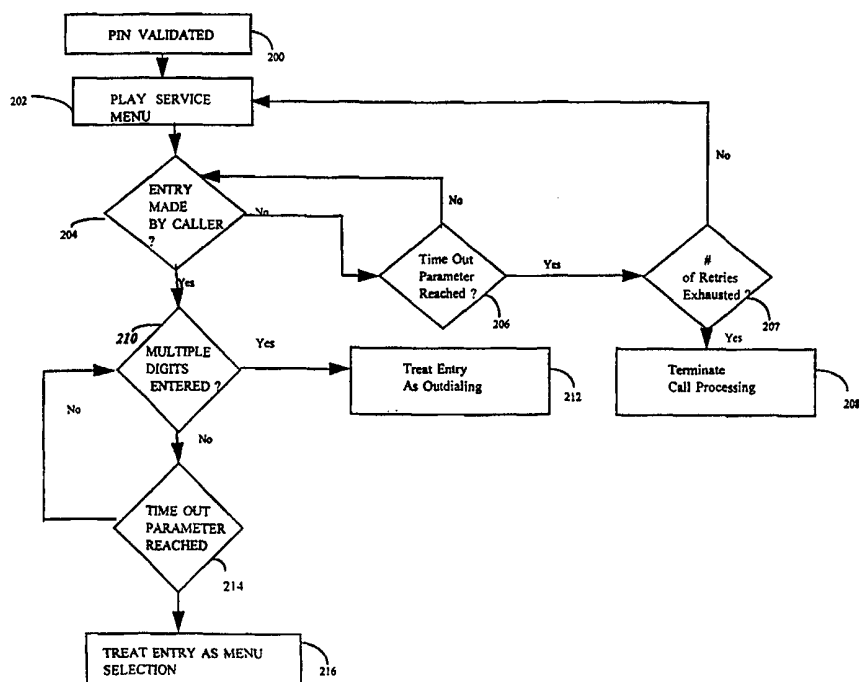




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(54) Title: AUTOMATED CALL USER INTERFACE



(57) Abstract

A service menu played to a caller after PIN validation has features which eliminate the need for menu items covering the following: (a) destination dial through — system recognizes dialing of 2nd (of variable) digits as a telephone number, or (b) speed dial through — system recognizes as speed dial "*" and single digit.

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AUTOMATED CALL USER INTERFACEBACKGROUND OF THE INVENTION

Voice response units ("VRUs") are well known. They allow a caller to enter and retrieve information by using the telephone keypad to respond to a voice menu. They can provide, for example, the playback of prerecorded, or voice synthesization of, successive digits in a telephone number in response to a request for directory assistance. In prepaid telephone systems, VRUs are used to provide the subscriber with account information such as the time available to talk and billing information.

Figure 1 illustrates a typical exchange between a caller and a prepaid system via a VRU. The caller dials into the prepaid telephone system (100) and upon connection, the caller's personal identification number ("PIN") is requested and provided (102, 104). Upon PIN validation (106), the system may play a service menu having various options (108) and require the caller to press a digit to select the desired service item. Frequently an "outdial" option is included in the service menu, requiring the caller to select this option (110) and then enter the destination (112, 114) before the call can be established (116).

Further, in systems offering individual speed dial capability, the system must either use nested menus or limit the number of services offered because of the need to reserve numbers for use as individual speed dial numbers.

Accordingly, it is an object of the present invention to

provide a novel system and method for allowing the direct dialing of a destination number in a menu driven system.

It is another object of the present invention to provide a novel system and method for incorporating speed dial capability in a menu driven prepaid environment .

It is yet another object of the present invention to provide a novel system and method for incorporating speed dial capability in a prepaid system without limiting the number of options in the service menu.

These and many other objects and advantages of the present invention will be readily apparent to one skilled in the art to which the invention pertains from a perusal of the claims, the appended drawings, and the following detailed description of the preferred embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a flow chart illustrating a typical exchange between a caller and a prepaid system.

Figure 2 is a functional block diagram showing the basic organization of the enhanced services system of the present invention in the embodiment of a prepaid telephone system.

Figure 3 is a functional block diagram of an embodiment of the present invention showing the voice response unit (VRU) embedded within the switching platform.

Figure 4 is a flowchart illustrating the Destination Dial-through feature of one embodiment of the present invention.

Figure 5 is a flowchart illustrating the Individual Speed Dial-through feature for another embodiment of the present invention.

