

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
10 January 2002 (10.01.2002)

PCT

(10) International Publication Number
WO 02/03230 A1

(51) International Patent Classification⁷: **G06F 17/00**

(21) International Application Number: PCT/US01/20616

(22) International Filing Date: 28 June 2001 (28.06.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/609,190 30 June 2000 (30.06.2000) US

(71) Applicant: **OMNICELL.COM** [US/US]; 1101 East Meadow Drive, Palo Alto, CA 94303 (US).

(72) Inventors: **FAULKNER, Roger, W.**; 33 Decker Way, San Jose, CA 95127 (US). **BLANK, Jeffrey, M.**; 10811 Minette Drive, Cupertino, CA 95014 (US).

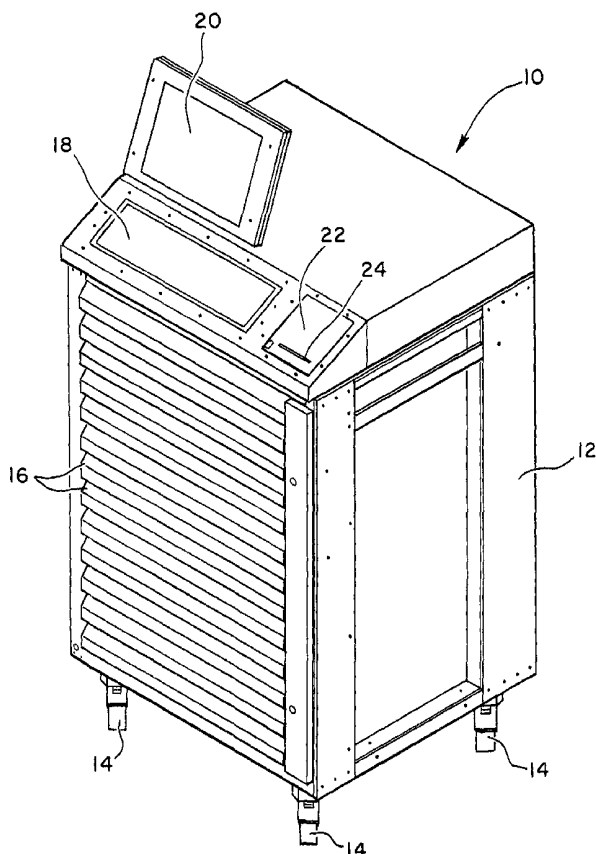
(74) Agents: **GIBBY, Darin, J.** et al.; Townsend and Townsend and Crew LLP, Two Embarcadero Center, Eighth Floor, San Francisco, CA 94111-3834 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: DISPENSING SYSTEM AND METHOD FOR DISPENSING ITEMS AND PROVIDING INFORMATION ON THE ITEMS OVER A NETWORK



(57) Abstract: A dispensing device for dispensing items comprises a cabinet having a plurality of storage locations for storing items. The dispensing device further includes a processor having an associated memory for storing item information, including the types of items and their respective storage locations within the cabinet. A display screen is coupled to the processor, and electronics are provided to permit coupling of the processor to a network. A web browser is included to permit information transferred over the network to be displayed on the display screen.



WO 02/03230 A1



Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

DISPENSING SYSTEM AND METHOD FOR DISPENSING ITEMS AND PROVIDING INFORMATION ON THE ITEMS OVER A NETWORK

5 BACKGROUND OF THE INVENTION

This invention relates generally to the field of dispensing, and in particular to the dispensing of items using a dispensing unit. More specifically, the invention relates to techniques for providing access to information about the items directly at the dispensing unit.

10 Dispensers are a popular way to distribute items because of their ability to provide security, inventory tracking and the like. For example, food items have long been dispensed from vending machines. More recently, dispensers have found use in supplying medical and/or pharmaceutical items.

In many cases, it may be desirable to provide information on the items being dispensed. For example, when dispensing pharmaceuticals it may be desirable to provide
15 information such as directions for use, warnings, possible side effects, manufacturers' specifications, the chemical structure of the pharmaceutical, and the like. Presently, no convenient way exists to provide such information while at the dispensing unit. For example, one way to provide information on pharmaceuticals is to contact a pharmacist or to call the manufacturer to obtain published literature on a particular pharmaceutical. However, such a
20 process is both inconvenient and time consuming.

Hence, this invention is related to techniques for providing convenient access to information on items being dispensed from a dispensing unit. More specifically, the invention is related to providing such information to the user while at the dispensing unit. In this way, access to the information is both convenient and easy to obtain.

25

SUMMARY OF THE INVENTION

In one embodiment, a dispensing device is provided that comprises a cabinet having a plurality of storage locations for storing items. The dispensing device further includes a processor having an associated memory for storing item information, including the
30 types of items and their respective storage locations within the cabinet. A display screen is

coupled to the processor, and electronics are provided to permit the processor to be coupled to a network. The dispensing device further includes a web browser to permit information transferred over the network to be displayed on the display screen. In this way, a user may obtain online access to information about any of the items held within the dispensing cabinet.

5 For example, the web browser may be employed to access an information server on the network that has information on one or more of the items that are stored within the cabinet. This information may be transmitted over the network and displayed on the display screen. Hence, the user has instantaneous access to a host of information relating to the items at the time of dispensing. In this way, the dispensing device provides an easy and
10 convenient way to obtain information on the items stored within the cabinet. Further, by permitting access to a network, such as the Internet, updated and accurate information may be quickly obtained and displayed.

 Conveniently, the dispensing device may be provided with software to identify URLs that are associated with information servers having information relating to the items in
15 the cabinet. Further, the dispensing device may be configured to produce an item information icon on the display screen. In this way, the item information icon may be selected to cause the dispensing device to identify a URL that is related to a specific item in the dispensing device so that information may be transmitted from the Internet and displayed on the display screen. Merely by way of example, a user may wish to remove a medical supply or
20 pharmaceutical item from the dispensing cabinet. Prior to removal, the user may select the information icon to access a web site having information on the medical supply or pharmaceutical item.

 In another aspect, the dispensing device may include an entry device to permit various types of information to be entered into the processor. For example, such information
25 may include patient identification information, user identification information, item removal information, and the like. The entry device may be configured as a keyboard, a card reader and/or a touch screen. In another aspect, the dispensing device may be configured to produce an identification page on the display screen having regions for entering the user identification information. The dispensing device may also be configured to produce a patient selection
30 page on the display screen. Conveniently, the patient selection page may have a list of patients that may be selected by touching the display screen. The dispensing device may further be configured to produce an item selection page on the display screen that has a list of

items that are held within the cabinet. Any one of the items may be selected simply by touching the display screen. An item removal page may also be produced and displayed on the display screen to permit quantity information to be entered prior to removing an item from the dispensing cabinet.

5 In still another aspect, the dispensing device may be configured to produce a web browser icon on the display screen. The web browser icon may be included in any of the pages that may be produced on the display screen. Selection of the web browser icon causes the web browser to be displayed on the display screen. In this way, the user may have access to the embedded web browser at any time simply by selecting the web browser icon.

10 Conveniently, the web browser may be configured to display a home page when the web browser icon is selected. Further, the web browser may be configured to display different types of information on the home page depending on the user. For example, some users may have access to an intranet site, and the home page may include a hypertext link to such an intranet site. Conveniently, the web browser may include a variety of conventional icons
15 such as a home icon, a forward icon, a back icon, a print icon, and the like. Further, the web browser may include a region for entering web site addresses to permit manual access to permitted web sites.

 In another aspect, a variety of techniques may be used to couple the dispensing device to a network. For example, the dispensing device may include a network card.

20 Alternatively, the dispensing device may include an integral web server, a modem, or the like.

 The invention further provides an exemplary method for dispensing items from a dispensing device. According to the method, information is entered into the dispensing device identifying an item that is held within the dispensing device. The
25 dispensing device then identifies a URL that is associated with an information server having information on the item. The information server is accessed over a computer network, and information about the item is transmitted over the computer network to the dispensing device. The information about the item is then displayed on a display screen of the dispensing device. In this way, a user may automatically receive information on an item held within the
30 dispensing device simply by entering appropriate item identification information into the dispensing device. Conveniently, the dispensing device may include a database having a list

of URLs and corresponding items that are held within the dispensing unit so that an appropriate URL may quickly be identified.

