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With international search report.

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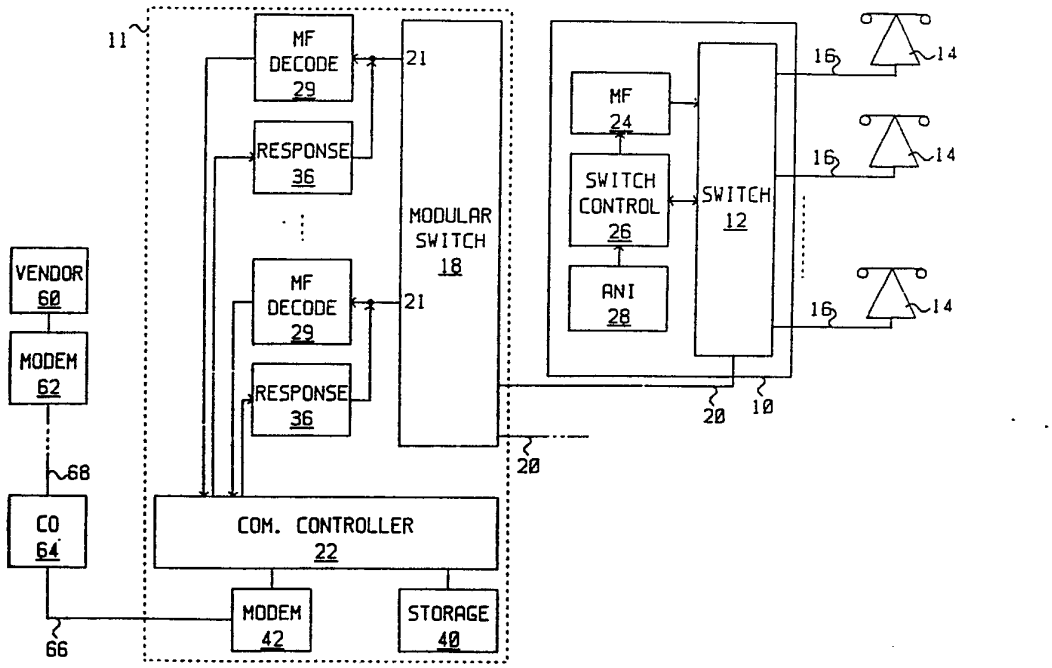

(57) Abstract

A catalog ordering system which is interfaced with the switched public network telephone system (10, 11, 64) is described. A subscriber (14) selects a specific item by placing a telephone call to a specified telephone number identifying the vendor (60) in question. Once connected, the subscriber (14) inputs a digital code specifying the item in question. The called and originating number are identified together with the inputted code, and combined to form a digital word. The digital word is then transmitted to the vendor (60) in question.

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CATALOG ORDERING SYSTEM WITH INCREASED SECURITY

The present invention relates generally to systems for ordering services or merchandise by telephone and, more specifically, to an improved system for preventing unauthorized orders from being placed.

The purchasing of merchandise or services by telephone has the potential for significantly reducing the time and expense involved in completing a transaction, both from the perspective of the seller and the buyer. The seller is relieved of the necessity of maintaining a retail showroom for his merchandise, which significantly reduces his overhead costs. Furthermore, the seller is able to service clients over a much wider geographic area, which allows significant economies of scale to be realized. The buyer is relieved of the necessity to go to the seller's place of business, and thus is able to save a considerable amount of time and travel expense.

However, telephone-based systems have a potential for unauthorized transactions, which limits their usefulness. Such unauthorized transactions may result from individuals seeking to order goods and charge a second party for those goods. Or they may result from a party wishing to harass said second party by ordering unwanted goods or services on his or her behalf.

If a seller receives a telephone order from a

person with whom he has not previously done business, he has no way of verifying that the person is, in fact, who he claims to be. This problem may be somewhat reduced by limiting orders to individuals who have identifiable credit cards or have previously established accounts with the seller. In this case, the caller must give the seller his credit card or account number, which may be verified by the seller before sending the merchandise or performing the services in question.

However, a system based on identification numbers, such as account or credit card numbers, requires that identification numbers be known only to the person authorized to use the account or credit card in question. A satisfactory system for assuring the secrecy of identification numbers has yet to be developed.

