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W-8000 München 81(DE)(54) **User interface for a mail processing system.**

(57) A user interface system for an electronic postage meter mailing machine apparatus has a programmable microcontroller for controlling the hard and soft system functions of the postage meter mailing machine (1). A non-volatile memory stores data information and executable routines. A display (7) and a plurality of soft and hard keys 9,11,13,15) are provided. The soft keys (8) are aligned to a portion of the display (7). Stored in the NVM is a plurality of system screens for display on said visual display (7), each of said screens having a menu field having N columns and M rows, a data window field and a prompt field and having descriptors for each of said respective fields, a plurality of text strings, a plurality of graphic display run routines, and a plural-

ity of routines for enabling said soft keys and for identifying said respective subsequent screen. The microcontroller is programmed under the influence of a user program being programmed to identify a first screen and then execute a screen select routine comprising the steps of (a) getting the screen identified from said screen region of said memory and display on said display, (b) getting the text strings identified by said screen descriptor of said identified screen from said text region and displaying said text string in respective areas of said menu field of said screen, and enabling said respective soft key for said respective menu area, and (c) displaying dynamic information in the data window field of said screen and executing graphic routine.

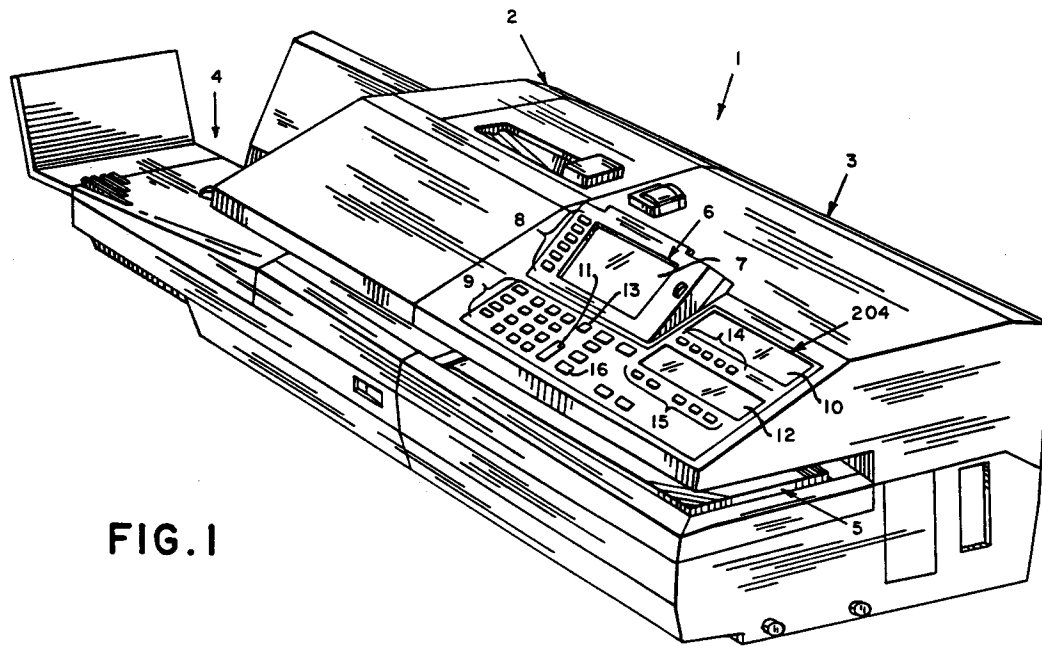


FIG. 1

The present invention relates to interactive user interface systems for microcomputer based machine systems. The machine is applicable to machine systems, such as postage meter mailing machines having a display or other human readable output means and a user input means, such as a keypad.

In many machine applications, it is an objective to provide a base machine with an ever increasing number of operator selectable functions presented to the operator through a user friendly interface. The user interface provides machine access means for operator control over and interface with machine functions. For example, it has been found advantageous to provide a mail processing system, such as a postage meter mailing machine, with accounting functionality, in addition to variable machine control functionality. It is also considered advantageous to provide the mailing machine with the ability to interface with external devices or systems such as funds allocation systems and external scales.

To facilitate operator use of mailing machine functionality, it is recognized that a user friendly interface system must be employed. A conventional user interface for a mailing machine includes a display, and keyboard coupled to and interactive with a microcontroller system housed in the mailing machine. It is known to embed the user interface system programming, i.e., the program code for the user interface, permanently in the memory of the microcontroller. The user interface system is customary a tree type menu driven system operated such that the operator is presented with a series of menu choices. The desired machine system function is derived from sequentially choosing menu tree branches. At this point, the operator is allowed to enter the necessary variable information for the selected machine function.

The disadvantage of conventional user interface systems, customarily utilized in mailing machines and similar machine environments, is that embedded systems require a large amount of memory space. The amount of memory space increases dramatically as the functionality of the mailing machine is increased. The consumption of memory space by the user interface adversely affects the amount of program memory available for machine program execution or run-time code.

Another disadvantage of conventional menu driven user interface systems is a lack of flexibility in modifying the interface code, since the text code, display screen format code, menu options, etc. cannot be modified without replacing the complete user interface code. This restriction is a particular disadvantage when the system is an embedded system. It is generally required, that should the code of a mailing machine need modification or

updating, including the user interface code, the mailing machine must be returned to a service center and a code dump and reload performed.

5 Summary of the Invention

The above-cited disadvantages and other disadvantages unique to the employment of a user interface system in an embedded machine environment, such as a mailing machine, are advantageously addressed in the present invention.

It is an objective of the present invention to present a user interface system for microprocessor based machine systems, particularly suited for postage meter mailing machines, wherein the user interface may be readily updated or modified.

It is a further objective of the present invention to present a user interface which allows for mix mode operation, for example, operator data input and function selection in a single screen display, and in combination, may further provide machine state information.

The mailing machine includes a display, a display input/output (I/O) driver, six soft keys aligned to respective portion of the display and a number of hard keys. The mailing machine is under the control of a microcomputer which includes a host programmable microprocessor in bus communication with suitable memory devices. One of the memory devices is a program memory. The microcomputer is also coupled to the display I/O driver and to I/O drivers for the soft keys and hard keys.

The memory registers of the program memory are mapped into a number of regions, for example, a command region, a text region, a screen region, a dynamic field region, a hard key region and a soft key region. The memory also includes a command file region. The command file contains all the commands for a fully featured mailing machine, inclusive of all option command structures. The execution code routines for the machine functions may be resident in the memory. Therefor, when the mailing machine is upgraded, for example, when an external device is added, the command set for scale related function does not need to be loaded or written to memory. The microcomputer can be programmed to poll the system during system initialization to determine the machine configuration and, according to poll result, enable the appropriate screen fields within the screen region menus. Alternatively, subsequent to the polling, the execution code and command files may be downloaded from an external device to the microcomputer.

Within the screen region is stored the data structure which represents each screen for the display. As part of that data structure, the screen data defines which hard keys and soft keys are to be enabled with respect to that screen and which

command is issued pursuant to the respective key selection. Each screen is identical in format such that there is a title area, a soft key text area, a dynamic or window area and a hard key text area. Therefore, an operator can be provided as many as six menu options and, concurrently, the ability to receive instruction and input variable data in the hard key text area and, in addition thereto, receive system dynamic information in the window area. As a result, the number of necessary menu choices presented can be greatly reduced to achieve a desired system run state making for exceptional user friendliness.

Brief Description of the Drawings

Fig. 1 is a schematic of a microcomputer system for a mail processing system having a user interface system in accordance with the present invention.

Fig. 2 is a schematic of a suitable mailing machine microcontroller system suitable for employing a user interface system in accordance with the present invention.

Fig. 3 is a schematic representation for a memory have specified region in accordance with the present invention.

Fig. 4 is a schematic representation of a display having defined regions in accordance with the present invention.

Fig. 5 is a logic schematic of the user interface screen select in accordance with the present invention.

Figs. 6A to 6H are a schematic representation of a user menu option and data flow in accordance with the present invention.

Detail Description of the Preferred Embodiment

Referring to Fig. 1, the present invention is particularly suited for postage meter mailing machine application. For example, a postage meter mailing machine, generally indicated as 1, is comprised of a feeder section 2 and a postage meter mailing machine section 3. In operation, envelopes are placed in a hopper 4 of the feeder section 2, whereupon the envelopes are serially fed through the feeder section to the mailing machine section 3 for imprinting of a postage indicia on fed envelopes by a postage meter print arrangement (not shown) detachably mounted within the mailing machine section 3. In the preferred embodiment, the mailing machine 1 includes a scale 5 for weighing the envelope and communicating with a microprocessor such that proper postage is printed by the printing mechanism of the postage meter on the envelope according to the weight of the envelope.

