, to place a call by using the traditional DTMF dialing method to manually dial the desired destination number, or by using one of the following voice activated dialing methods: 1) speaking a name or reference word corresponding to the desired destination number from the user’s personal dialing directory; 2) speaking the desired destination number; or 3) accessing a general directory through a voice command, and thereafter speaking the name or reference word of desired person/entity he/she wishes to call.

If the user chooses the third method, and the system finds the destination number of the desired person/entity by interacting with an automated general directory system, the present invention allows the user to simply instruct the system to place the
call and to place the retrieved name and destination number from the general directory into the user's personal directory. Furthermore, regardless of which method was chosen to place the call, if the user receives a busy signal or no answer at the destination number, the present invention allows the user to leave a message for later delivery.

**Brief Description Of The Drawings**

Figure 1 shows a schematic illustration of an overview of a system according to the present invention.

Figure 2A shows an initial section of a flowchart illustrating a preferred exemplary embodiment of a system according to the present invention.

Figure 2B shows a continuation of the flowchart illustrated in Figure 2A.

Figure 2C shows a continuation of the flowchart illustrated in Figure 2B.

Figure 2D shows a further continuation of the flowchart illustrated in Figure 2A.

Figure 2E shows a continuation of the flowchart illustrated in Figure 2D.

Figure 2F shows a continuation of the flowchart illustrated in Figure 2E.

Figure 2G shows a further continuation of the flowchart illustrated in Figure 2E.

Figure 2H shows a further continuation of the flowchart illustrated in Figure 2D.

Figure 2I shows a further continuation of the flowchart illustrated in Figure 2B.

**Detailed Description**

Figure 1 shows a preferred embodiment of a system according to the present invention. A user on a telecommunications network initiates a call using a telephone
handset 1, which is connected to a local network 10 on a local switch 200 of the user's telephone network provider. Those skilled in the art will understand that other devices may be used in place of a conventional telephone with handset (such as, for example, wireless/cellular phones, headset phones, speakerphones, computer configurations with a microphone, modem and a sound card) without departing from the scope and spirit of the present invention.

The local switch 200 is preferably owned and operated by the user's telephone network provider. Preferably, the user's telephone network provider also provides the user with an automated personal directory/database system ("APDS") 40, connected to the local network 10, which allows the user to store and manage information, including destination numbers, for specific people/entities. The user's telephone network provider preferably also provides an automated message delivery system ("AMDS") 50 which allows the user to deliver messages if the user receives a busy or no answer signal from a destination number. The user's telephone network provider preferably further provides an automated directory assistance system ("ADAS") 60 which allows the user to obtain further automated directory assistance in addition to the services provided by the present invention, or to provide an option of connecting to a live operator. Although it is preferred that these systems are provided by the user's telephone network provider, those skilled in the art will understand that any or all of the systems may also be provided by other system providers without departing from the scope and spirit of the present invention.

The local switch 200 is connected to a public switched telephone network ("PSTN") 205. The PSTN 205 is connected to a multitude of other local switches, including a "remote" local switch 210 for the destination number that the user wishes to call, which will receive the call, for example, via a telephone handset 300. Also, there are many telephone service providers which provide automated general directory services, perhaps even the user's telephone network provider. For simplicity however, only a single automated general directory service provider 230 is depicted in this figure, having an automated general directory/database system ("AGDS") 225 operating from a general directory/database 230 containing information regarding, for example, the service provider's customers.
A voice activated system 100 having an information processing system 20, a
speech recognition system 25, and a text-to-speech converter 330 is connected to the
local switch 200 as an intelligent peripheral to the local switch 200. Those skilled in
the art will understand that voice activated system 100 may also be integrated into the
local switch, instead of connected as a peripheral, without departing from the scope
and spirit of the present invention. The information processing system 20 interfaces
with the local network 10 and the various other systems connected to the local
network 10 and those connected to the PSTN 205 using communication protocols
such as those defined in ANSI IS 41 or ANSI IS 41-C and variants thereof. The
speech recognition system 25 implements speech recognition algorithms to convert
voice commands spoken by the user into a form usable by the voice activated system
100, such as ASCII (text), or to convert spoken information received from one of the
other automated systems into a usable form. The text-to-speech converter 30 is used
to convert information on the voice activated system 100 from its internal form, e.g.,
ASCII, to speech in order to allow the voice activated system 100 to interact with, for
example, the user.