In one aspect, the dispensing device includes a web browser to display the information transmitted over the network. Conveniently, the dispensing device may also include a browse item information icon that may be selected when a user wishes to obtain information on an item held within the dispensing device. When the browse item information icon is selected, an appropriate URL is identified and the user is taken to the appropriate web site.

In another step of the method, once the item is identified, the item is removed from the dispensing device and removal of the item is recorded in a memory of the dispensing device. This may be accomplished, for example, by touching an item removal button or entering information into an appropriate region in the display screen. Further, the user may enter the quantity of the item being removed into a region on the display screen.

In another step, the user may access patient data over a local network to which the dispensing device is coupled. Patient data may be displayed on the display screen and selected by the user to associate a patient with an item that is being removed from the dispensing device.

In another aspect of the method, a web browser icon may be selected from the display screen to display the web browser on the display screen. In this way, the user may have instant access to the web browser from any of the pages simply by selecting the web browser icon. Conveniently, selection of the web browser icon will produce a home page. Further, access to certain sites may be prevented using the web browser depending on previously entered user identification information.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a front perspective view of one embodiment of a dispensing device having an embedded web browser according to the invention.

Fig. 2 is a front perspective view of an alternative embodiment of a dispensing device having an embedded web browser according to the invention.

Fig. 3 is a flowchart illustrating one method for displaying a web browser on a dispensing device according to the invention.

Fig. 4 is a flowchart illustrating a method for obtaining and viewing drug reference data using an embedded web browser of a dispensing device according to the invention.

5 Fig. 5 illustrates a user ID entry page that may be displayed on a display screen of a dispensing device according to the invention.

Fig. 6 illustrates the entry page of Fig. 5 along with a block for entering a password.

10 Fig. 7 illustrates a patient list page that may be displayed on a display screen of a dispensing device to permit a patient to be selected by touching an appropriate region on the display screen according to the invention.

Fig. 8 illustrates a specific patient page that is produced on a display screen of a dispensing device after a patient has been selected from the patient list page of Fig. 7.

15 Fig. 9 illustrates a medication removal page that may be displayed on a display screen of a dispensing device to permit a user to select a drug for removal by touching an appropriate region on the display screen according to the invention.

Fig. 10 illustrates a quantity entry page that may be displayed on a display screen of a dispensing device to permit the quantity of the specified medication to be entered prior to removal according to the invention.

20 Fig. 11 illustrates a web browser that is displaying a drug information page of a web site that was generated after a browse drug information icon of the entry page of Fig. 10 was selected.

Fig. 12 illustrates a web browser home page that may be displayed on a display screen of a dispensing device according to the invention.

25 DESCRIPTION OF THE SPECIFIC EMBODIMENTS

The invention provides various dispensers that include an embedded web browser. This provides the ability to obtain online access to information relating to items being dispensed as well as to any available information over a network. For example, the web browser may permit documents to be viewed that have been transmitted over the
30 Internet, an Intranet, an Ethernet, a local area network, or the like. The dispensers of the invention also include appropriate circuitry to permit the dispensers to be connected to a

network. For example, the dispensers may include a network card, an integral server, a modem, or the like.

The invention provides for the incorporation of an embedded web browser into essentially any type of dispenser. Merely by way of example, an embedded web browser may be included with dispensers that dispense items such as medical supplies, pharmaceuticals, office supplies, food items, spare parts, and the like. However, the invention will find particular use with dispensers for dispensing medical supplies and/or pharmaceutical items. The dispensers may be configured to provide security to the items and/or provide inventory tracking features. Examples of such dispensing units are described generally in U.S. Patent Nos. 5,805,455; 5,805,456; 5,745,366; 5,905,653; 5,927,540; 6,039,467, and PCT Application Nos. 94/07841 and 97/22379, the complete disclosures of which are herein incorporated by reference. Such dispensing units may be configured to have storage locations for holding the various items, and may include a processor having information on the types of items and their respective storage locations within the dispenser. Touch buttons or other entry devices may be employed to record any transactions. For example, a touch button may be pressed a number of times corresponding to the number of items that have been removed from a storage location adjacent the touch button. A similar process may be employed to record restocking of any items. As another example, the dispensers may include a touch-sensitive display screen or a keyboard to record removal or replacement of items.

Various security features may be provided by locking the storage locations and permitting access only when appropriate identification information has been entered. Conveniently, multiple dispensers may be included within a single location and connected by a network so that a central computer may be employed to monitor inventory levels at each of the dispensers.

Use of a web browser is advantageous in that it permits any type of web document to be viewed at the dispensing unit. For example, the web browser may be employed to view information from the Internet relating to items held within the dispensing unit. For instance, when the dispensing unit is stocked with pharmaceutical items, the web browser may be employed to display documents from a web site of a manufacturer or distributor of the pharmaceutical item. In this way, information such as directions for use,

warnings, side effects, the chemical structure of the pharmaceutical, and the like may be accessed and viewed from the dispensing unit.

Another feature of the invention is that the dispensers may be configured to automatically determine one or more URLs to access the information on a specific item held
5 within the dispensing unit. For example, a user may identify an item that is to be dispensed and then select an appropriate icon to cause the dispensing unit to connect to an appropriate web site having information related to the item. Using the web browser, this information may then be displayed at the display screen of the dispenser.

Another feature of the invention is the ability to toggle back and forth between
10 the web browser and other pages displayed on the display screen. For example, the display screen of the dispenser may include various screens for entering user information, patient information, item removal information, and the like. At any time, the user may select to switch to the web browser so that web documents may be viewed. As an alternative to toggling back and forth, the dispensers may be run on a Windows operating system to permit
15 the web browser to be displayed in one window while other pages are displayed in other windows. In one aspect, dispensers may be configured to selectively prevent access to certain sites using the web browser depending on the particular user. For example, the dispenser may be configured to filter out certain links displayed on the home page depending on the particular user. As another example, the dispensers may be configured to prevent
20 access to an Intranet depending on the entered user information. As still another example, the dispensing units may be configured to prevent access to the web browser altogether if the user is not authorized the access to the web browser.

Referring now to Fig. 1, one embodiment of a dispensing unit 10 that may be provided with an embedded web browser will be described. Dispensing unit 10 is
25 constructed of a cabinet 12 that may optionally be placed on wheels 14. Dispensing unit 10 further includes a plurality of drawers 16 that are retractable from cabinet 12. Conveniently, drawers 16 may include one or more dividers to provide multiple storage locations within each drawer. In this way, different types of items may be installed within each drawer. Although not shown, dispensing unit 10 further includes a processor having an associated
30 memory for controlling operations of dispensing unit 10. For example, the memory may include a record of the types and quantities of items held within each of the storage locations.

As such, dispensing unit 10 may be configured to be similar to the dispensing unit described in U.S. Patent No. 6,039,467, previously incorporated herein by reference.

Dispensing unit 10 further includes a keyboard 18 to permit various information to be manually input into the processor. For example, keyboard 18 may be employed to enter information such as user identification information, patient identification information, item removal and/or replacement information, URL information, and the like. A display screen 20 is also provided to permit various pages to be displayed when operating dispensing unit 10. For example, display screen 20 may be employed to display pages that elicit user information, patient information, item removal and/or replacement information or to display a web browser as described in greater detail hereinafter. Conveniently, display screen 20 may be configured as a touch screen so that various displayed items may be selected simply by touching the display screen as is known in the art.

Dispensing unit 10 may also include a printer 22 having a slot 24 through which printed information is dispensed. Use of printer 22 permits various reports, such as inventory tracking reports, restocking reports, and the like to be printed. Optionally, printer 22 may be configured to print out any information displayed on display screen 20, such as any web pages, patient information, pharmaceutical information, more the like.

In use, an item, such as a pharmaceutical item, may be removed from dispensing unit 10 by entering appropriate user and/or patient information into dispensing unit 10 using keyboard 18 and/or display screen 20. Item removal information is also entered into dispensing unit 10 along with a quantity of the item to be removed. Upon entry of the appropriate information, the appropriate drawer 16 is unlocked and the user is apprised of the appropriate drawer, either by an indicator or by partially ejecting drawer 16 from cabinet 12. The user then takes the entered quantity and enters the transaction into dispensing unit 10 for recordal. The restocking of items may proceed in a similar manner.