The mailing machine 1 includes a user inter-

face, generally indicated as 6. The user interface 6 includes a visual display 7 and a plurality of soft keys 8 aligned to a respective portion of the display 7 and a plurality of hard keys 9, which form a keyboard or keypad, at least one of the keys 9 being designated as an enter key 11 and another designated as a return key 13. Also one of the hard keys is designated as a start key 16. The interface 6 also includes first and second mimic displays 10 and 12, respectively. The mimic interface display also includes function hard keys, generally indicated as 14 which are associated with the mimic display 10 and hard keys 15 which are associated with mimic display 12.

Referring more particularly to Fig. 2, a suitable microcontroller system, generally indicated as 100, is comprised of a core board 102 having located thereon a microprocessor based motor controller 104 in bus 106 communication with a code read only memory (ROM) 107, a motor application specific integrated circuit (ASIC) 108 and a shared non-volatile memory (NVM) controller 112. A microprocessor based host controller 116 is in bus 118 communication with the NVM controller 112 and connectors 120, 122 and 123, respectively. The motor controller 104 is also in bus 126 communication with a meter board 128, date board 130 and scale board 132, also referred to as Weight On The Weight (WOW) board 132. Also in communication with the host controller bus 118, and thereby the host controller 116, are DUAL UART input-output (I/O) module 150 and a Echoplex communication I/O module 152. The NVM controller 112 is in bus 113 communication with a shared non-volatile memory NVM 115.

A microprocessor based sensor controller 119 is in bus 136 communication with the NVM controller 112. An analog-to-digital (A/D) converter 138 is in bus 140 communication with the sensor controller 119. A sensor bus 142 couples the sensor controller 119 and A/D converter to the harness coupler 144. A flex harness 146 is attached to the harness coupler 144 at one end and to the respective drive motors and sensors (not shown) of the postage meter mailing machine 1. A more detailed description of a particularly suitable postage meter mailing machine is described in U.S. Patent No. 4,935,078 entitled HIGH THROUGHPUT MAILING MACHINE TIMING.

A personality module 160 is in communication with the host controller bus 118 through a personality bus 162 through coupler 120. The personality module 160 includes a Expansion NVM 164, a graphics controller 166, a combination keyboard and MIMC I/O port 168. A man machine interface module 170 including a liquid crystal display (LCD) board 172 and a keyboard and MIMIC board 174 are in respective bus 176 and 178 communication

with the graphics controller 166 and I/O board 168 through respective couplers 180 and 182. NVM accounting cartridges 184 and 186 are in communication with the NVM expansion I/O board 164 through coupled buses 188 and 190, respectively.

The dual communication module 150 permits bus 192 and 194 coupling thereto of a weighing platform with integrated rating 200, a rating board 202, a service device 204, or another general purpose device 206 such as a printer. In like manner, an echoplex scale 208 may be coupled to the echoplex I/O module 152 by bus 210.

A system bus controller 220 is in bus 222 communication with the host controller bus 118 through the coupler 123. Also a code ROM 221 is in coupled bus 223 communication with the host controller bus 118 through coupler 122. The system bus 224 provides communication of the system bus controller 220 with a I/O expansion module 226 from which may be coupled a parallel printer interface 228, a general purpose interface 230 and a custom parallel interface 223. Other optional devices, such as, a modem 236, an inserter module 238, an OCR module 242, an addresser module 244 and an additional stacker module 240 may be carried by bus 224.

Referring to Figs. 3 and 4, the display 7 is mapped such that each screen defines a data window area DW, a soft key menu field MF, a screen title field TF, and a prompt/error field PF. The soft keys, individually referred to as 8a through 8f, are aligned to respective portions of the screen menu field MF. Aligning the soft keys to the screen field MF in this manner allows a machine operator to easily associate the options presented in the menu field MF with the depression of the correspondingly aligned soft key. Operator instructions, requests for operator variable data input and operator error messages are presented in the prompt field PF. Within the data window DW, user system information pertinent to the current state of the mailing machine 1 or selected soft function can be presented to the operator. It is noted that the soft functions refer to data processing functions, such as funds accounting, and hard functions refers to machine control functions.

Referring to Figs. 3 and 5, the Code ROM Module 221 is partitioned into addressable regions. A first one of the regions is the text region RN-1. The text region RN-1 has stored therein the text strings for display. A second region RN-2 has stored the individual screen descriptors for driving the graphics controller 166. Each screen defines the associated text strings to be displayed with that screen. A region RN-3 is reserved for interactive information, that is, the command structure for display of machine state information.

Referring more particularly to Fig. 5, upon initialization of a screen select processor at 300 which is

determined by the function key actuated by the operator in the previous screen, the identified screen is retrieved from the screen field area. Each identified screen within the screen field area includes screen descriptors. Some of these descriptors define the appropriate text strings and define screen location, define the dynamic field for data window, and also enable the appropriate soft keys. At 303, the corresponding data pursuant to the screen descriptor is retrieved. At 305, the first retrieved data item is selected for testing at 306. If the first data item is not a text string, the appropriate graphic information is retrieved from the dynamic field RN-2 at 307. The retrieved graphic display routine is accordingly executed at 308 for display in the data window DW.

Concurrent then with execution of the display routine at 308, a test is performed to determine whether the additional data item has been retrieved at 305. If no further display items have been retrieved, then the routine is finished at 312. If there are additional data items at 309, the routine gets the next data item for testing at 306. If at 306 the data item is a text string, the routine proceeds to 314.

Returning to decision point 306, if a text string has been retrieved as the first item or, as here, is the next data item to be tested, the specific location for display of the data item and the specific corresponding text identification is retrieved at 314. At 315, the specific test string is retrieved and at 316 the text string is caused to be displayed on the display at the proper screen location. Now at 309, the presence of any additional data item is tested for, if no additional data item, the routine proceeds to 312. If there are additional data items, the routine repeats until all data items have been identified and displayed.

Referring more particularly to Figs. 6A to 6H illustrate a preferred form of the user interface system, upon power-up of the interface system, indicated at 11, the screen retrieve routine is executed. First, within the PF screen field, the operator is prompted to input the operator ID number at 12, if enabled. The interface system proceeds to prompt the user at 14 to press the start key for a mail run at 14. However, prior thereto, the operator will be prompted at 13 to input any missing user ID information at 15. Within the message field MF, the operator is now presented with the menu set A1 through A6 which provides the operator with the option to choose by actuation of the respective soft key to change mail classes, change accounts, prepare site setup, service diagnostic, view addition options or quit.

If the operator should choose to change the mail class by depressing soft key 8a, the operator

is then prompted at 17 within the prompt field PF to pick a class or enter a speed code and to press enter when done. The operator is also presented in the menu field with the options S1 through S2 which present a variety of available classes. If the operator were to wish additional classes to choose from, he simply presses the soft key 8e aligned to option S5 and additional options are presented to the operator. It should be appreciated that the user interface can proceed in this manner to accommodate as many classes as are desired. As noted and hereafter understood, an operator may choose any of the presented menu choices by depressing the aligned soft key.

Pursuant to a selection of option S6, the operator may choose to view the appropriate fees at 21 in the data window DW associated with the classes displayed in the data window. The operator is then prompted at 22 in the prompt field PF to hit the resume, option S6, to resume the selections at the A1 through A6 menu selection point.

Along with the option to change classes in menu field MF, the operator is given the choice to change accounts at A2 upon which further operation will apply. The operator is presented with a prompt at 25 to enter the account number. Once the new account number is entered at 26, the machine returns to node N1 and the operator is prompted to press the start to run the mail at 14. A diagnostic services option is present at A4 where, should that option be chosen, the user interface will then enter into a service diagnostics display routine which is presented to the user in the similar format as hereafter discussed. Should the operator enter a quit mode A6, the user interface then returns to a request for an operator ID at 12.

The operator may choose at this point to view more options at A5 following which selection the operator is then prompted to make a selection or press start to run at 30 and the operator is presented with a second set of options A7 through A12. The A7 option reinstates options A1 through A6 to the MF. Option A8 allows the operator to display the meter register and other meter information. If selected, the meter information is displayed in the data window DW and the operator is prompted to hit enter or go back to the previous presented options A1 through A6 at 32. The operator may choose to view reports at A9, should the operator make that selection, the operator is then presented with a list of reports in the data window DW and is prompted at 40 to select the report by hard key entry. The operator is then presented with a choice of three report types B1 through B3 to choose from. The available options now are account summary at B1, last transaction at B2, and site setup and operating reports at B3.

Should the operator choose option B1, the op-

erator is prompted at 42 to pick the type account summary the operator wishes to view in the data window. The operator is presented in the menu field with the option to view daily account summary in C1, a period one summary in C2 or a period two summary in C3. The operator is prompted in the prompt field PF at 43 to enter in the account number at 44 to which the report is displayed at 44. The operator is now prompted in the prompt field PF at 45 to either hit enter or to go back when done. If the operator has chosen to view the report, the operator is then presented with a menu field with options D1 through D6 which, respectively are, previous page of the report, next page, previous account, next account, specified account or grand totals of accounts. Should the operator choose to specify another account at DF, a request is presented at 47 in the prompt field PF for the account number. The operator is presented with the new account information in the data window DW and offered options D1 through D6.