A second drawback of existing telephone-based ordering systems is the need for the seller to maintain a sales staff to answer the telephone and take down the orders. This limits existing ordering systems to sellers who have sufficient business to keep at least one such sales person occupied.

Broadly, it is an object of the present invention to provide an improved telephone-based ordering system.

It is further object of the present invention to provide a telephone based ordering system which is secured against unauthorized orders.

It is yet another object of the present invention to provide a telephone based ordering system

that does not require the seller to maintain a sales staff for taking orders over the telephone.

These and other objects of the present invention will become obvious to those skilled in the art from the following detailed description of the present invention and the accompanying drawings.

Brief Description of the Drawings

Figure 1 is a block diagram of an ordering system according to the preferred embodiment of the present invention.

Figure 2 is flow chart of the operations carried out by the communications controller shown in Figure 1.

Summary of the Invention

The present invention comprises an apparatus for the subscriber selection of one of a plurality of services or products offered by a vendor of said services or products. The apparatus is coupled to a switched public network telephone system having at least one central office switch, and a plurality of telephones. Each of said telephones is identified by a telephone number. The telephone system including means for operatively coupling a calling telephone to an answering telephone in response to the telephone number identifying said answering telephone being communicated to a central office switch by said calling telephone or an apparatus connected thereto. The calling telephone includes means for coupling signals indicative of a digital code to said telephone system. The apparatus of the present invention includes circuitry for

detecting selected answering telephone numbers communicated by a calling telephone to a central office switch. Each of said selected answering telephone number identifies a predetermined vendor. This circuity includes signal generating circuitry for generating a signal indicating the selected answering telephone number so detected and the telephone number of the calling telephone. The present invention also includes circuitry for detecting one or more digital codes inputted by said subscriber from said calling telephone. The present invention develops a digital word representing the telephone number of the calling telephone, the digital codes detected, and the answering telephone number specifying said vendor. This digital word is communicated to the vendor specified by said selected telephone number in response to signals from said vendor.

Detailed Description of the Invention

The above cited co-pending application describes a system for ordering television programs to be sent over a cable TV system to a subscriber's house. The program to be sent is specified by a telephone number. The subscriber dials the telephone number corresponding to the program he wants to receive, and the system described in said co-pending application sends a message to the cable TV supplier indicating that the subscriber (having a specified telephone number) ordered the program specified by the called telephone number.

This system could, in principle, be used for ordering any single product or service. The purchaser would order a specific product or service by dialing a telephone number corresponding to the product in

question. The purchaser is identified by the telephone number from which the order was placed. The merchandise and bill are then sent to an address associated with the telephone number from which the call was placed.

The present invention is an expanded version of the ordering system described in the above cited co-pending patent application. The expanded system may be used to implement a general catalog ordering system. The main limitation of the invention described in said co-pending patent application stems from the use of a single telephone number to identify the service or product ordered and a single telephone number to identify the account to which the goods are to be charged. A vendor such as a large catalog ordering house would quickly use up the available telephone numbers. Hence, some means of "extending" the telephone number dialed is needed. The present invention provides for such "extended" numbers.

A second limitation of the ordering system described in the above cited co-pending application results from its direct link to the vendor. The system in question was optimized for cable television program ordering. In such a system, the product, i.e., the television program, must be delivered to the purchaser shortly after the purchaser hangs up the telephone. Hence, the cable television company can not allow orders to be stored for any significant period of time. As a result, the system in question maintains a continuous connection between the apparatus that collects the telephone orders and the cable television company. Such a continuous connection significantly increases the vendor's costs.

In a catalog ordering system, there will almost always be a delay of at least a day between the time at which an order is placed and the time at which the order is to be received by the purchaser. Hence, messages can be allowed to accumulate in the hardware of the ordering system, which relieves the vendor of the need to maintain a continuous telephonic connection. The present invention provides for such message storage.

In the preferred embodiment of the present invention, the purchaser dials a telephone number identifying the vendor whose goods said purchaser wishes to purchase. After the call is connected, the purchaser dials a second number indicating the product he wishes to order and any other information needed by the vendor, e.g., an account number to which the purchases are to be charged.