Dispensing unit 10 may operate on a Windows-based platform using appropriate software commercially available from Microsoft. In this way, various windows may be produced on display screen 20. Further, dispensing unit 10 includes an embedded web browser to permit web documents to be displayed on display screen 20. Although not shown, dispensing unit 10 includes appropriate electronics to permit dispensing unit 10 to be connected to a network, such as the Internet. For example, dispensing unit 10 may include a network card to permit access to the Internet.

Fig. 2 illustrates an alternative embodiment of a dispensing unit 10' that is configured to be similar to dispensing unit 10, except that dispensing unit 10' is configured as a portable or desktop unit. For convenience of illustration, elements that are similar to those of dispensing unit 10 will include the same reference numerals followed by a "'". Dispensing unit 10' is provided with a fewer number of drawers 16' as compared to the number of drawers 16 on dispensing unit 10. In this way, dispensing unit 10' may be constructed to be smaller in size and used for applications where fewer items are stored. In all other aspects, dispensing unit 10' may be constructed to be identical to dispensing unit 10 as previously described.

Referring now to Fig. 3, one method for accessing a web browser on a dispensing device, such as dispensing unit 10 or dispensing unit 10', will be described. The process begins at step 26 where the user enters identification information into the processor. The user then authenticates the identification information with a password as shown in step 28. The processor then validates the identification information and the password as shown in step 30. If the identification information and/or password are incorrect, the user is denied access to dispensing unit and is provided with the opportunity of reentering another identification information and password.

If the identification information and password are validated, the user is permitted to access the various dispensing functions offered by the dispensing unit as shown in step 32. For example, the user may follow various procedures to remove and/or replace items to or from the dispensing unit. The processor also does a check to determine if the user has access to a browser function of the dispensing unit as illustrated in step 34. If so, the dispensing unit is configured to enable the browser function on the display screen as illustrated in step 36. For example, the processor may be configured to produce a browser icon on any one of the pages that may be produced on the display screen. Once the user selects the browser function (see step 36), the embedded browser is displayed as shown in step 40. Conveniently, the embedded browser may be configured to display a home page when the browser function is selected.

Hence, according to the method outlined in Fig. 3, the user is permitted to access an embedded web browser once appropriate information has been entered into the dispensing unit. The user may then utilize the web browser to view any web documents,

including web pages that are transmitted from servers that are connected to the Internet or other types of networks.

Referring now to Fig. 4, one method for obtaining item information by using a web browser in a dispensing unit will be described. As shown in steps 42, 44 and 46, the process begins by entering user identification information and a password into the dispensing unit to permit the dispensing unit to validate the identification information and password in a manner similar to that previously described in connection with the method of Fig. 3. Once permitted access to the dispensing unit functions, the user may select a patient as shown in step 48. The user may also enter a request to remove a medication from the dispensing unit as shown in step 50. The user then selects the medication, such as by touching a highlighted medication on the display screen, as shown in step 52. Once a medication has been identified, the user may enter a request to obtain information on the selected medication as shown in step 54. Once this request is entered, the processor formulates an appropriate URL to retrieve drug reference information for the selected medication as shown in step 56. The information is then transmitted over the network and is displayed via an embedded browser on a display screen of the dispensing unit as illustrated in step 58. Hence, a user may be provided with up-to-date information on a requested item simply by entering a request into the processor. The dispensing unit then automatically determines an appropriate URL to permit the information to be transmitted from a server and displayed on the display screen of the dispensing unit using a web browser.

Referring now to Figs. 5-12, various pages that may be produced on a display screen of a dispensing unit, such as the dispensing units of Figs. 1 and 2, will be described. Fig. 5 illustrates a user identification page 60 having a block 62 to permit user identification information to be entered into the processor. This information may be entered, for example, by typing in the user identification information using a keyboard or a keypad. A region 64 is also provided giving various instructions prompting the user to enter the identification information. Also included on page 60 (as well as other pages described herein) are various icons to enable various functions of the dispensing unit. For example, a patient care icon 66 may be selected to access patient specific operations, such as remove medications, return medications and waste medications. A reports icon 68 may be selected to produce various reports, such as inventory levels, patient accounts, and the like. A resolve discrepancy icon 70 may be selected using a restocking process if the quantity of items are different than is

indicated in the memory of the dispensing unit. An inventory menu icon 72 may be selected to produce various menus used when restocking items into the dispensing unit. A user menus icon 74 may be selected to produce various menus showing the functions of the dispensing unit. An administrative menus icon 76 may be selected to produce various administrative
5 menus, such as when updating patient information, user identification information, to update URLs, and the like. Finally, an exit icon 78 may be selected where the user wishes to exit from the system.

Fig. 6 illustrates a password registration page 80 which is essentially identical to page 60 of Fig. 5, except that page 80 includes a block 82 where the user enters their
10 password.

Upon verification of the user ID and password, a patient list page 84 is produced on the display screen as illustrated in Fig. 7. Patient list page 84 includes a display region 86 for displaying names of the patients held within the health care facility. An instruction region 88 is also provided giving instructions for how to use the page. For
15 example, instructions are given to select a patient from the list. This may be accomplished, for example, by simply touching the display screen where the patient is listed. To search for a patient, the keyboard may be used to enter the first few characters of the patient's last name. Alternatively, the scroll bar may be used. A global list icon 90 may be selected to list all patients to facilitate location of a particular patient. An add new patient icon 92 is provided
20 to permit new patients to be entered into the patient list. Conveniently, a sort icon 94 may be provided to sort the patients by room.

Once a patient is selected, a patient page 96 is produced as illustrated in Fig. 8. Patient page 96 lists various information about the patient, including their room number, health condition, admission date, other notes, and the like. Patient page 96 may conveniently
25 include a next patient icon 98 to permit the user to advance to the next patient. Patient page 96 also includes a remove medication icon 100 that is selected by the user when ready to remove one or more pharmaceutical items from the dispensing unit for the identified patient. A return medication icon 102 may also be provided when the user is returning any unused items back into the dispensing unit. A waste icon 104 may also be provided to permit the
30 user to return items to waste.

When the user selects icon 100 from page 96, a medication page 106 is produced on the display screen as illustrated in Fig. 9. Medication page 106 lists the

medications that are held within the dispensing unit and that are available for dispensing. An information region 108 is provided to supply the user with searching an item selection information. For example, the user may search through the list by typing the first three characters of the name. The scroll bar, page up, page down or arrows may be employed to scroll through the list. Once an appropriate medication is displayed, it may be selected for removal by touching the touch screen over the name of the item or by selecting a remove now icon 110 once the name of the item is highlighted. A display icon 112 may also be provided to display a list of selected medications that are to be removed. A stock medication icon 114 may be provided to display medications that are stocked within the dispensing unit.

After a medication is selected, a medication display page 116 is produced on the display screen as illustrated in Fig. 10. Page 116 includes a block 118 to permit the quantity of the indicated medication that is desired to be removed from the dispensing unit. The desired amount may be entered using the keypad or by pressing the plus and minus arrows adjacent block 118. Once the desired quantity is entered, an OK icon 120 is selected to enter the request. Conveniently, a cancel icon 122 may be selected to cancel the selection. Page 116 may also include an allergy information icon 124 that may be selected to ensure that the patient is not allergic to the selected medication. A patient information icon 126 may also be selected to toggle the user back to region 96 of Fig. 8 having information on the patient.

Once the quantity of the item to remove have been entered, the user may remove the medication from the dispensing unit. The dispensing unit will then have a record of the quantity of the item removed for the selected patient. This information may periodically be sent to the central server for inventory tracking, account posting, and the like.

At the time of removal, the user may also wish to obtain more information on the selected medication. Hence, page 116 includes a browse drug information icon 128 that may be selected to enable an embedded web browser, and to display on the display screen information on the drug using the web browser as illustrated in the drug information page 130 of Fig. 11. Drug information page 130 is displayed using a web browser having various icons common to web browsers, such as a back icon 132, a forward icon 134, a stop icon 136, a refresh icon 138, a home icon 140, and a print icon 142. A return icon 144 may also be employed and may be selected to return the system to its normal operating function as previously described in connection with Figs. 5-10. Page 130 further includes a region 146

for displaying a URL of a server from which the information displayed on page 130 is being obtained. For example, in Fig. 11 a drug web site server has been accessed to display information on the selected drug.