By hitting the return key, the operation of the machine is returned to the B menu options. The operator may now choose B2 by which the last transaction report generated is presented in the data window DW at 50. The operator is prompted in the prompt field PF to either hit enter or return key when done. The operator is now presented with a menu selection E1 through E5 which refers, respectively, to the previous transaction, next transaction, previous page, next page or specific transaction. The operator at E5 can specify a specific transaction at 52 for report activity. The final option presented in the B menu field is a site setup and report field at B3 from which the operator is prompted in the prompt field PF to pick, type or site setup, or operation report to view 54. The operator is presented in the menu field with the options F1 through F4. Should the operator choose the F1 option, which is display accounts list and status, the account list is displayed in the data window DW. The operator is prompted in the prompt field PF again to hit enter or to return. The operator is now presented with the G menu field displaying options G1 through G3 at which the operator can, respectively, choose previous page, next page, or specify account. Should the operator choose to specify the account, the prompt field PF requests that the account number is entered at 57. From the F menu, the operator may choose speed account list to which the data window is caused to display just the account list without status proceeding to the G menu as described. The operator can also choose to configure an account at F3 in which case the operator is presented in the data window with the configurations options at 60. The operator is also presented in the prompt field PF with the option to enter or return. The operator is now

presented in the menu field with options H1 and H2, respectively, previous page or next page to respond. It is noted that in configuring the accounts, the operator is given a list of options which can be actuated through hard key actuation.

The remaining F field choice F4 is the class fee list. Choosing that option presents in the data window the class fee list which has been created and, in like manner, in the prompt field PF the enter or go back item is displayed. Upon display of the class field list, the operator is presented with a menu field I having options I1 through I4, in which case the operator can choose to name a class in detail, special fee or meter/carrier information to be displayed, display previous page or next page.

A return sends the operator back to the F menu option, and thereafter the operator can be returned to the A menu field. From the A menu field, should the operator choose at A10 to generate or cancel a report if a printer is available, the operator is then presented the J menu selection field, in which the operator is presented with options J1 through J6.

Should the operator choose selection J1, accounting reports, the prompt field PF prompts the user at 20 to pick the type of report. The menu field MF now presents options K1, K2 and K3 to which the operator may select account summary at K1, account details at K2 and the workstation/carrier summary at K3. Should the operator choose the account summary, he is prompted in the prompt field PF to pick the account report type and is presented options L1 through L3, respectively, complete summary, summary with actual postage and surcharge totals suppressed, and complete summary with carrier class totals without actual and surcharge totals. Following selection from the L menu, the operator is presented with options M1 and M2, respectively, print all accounts and print one account, and prompted at 72 to pick a print option. Should the operator choose to print all accounts, the operator is prompted at 73 in the prompt field PF to print one account per page following which the operator is then presented with yes or no options, respectively, N1 and N2 in the menu field. If the operator chooses to print one account, he is prompted at 74 in the prompt field PF to enter the account number. The operator is now prompted at 75 in the prompt field as to whether zero balance accounts should be suppressed and present options O1 and O2, representing, respectively, yes or no. The operator is now prompted at 75 with the prompt field PF whether inactive accounts should be suppressed and presented at P1 and P2 with yes or no options. The operator is then informed in the display window DW that the print reporting query is being processed.

The system is then returned to the J menu options. Should the operator select the J2 menu option, the operator is prompted in the prompt field PF at 80 to pick a transaction report type and is presented with the options Q1 through Q5 in the menu field, which respectively are, a daily transcription report, daily accounts reports, daily account totals, daily workstation reports, and daily meter activity reports. If the operator selects options Q1, the operator is prompted at 81 in the prompt field PF to pick a daily transaction report and is presented with options R1 through R3 in which case the operator can choose in account order, in carrier order or in the order processed. If option R3 is chosen, the operator is notified in the data window that the report is in system queue and is being processed. Upon the operator's selection of options R1 or R2, the operator is prompted to pick print options at 83. The operator may then choose from the menu field options T1 or T2, to print all accounts or print one account, respectively. If the operator chooses to print one account, the operator is then prompted at 85 to specify the account to be printed. The print request is placed in the print queue at 77.

At the Q menu, the operator may choose to select the daily account reports option Q2, in which case the operator is prompted at 87 to pick a daily account report and is presented in the menu field with option U1 or U2, respectively, an account summary and account summary with totals by carrier and class. The operator is then again presented with the print options T1 and T2 and queried whether to print all the accounts or one account and is prompted at 83. Also presented in the Q menu field is the option for daily account totals Q3. If selected, the operator is prompted at 88 whether the report is to be presented by carrier/class, respectively, V1 and V2. The operator is again prompted at 83 and presented the print option, T menu. The Q menu field also presents a Q4 option, daily workstation report. Upon choosing Q4, the operator is prompted at 89 whether the class usages will be specified and presented in the menu field with yes or no option W1 and W2, respectively. The report is then placed in the report query field at 90. The Q menu is then presented. The final Q option is the daily meter activity report, Q5. Upon selection of Q5, the request for the report is placed in the report queue at 91 and the Q menu is presented. By hitting the back key, the operator is then transferred to the J menu.

The remaining choices in the J field are J3 through J6. If the operator should choose to actuate the J3 account class list, the operator is prompted at 93 to pick type of account class list report. The menu field then presents options X1 through X3, respectively, account class list, class

fee list, or speed code list. Upon selection, the report information is placed in queue at 94.

The J5 option, service/supervisor configuration reports, is a system service operation and may be entered by external devices for service allowing increased flexibility in configuring or modifying the user interface or providing service diagnostics. The operator is presented with the options ZZ1 and ZZ2, site configuration and operator ID reports, respectively. Following selection, the report configurations are placed here in queue at 99. There is a cancel report J6 which the operator can choose to cancel all reports in the queue. Upon selection, the operator is requested to confirm at 100 and presented with options V1 and V2, yes or no, respectively. If confirmation is no, the data window DW displays at 102, report queue not cancelled. If confirmation is yes, the operator is prompted in the data window report cancelled at 101. It is noted that an item in queue represents a host controller busy or working state on enter functions selected.

The operator may be returned back to the A menu. The operator may now select option A10. Option A10 represents a series of choices which are country specific, for example, weight format. It should be appreciated now that the presented options, prompts and machine state information can be configured in a manner as aforescribed to be country specific to that particular country's mail weight classification system or other variant.

An operator machine adjustment option can be selected. For example, a refill/machine adjustment option A12, where the operator is prompted at 107 to select tape refill AA1, meter refill AA2, display add slogan AA3, indicia print adjustment AA4 or machine speed adjustment AA5. These options allow the operator a convenient means of adjusting system functions through the user interface. For example, the operator may choose option AA2 which is meter refill adjustment. The operator is prompted at 120 to please pick the proper RMRStm (Remote Meter Reset System) function. This option is available for machines which are capable of remote meter funds resetting functions. The operator is given the selection option AB1 and AB2, respectively, start post reset or change reset amount. If the start postage meter reset is chosen, the operator is prompted at 121, enters combination and then is given a choice to stop reset at AC1. Following reset, the menu is returned to the A menu. If the operator chooses to change reset amount, he is requested to enter the reset amount ABB. The operator is prompted at 122 to enter amount and prompted in the data window or new amount.

It is therefore, apparent that through the use of three root screens and sub-access system here, an operator can be prompted easily without having to

page through an excessive amount of screens compared with the options chosen to conclude a function. Some of this is also assisted by the possibility of an option screen, in which instructions and dynamic information are portrayed in a single display state.

Claims

1. A user interface system

for apparatus having a programmable microcontroller means for performing hard and soft apparatus system functions and having memory means for storing data information and executable routines said microcontroller means being in bus communication with a visual display means for displaying information under control of said microcontroller means and a plurality of soft keys, said user interface system comprising:

said memory means having stored therein

- (a) a plurality of system screens for display on said visual display means each of said screens having a menu field of N columns and M rows, a data window field and a prompt field, and having descriptors for each of said fields,
- (b) a plurality of text strings,
- (c) a plurality of graphic display run routines,
- (d) means for enabling said soft keys and means for identifying a respective subsequent screen in response to activation of a soft key; and,

said user interface being programmed to identify a first screen and having a screen select routine to

- (a) get the identified screen from said screen region of said memory and display it on said display means,
- (b) get the text strings identified by said screen descriptors of said identified screen from said text region and display said text strings in respective areas of the menu field of said screen, and enable said respective soft keys,
- (c) display dynamic information in the data window field of said screen and execute a graphic display run routine,
- (d) await activation of one of said soft keys, and
- (e) execute a command file.

2. A user interface system as claimed in claim 1 wherein each of said soft key is aligned with a respective portion of said screen menu field and said respective text string is aligned op-

posite said enabled soft key.