The system preferably functions as follows. The purchaser dials the number for the vendor in question. A prompt message instructs him to dial the code for the product he wishes to order. After a code is dialed, a second prompt message asks if he wants to order more. If so, he dials a second number. If he is finished, he dials a "#" or other termination digit. In the preferred embodiment, after each number is entered by the purchaser, the system reads said number back to the purchaser and allows him to enter a digit indicating whether or not the order was properly entered. If it was not properly entered, the system prompts the purchaser to enter the number again. After all of the ordering information has been entered and verified, the system disconnects the telephone connection to the purchaser. The system then stores a message for the vendor in question, which includes the

telephone number from which the purchaser placed the order in question and the codes received. The messages for any given vendor are transferred to the vendor in question over a telephone line in response to a telephone call from said vendor.

This system relieves the vendor of the costs of maintaining an order desk and personnel for transcribing customer orders. Preferably, the vendor has a computer system for performing the bookkeeping functions associated with his catalog business. The messages stored in the present invention are transferred to said computer system over a telephone line using a conventional modem. This transfer may be made at intervals which are convenient to the vendor. Hence, the vendor may accumulate orders in the present invention even during time intervals in which no one is present at the vendor's premises. This significantly reduces the vendor's cost of doing business.

Since each of the "orders" represented by one of the above messages includes the telephone number from which said order was placed, the vendor can verify the identity of the purchaser. If added security is required, the vendor can require an account number as part of the information collected from the purchaser. The combination of an account number and the order being placed from a telephone associated with said account number provides a high degree of security. An unauthorized party would have to obtain a copy of the account number or numbers associated with the telephone number in question and then gain access to the authorized purchaser's premises to place an unauthorized order.

Referring now to Figure 1, there is shown a

catalog ordering system constructed according to the principles of the present invention. The catalog ordering system system of the present invention employs a service node 11 designed for interaction between the established switched public telephone network which includes a plurality of central offices 10, and the catalog vendor 60.

To avoid confusing the principles of the present invention, only one central office 10 is illustrated in Figure 1. Each central office 10 includes a central office switch 12 which connects a subscriber's telephone 14 to an outgoing trunk 20. A plurality of telephones 14 are each operatively coupled to its respective central office switch 12 over an associated one of a plurality of subscriber loops 16. Each of the subscriber loops 16 is an ordinary twisted pair which extends from the central office switch 12 located in the respective central office 10 to the telephone 14 which is located at the subscriber premises. The routing of calls between telephones 14 served by a single central office 10 or between telephones 14 served by separate central offices 10 is well known and need not be described herein.

According to the present invention, the service node 11 includes a modular switch 18 operatively connected to a plurality of the central offices 10. More specifically, the modular switch 18 is coupled to each central office switch 12 over a standard one-way outgoing trunk 20. For example, trunk 20 may be a traffic service position system trunk which normally connects a central office switch 12 to an operator's console. However, other standard trunk types may be used in the present invention, as long as such trunks have the capability of having called and calling

directory numbers sent over them as hereinbelow described.

The modular switch 18 performs telephonic switching and signaling functions under the control of a communications controller 22, described hereinbelow, which is also part of the service node 11. The modular switch 18 provides trunk termination for each of the outgoing trunks 20 connected thereto and trunk supervision sensing from the originating central office 10 to the communications controller 22. Such trunk supervision sensing includes on-hook and off-hook sensing. The modular switch 18 also provides trunk supervision signaling toward the originating central office 10 both in response to commands from the communications controller 22 and automatically, according to established conventions. A MSP model modular switching peripheral commercially available from Redcom Laboratories may be used for the modular switch 18.

The communications controller 22 provides for overall system control. It acts as the controller of the modular switch 18 and oversees the processing of incoming calls arriving on the trunks 20. The communications controller 22 also provides storage for the data representing orders collected from telephone subscribers. Finally, the communications controller 22 oversees the transmission of the data for each catalog vendor to said vendor.

