

**“CallerID” - The Discovery and Invention of “Caller Identification”**  
CLAIMS 42, 43 and 44 which lead to what is known today as:

## CallerID

Link to the entire Patent 4,797,911

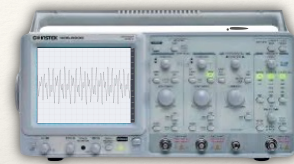
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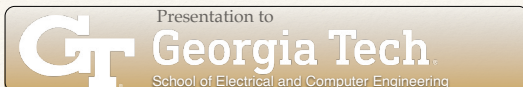
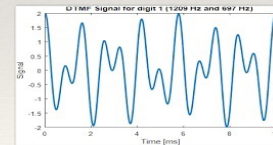
### 1980 Wisconsin Emergency Dispatching Center: How CallerID Became a Global Phenomena

While testing ‘Answer Detection’ algorithm, telephone set **began to ring**, and my oscilloscope was displaying multiple modulated waveforms.

*These waveforms turned out to represent the phone number of the caller!*



	1209Hz	1336Hz	1477Hz	1633Hz
697Hz	1	2	3	A
770Hz	4	5	6	B
852Hz	7	8	9	C
941Hz	*	0	#	D



### How CallerID Became a Global Phenomena

- Discovery and decryption of calling party’s telephone number led to **caller’s identification**
  - ❖ Telephone number of calling party was used to extract personal information from database and displaying it on agent’s terminal screen helping validate the calling party

*telephones had no displays until late 1980’s*



- ❖ “Identifying Caller”, Melita International’s solution was first deployed at American Express, Phenix, AZ around 1986

# United States Patent [19]

Szlam et al.

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[45] Date of Patent: **Jan. 10, 1989**

[54] **CUSTOMER ACCOUNT ONLINE  
SERVICING SYSTEM**

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[22] Filed: **Jun. 16, 1987**

[51] Int. Cl.<sup>4</sup> ..... **H04M 1/274; H04M 11/10**

[52] U.S. Cl. .... **379/67; 379/84;  
379/92; 379/216; 379/246**

[58] Field of Search ..... **379/67, 69, 88, 216,  
379/84, 92, 127, 246**

[56] **References Cited**

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[57] **ABSTRACT**

A method and an apparatus for direct and immediate updating of customer account information, handling inquiries, and initiating communications is disclosed. A mainframe computer (16) contains customer or potential customer account information such as customer name, customer telephone number, customer account code, customer order status, etc. Mainframe computer

(16) sends batches of customer account information to a system controller (11) via a data controller (15). System controller (11) directs trunk interface units (10a-10d) to dial the customer's telephone number and monitor the status of the outgoing calls. The trunk interface units (10a-10d) advise the system controller (11) when an outgoing call has been answered and, if an operator is available at an operator terminal (12a-12f), the system controller (11) directs a switch (13) to connect the answered trunk (T1-T16) to the available operator terminal and sends abbreviated customer account information to the operator terminal. The operator terminal then requests the full customer account information from the mainframe computer (16) via the data controller (15). The operator at the operator terminal 12 then conducts the necessary business with the customer and makes any desired changes in the customer account information in the mainframe computer (16). The changes are sent by the operator terminal (12), via the data controller (15), to the mainframe computer (16) for immediate updating and storage of the updated account information in the main database. The operator at the operator terminal (12) is relieved of the duties of obtaining the telephone number, dialing telephone number, and waiting for the party to answer, and is therefore utilized more efficiently. Furthermore, the customer account information in mainframe computer (16) is continuously updated and made current so that the operator always has the most current customer account information. Also disclosed is a method and an apparatus for processing of incoming calls. Furthermore, a retrofit device is disclosed for use with existing systems.

**73 Claims, 9 Drawing Sheets**

## CUSTOMER ACCOUNT ONLINE SERVICING SYSTEM

### TECHNICAL FIELD

The present invention relates to customer account servicing systems and particularly provides a method and apparatus for placing outgoing calls, routing incoming calls, and online servicing of customer accounts.