3. A user interface system as claimed in claim 1 or 2 wherein said memory means comprises:
 - (a) a screen region having stored therein said plurality of system screens; 5
 - (b) a text region having stored therein said plurality of text strings;
 - (c) a dynamic field region having stored therein said graphic display run routines; 10
 - and
 - (d) a soft key field having stored therein said routine for enabling said soft keys and for identifying said respective subsequent screen. 15
4. A method of providing an apparatus with user selectable apparatus system functions, said apparatus having a programmable microcontroller in bus communication with a program memory, a visual display means for visual display of information and a plurality of soft keys, comprising the steps of: 20
 - storing in said program memory:
 - (i) a plurality of system screens for display on said visual display, each of said screens having a menu field of N columns and M rows, a data window field and a prompt field, and having descriptors for each of said fields, 25
 - (ii) a plurality of text strings, 30
 - (iii) a plurality of graphic display run routines; and
 - (iv) means for enabling said soft keys and means for identifying a respective subsequent screen in response to activation of a respective soft key; and, 35
 - programming said microcontroller to identify a first screen and having a screen routine to 40
 - (a) get the identified screen from said screen region of said memory and display it on said display;
 - (b) get the text strings identified by said screen descriptors of said identified screen from said text region and display said text strings in respective areas of said menu field of said screen, and enable said respective soft keys ; 45
 - (c) display dynamic information in the data window field of said screen and execute a graphic display run routine; 50
 - (d) await activation of one of said soft keys and repeat for next screen till end ;
 - and 55
 - (e) execute a command file.
5. A method as claimed in claim 4 further com-

prising the steps of storing in said memory means a plurality of regions including:

- (a) a screen region having stored therein said plurality of system screens;
 - (b) a text region having stored therein said plurality of text strings;
 - (c) a dynamic field region having stored therein said graphic display run routines; and
 - (d) a soft key field having said routine for enabling said soft keys and for identifying said respective subsequent screen.
6. A user interface system for a mailing machine, said mailing machine having a programmable microcontroller means for performing hard and soft apparatus system functions and having memory means for storing data information and executable routines, said microcontroller being bus communication with a visual display means for displaying information under control of said microcontroller and a plurality of soft keys, wherein said user interface system comprising:
 - said memory means having stored therein:
 - (a) a plurality of system screens for display on said visual display means each of said screens having a menu field of N columns and M rows, a data window field and a prompt field, and having descriptors for each of said respective fields;
 - (b) a plurality of text strings;
 - (c) a plurality of graphic display run routines;
 - (d) means for enabling said soft keys and means for identifying a subsequent subsequent screen in response to activation of a respective soft key; and,
 - said user program being programmed to identify a first screen and having a screen select routine to:
 - (a) get the screen identified from said screen region of said memory and display it on said display means;
 - (b) get the text strings identified by said screen descriptors of said identified screen from said text region and display said text strings in respective areas of said menu field of said screen, and enable said respective soft keys;
 - (c) display dynamic information in the data window field of said screen and execute a graphic display run routine;
 - (d) await activation of one of said respective soft keys and repeat for next screen till end ; and
 - (e) execute a command file upon actuation of a selected one of said keys.

7. A user interface system as claimed in claim 6 wherein each of said soft keys is aligned with a respective portion of said screen menu field and said respective text string is aligned opposite said enabled soft key. 5
8. A user interface system as claimed in claim 6 or 7 wherein said memory means has: 10
- (a) a screen region having stored therein said plurality of system screens;
 - (b) a text region having stored therein said plurality of text strings; 15
 - (c) a dynamic field region having stored therein said graphic display run routines; and
 - (d) a soft key field having stored therein said routine for enabling said soft keys and for identifying said respective subsequent screen. 20
9. A method of providing a mailing machine with user selectable apparatus system functions, said apparatus having a programmable microcontroller in bus communication with a program memory, a visual display means for visual display of information and a plurality of soft keys, comprising the steps of: 25
- storing in said program memory
 - (i) a plurality of system screens for display on said visual display, each of said screens having a menu field of N columns and M rows, a data window field and a prompt field, and having descriptors for each of said respective fields, 30
 - (ii) a plurality of text strings; 35
 - (iii) a plurality of graphic display run routines;
 - (iv) means for enabling said soft keys and means for identifying a respective subsequent screen in response to activation of said respective soft key; and, 40
 - programming said microcontroller to identify a first screen and having a screen select routine to: 45
 - (a) get the identified screen from said screen region of said memory and display it on said display;
 - (b) get the text strings identified by said screen descriptors of said identified screen from said text region and display said text strings in respective areas of said menu field of said screen, and enable said respective soft keys; 50
 - (c) display dynamic information in the data window field of said screen and execute graphic display run routine; 55
 - (d) await activation of one of said soft keys and repeat for next screen till end;

and
(e) execute a command file.

10. A method as claimed in claim 9 further comprising the steps of storing in said memory means a plurality of regions including: 5
- (a) a screen region having stored therein said plurality of system screens;
 - (b) a text region having stored therein said plurality of text strings;
 - (c) a dynamic field region having stored therein said graphic display run routines; and
 - (d) a soft key field having said routine for enabling said soft keys and for identifying said respective subsequent screen. 10
11. A user interface system comprising: 15
- a microcontroller for executing programmed tasks; and including:
 - a memory for storing data and executable routines, a display for displaying information, and a plurality of keys; 20
 - the memory storing data representing a plurality of display screens and associated information;
 - the microcontroller being operable to identify a first screen, fetch corresponding data from said memory and display the screen on said display with the associated information; and 25
 - further operable to execute a routine in response to activation of a said key. 30
12. A mailing machine having an interface system according to any one of claims 1 to 3, 6 to 8 and 11 or a system operable in accordance with the method of any of claims 4,5,9 and 10. 35