Conveniently, the dispensing unit may be configured to automatically
5 determine a URL that is associated with the drug selected on page 116 of Fig. 10. Hence, when the user selects browse drug information icon 128, the dispensing unit automatically determines an appropriate URL and displays the drug information on page 130 using the web browser. Depending on the accessed web site, a variety of information may be displayed on page 130. For example, various hypertext links for suppliers of the drug may be provided.
10 These links may be selected by the user to take the user to web pages of other suppliers to obtain other information on the drug. Page 130 may also display the chemical structure of the drug along with available quantity. As shown, hypertext links are also provided to give a written description of the drug, a mechanism of action, and the pharmacokinetics. Other * hypertext links include dosages, precautions, drug interactions, adverse reactions, costs,
15 product identification, classification, and the like. Further, it will be appreciated that the user may enter a URL into region 146 to access other servers to obtain information on the selected item, or any information available over the Internet.

As shown in Figs. 7-9, the various pages also include a browser icon 148. This icon may be selected at any time to activate the web browser of the dispensing unit.
20 When icon 148 is selected, a home or default page 150 is displayed on the display screen as illustrated in Fig. 12. The web browser includes the same icons previously described in connection with Fig. 11, and for convenience of illustration will use the same reference numerals. The home page may include various information, advertising, and hypertext links to permit the user to access other sites. For example, links may be provided to obtain
25 information on a medical facility's policies and procedures, to access Rx data acceptance information, to view policies on user IDs and Passwords, to access the web sites of various companies, and the like. The user may also enter their own URL address into block 146 to access any server over the Internet.

Conveniently, the dispensing unit may be configured to produce a differently
30 configured home page depending on the entered user identification information. In this way, the user may be limited to only certain information using the web browser. Alternatively, the user may be denied access to the web browser altogether unless appropriate identification

information is entered. In some cases, the user may be provided with access to an Intranet using the web browser. This access may also be limited depending on the entered user identification information.

Hence, the dispensing systems of the invention may be provided with an
5 embedded web browser that may be accessed at any time to obtain information over a network connection. Further, the dispensing units may be configured to automatically access a server having information on items within the dispensing units to provide online information about the items. In this way, the user is provided with a host of information directly from the dispensing unit.

10 The invention has now been described in detail for purposes of clarity and understanding. However, it will be appreciated if certain changes and modifications may be practiced within the scope of the appended claim.

WHAT IS CLAIMED IS:

1 1. A dispensing device for dispensing items, the device comprising:
2 a cabinet having a plurality of storage locations for storing items;
3 a processor having an associated memory for storing item information,
4 including the types of items and their respective storage locations within the cabinet;
5 a display screen coupled to the processor;
6 electronics to permit coupling of the processor to a network; and
7 a web browser to permit information transmitted over the network to be
8 displayed on the display screen.

1 2. A dispensing device as in claim 1, wherein the web browser is
2 configured to provide access to an information server on the network having information on
3 at least some of the items stored within the cabinet, and to permit the information to be
4 transmitted over the network and displayed on the display screen.

1 3. A device as in claim 2, further comprising code to identify URLs that
2 associated with information servers having information relating to the items in the cabinet.

1 4. A device as in claim 3, further comprising code to produce an item
2 information icon on the display screen, wherein the item information icon is selectable to
3 display on the display screen information specific to a selected item using the web browser.

1 5. A device as in claim 1, wherein the dispensing cabinet includes
2 medical and/or pharmaceutical items.

1 6. A device as in claim 1, further comprising an entry device to permit
2 information to be entered into the processor, including patient identification information, user
3 identification information, and item removal information.

1 7. A device as in claim 6, further comprising code to produce an
2 identification page on the display screen, the identification page having regions for entering
3 the user identification information.

1 8. A device as in claim 6, further comprising code to produce a patient
2 selection page on the display screen, the patient selection page having a list of patients that
3 are selectable by touching the display screen.

1 9. A device as in claim 6, further comprising code to produce an item
2 selection page on the display screen, the item selection page having a list of the items that are
3 held within the cabinet and that are selectable by touching the display screen.

1 10. A device as in claim 9, further comprising code to produce an item
2 removal page having a region for entering a quantity of an item to be removed from the
3 cabinet.

1 11. A device as in claim 1, further comprising code to produce a web
2 browser icon on the display screen and to display the web browser on the display screen
3 when the web browser icon is selected.

1 12. A device as in claim 11, further comprising code to produce a web
2 browser home page when the web browser icon is selected.

1 13. A device as in claim 12, further comprising code to list certain
2 information on the home page depending on the previously entered user information.

1 14. A device as in claim 1, further comprising code to prevent access to
2 certain sites using the web browser depending on previously entered user information.

1 15. A device as in claim 1, wherein the web browser includes icons
2 selected from a group consisting of a home icon, a forward icon, a back icon, and a print icon.

1 16. A device as in claim 1, wherein the electronics comprises a network
2 card.

1 17. A method for dispensing items from a dispensing device, the method
2 comprising:
3 providing a dispensing device comprising a cabinet having a plurality of
4 storage locations for storing items, a processor having an associated memory for storing item

5 information, including the types of items and their respective storage locations within the
6 cabinet, and a display screen coupled to the processor;
7 entering into the dispensing device information identifying an item held within
8 the dispensing device;
9 identifying a URL that is associated with an information server having
10 information on the item;
11 accessing the information server over a computer network; and
12 transmitting information about the item over the computer network and to the
13 dispensing device; and
14 displaying the information about the item on a display screen of the dispensing
15 device.

1 18. A method as in claim 17, further comprising displaying the
2 information using a web browser.

1 19. A method as in claim 18, further comprising selecting a browse item
2 information icon to display the item information on the display screen.

1 20. A method as in claim 17, further comprising removing the item from
2 the dispensing device and recording removal of the item in the memory.

1 21. A method as in claim 20, wherein the recording step comprises
2 entering a quantity of the item removed into a region on the display screen.

1 22. A method as in claim 17, further comprising entering into the
2 processor user identification information.

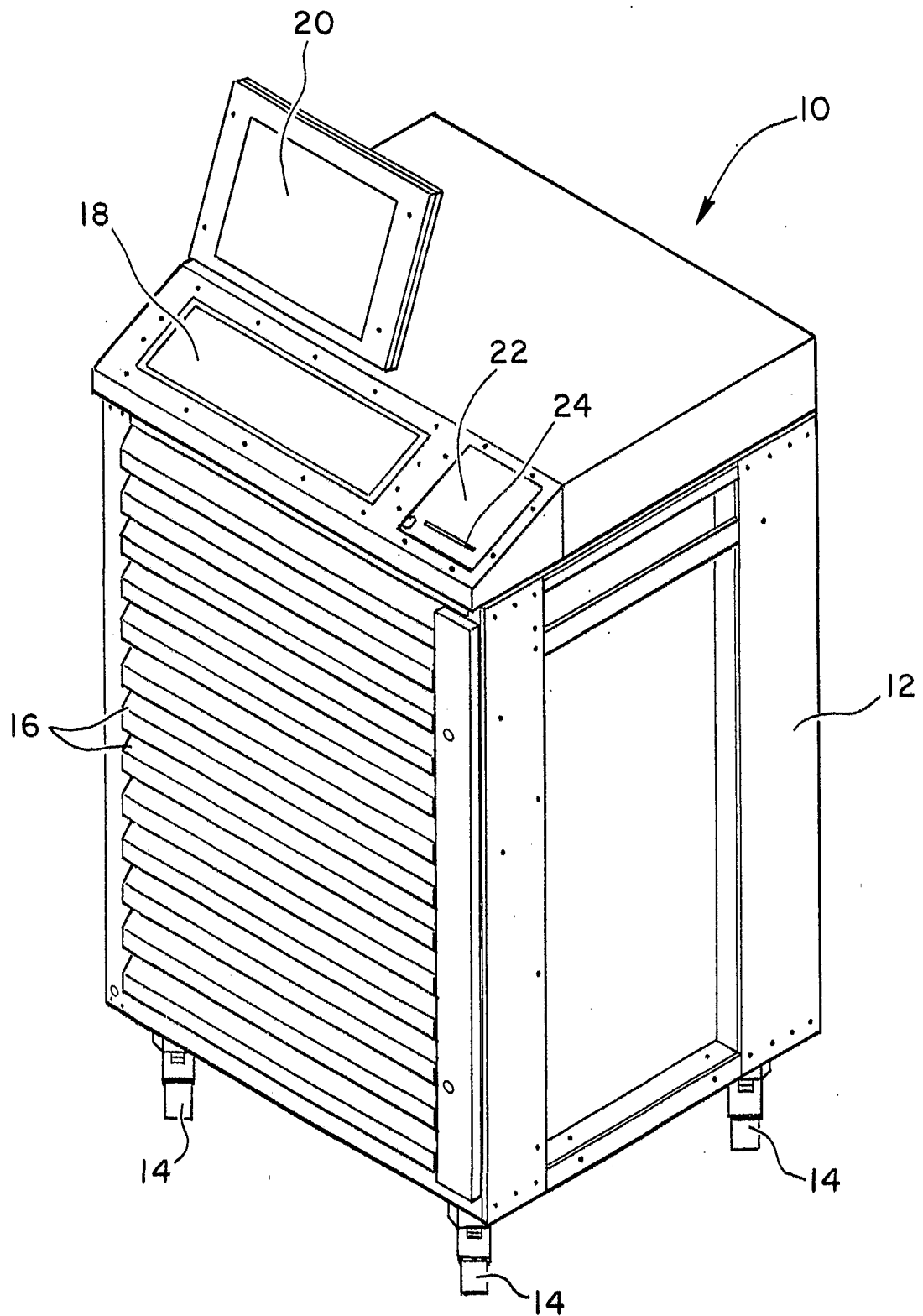
1 23. A method as in claim 17, further comprising accessing patient data
2 over a local network and displaying the patient data on the display screen.