Figures 2A-2I show a flowchart illustrating a preferred exemplary operation of
a system according to the present invention. In step 100, as shown in Fig. 2A, a user
on a telecommunications network initiates the system implementing this preferred
embodiment by, for example, picking up a telephone handset which is connected to the
telecommunications network.

At step 102, the user either manually dials a desired destination number or
speaks a voice command, and the system receives the manually dialed digits or spoken
voice command and processes this information to determine which mode of dialing the
user has initiated. (As used herein, the terms "dials," "dialed" or "dialing" indicates
any non-spoken entry, including but not limited to DTMF, pulse, etc.) This
differentiation between the two types of initiating commands can be accomplished by
using, for example, a standard DTMF authentication sensor to determine if the user is
manually dialing the destination number; otherwise the system would treat the
information as a spoken voice command. Those skilled in the art will also understand
that in addition to using conventional DTMF dialing systems, the user may use other
manual dialing systems such as, for example, a pulse mode dialing system without
departing from the scope and spirit of the present invention.

If the user manually dials the desired destination number at step 102, the
system goes to step 200 (shown in Fig. 2B), in which the system dials the destination
number that was manually dialed by transmitting the user-dialed DTMF or pulse
signals of the destination number to a PSTN 205. Upon establishing a connection with
the destination number, the system determines whether a busy signal or no answer is
received at step 202.

If neither a busy signal nor a no answer is received, the system terminates its
operation at step 220 (although this does not disconnect the user’s connection with the
destination number) allowing the user to engage in conversation (or other
communications) with the call recipient.

If a busy signal or a no answer is received, then at step 210, the system
prompts the user whether he/she would like to leave a message for later delivery. It is
preferable that the user must choose to accept the option of leaving a message, i.e., the
default should be that the system presumes that no message is desired. This can be
accomplished by, for example, having the system at step 210 prompt, “If you would
like to leave a message, say ‘yes’ or press 1.” Thereafter, at step 211, the system
receives and processes the response from the user. The system should preferably be
configured to receive both a spoken “no” response in addition to a spoken “yes,” and
process/recognize these responses using commonly known speech recognition
algorithms. For the rest of the figures, the receiving of a “yes/no” response and
processing of this response as performed in step 211 will not be explicitly depicted, and
it should be implicitly understood that whenever the system prompts the user for a
spoken “yes/no” response, these steps are being performed.

If the system determines that the user does not wish to leave a message (i.e.,
responded by failing to say “Yes” or press 1, or by affirmatively saying “No” in the
above example), the system prompts, “Say ‘place new call’ or press the # key to place
another call” at step 270, as shown in Fig. 21. At step 272, the system receives and
processes the response. If the user speaks, “Place new call” or presses the # key, then
the system loops back to step 102 (shown in Fig. 2A), thus allowing the user to place a
call to another destination number (or, if desired, make another attempt to the same
destination number). In a preferred embodiment, whenever the system loops back to
step 102, the system may preferably notify the user that he/she should either speak a
voice command or manually dial the destination number to initiate a call. If there is no
response or any other response, the system will terminate at step 280. During this
time, the connection to the destination number should remain intact until the user’s
telephone network provider “times out” the connection (i.e., disconnects the call after a
predetermined time period as set by the telephone network provider) at step 260.