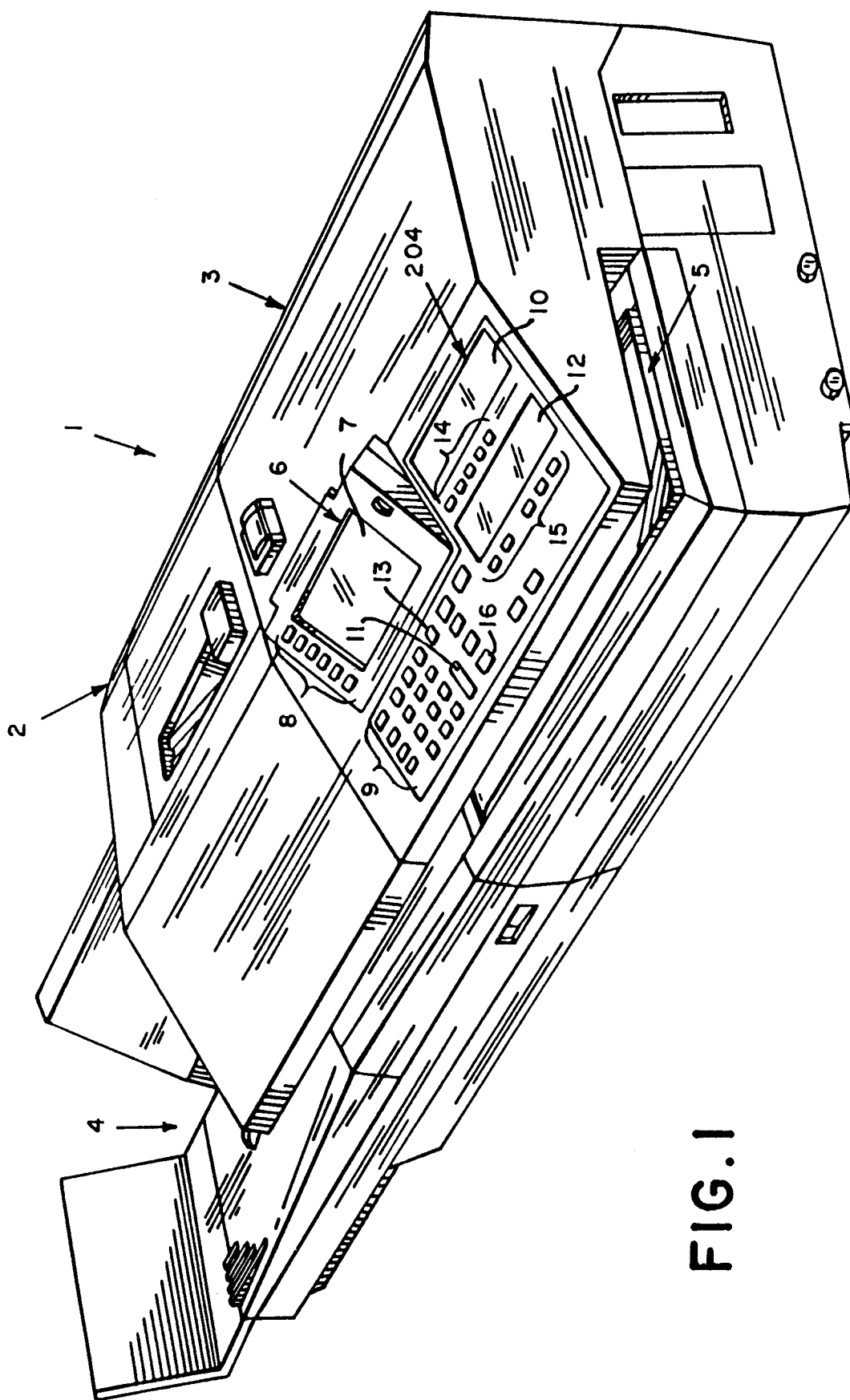


FIG. 1

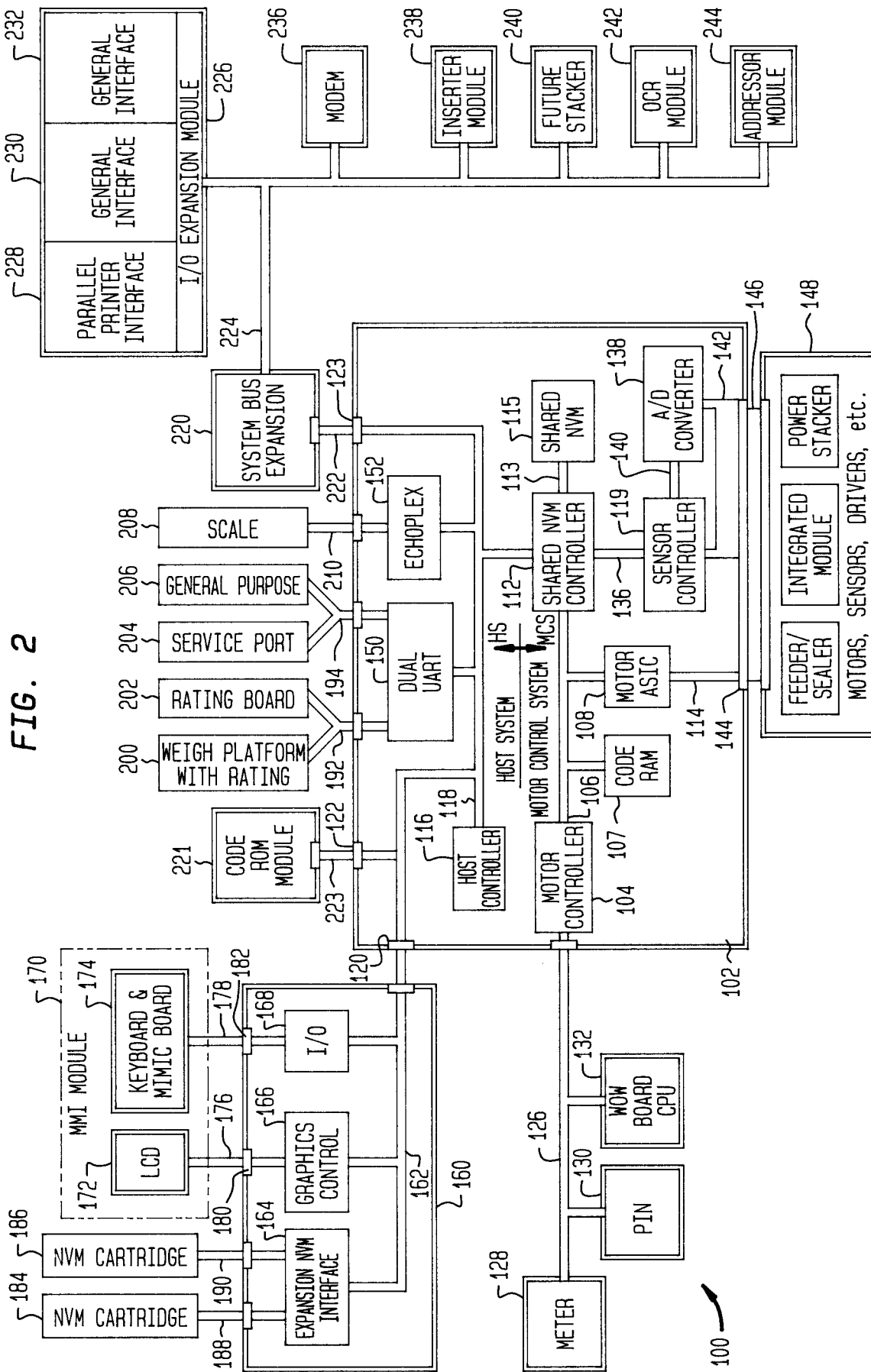


FIG. 3

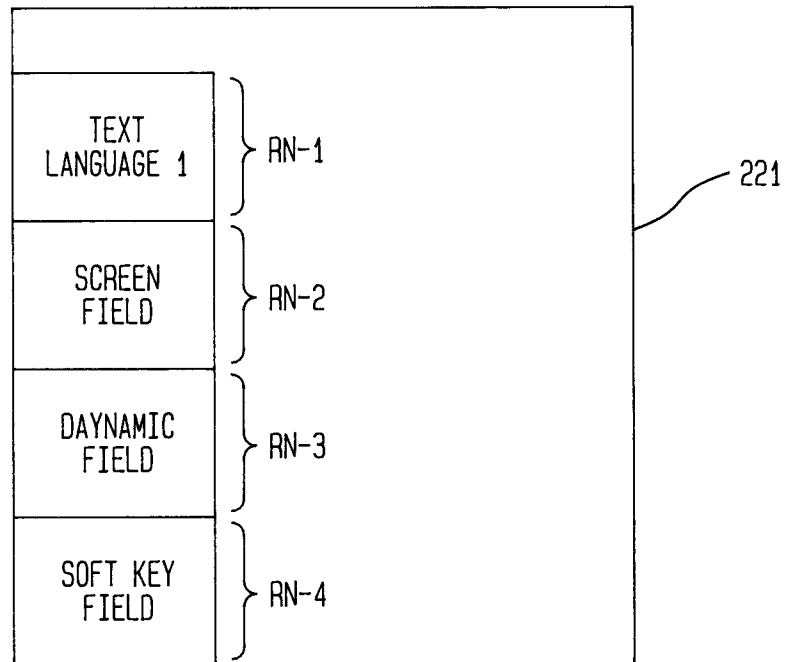


FIG. 4