1 24. A method as in claim 18, further comprising selecting a web browser
2 icon on the display screen to display the web browser on the display screen.

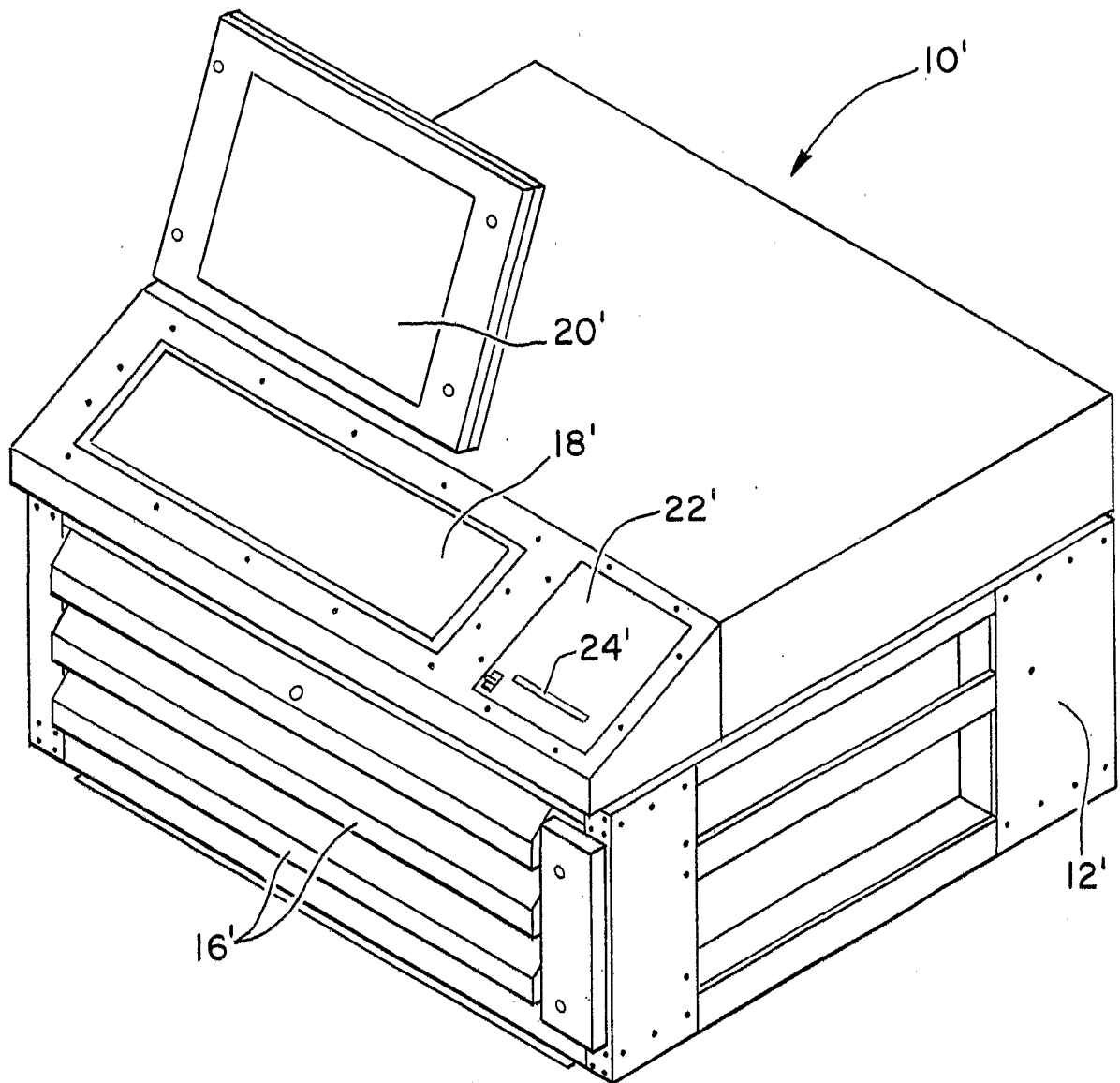
1 25. A method as in claim 24, wherein the web browser is configured to
2 display a home page.

- 1 26. A method as in claim 25, further comprising preventing access to
2 certain sites using the web browser depending on previously entered user identification
3 information.