If at step 211, shown in Fig. 2B, the system determines that the user answered
affirmatively, then at step 240, the system records the message. In the context of the
present invention, the term “affirmatively” as characterizing the user’s response should
be understood to mean that the user either spoke “yes” or a corresponding DTMF
command, and the term “negatively” should be understood to mean that the user either
spoke “no” or a corresponding DTMF command. Those skilled in the art will also
understand that other words may be understood by the system as affirmative or
negative commands including, for example, foreign language equivalents, without
departing from the scope and spirit of the present invention.

In a preferred embodiment, if the system determines that the user answered
affirmatively at step 210, then at step 212a (details not shown as they are commonly
known) the system may also give the user the option of specifying a priority for the
message delivery which would affect how the message is delivered. For example, the
user may be given the option of specifying parameters such as the number of attempts
at delivery and/or the length of time between attempts. The options that are offered
will preferably be dictated by the options available on the particular AMDS 50 used to
deliver the message.

At subsequent step 241, the system connects to the AMDS 50, and at step 242,
the system provides the AMDS 50 with the necessary information to deliver the
message (e.g., destination number, delivery options and the message itself). From this
step, the system loops back to step 102, allowing the user to place another call, while
the actual delivery of the message is performed by the AMDS 50.

Fig. 2C shows an exemplary set of steps performed by the AMDS 50 for
delivering the message. At step 244, the AMDS 50 re-connects to the destination number. At step 246, the AMDS 50 determines whether a busy signal or no answer is received. If a busy signal or no answer is received, then at step 248, the AMDS 50 disconnects from the destination number, waits a predetermined length of time and then loops back to step 244. If neither a busy signal or no answer is received at step 246, then the AMDS 50 delivers the user’s recorded message at step 250. Of course, the timing and the repetitiveness of these steps may be dictated by the user delivery options specified by the user in subroutine 212a (shown in Fig. 2B). This concludes the necessary steps to deliver a message according to this exemplary embodiment.

Examples of commonly known speech recognition algorithms that may preferably be used for all speech recognition in the present invention would be speech to text conversions using voice template matching, speaker dependent models, or speaker independent models using phonetic modeling as implemented by VCS of Dallas, Intellivoice, IBM and Dragon Systems. Furthermore, those skilled in the art will understand that although the responses "yes" and "no" are used to indicate the preferred responses, other vocal responses or even their foreign equivalents may also be used without departing from the scope and spirit of the present invention.

Additionally, the system's auditory prompts to the user may be accomplished by using commonly known text-to-speech converters to convert textual prompts stored on the system into speech.

If at step 102, the user speaks a voice command, then at step 300 (shown in Fig. 2D), the system attempts to recognize the voice command. At step 301, the system states the recognized voice command in a predetermined format, e.g., "You have chosen to . . . (i.e., dial XXX-XXX-XXXX (whatever digits were recognized at step 300)/access a general directory /access your personal directory to search for .... (recognized spoken name or reference word))." and prompts the user if this is a correct recognition of the voice command. If the user responds negatively, the system loops back to step 102. In another embodiment, this step of having the user confirm the system's recognition may become unnecessary if the speech recognition technology provides a sufficiently high recognition rate.

If, at step 300, the system determines that the user spoke a set of digits for a
destination number, and the user confirms it at step 301, then at step 400, the system
converts the digits recognized in step 300 and converts these digits to the corresponding
DTMF commands or optionally, the corresponding pulse-coded signals. From here,
the system uses these converted digits as the destination number to dial in the
subroutine shown in Fig. 2B starting from step 200.

If at step 300, the system determines that the user spoke a predetermined voice
command/access word for accessing a general directory (e.g., by saying,
"Information"), and the user confirms it at step 301, then at step 500 (shown in Fig.
2E), the system initializes a counter variable to zero. The counter variable is used to
determine whether the system is having difficulty recognizing the necessary spoken
information and should therefore use a prompting mode (explained below in reference
to Fig. 2G) to receive the information.