Figure 6 is a flowchart combining the Individual Speed Dial-through and the Destination Dial-through features in a further embodiment of the present invention.

Figure 7 is a flowchart illustrating an alternative embodiment for combining the Individual Speed Dial-through and the Destination Dial-through features for the present invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

Figure 2, illustrating an enhanced services platform in the embodiment of a prepaid telephone system, shows a suitable conventional telephone switch 10 such as the Harris Corporation 20/20 switch in a conventional public switched

telephone network (PSTN) connected to large numbers of subscriber telephones such as the caller telephones 12 and the called party telephones 14. Also connected to the switch 10 may be a bank of voice response units (VRUs) 15 on which the prepaid call processing application 18 resides.

Alternatively as shown in Figure 3, the VRUs 15 may be embedded within the architecture of an integrated network server (IN Server) 16 which is physically mounted on the back plane of the telephone switch 10. The embedding of the VRU in the switch platform effects seamless transfer of information and may be accomplished by means of an adaptor card with the elimination of the T1 and E1 circuits.

The management of a prepaid system is generally under the control of a call processing application 18 resident within the VRU. The call processing application 18, in association with peripheral equipment, determines the action to be taken (e.g., determining the correctness of a PIN entry, the prompting of users for destination numbers or desired services, outdialing to a requested telephone number, etc.) during the processing of a call request.

The call processing application 18 for one embodiment of the present invention incorporates a "smart" service menu having a Destination Dial-through feature which allows the system to distinguish between the dialing of a destination number and the selection of a menu item, eliminating the need for the caller to specifically select an "outdial" menu item to dial. The system recognizes the different actions by counting digits. The entry of two or more digits by the

caller is treated as an outdialing. If only a single digit is entered, the entry is treated as a menu selection.

The Destination Dial-through feature is illustrated in Figure 4. Upon PIN validation (200), the system plays the service menu (202) and waits for an entry (keypad, voice, etc.) by the caller (204) until either an entry has been made or a time out parameter has been reached resulting in call termination (206, 208) or replay of the service menu until a predetermined number of retries has been exhausted (207). If an entry has been made, the system determines whether multiple digits have been entered (210), and if so, the system treats the entries as an outdialing (212). Otherwise, the system treats the entry as a menu selection (216). A time out parameter may be utilized to govern the timing between digit entries to distinguish between a slow multiple digit entry and a single digit entry (214).

Another embodiment of the present invention illustrated in Figure 5 eliminates the need to provide menu choices to make individual speed dialing available to the caller. This feature, Individual Speed Dial-through, uses the '*' (asterick) plus a number, for example, from 1 to 9 (multiple digits may be used) to designate a speed dial choice. By using the asterick, the system can differentiate between an individual speed dial request and either a menu choice or a destination number depending on the system design (218), and respond accordingly (212/216, 220). If an asterick is entered but no subsequent entry is made before the time out parameter is reached, the system will either replay the service menu or

terminate the call depending on whether the number of retries have been exhausted.

A further embodiment illustrated in Figure 6 incorporates both the Individual Speed Dial-through and the Destination Dial-through features.

Figure 7 shows an alternative embodiment for incorporating both Individual Speed Dial-through and Destination Dial-through features. In this embodiment, whether an entry is to be considered as a menu selection, a speed dial request, or a destination number is determined by the number of entries made. If a single character is entered, the entry is treated as a menu selection (230, 212). The entry of only two characters is treated as a speed dial request (232, 220). Upon the entry of a third character, the system treats the entries as a destination number (216). To determine the number of characters entered, a time out parameter (not shown) may be used to establish the acceptable timing delay between successive entries.

While preferred embodiments of the present invention have been described, it is to be understood that the embodiments described are illustrative only and the scope of the invention is to be defined solely by the appended claims when accorded a full range of equivalence, many variations and modifications naturally occurring to those of skill in the art from a perusal hereof.

WHAT IS CLAIMED IS:

1. In a telephone dialing system having a service menu, a method of dialing so as to avoid the service menu comprising the steps of:

(a) playing a service prompt;

(b) detecting one or more telephone keypad entries within a first predetermined time interval following the playing of the prompt;

(c) treating the first entry as a menu selection in the absence of the detection of a second entry within a second predetermined time interval following the detection of the first entry;

(d) treating the second and any subsequent entries as a speed dial telephone number in response to the first entry being a non-digit; and,

(e) treating the first and subsequent entries as a telephone number in response to the first entry being a digit and the detection of the second entry within the second predetermined time interval following the detection of the first entry.