### BACKGROUND OF THE INVENTION

Many businesses, especially those with large numbers of customer accounts, periodically contact the customer by telephone to obtain updated account information, remind the customer of a past due account, collect on delinquent accounts, or conduct other business. Also, some businesses are based primarily or exclusively upon sales conducted via telephone, either in response to a previously mailed catalog or advertisement or from direct solicitation by calling the customer. In such businesses the customer account information is typically stored in a mainframe computer and a copy of the customer account information is placed upon a storage medium such as a disk or a tape. This copy is then installed in another computer for access by operators (customer account, sales or service representatives). In some installations the operator sees a telephone number upon the screen and the number is either manually dialed by the operator or dialed by the operator's terminal in response to one or more keystroke inputs by the operator. The operator must then wait to determine if the call is answered, the called number is busy, is out of service or has been changed, or that there is no answer. Therefore, for each call placed, there may be an elapsed time of one to two minutes wherein the operator is looking at the screen, dialing the number or causing the number to be dialed, and waiting for a response from the called number. Therefore, there is need for a method and an apparatus which automatically dials the call without operator intervention or control and only connects the operator and displays the customer account record, which is resident in the mainframe, if the call is answered, thereby allowing the operator's time to be more effectively used.

In businesses which rely primarily or exclusively upon calls from the customer, an operator must answer the call, determine whether the customer desires to place an order, check on the status of an order or obtain account information. The operator must then obtain the account number from the customer, key in the account number of the terminal, and wait for the customer account information to appear on the screen before any business can be transacted. In this case, for each incoming call, there may be several minutes of time wherein the operator is nonproductive or minimally productive, or if all operators are busy, the calling party hears a busy signal or hears repeated ringing but no answer. Therefore, there is a need for a method and an apparatus for obtaining preliminary customer account information from the customer or automatically determining the calling party's telephone number and account information prior to the call being serviced by an operator.

Typically, the customer account information for business transacted is entered on the previously made copy or retained in a separate file. Therefore, at the end of the day or business session, the changes made in the copy must be incorporated into and consolidated with the customer account information in the mainframe system.

If several calls are made and/or received regarding the same customer account during the period of a single day then the account information the operator sees at any time may be incorrect since the account information provided to the operator's terminal may be the information resident within the system controller, which has not yet been updated. In this event the operator must, if possible, call up the files containing information on changes made to this account before any business can be correctly transacted. Again, valuable operator time is wasted in obtaining the most current copy of the customer's account information from the mainframe or system controller, and then updating the most current file containing the changes to the customer account. Therefore, there is a need for a method and an apparatus for online or real time updating of the customer account information in the mainframe so that the operator will have immediate access to the current customer account information without having to search between the mainframe file and the changes file, and for maintaining a copy of any changes made to the customer account information and the status of each call so that, in the event of a problem, the call results and any changes can be traced or duplicated.

### SUMMARY OF THE INVENTION

The present invention provides a method and apparatus for relieving the operator of the duty of causing the number to be dialed and waiting for an answer, relieves the operator of the duty of obtaining preliminary customer account information, and provides for online, direct updating of the customer account information in the mainframe, thereby eliminating the need for consolidation of changes into the customer account file and thereby providing the operator with the most current information on the customer account.

More particularly described, the present invention provides an apparatus which automatically dials the telephone number of a customer or potential customer, ascertains whether the called number is busy, ringing, no answer, out of service, changed or answered, and, if the call is answered, routes the call to the next available operator and, automatically, obtains the current customer account information from the mainframe and displays, at the operators terminal, the current customer account information.

Also more particularly described, the present invention provides an apparatus which automatically answers incoming calls, queries the customer as to the nature of his call, obtains preliminary information, such as the customer account code and/or the reason for the call from the caller, obtains the current customer account information from the mainframe, routes the incoming call to the next available operator, and provides, at the operator's terminal, the customer account information and the nature of the query.