The communications controller 22 assigns a unique state variable to each of the outgoing trunks 20 terminated by the modular switch 18 under its control. The communication controller 22 steps the state of each trunk 20 through discrete states as events occur during

the call-handling process. The state of the trunk state variable is stepped through a closed cycle (idle to idle) once for each incoming call process. When an incoming call is detected on one of the trunk lines 20, the communications controller 22 causes that call to be assigned to one of the lines 21 connected to the modular switch 18. A multifrequency decoder 29 is connected to each of the lines 21. The multifrequency decoder 29 converts the multifrequency tones on line 21 to digital form and communicates the digital representation of said multifrequency tones to the communications controller 22. The communications controller 22 collects the information specifying the vendor number being called and the telephone number from which the call is being made. The communications controller 22 then ellicts data from the telephone subscriber by a protocol described below. The subscriber inputs the data in question by pressing one or more buttons on his telephone set which must be of the touch tone variety. Each such button generates a multifrequency tone identifying the button pushed. The communications controller 22 communicates with the subscriber by generating voice messages via voice response units 36 which are also connected to each line 21. The voice response units 36 generate vocal messages in response to digital data communicated to said voice response units 36 by the communications controller 22. Such voice response units are conventional in the art. When the subscriber finishes inputting the data in question, the communications controller 22 stores the data in question in an on-line storage device 40 which is preferably a magnetic disk of conventional design.

The communications controller 22 also supervises the communication of the data collected for

each catalog vendor to the vendor in question. In the preferred embodiment, the catalog vendor 60 retrieves the data stored for said vendor with the aid of modems 42 and 62 which are used to transmit the data in question over telephone lines 68 and 66 which connect the vendor 60 the communications controller 22 through a telephone exchange such as the central office shown at 64. In the preferred embodiment, the vendor 60 places a telephone call to a telephone number connected to modem 42. The vendor 60 identifies himself to the communications controller 22 by giving a password identifying said vendor 60. The communications controller 22 then transmits the data received for said vendor via modem 42 in a conventional digital format.

As mentioned hereinabove, the catalog ordering system of the present invention shares each central office switch 12 with normal message traffic. The central office 10 will process calls made under this invention no differently than it processes any other message traffic. A cyclic call-handling process is performed by shared equipment within each central office 10, such equipment operating without modification. The phases within the central office 12 cyclic call-handling process include call origination, dialed directory number collection, translation, idle trunk search, trunk seizure, digit outpulsing, audio path completion, talk and call termination. In summary, the central office switch 12 does not treat calls made under the present invention any differently than other message traffic. Following a call setup phase, the central office switch 12 creates a voice grade path through itself, which connects the caller to the outgoing trunk 20. The call to the catalog ordering system telephone number is processed similarly to a toll message call usually handled by a

conventional Class 4 switch.

Each central office switch 12 includes a plurality of multifrequency outpulsers, generally indicated at 24. In conventional message traffic, the multifrequency outpulser sends digits and simple process state information to a destination central office 10 over the interoffice connecting trunks (not shown). These multifrequency outpulsers 24 are used for the catalog ordering system system of the present invention in a manner similar to that used for other interoffice calls. A central office switch controller 26 located in each central office 10 selects an idle multifrequency outpulser from the pool of multifrequency outpulsers 24 when one is needed. The central office switch controller 26 controls the establishment of an audio path from the selected multifrequency outpulser to the outgoing trunk 20.

At the beginning of the call set-up phase, the central office switch controller 26 detects when one of the telephones 14 goes "off-hook" by conventionally sensing a DC current in the associated subscriber loop 16. The called number is collected from the subscriber loop 16 by the central office switch controller 26 as it is dialed. If the collected called number is one assigned to a catalog vendor programming event, the central office switch controller 26 will, as a result of the execution of a conventional data-base look-up function, identify an outgoing trunk 20 connecting the central office switch 12 to the modular switch 18, as the destination of such a call. Under the control of the central office switch controller 26, a conventional automatic number identification (ANI) unit 28 identifies the calling or originating number. After the central office switch controller 26 determines that

the destination of a given call is an outgoing trunk 20, and after the calling number has been determined, the central office switch controller 26 will select an idle multifrequency outpulser 24, seize the outgoing trunk, create a voice path through the central office switch 12 connecting the selected multifrequency outpulser 24 to the outgoing trunk, and send the called and calling numbers to the selected multifrequency outpulser. The selected multifrequency outpulser then outpulses the called and calling numbers as multifrequency tones. The multifrequency tones are sent to the modular switch 18 over the outgoing trunk 20 of the same central office 10 in which the multifrequency outpulser resides.