2. In a telephone dialing system having a service menu, a method of dialing providing the ability to bypass the service menu comprising the steps of:

- (a) playing the service prompt to a user;
- (b) detecting one or more telephone keypad entries from the user;
- (c) based on the content of the entries, treating the entries as one of a menu selection, a destination number, or a speed dial number.

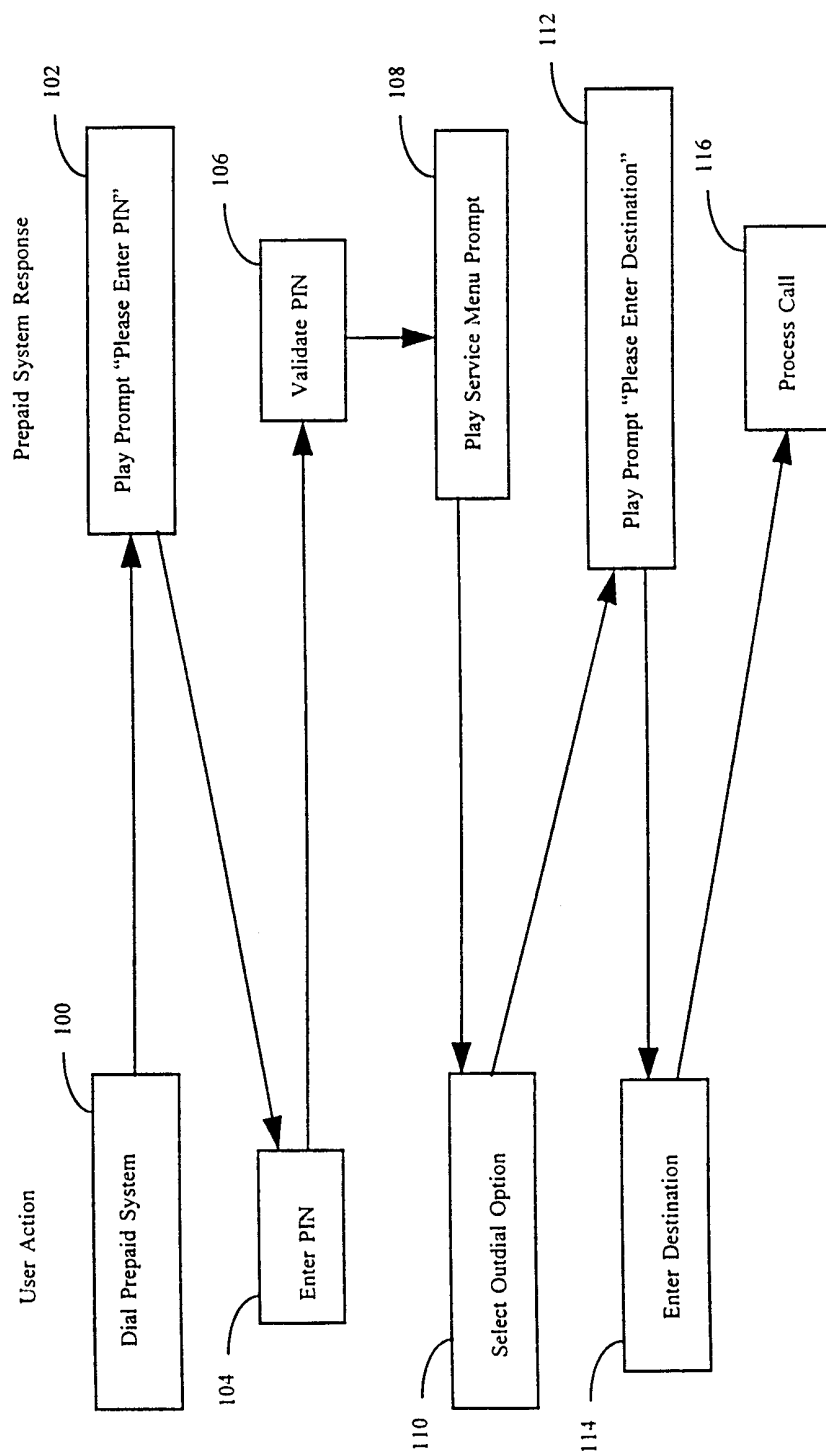
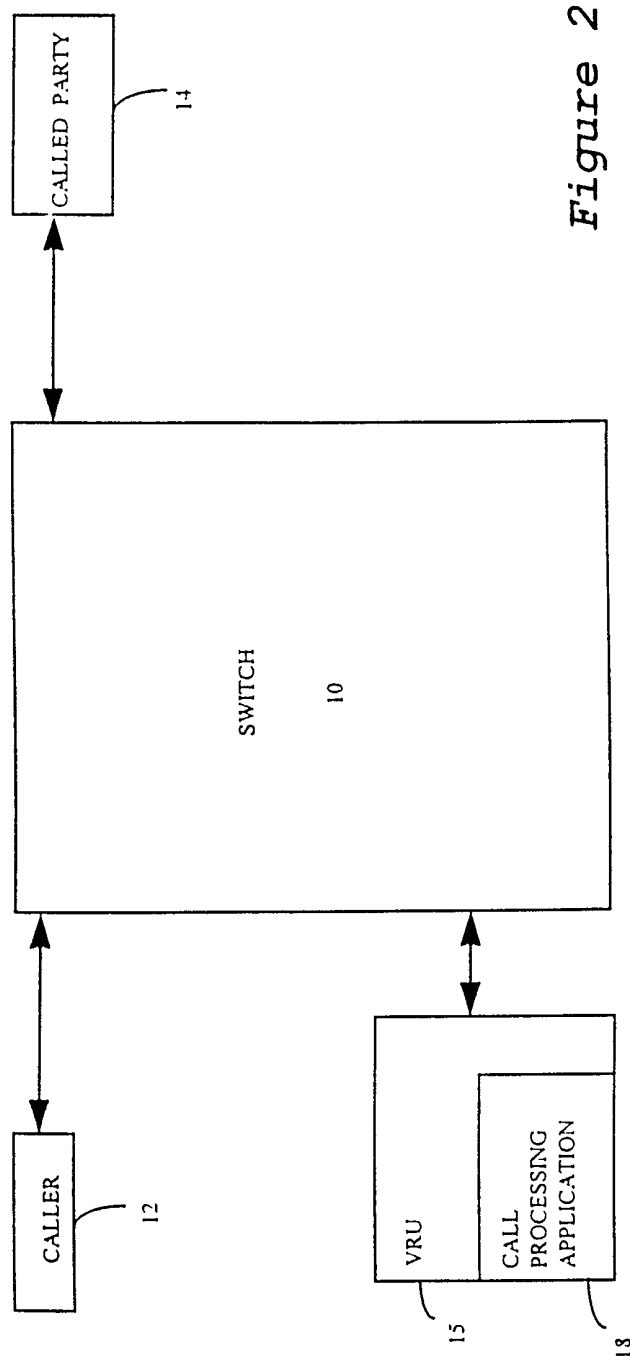