At subsequent step 502, the system receives a brief description of the person
the user wishes to call. For example, the user may preferably give a description such
as, "John Brown on Lilly Street in San Francisco, California." At step 504, the system
increments the counter variable by one to indicate that a first attempt was made to
receive the information in a brief description format. At step 506, the system uses
commonly known speech recognition algorithms to convert the user's spoken
description into a form usable by the system. Preferably, the system extracts only the
words relevant to determining the destination number (e.g., name and address) from
the user's spoken brief description while disregarding irrelevant words.

At step 508, the system states the recognized relevant information in a
predetermined format. For example, in response to the user's description in the
example above, the system may preferably say, "You are calling John Brown in San
Francisco California on Lilly Street." At step 510, the system prompts the user to
indicate if this stated information is correct. As before, in another embodiment, this
confirmation step may become unnecessary.

If the user responds affirmatively, then at step 600 the system connects to the
AGDS 225 (shown in Fig. 1) and provides the recognized information to the AGDS
225. The specific general directory service provider to be contacted may preferably be
determined using the extracted information from the user's description. The AGDS
225 searches for a matching entry in its general directory/database 230 at step 602. If a match is not found at step 604, AGDS provides an indication that a match was not found to the system at step 610. At step 612, the system prompts the user that the directory listing is unavailable and give the user the option to either start again from the beginning, i.e., have the system loop back to step 102, or connect to the ADAS 60, and the system responds to the user's response accordingly.

If a match was found at step 604, then at step 620, the AGDS 225 provides an indication that a match was found and provides the relevant information for the matching entry to the system. At step 621, the system notifies the user that a match was found and state the information received from the AGDS 225 for the matching entry. In another embodiment, instead of the AGDS 225 providing the information to the system and the system relaying the information to the user, the AGDS 225 would state the information for the matching entry directly to the user and the system would listen in and recognize this stated information using commonly known speech recognition algorithms.

Then at step 622, shown in Fig. 2F, the system asks the user whether to add the matching entry from the general directory into the user's personal dialing directory. If the user responds affirmatively, then at step 624, the system provides the information for the matching entry to the APDS 40. At step 630, the AGDS adds the information from the matching entry from the general directory into the user's personal dialing directory/database 45 on the APDS 40.

Meanwhile, the system goes to step 700 in which the system prompts the user whether he/she wishes to have the system dial the destination number for the matching entry. If the user answers negatively, the system loops back to step 102. If the user answers affirmatively, the system converts this destination number to the corresponding DTMF commands or optionally, the corresponding pulse-coded signals at step 702, and uses this as the destination number in the subroutine shown in Fig. 2B starting from step 200.

If the user responded negatively at step 622, the system goes directly to step 700 which was discussed above.

If back at step 510, shown in Fig. 2E, the user responded negatively to the
system's prompting whether the recognized relevant information from the user's spoken brief description was correct, the system goes to step 630 which checks if the counter variable has a value of 2 (indicating that two attempts have been made to recognize the user's spoken brief description). Since only one attempt has been made at this point, the result will be negative which leads the system to step 632 in which the system prompts the user to repeat the brief description. The system then loops back to step 502, and if the user responds negatively a second time at step 510, the result of the check at step 630 will then be positive indicating to the system to enter into a prompting mode to receive the necessary information.

In an exemplary embodiment of the prompting mode, the system first states, "Say the name of the person you are calling" at step 650a, receives the user's response at step 650b; state, "Say the street" at step 650c, receives the user's response at step 650d; state, "Say the city" at step 650e, receives the user's response at step 650f; and state, "Say the state" at step 650g, and receives the user's response at step 650h. Then at step 655, the system will process/recognize all of this received information. This prompting mode should result in a more accurate recognition than the user's description above since there will be no extraneous connector words and the different categories of information will be processed (i.e., recognized) separately. Additionally, this prompting mode should speed up the processing time by allowing more directory-driven operation.