Figure 2 is a flow chart of the operations carried out by communications controller 22 upon detecting an incoming call on one of the trunk lines 20. In general, a message received from the caller is detected using one of the multifrequency decoders 29, and a message is sent to the caller by signals from the communications controller 22 to the audio response unit 36 associated with said multifrequency decoder 29. When a call from a subscriber is detected, the incoming call is assigned to one of the lines 21 connected to modular switch 18. The telephone number to which the call is directed, i.e., the vendor's telephone number, as well as the telephone number from which the call was placed read via the associated multifrequency decoder 29. The communications controller 22 then looks up a procedure which specifies a "log-in" message for use with said vendor's telephone number. The log-in message in question is then sent to the caller. In general, the log-in procedure will require a response comprising a multi-digit code inputted by the caller by pushing the corresponding buttons on said caller's

telephone. This code is detected by communications controller 22 which causes a message repeating the code to be sent back to the caller. This message is followed by a request to verify that the code is correct by pushing a specified button on the caller's phone. If the call is incorrect, the log-in message is repeated.

The communications controller 22 then sends the caller a message instructing said caller on how to enter his order. The message in question will, in general, be different for different vendors. This message is stored as part of the log-in procedure associated with the vendor in question. In general, an item will be ordered by inputting a code corresponding to the item in question. Said codes may be available to the caller in the form of a catalog or they may be included in the log-in message. The end of each code is marked by specific code or sequence of codes. When the communications controller 22 detects said end code, the communications controller 22 repeats the message back to the caller and requests that the caller verify the message by pushing a specified button on his telephone. If code is not correct, the communications controller 22 repeats the above operation starting with the playback of the message requesting order entry. If the code is verified by the caller, it is stored. The communications controller 22 then requests a code indicating whether the caller wishes to input further codes. If so, the communications controller 22 repeats the above procedure with the playback of the message requesting order entry. If the caller indicates that no more codes are to be entered, the communications controller 22 plays a termination message to the caller and then causes modular switch 18 to terminate the call. The codes inputted by the caller are then stored

in a file corresponding to the vendor in question.

Each vendor serviced by the service node receives his messages by communicating with the communications controller 22 over a conventional telephone line as described above. Each message consists of the telephone number from which the call was placed and the codes inputted by the caller. After the messages are transferred to the vendor, the messages in the file in question are erased. Numerous protocols for transferring a file from one computer to another computer or computer terminal over a telephone line are known to the art. Any protocol that prevents unauthorized access to the file in question is satisfactory.

It will be apparent to those skilled in the art that each vendor could maintain a permanent connection to the present invention. In this case, it would not be necessary for the present invention to store the data collected from each subscriber, since the data in question could be immediately transmitted to the appropriate vendor.

Accordingly, there has been described a system for providing a telephone-based catalog ordering system which provides security against unauthorized orders. Various modifications in addition to those described above will readily be apparent to those skilled in the art. The scope of the present invention is therefore defined only by the following appended claims.

WHAT IS CLAIMED IS:

1. An apparatus for subscriber selection at least of one of a plurality of services or products offered by a vendor of said services or products, said apparatus being coupled to a switched public network telephone system having at least one central office switch and a plurality of telephones, each of said telephones being identified by a telephone number, said telephone system including means for operatively coupling a calling telephone to an answering telephone in response to the answering telephone number being communicated to a central office switch, said calling telephone including means for coupling signals indicative of a digital code to said telephone system, said apparatus being located remotely from the premises of said vendors and comprising: first detecting means for detecting selected answering telephone numbers communicated by a calling telephone to a central office switch, each said selected answering telephone number identifying a predetermined vendor, said first detecting means including signal generating means for generating a signal indicating the selected answering telephone number so detected; second means for detecting the telephone number of the calling telephone which communicated said selected answering telephone number; third detecting means for detecting said digital code; means operatively coupled to said first, second, and third detecting means for developing a digital word representing said detected digital code, and said detected calling telephone number; and means operatively coupled to said developing means accepting an order specified by said calling telephone number, said answering telephone number, and said digital code, said accepting means including means for transmitting

each said digital word to the vendor specified by said selected answering telephone number after accepting said order.