Figure 1
(Prior Art)

*Figure 2*

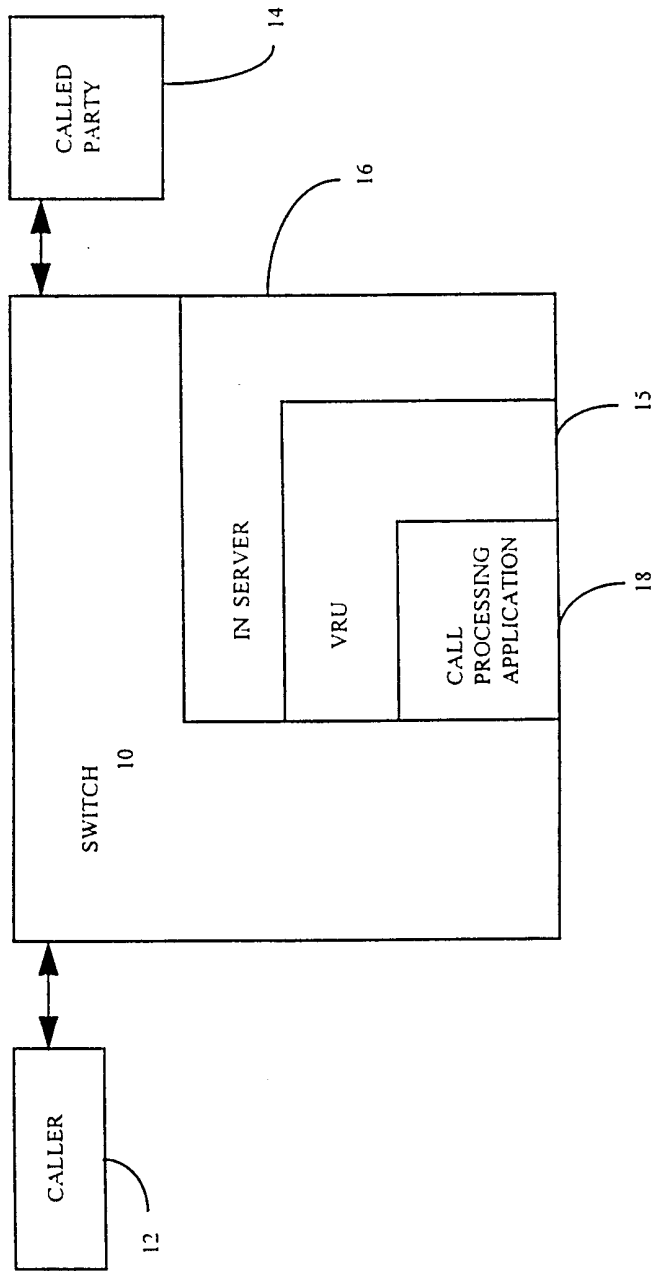
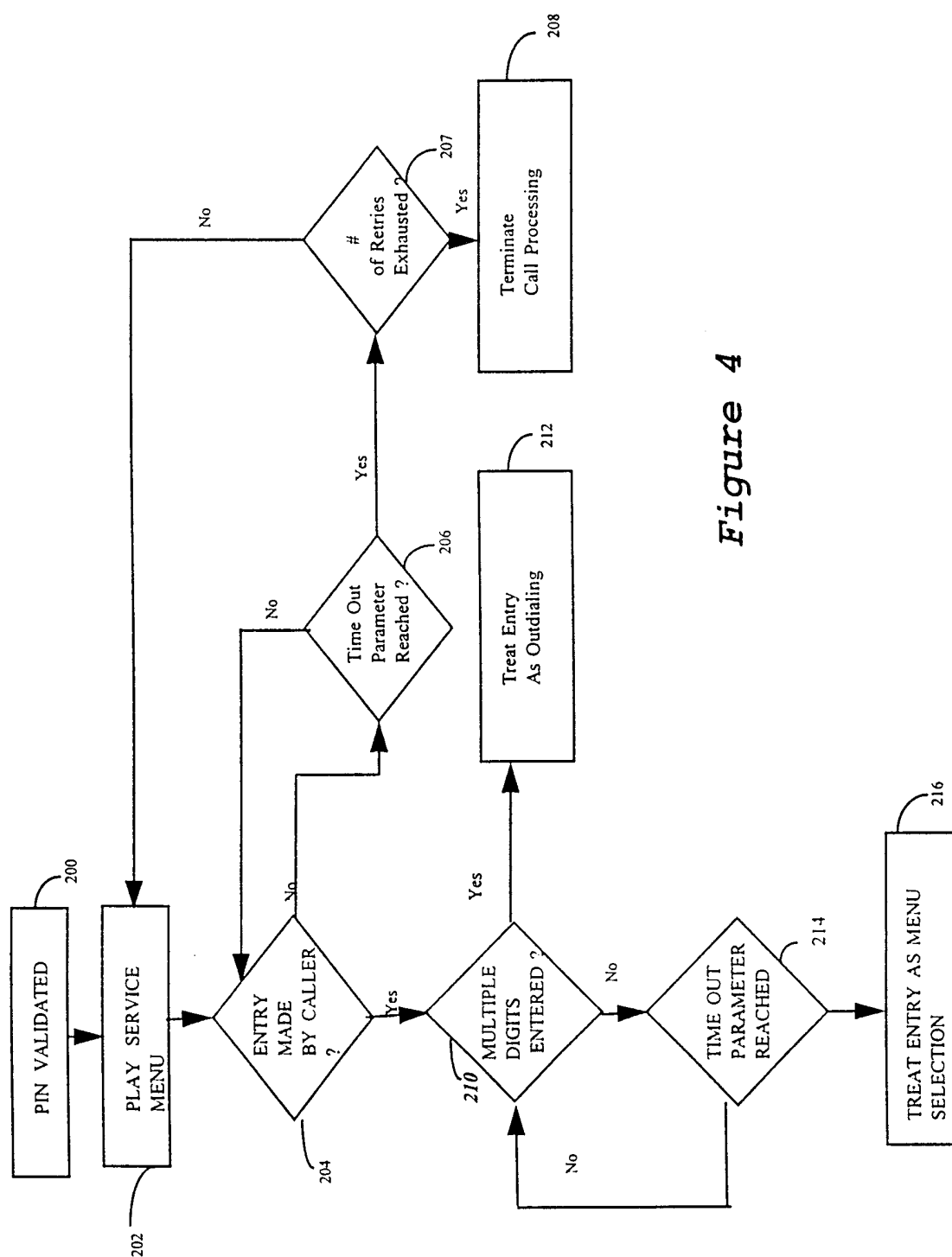
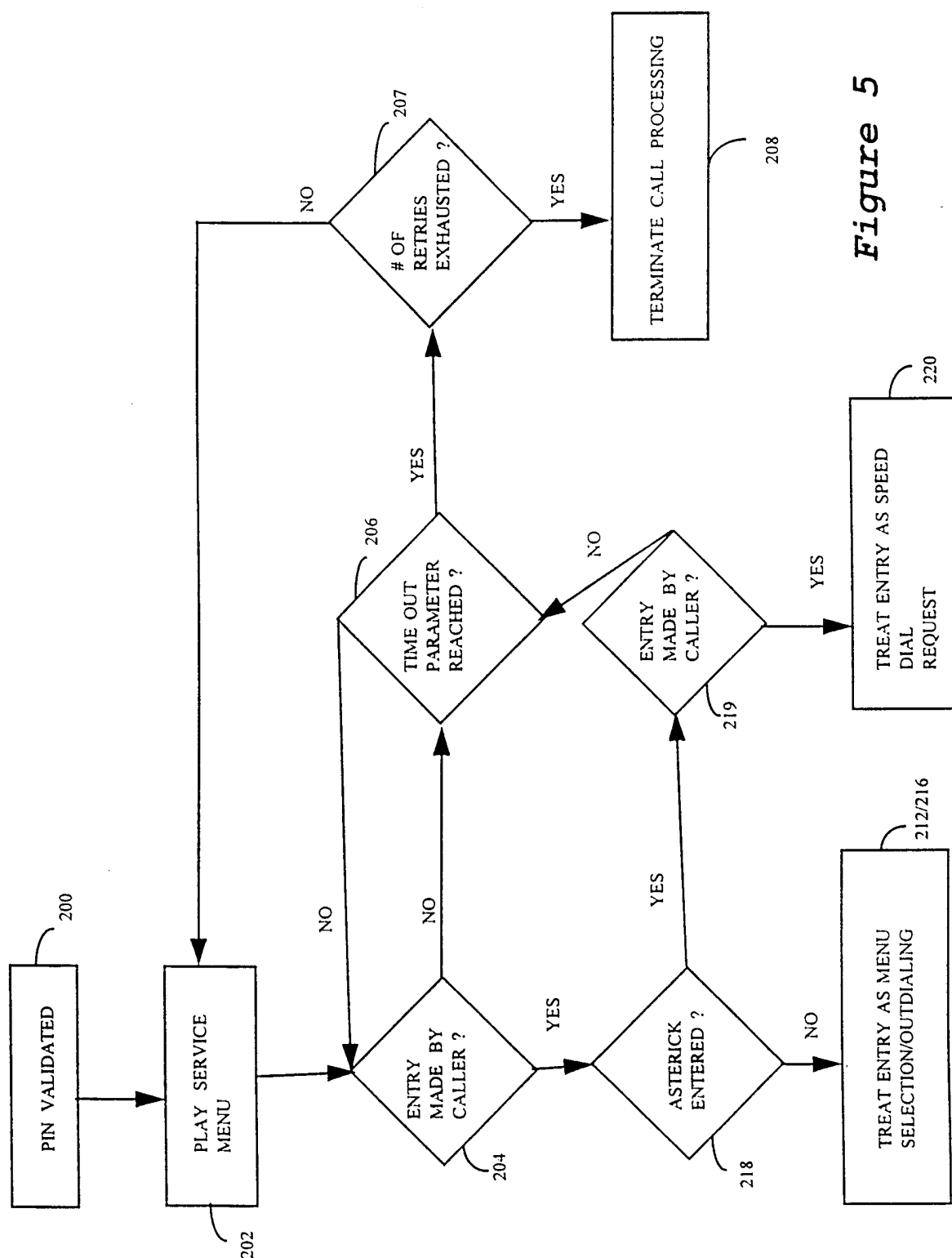
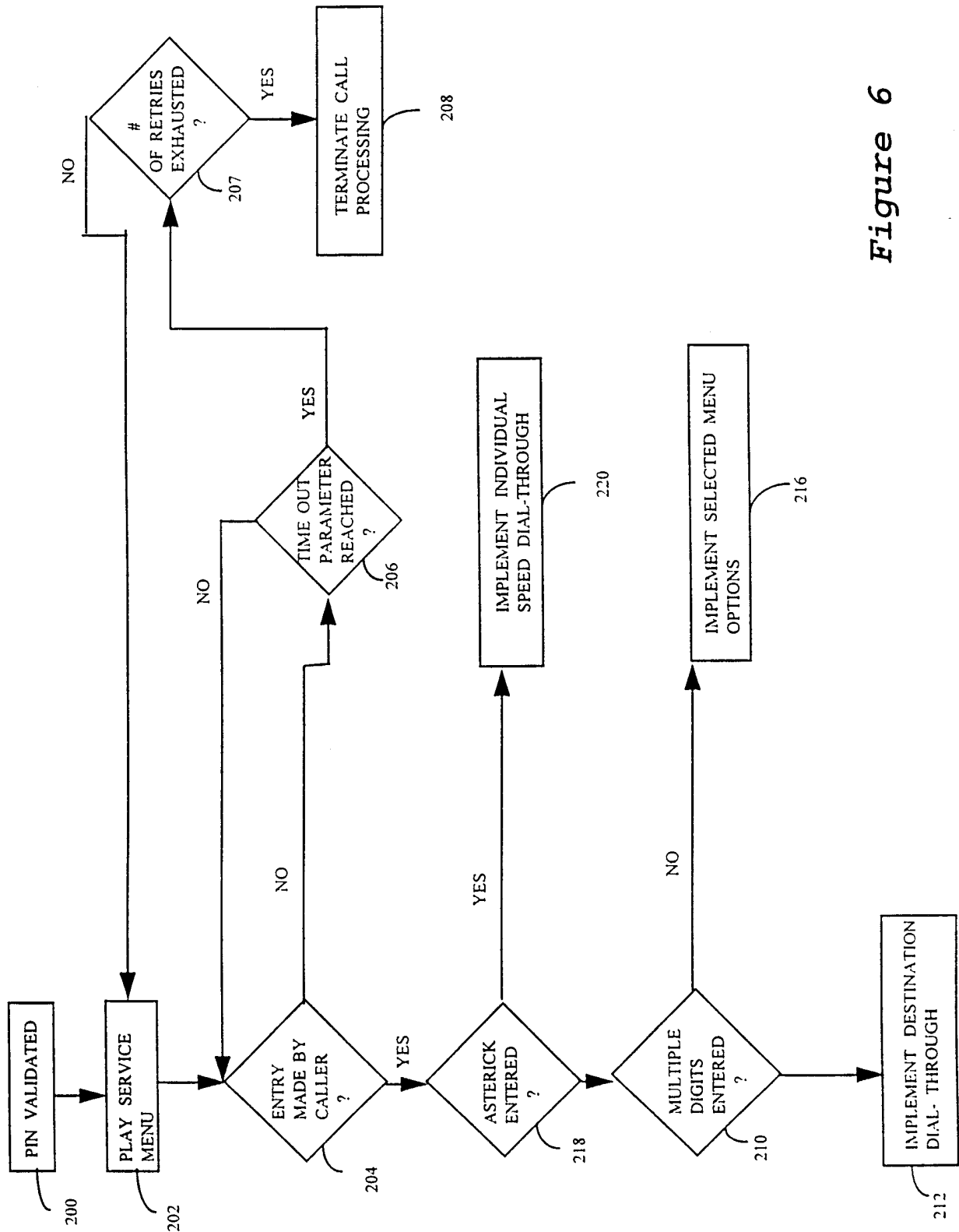