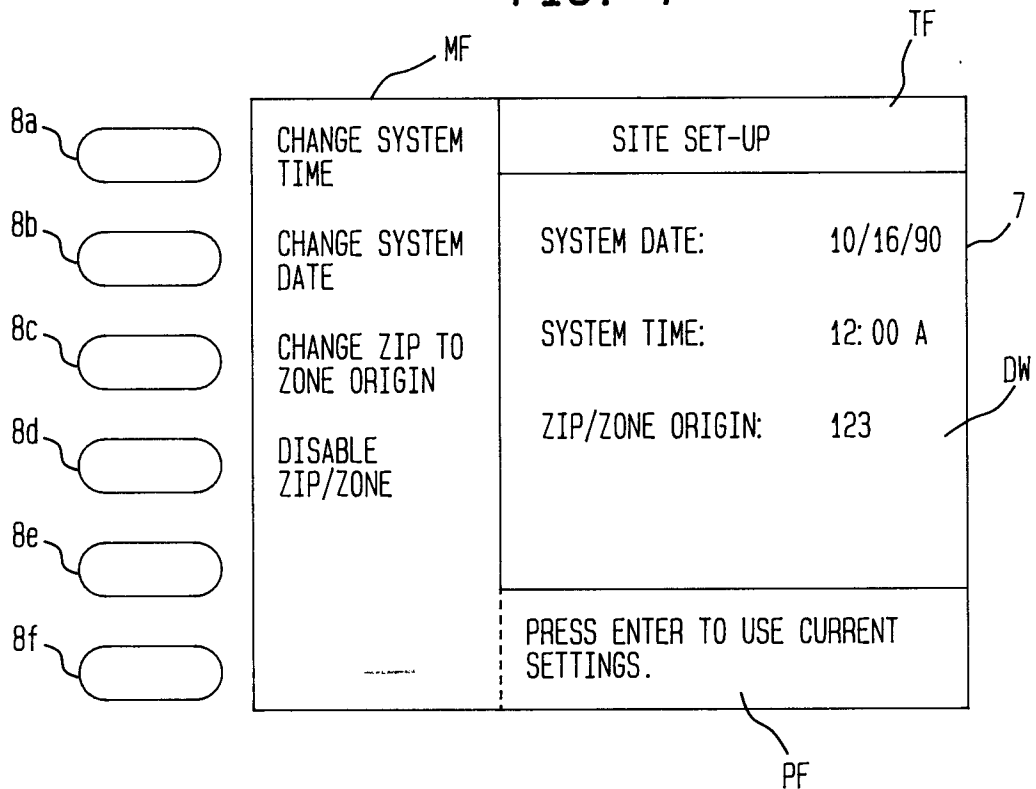
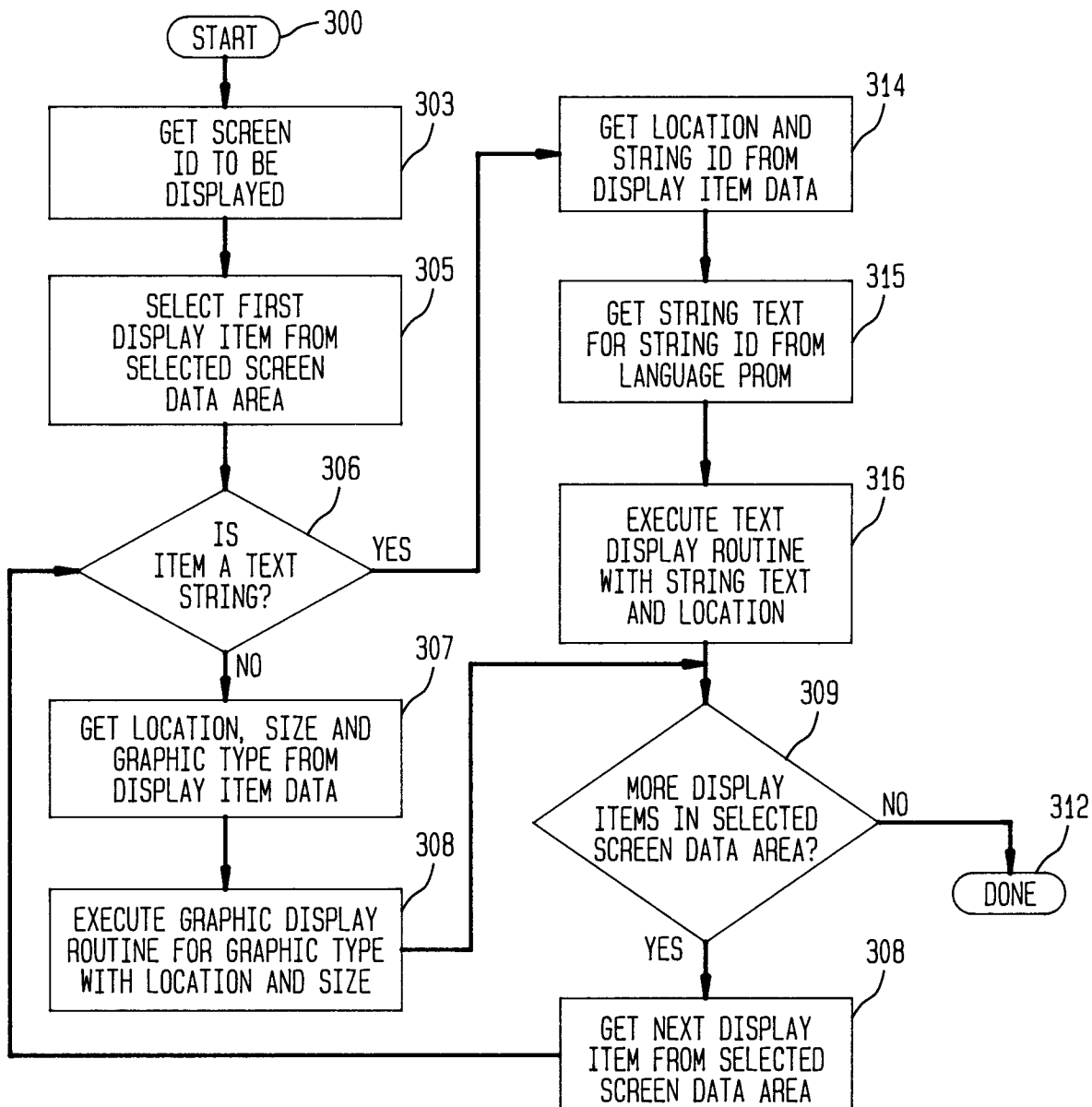


FIG. 5

(MULTIPLE-LANGUAGE CAPABILITY FOR A SYSTEM WITH "SOFT" DISPLAY
"SCREEN PAINTER" ALGORITHM)