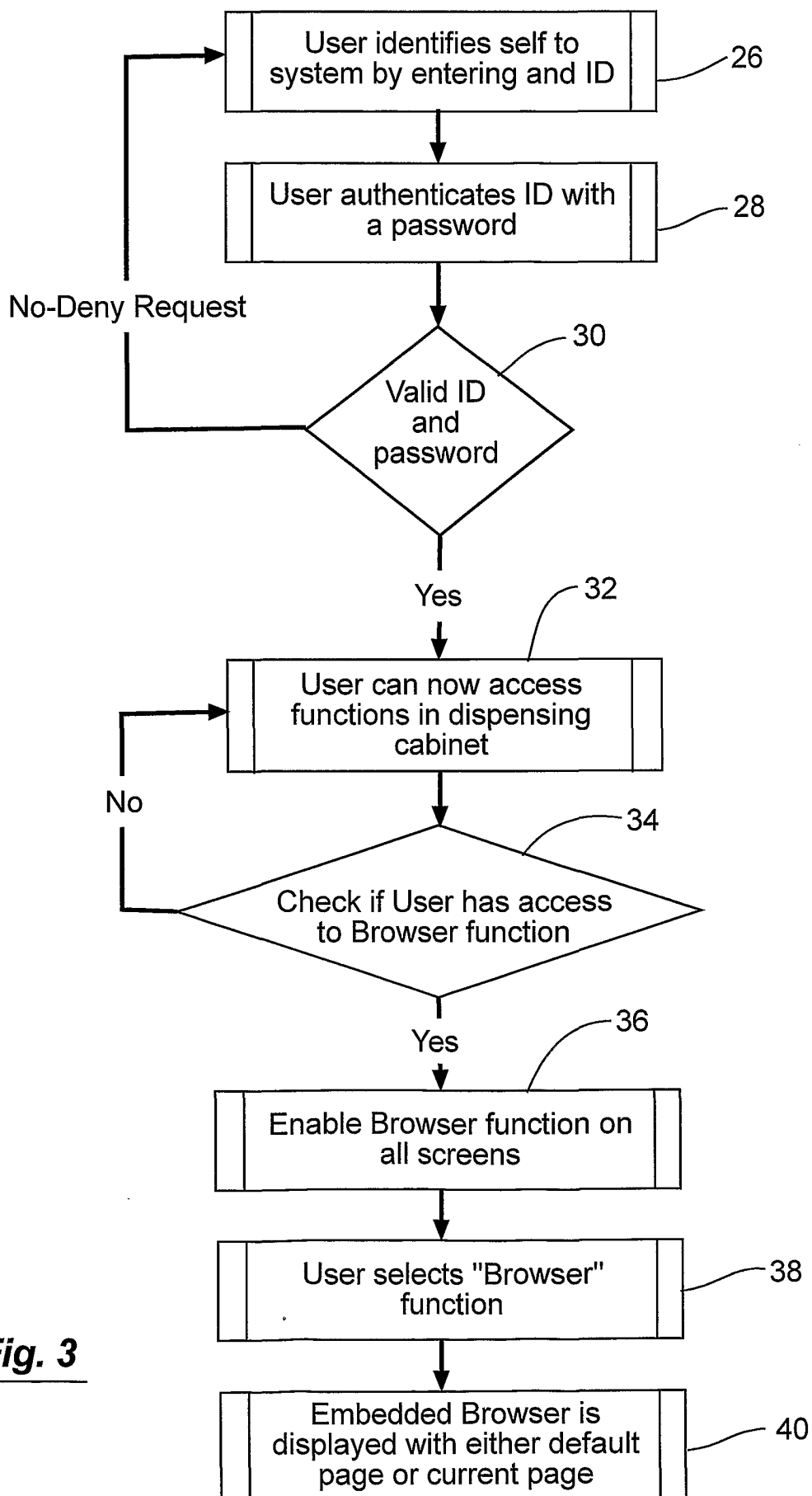
1/12

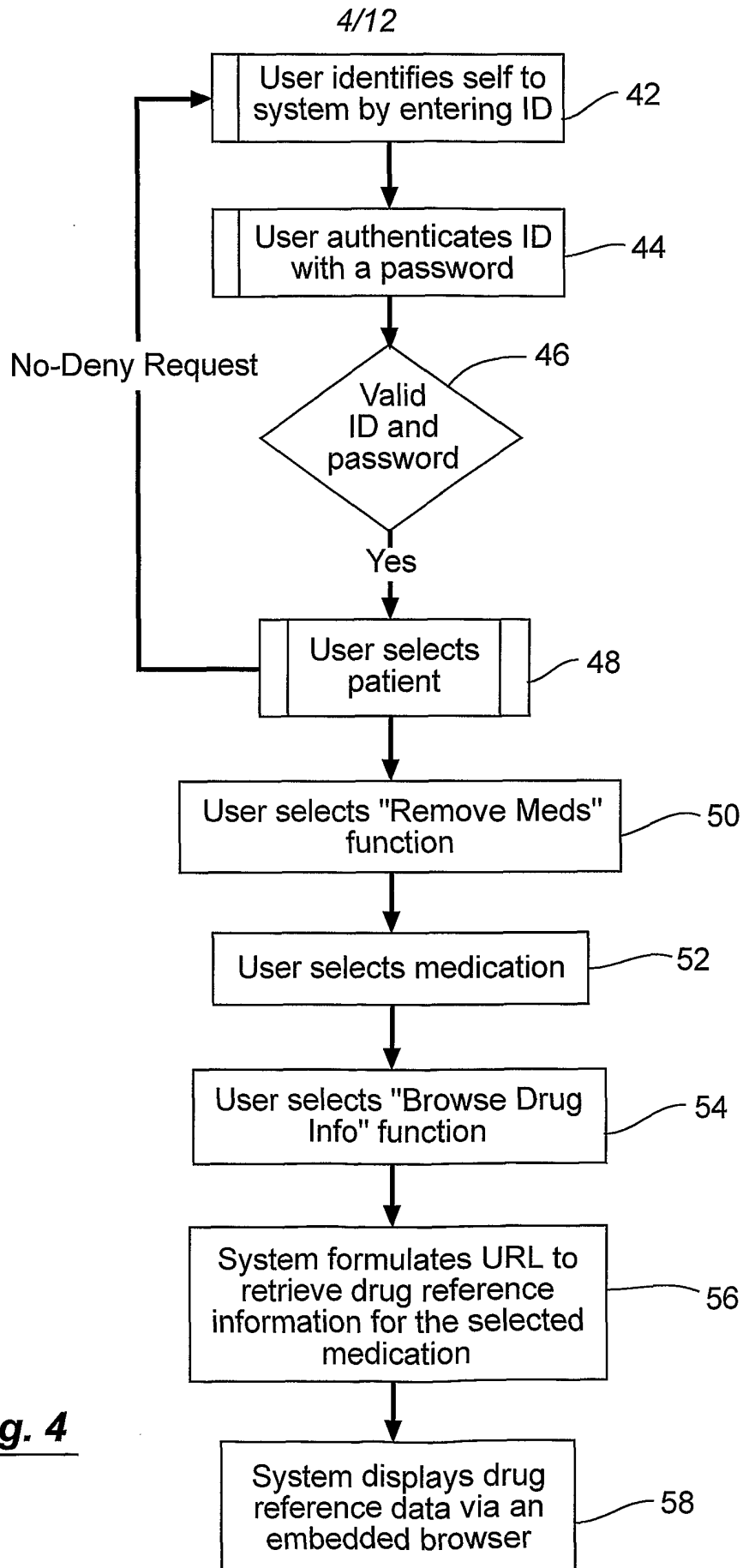
Fig. 1

2/12

**Fig. 2**

3/12

**Fig. 3**

**Fig. 4**

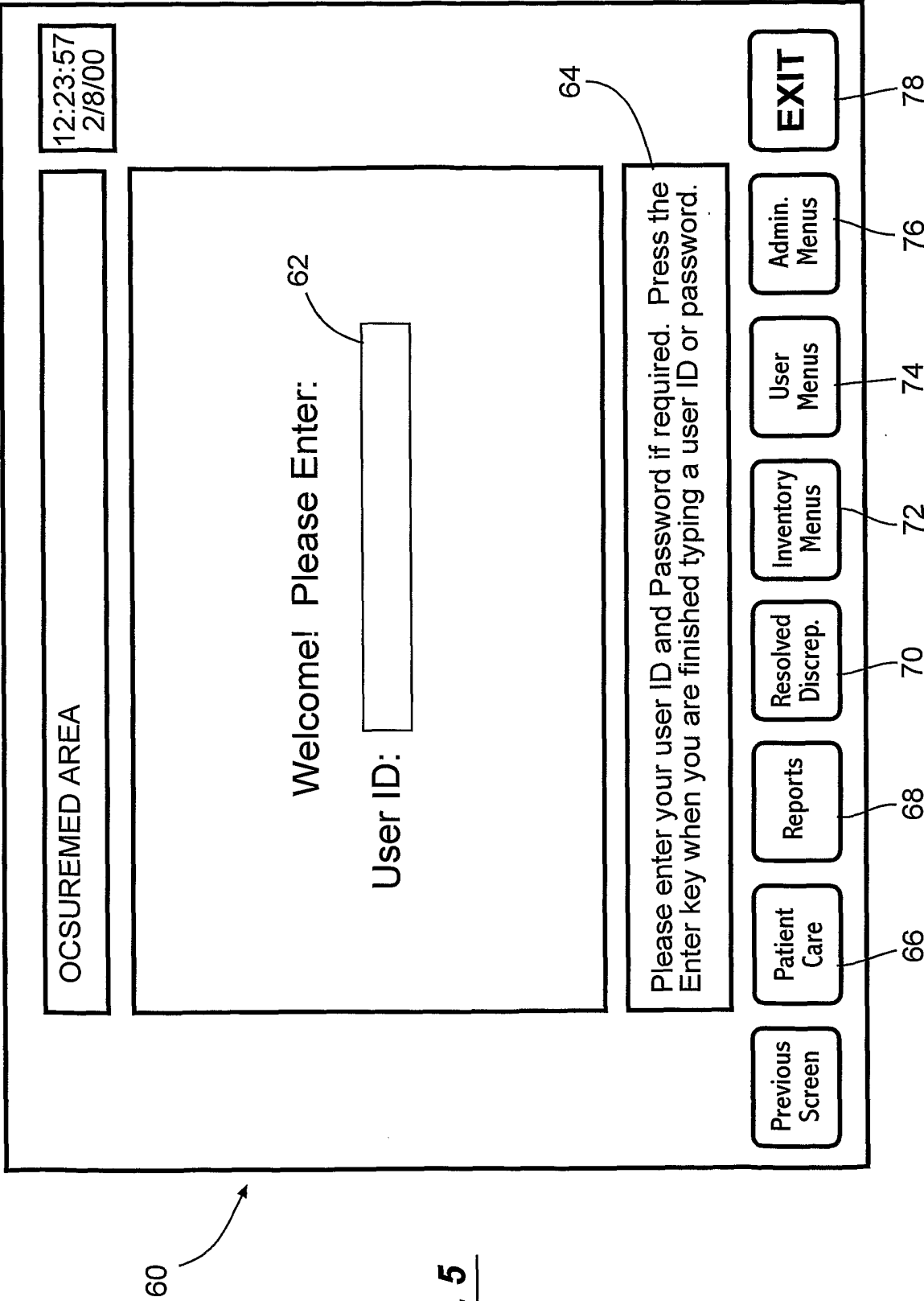


Fig. 5

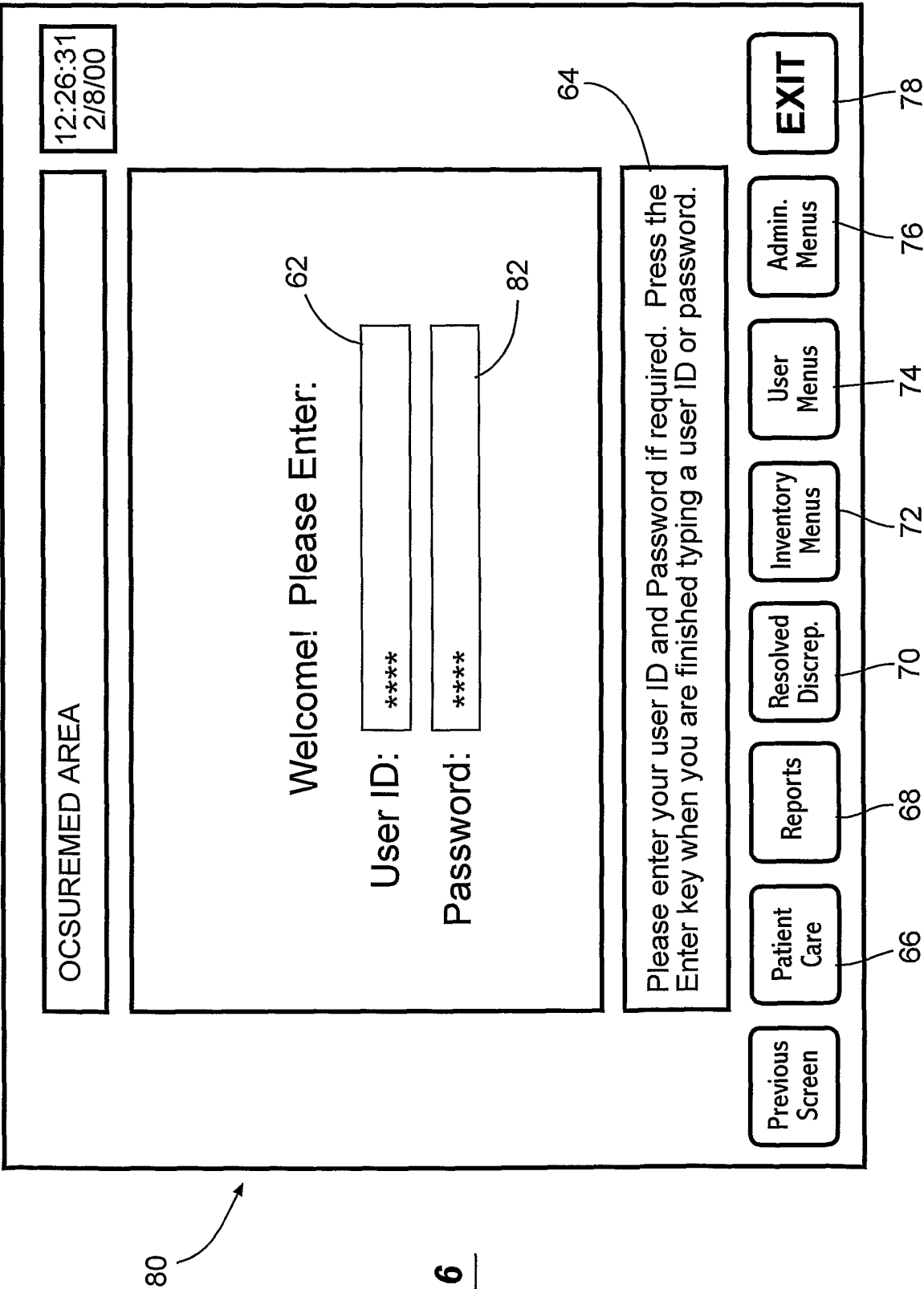


Fig. 6

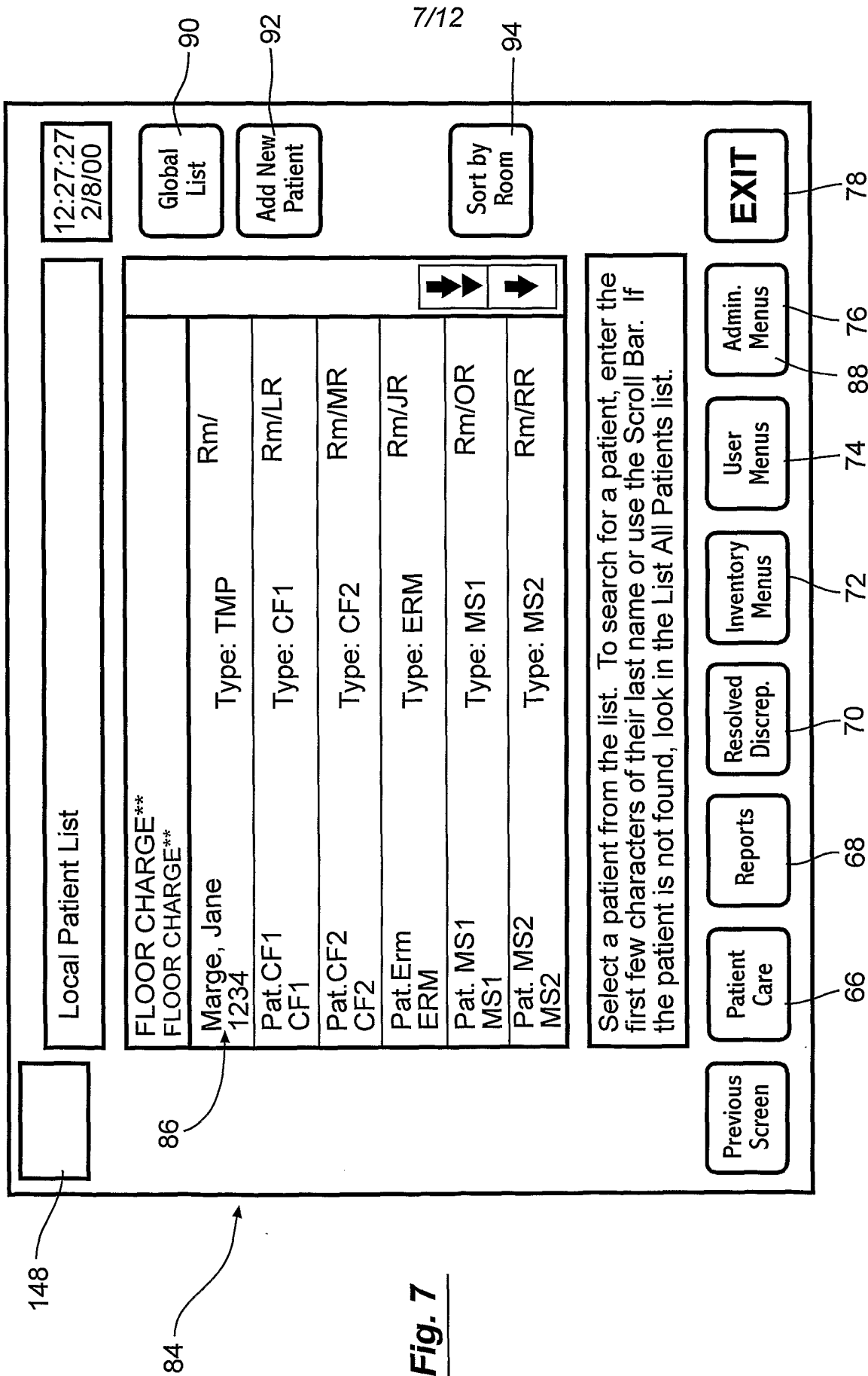


Fig. 7