Also more particularly described, the present invention provides an apparatus which automatically answers incoming calls, obtains the calling party's telephone number from the telephone company central office equipment, retrieves, from the mainframe, the current customer account information corresponding to the calling party's telephone number, routes the call to the next available operator, and provides, at the operator's terminal, the current customer account information retrieved from the mainframe.

of said data on said selected said customer account to said data terminal; and  
 said trunk interface unit for receiving said extracted customer telephone number, providing said extracted customer telephone number to said dialing means, causing said dialing means to place said extracted customer telephone number on said trunk, receiving said decoded response, activating said message player means, receiving said status from said call progress monitoring means, and providing a combined ring detect status and call progress status as said status to said system controller.

39. The apparatus of claim 29 wherein said control means causes said information storage system to provide a complete record of said data on said selected customer account to said data terminal.

40. The apparatus of claim 29 wherein said control means comprises:  
 a data controller,  
 a system controller; and  
 a trunk interface unit;  
 said data controller for receiving said data on said customer accounts and providing said data to said system controller and to said data terminal;  
 said system controller for receiving said data from said data controller, extracting said customer telephone number, sending said extracted customer telephone number to said trunk interface unit, monitoring said status of said trunk via said trunk interface unit, controlling said trunk switching means, and providing at least said predetermined portion of said data on said selected said customer account to said data terminal; and  
 said trunk interface unit for receiving said extracted customer telephone number, providing said extracted customer telephone number to said dialing means, causing said dialing means to place said extracted customer telephone number on said trunk, receiving said status from said call progress monitoring means, and providing said status to said system controller.

41. The apparatus of claim 37 wherein at least one said predetermined message prompts said called party to provide a response using a predetermined group of voice words.

42. Apparatus for online updating of data on customer accounts contained in an information storage system, comprising:  
 an operator terminal comprising a data terminal and an audio communications means;  
 trunk switching means for selectively connecting a telephone trunk to said audio communications means;  
 incoming call detection means for providing a ring detect signal when an incoming call occurs on said telephone trunk;  
 automatic number identification (ANI) decoder means responsive to predetermined signals on said telephone trunk for providing a calling party telephone number;  
 control means responsive to said ring detect signal for causing said trunk switching means to connect said telephone trunk to said audio communications means, and responsive to said calling party telephone number for causing said information storage system to provide to said data terminal said data on a selected said customer account which has a said

customer telephone number corresponding to said calling party telephone number;  
 whereby said data terminal provides data entries made at said data terminal to said information storage system; and  
 said information storage system updates said data for said selected said customer account by incorporating said data entries into said data for said customer account.

43. The apparatus of claim 42 wherein said information storage system provides said data directly to said data terminal.

44. The apparatus of claim 42 wherein said information storage system provides said data to said data terminal by way of said control means.

45. The apparatus of claim 42 and further comprising:  
 a plurality of said operator terminals;  
 a plurality of said incoming call detection means, each of said incoming call detection means for providing a said ring detect signal when a said incoming call occurs on a predetermined trunk of a plurality of telephone trunks; and  
 a plurality of said ANI decoder means, each of said ANI decoder means being responsive to said predetermined signals on a predetermined said trunk for providing a said calling party telephone number,  
 wherein said trunk switching means selectively connects selected ones of said telephone trunks to selected ones of said audio communications means; and  
 wherein said control means monitors each of said operator terminals to determine whether each said operator terminal is available or not available and, when a said incoming call occurs on one of said telephone trunks, said control means receives said calling party telephone number from said ANI decoder means for said one of said trunks, provides said calling party telephone number to said data terminal of an available said operator terminal and to said information storage system, causes said information storage system to provide to said data terminal said data on a said customer account which has a said customer telephone number corresponding to said calling party telephone number, and causes said trunk switching means to connect said one of said trunks to a said audio communications means of said available said operator terminal.

46. The apparatus of claim 45 and further comprising:  
 message player means for placing a message on a selected one of said telephone trunks;  
 wherein, when an incoming call occurs on one of said telephone trunks and a said operator terminal is not available, said control means causes said message player means to place said message on said telephone trunk having said incoming call.