At step 660, the system states the recognized information in the same predetermined standard format used in step 508 (shown in Fig. 2E) and prompts the user if this is correct. If the user responds negatively, the system will prompt the user at step 670 that the directory listing is unavailable and give the user the option to either start again from the beginning, which causes the system to loop back to step 102, or connect to the ADAS 60. If the user responds affirmatively at step 660, then the system will loop back to step 600 shown in Fig. 2E, and proceed as described above.

If at step 300, the system determines that the user did not speak the digits for a destination number or the predetermined voice command to access a general directory, the system assumes, by default, that the user spoke a name or reference word to search for in the user's personal directory/database 45. So at step 301, the system prompts
the user if the user wishes to search his/her personal directory/database 45 for the name/reference word recognized in step 300. If the user responds negatively, the system loops back to step 102 (shown in Fig. 2A).

If the user responds affirmatively, then at step 900, the system connects to the APDS 40 and provides the recognized name/reference word to the APDS 40. Then at step 902, the APDS 40 searches the user's personal directory/database 45 for an entry corresponding to the recognized name/reference word. If a match is not found at step 904, the APDS 40 provides an indication to the system that a match was not found at step 910. At step 912, the system notifies the user that a match was not found, and loops back to step 102 shown in Fig. 2A.

If a match is found at step 904, then at step 920, the APDS 40 provides an indication to the system that a match was found and provides the information corresponding to the matching entry to the system. At step 922, the system states all or part of the information received from the APDS 40, and prompts the user if this is the person/entity he/she wishes to call. The actual information provided to the user for the matching entry may vary depending on various factors such as, for example, system administration needs, user's tastes, etc. If the user responds negatively, the system loops back to step 102 (shown in Fig. 2A). If the user responds affirmatively, the system goes to step 700 shown in Fig. 2F to determine whether the user wishes to dial this person/entity.

In another embodiment, the system is configured to allow the user to either immediately speak the appropriate voice commands, for example at steps 102 and/or 300, or the system may also state a list of available options and have the user select the specific option by using a voice command or a DTMF command.

And in a further embodiment, the system, upon initiation of the system, prompts the user whether to use DTMF initiated operation or voice commands to place the call, and proceeds using the option selected by the user.

Those skilled in the art will understand that these disclosed preferred embodiments are merely exemplary, and that other embodiments may be encompassed by the scope and spirit of the present invention.
What Is Claimed Is:
1. A method for placing a call via a telecommunications network, comprising the steps of:
   receiving an initiating command from a user on a calling unit connected to the telecommunications network;
   determining if the initiating command is one of:
   - a dialed destination number (a first set of dual tone multifrequency commands entered by the user via the calling unit corresponding to the receiving destination number and a first set of pulse-coded signals) entered by the user via the calling unit, and
   - a first voice command spoken by the user,
   transmitting a destination number to a public switched telephone network, the step of transmitting being selected from one of:
   - transmitting the dialed destination number to the public switched network if the initiating command is the dialed destination number,
   - transmitting a first destination number to the public switched network corresponding to a set of spoken digits if the initiating command is the first voice command having the set of spoken digits,
   - receiving a second voice command from the user, accessing and searching a general directory comprising stored destination numbers for a first entry corresponding to the second voice command, and transmitting a second destination number corresponding to the first entry to the public switched network if the initiating command is the first voice command having at least one predetermined access word, and
   - establishing a connection.

2. The method according to claim 1, wherein a further selection for the step of transmitting includes accessing and searching a personal directory of the user comprising stored destination numbers for a second entry corresponding to the first voice command, and transmitting a third destination number corresponding to the second entry to the public switched network if the initiating command is the first voice
command having at least one of a predetermined name or predetermined reference word.

3. The method according to claim 1, wherein the connection is established during a single transaction between the user and the telecommunications network, and wherein the user may change the initiating command during the single transaction.

4. The method according to claim 1, further comprising the step of recording and delivering a message if a busy signal or no answer is received upon connecting to the destination number.

5. The method according to claim 2, further comprising the step of storing a first predetermined set of information corresponding to the first entry found as a result of the search of the general directory into a personal directory of the user.