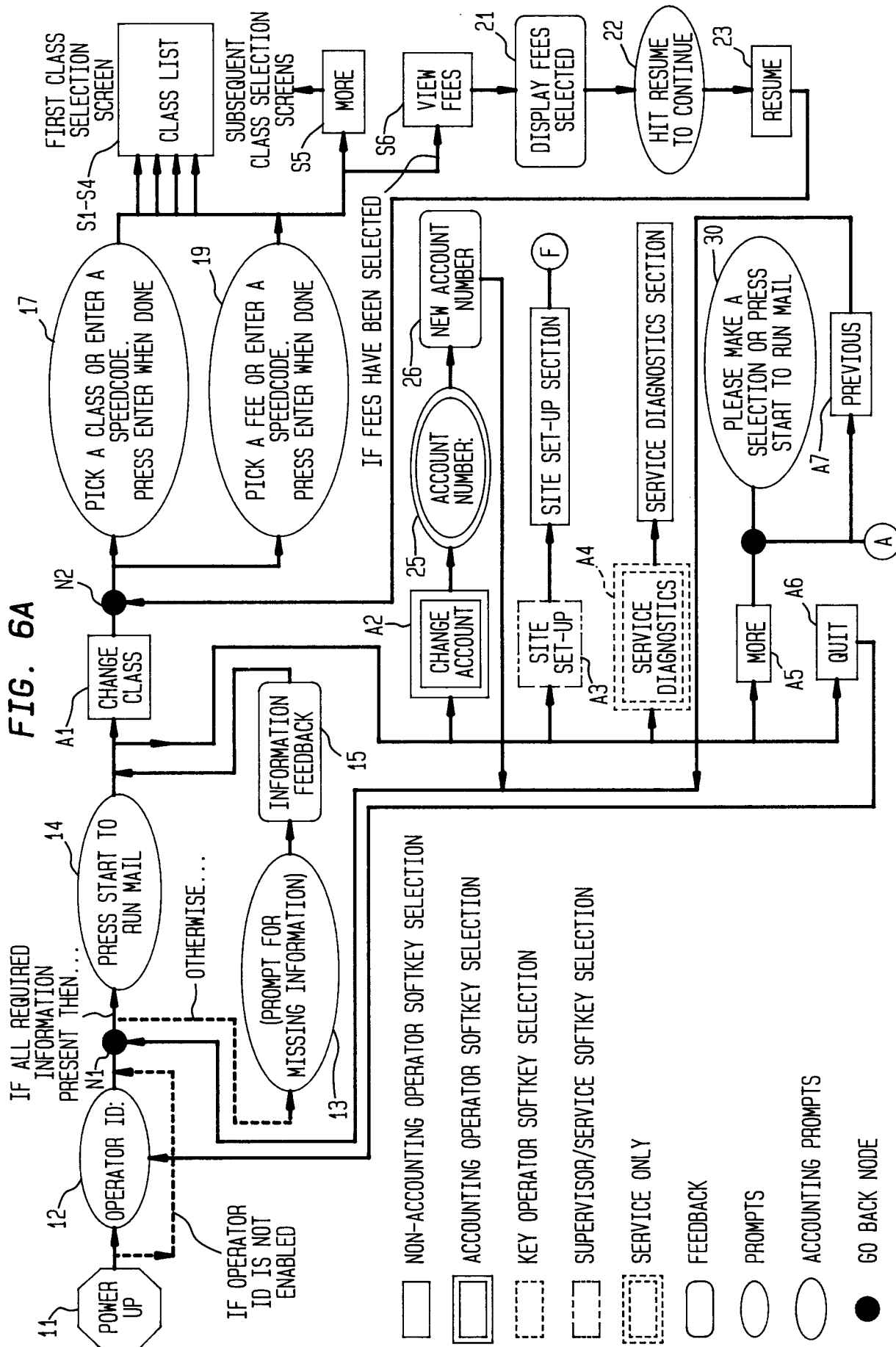


FIG. 6B

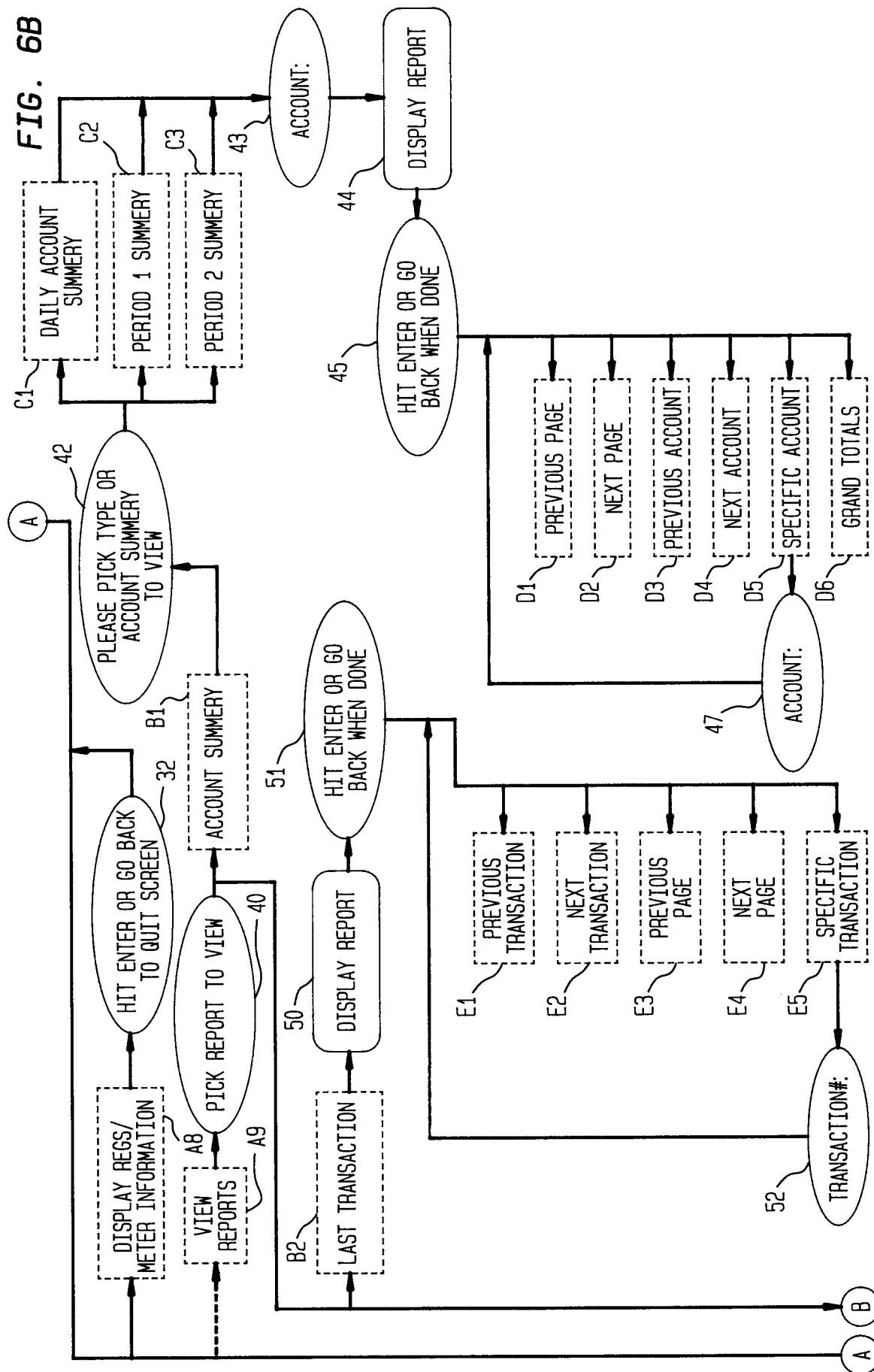


FIG. 6C

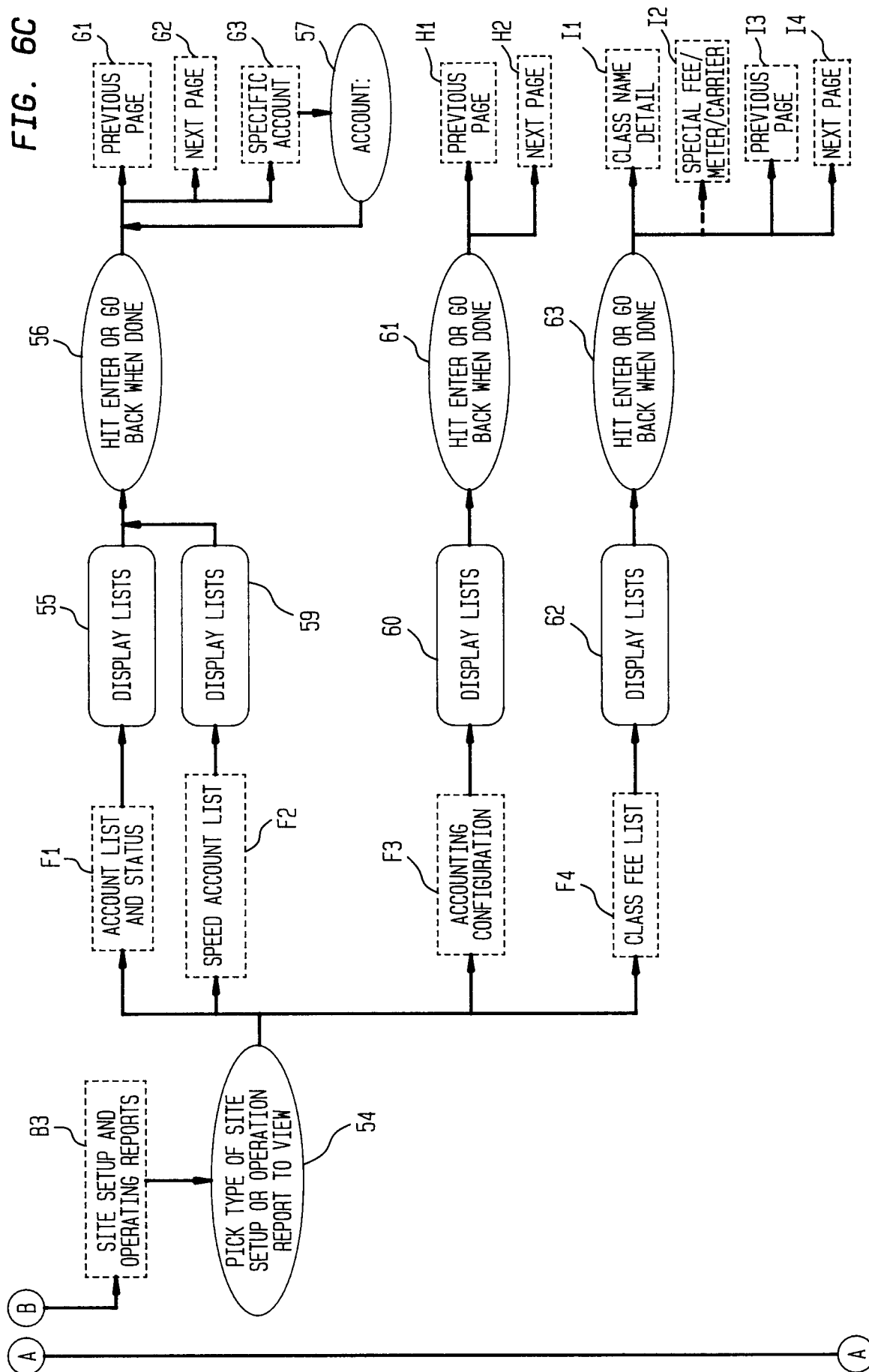
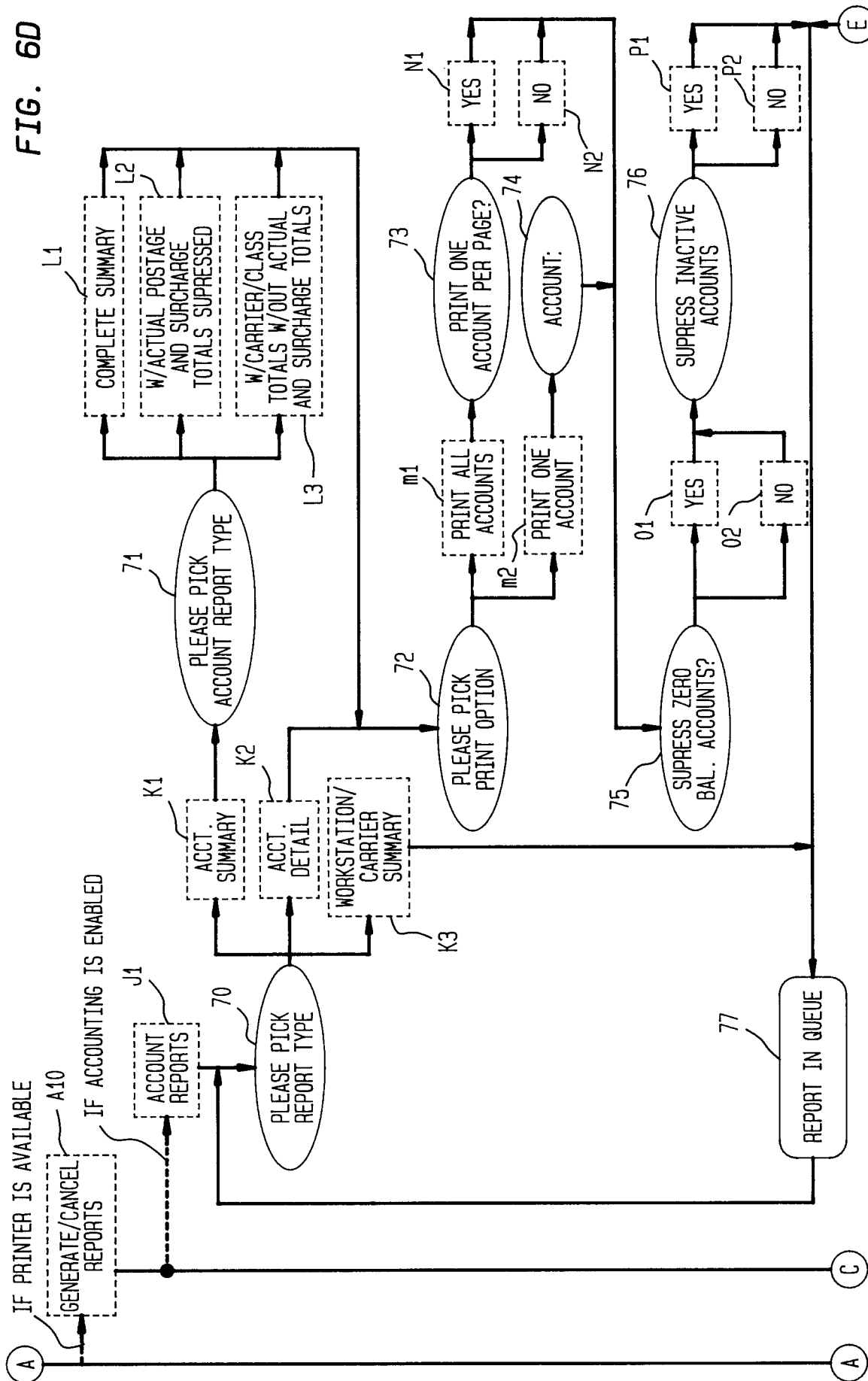