2. The apparatus of Claim 1 wherein said developing means comprises means for developing a digital word representing said detected digital code, said detected calling telephone number and said detected answering telephone number.

3. The apparatus of Claim 1 further comprising means operatively coupled to said developing means for storing each said digital word.

4. The apparatus of Claim 3 wherein said transmitting means further comprise means for transmitting said stored digital words to said vendor in response to a signal generated by said vendor.

5. The apparatus of Claim 4 wherein said vendor is coupled to said apparatus by a communication link comprising a telephone circuit in said telephone system.

6. The apparatus of Claim 1 further comprising means for verifying said digital code.

7. The apparatus of Claim 6 wherein said means for verifying said digital code comprise means for repeating said digital code back to said calling telephone and means for receiving a signal indicating that said digital code is correct.

8. The apparatus of Claim 1 further comprising means for generating and coupling acoustical messages to said calling telephone.

9. In a switched public network telephone system having at least one central office switch and a plurality of telephones, each of said telephones being identified by a telephone number, said telephone system including means for operatively coupling a calling telephone to an answering telephone in response to the answering telephone number being communicated to a central office switch, said calling telephone including means for coupling signals indicative of a digital code to said telephone system, a method for subscriber selection of at least of one of a plurality of services or products offered by a vendor of said services or products comprising the steps of: detecting selected answering telephone numbers communicated by a calling telephone to a central office switch, each said selected answering telephone number identifying a predetermined vendor; detecting the telephone number of the calling telephone which communicated said selected answering telephone number; detecting a digital code specifying a product or service offered by the vendor identified by said detected answering telephone number; developing a digital word representing said detected digital code, and said detected calling telephone number; and transmitting each said digital word to the vendor specified by said selected answering telephone number.

10. The apparatus of Claim 9 wherein said digital word further includes information specifying said detected answering telephone number.

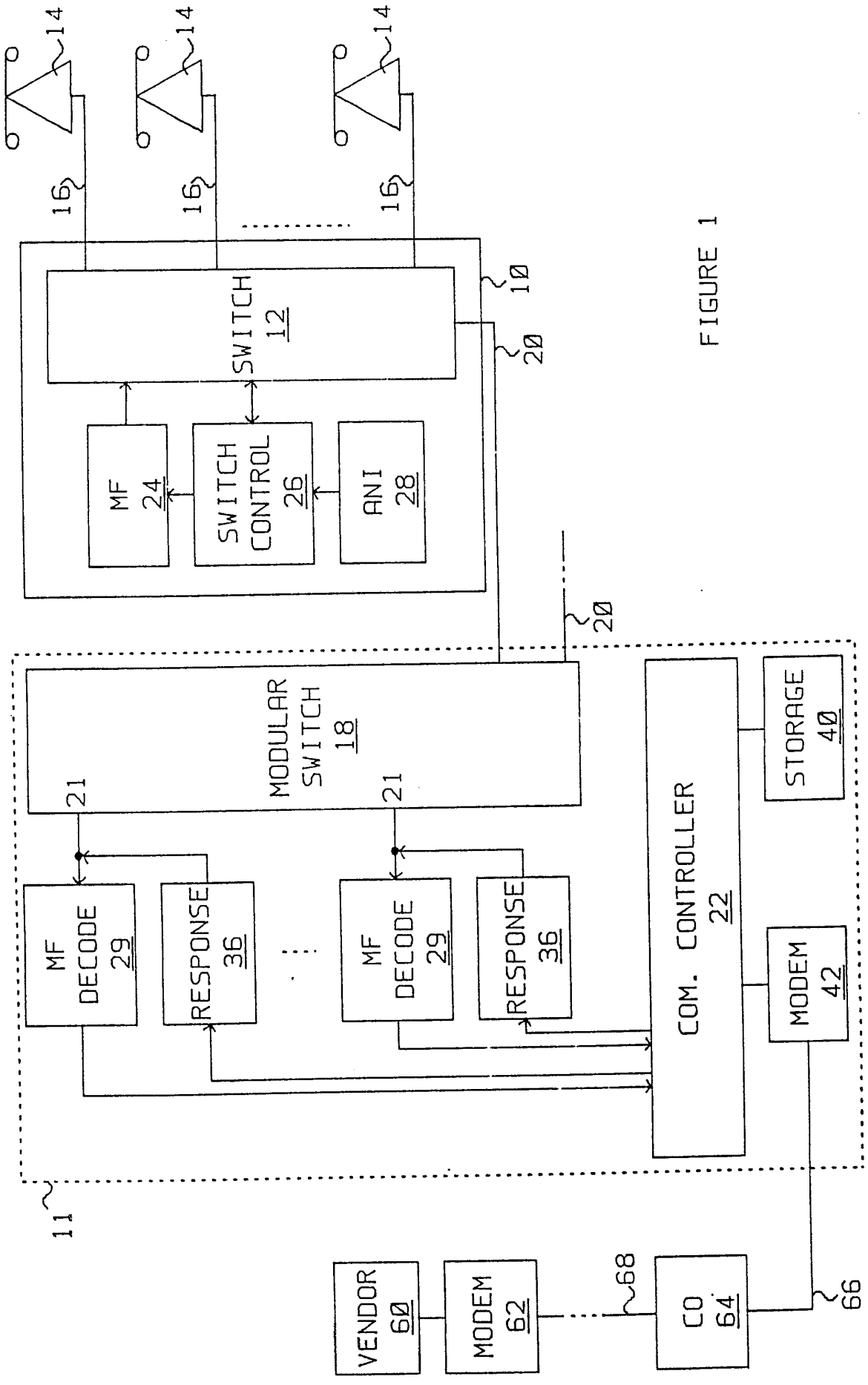
14
16
SWITCH 12
10
20
MF 24
SWITCH CONTROL 26
ANI 28
MODULAR SWITCH 18
21
MF DECODE 29
RESPONSE 36
COM. CONTROLLER 22
STORAGE 40
MODEM 42
11
VENDOR 60
MODEM 62
68
CO 64
66