6. The method according to claim 1, wherein the accessing and searching of a general directory is performed by an automated general directory service provider further comprising the sub-steps of:

   providing the automated general directory service provider with a second predetermined set of information corresponding to the first vocal description,

   receiving the result of the search from the automated general directory service provider.

7. The method according to claim 2, wherein the accessing and searching of the personal directory of the user is performed by an automated personal directory service provider further comprising the sub-steps of:

   providing the automated personal directory service provider with a third predetermined set of information corresponding to the second vocal description,

   receiving the result of the search from the automated personal directory service provider.
8. The method according to claim 1, wherein all interaction with the user is conducted using at least one of a vocal instruction provided by the user and a corresponding dual tone multi-frequency command.

9. A voice activated system for placing a call via a telecommunications network, comprising:
   a first communications circuit receiving an initiating command from a user on a calling unit connected to the telecommunications network;
   a processor performing the steps of:
       determining if the initiating command is one of:
       a dialed destination number (a first set of dual tone multi-frequency commands entered by the user via the calling unit corresponding to the receiving destination number and a first set of pulse-coded signals) entered by the user via the calling unit, and
       a first voice command spoken by the user;
       transmitting a destination number to a public switched telephone network, the step of transmitting being selected from one of:
       transmitting the dialed destination number to the public switched network if the initiating command is the dialed destination number,
       transmitting a first destination number to the public switched network corresponding to a set of spoken digits if the initiating command is the first voice command having the set of spoken digits,
       receiving a second voice command from the user,
   accessing and searching a general directory comprising stored destination numbers for a first entry corresponding to the second voice command, and transmitting a second destination number corresponding to the first entry to the public switched network if the initiating command is the first voice command having at least one predetermined access word; and
   a second communications circuit establishing a connection.

10. The system according to claim 9, wherein a further selection for the step of
transmitting includes accessing and searching a personal directory of the user
comprising stored destination numbers for a second entry corresponding to the first
voice command, and transmitting a third destination number corresponding to the
second entry to the public switched network if the initiating command is the first voice
command having at least one of a predetermined name or predetermined reference
word.
FIG. 2A

USER INITIATES SYSTEM

RECEIVE AND PROCESS EITHER A MANUAL DIAL OR VOICE COMMAND

MANUAL DIAL

B
(Fig. 2B)

VOICE COMMAND

O
(Fig. 2D)
FIG 2B

B (FROM FIG. 2A)

ATTEMPT TO CONNECT TO DESTINATION NUMBER

BUSY OR NO ANSWER RECEIVED?

YES

SYSTEM Terminates

NO

PROMPT "IF YOU WOULD LIKE TO LEAVE A MESSAGE, SAY 'YES' OR PRESS 1."

RECEIVE AND PROCESS RESPONSE

"YES" OR 1

NO RESPONSE OR "NO"

RECORD MESSAGE

CONNECT TO AMDS

PROVIDE NECESSARY INFORMATION TO AMDS

GO TO STEP 102 (FIG. 2A)

(Fig. 2C)
FIG. 2C

(FROM FIG. 2B)

C

RE-CONNECT TO DESTINATION NUMBER

BUSY OR NO ANSWER RECEIVED?

YES

DISCONNECT AND WAIT PREDETERMINED LENGTH OF TIME

NO

DELIVER MESSAGE

AMDS TERMINATES

(STEPS PERFORMED BY AMDS)
(FROM FIG. 2A)

D

RECOGNIZE VOICE COMMAND

STATE RECOGNIZED VOICE COMMAND; PROMPT "CORRECT?"

"YES", SO RECOGNIZED VOICE COMMAND WAS/WERE . . .