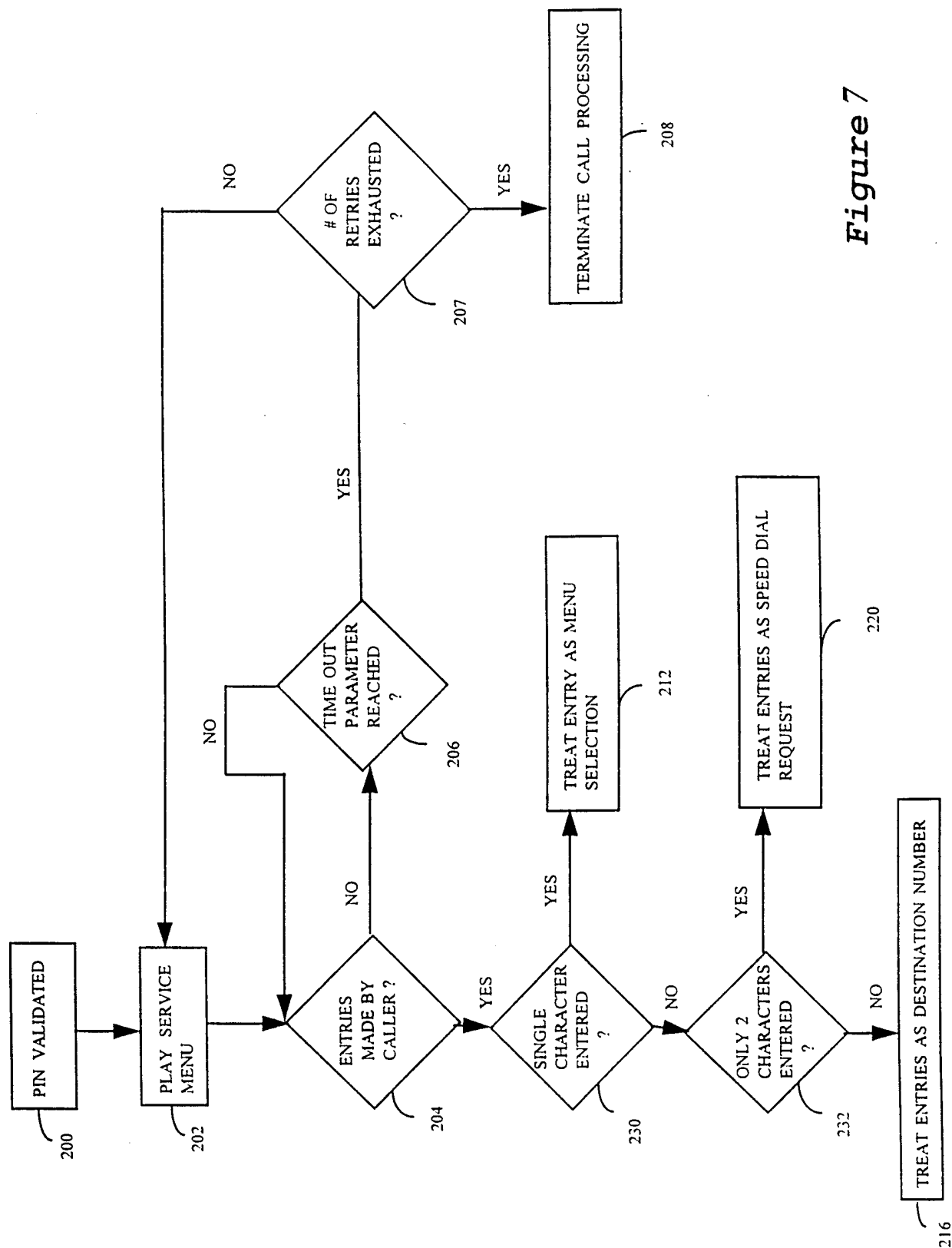


Figure 3

*Figure 4*

**Figure 5**

**Figure 6**

**Figure 7**

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/17430

A. CLASSIFICATION OF SUBJECT MATTER IPC(6) :HO4M 1/64 US CL :379/88.01, 88.03, 88.04 355 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. : 379/88.01, 88.03, 88.04 355 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 5,222,121 A (Shimada) 22 June 1993 (22.06.93), Figs.2-4 and col. 4-7.	1 --- 2
Y	US 5,717,738 A (Gammel) 10 February 1998 (10.02.98), Figs. 2-5 and 19-22.	1 and 2
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
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