FIGURE 1

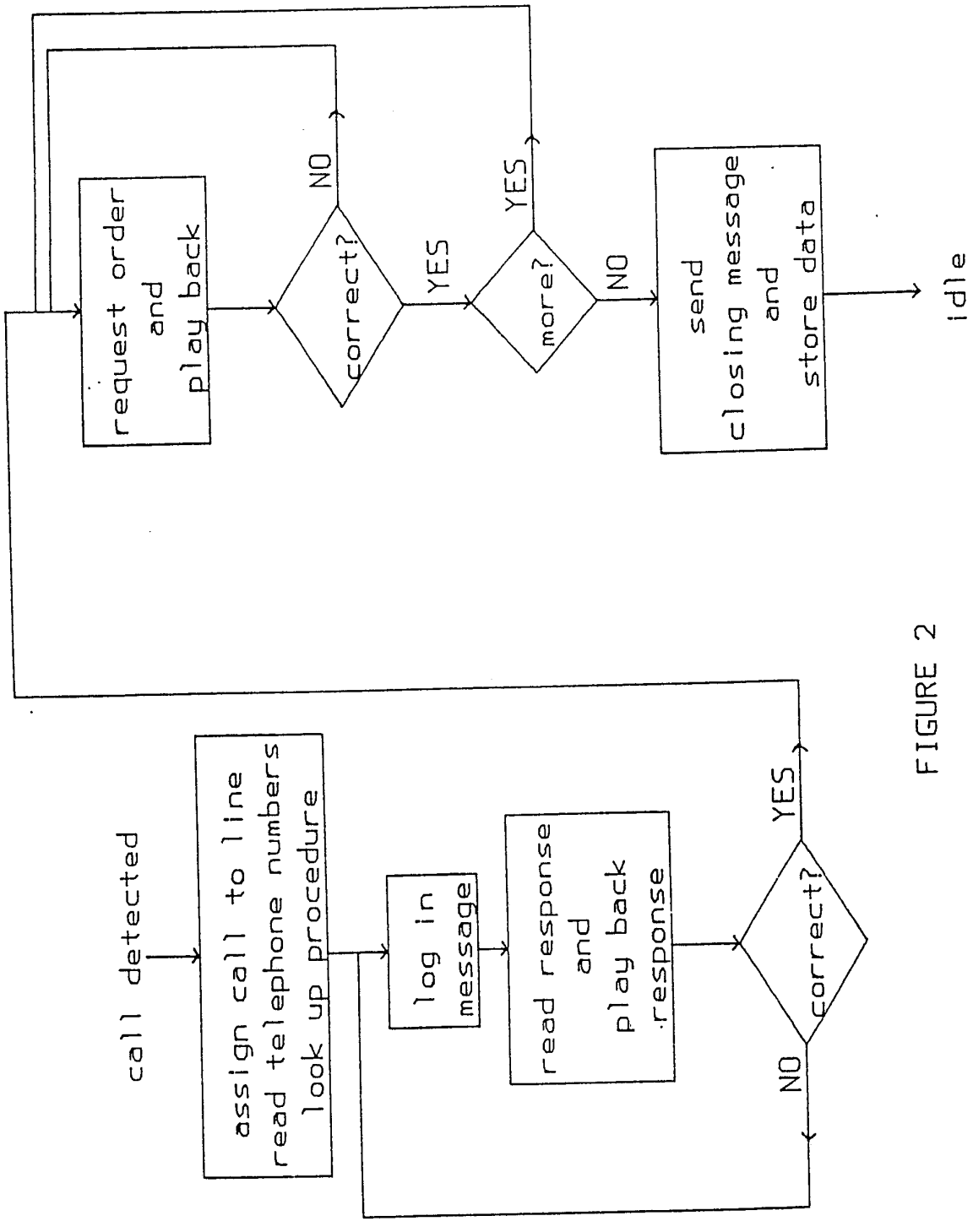
call detected
assign call to line
read telephone numbers
look up procedure
log in
message
read response
and
play back
response
correct?
YES
NO
request order
and
play back
correct?
NO
YES
more?
YES
NO
send
closing message
and
store data
idle