PERSONAL DIRECTORY

H (FIG. 2H)

GENERAL DIRECTORY

E (FIG 2E)

SPOKEN DIGITS

CONVERT SPOKEN DIGITS

GO TO STEP 102 (FIG. 2A)

GO TO STEP 200 (FIG. 2B)
FIG 2E

1. **E (FROM FIG. 2D)**
   - Set counter = 0

2. **502**
   - Receive brief description

3. **504**
   - Set counter = counter + 1

4. **506**
   - Recognize brief description; extract relevant information

5. **508**
   - State recognized relevant information

6. **510**
   - Prompt "Correct?"
     - "No" → **630**
       - Is counter = 2?
       - No → **600**
         - Provide relevant information to AGDS
       - Yes → **610**
         - AGDS provides result of search

7. **602**
   - Search general directory

8. **604**
   - Match found?
     - No → **610**
       - AGDS provides result of search
     - Yes → **620**
       - AGDS provides result of search

9. **620**
   - Notify user that match found; state relevant information for matching entry

10. **620**
    - (FIG. 2F)

11. **632**
    - Prompt to repeat information

12. **630**
    - Is counter = 2?
      - Yes → **F (FIG. 2F)**
      - No → **G (FIG. 2G)**

(Steps performed by AGDS)
FIG. 2F

(FROM FIG. 2E)

F

622
PROMPT
"ADD THIS ENTRY TO PERSONAL DIRECTORY?"

"YES"

624
PROVIDE INFORMATION FROM GENERAL DIRECTORY TO APDS

630
ADD INFORMATION FROM ENTRY TO USER'S PERSONAL DIRECTORY

( STEPS PERFORMED BY APDS )

700
PROMPT
"HAVE THE SYSTEM DIAL FOR YOU?"

"YES"

702
CONVERT RETRIEVED DESTINATION NUMBER

710
SYSTEM TERMINATES

GO TO STEP 200 (FIG. 2B)
G (FROM FIG. 2E)

650a
PROMPT FOR NAME INFORMATION

650b
RECEIVE NAME INFORMATION

650c
PROMPT FOR STREET INFORMATION

650d
RECEIVE STREET INFORMATION

650e
PROMPT FOR CITY INFORMATION

650f
RECEIVE CITY INFORMATION

650g
PROMPT FOR STATE INFORMATION

650h
RECEIVE STATE INFORMATION

655
RECOGNIZE RECEIVED INFORMATION

660
STATE RECOGNIZED INFORMATION: PROMPT "CORRECT"?

670
PROMPT "BEGIN AGAIN" OR "CONNECT TO OPERATOR"?

"YES"
GO TO STEP 600 (FIG. 2E)

"NO"

"BEGIN AGAIN"
GO TO STEP 102 (FIG. 2A)

"CONNECT TO OPERATOR"
CONNECT TO ADAS
FIG 2H

(FROM FIG. 2D)

H

Provide recognized name or reference word to APDS

Search personal directory for recognized name or reference word

Match found?

NO

APPS provides result of search

YES

APPS provides result of search

State name and destination number of matching entry; prompt "Correct?"

"NO"

Go to step 102 (FIG. 2A)

"YES"

Go to step 700 (FIG. 2F)

(Steps performed on APPS)

Notify user that no match found
FIG. 21

1 (FROM FIG. 2B)

260
CALL TIMES OUT

270
PROMPT "SAY 'PLACE NEW CALL' OR PRESS THE # KEY TO PLACE ANOTHER CALL"

272
RECEIVE AND PROCESS RESPONSE

"PLACE NEW CALL" OR #

GO TO STEP 102 (FIG. 2A)

ALL OTHER RESPONSES

280
SYSTEM TERMINATES
A. **CLASSIFICATION OF SUBJECT MATTER**

IPC(6) : H04M 1/64, 7/00, 3/00

US CL. : 379/67.1, 80, 88.01, 88.03, 88.2, 223, 258, 263, 265, 309.

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

B. **FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 379/67.1, 80, 88.01, 88.03, 88.2, 223, 258, 263, 265, 309.

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

none

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

APS

C. **DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
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<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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</table>

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

Date of the actual completion of the international search: 06 MARCH 1999

Date of mailing of the international search report: 15 APR 1999

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