47. The apparatus of claim 46 wherein said message player means comprises:  
 a plurality of message playing devices, each of said devices being for placing a said message on a predetermined one of said telephone trunks.

48. The apparatus of claim 42 and further comprising:  
 message player means for placing a predetermined message on said telephone trunk for prompting a calling party to provide a response; and  
 decoder means responsive to signals placed on said telephone trunk by said calling party for providing a decoded response;



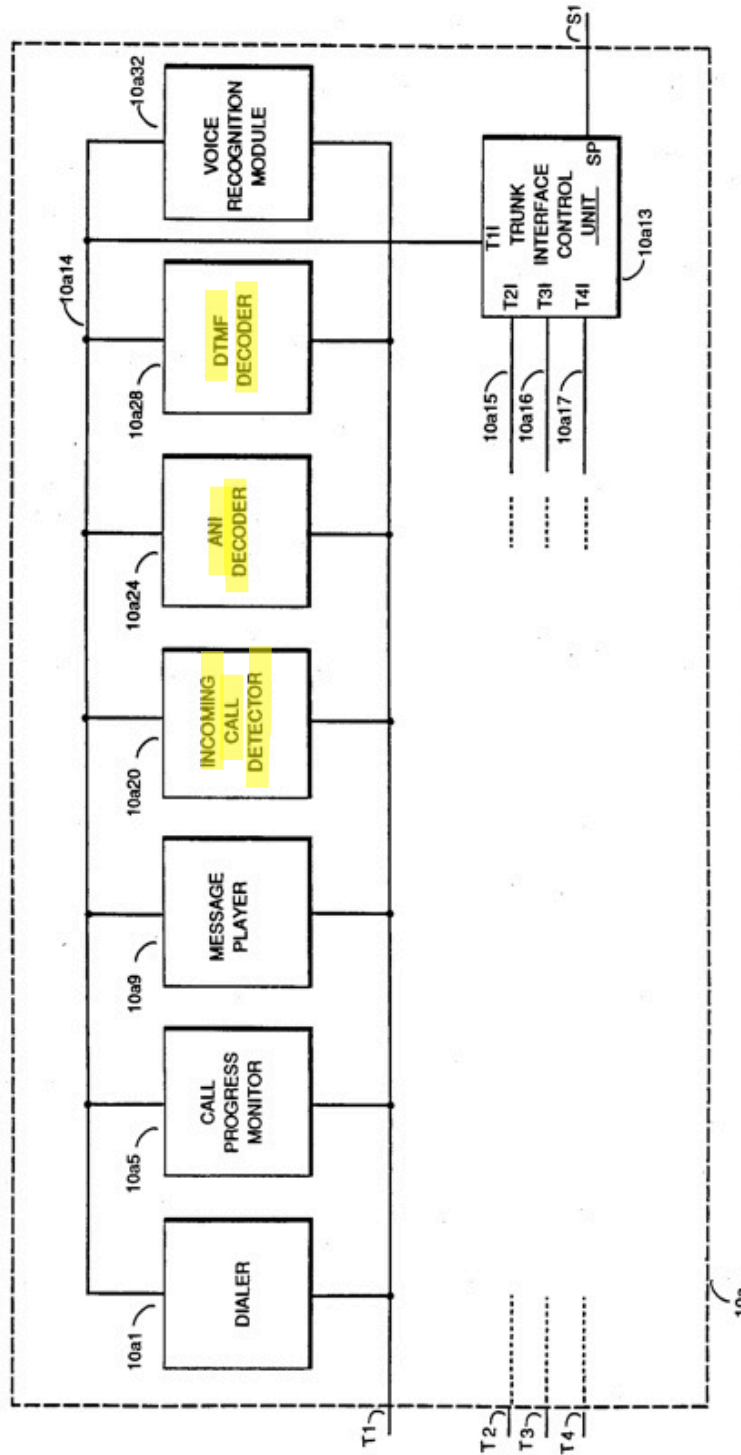


FIG. 5

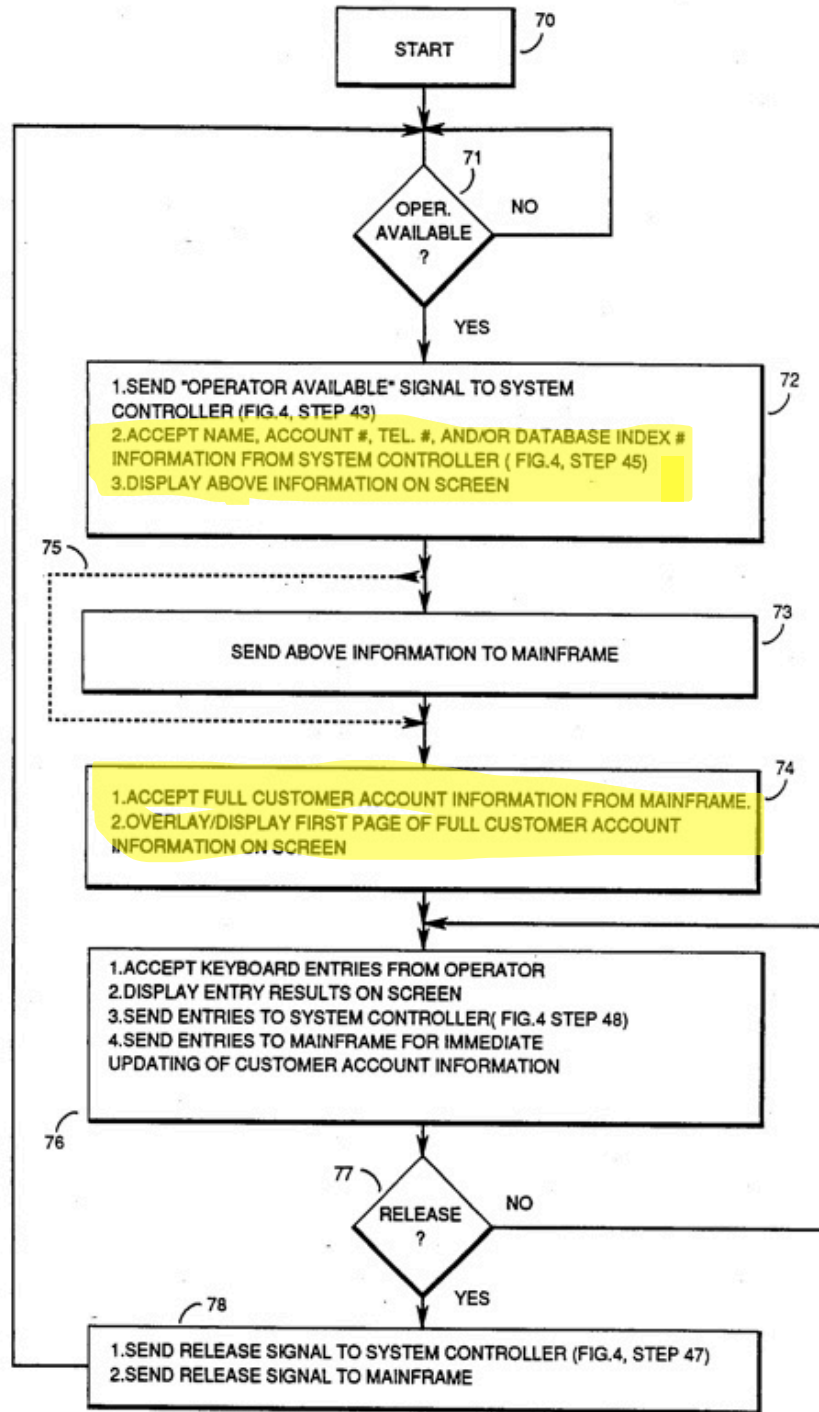


FIG. 7