FIGURE 2

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US90/01232

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC (5): H04M 11/08, 15/00; U.S. CL.: 379/104,105,246; 358/86

II. FIELDS SEARCHED

Minimum Documentation Searched [7]

Classification System	Classification Symbols
U.S. CL.:	358/84-86; 455/2,4,5; 379/43,44,102,104,105,127,142,246,89,92.

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [9]

Category *	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No. [13]
Y,&,P	US, A, 4,852,154 (Lewis et al) 25 July 1989, See patented claims 1,3-5 and 7-9.	1-10
X	EP, A, 0,217,308 (Foster et al) 08 April 1987, See Fig. 4, steps 403-407; Fig. 5 steps 502-506; Fig. 6, steps 601-602,607; page 8, lines 30-32; page 14, lines 14-28.	1-3,6,8-10
Y		4,5,7
Y	US, A, 4,659,877 (Dorsey et al) 21 April 1987, See column 13, lines 11-16.	6,7
Y	WO, A, 87/04884 (Lewis et al) 13 August 1987, See all figures; abstract; pages 14-24.	1-10

* Special categories of cited documents: [10]

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

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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

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

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

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

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

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
11 May 1990	17 JUL 1990
International Searching Authority: ISA/US	Signature of Authorized Officer: Wing Fu Chan

Form PCT/ISA/210 (second sheet) (Rev. 11-87)

FURTHER INFORMATION CONTINUED FROM THE SECOND SHEET

Y	K. G. Hegebarth, "ANI is the key to unlock advanced network services", Telephony, Vol. 215, No. 20, pages 64,66,68, 14 November 1988. See page 68 left column.	1-10

V. ☐ OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE [1]

This international search report has not been established in respect of certain claims under Article 17(2) (a) for the following reasons:

1. ☐ Claim numbers . ..., because they relate to subject matter [1] not required to be searched by this Authority, namely:

2. ☐ Claim numbers....., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out [1], specifically:

3. ☐ Claim numbers_____, because they are dependent claims not drafted in accordance with the second and third sentences of PCT Rule 6.4(a).

VI. ☐ OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING [2]

This International Searching Authority found multiple inventions in this international application as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. ☐ As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest

☐ The additional search fees were accompanied by applicant's protest.

☐ No protest accompanied the payment of additional search fees.