FIG. 6D



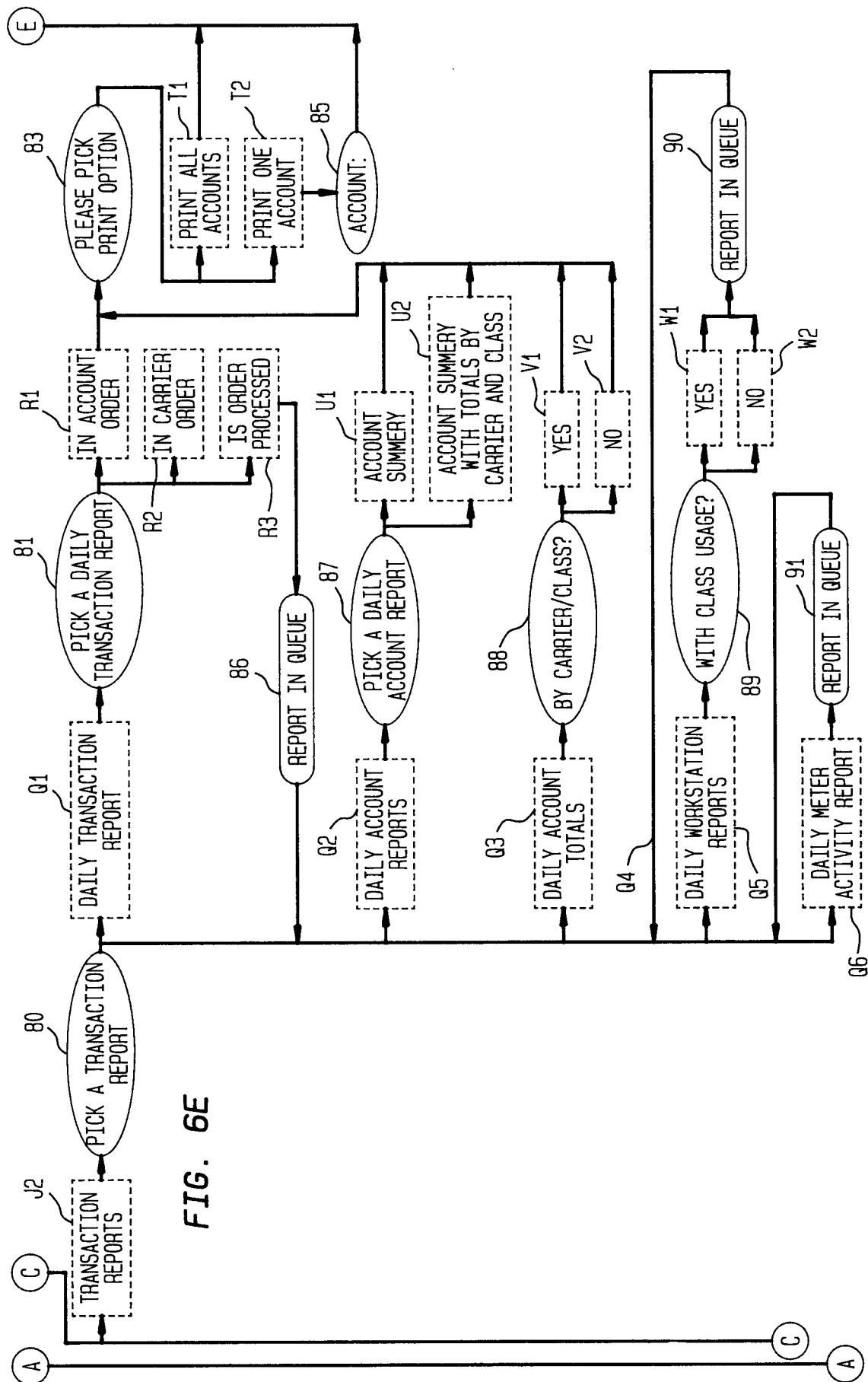


FIG. 6F

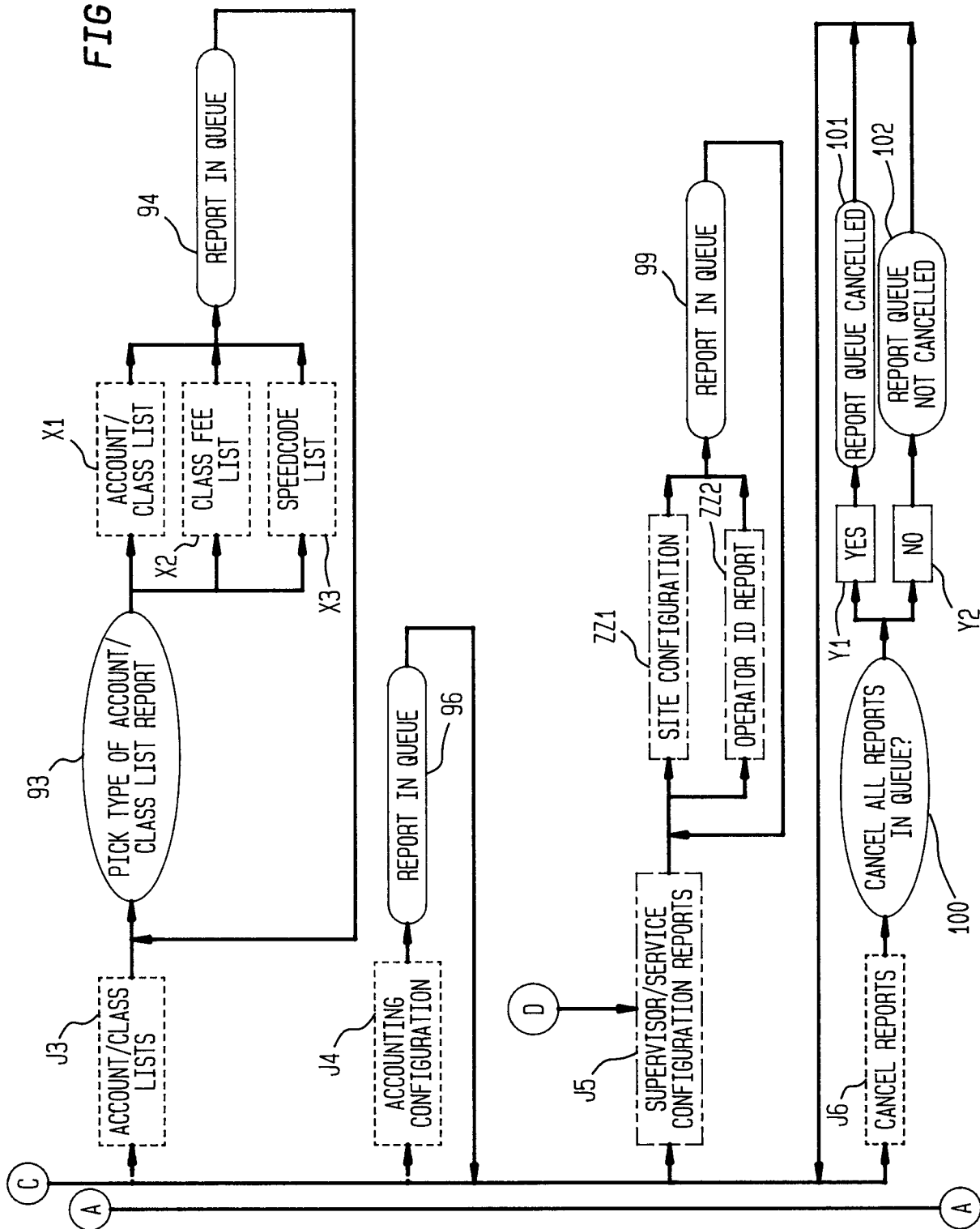


FIG. 6G