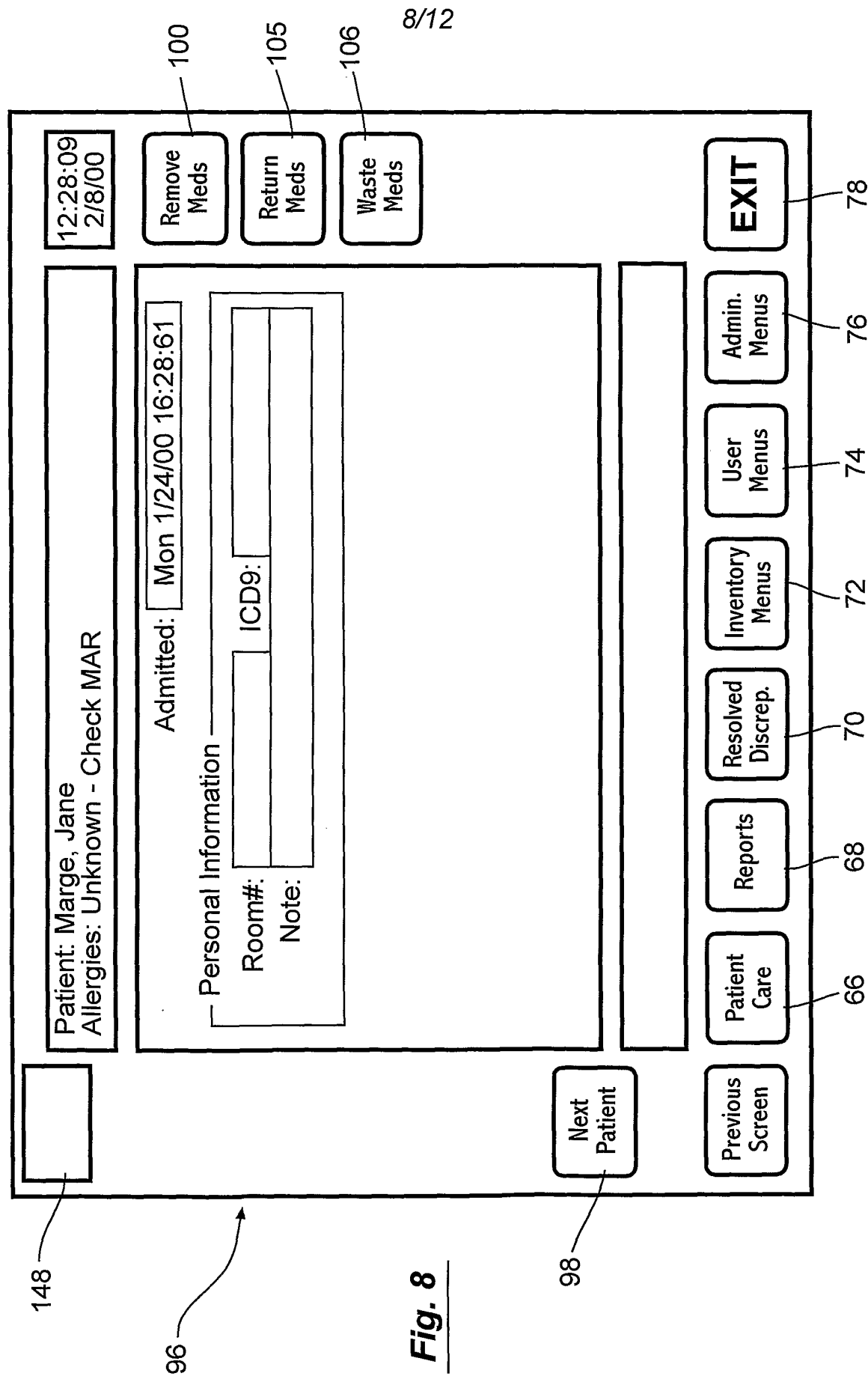


Fig. 8

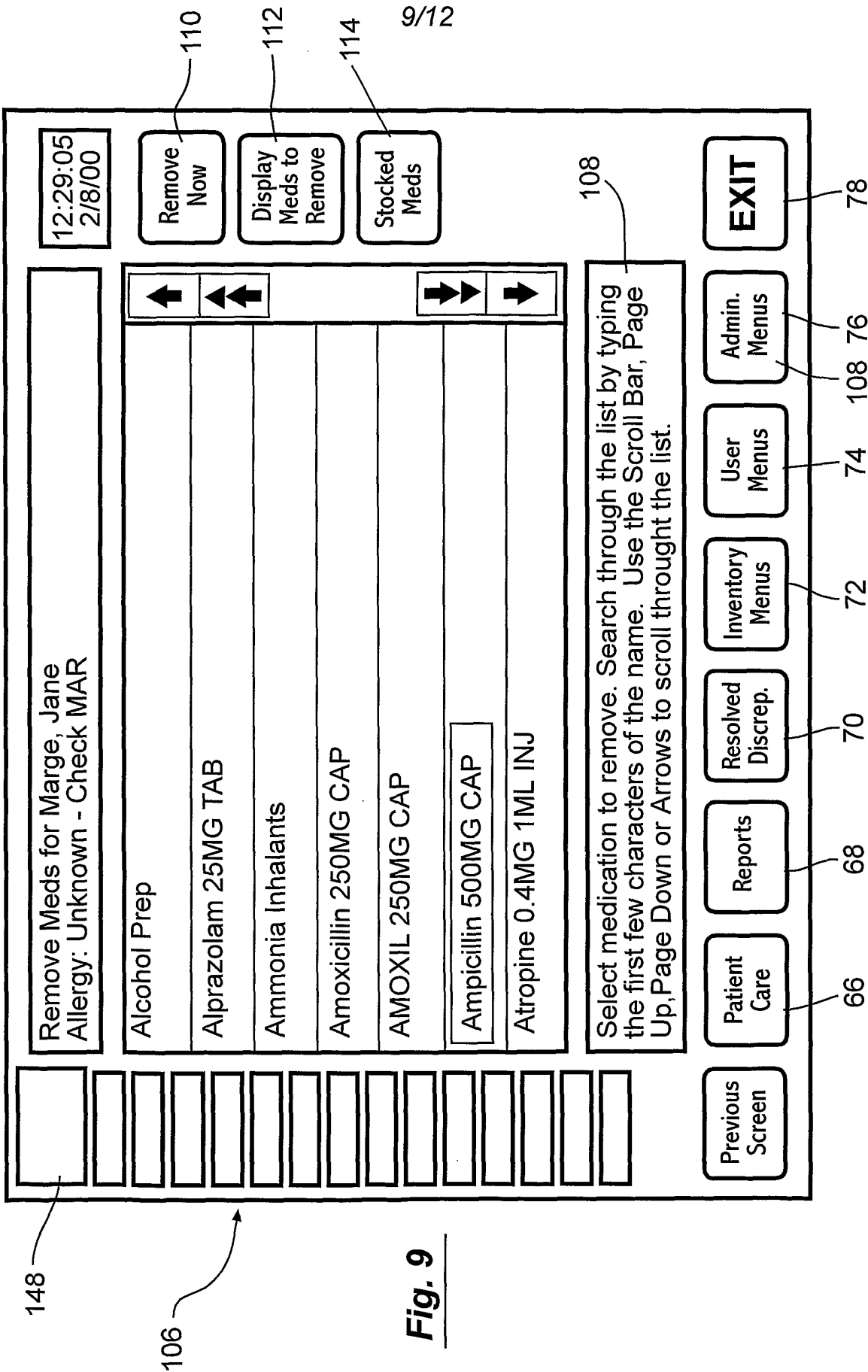


Fig. 9

10/12

12:29:44
2/8/00

120

122
Cancel Selection

Remove Meds for: Marge, Jane
Allergies: Unknown - Check MAR

Ampicillin 500mg CAP

Item Note:

Quantity to Remove: 1 EA
118

+

-

Enter the amount you wish to remove and press the OK button or ENTER when done. You may use the Arrows to increase or decrease the quantity.

124

Allergy Info

126

Patient Info

116

128

Browse Drug Info

Previous Screen

Patient Care

Reports

Resolved Discrep.

Inventory Menus

User Menus

Admin. Menus

EXIT

Fig. 10

11/12

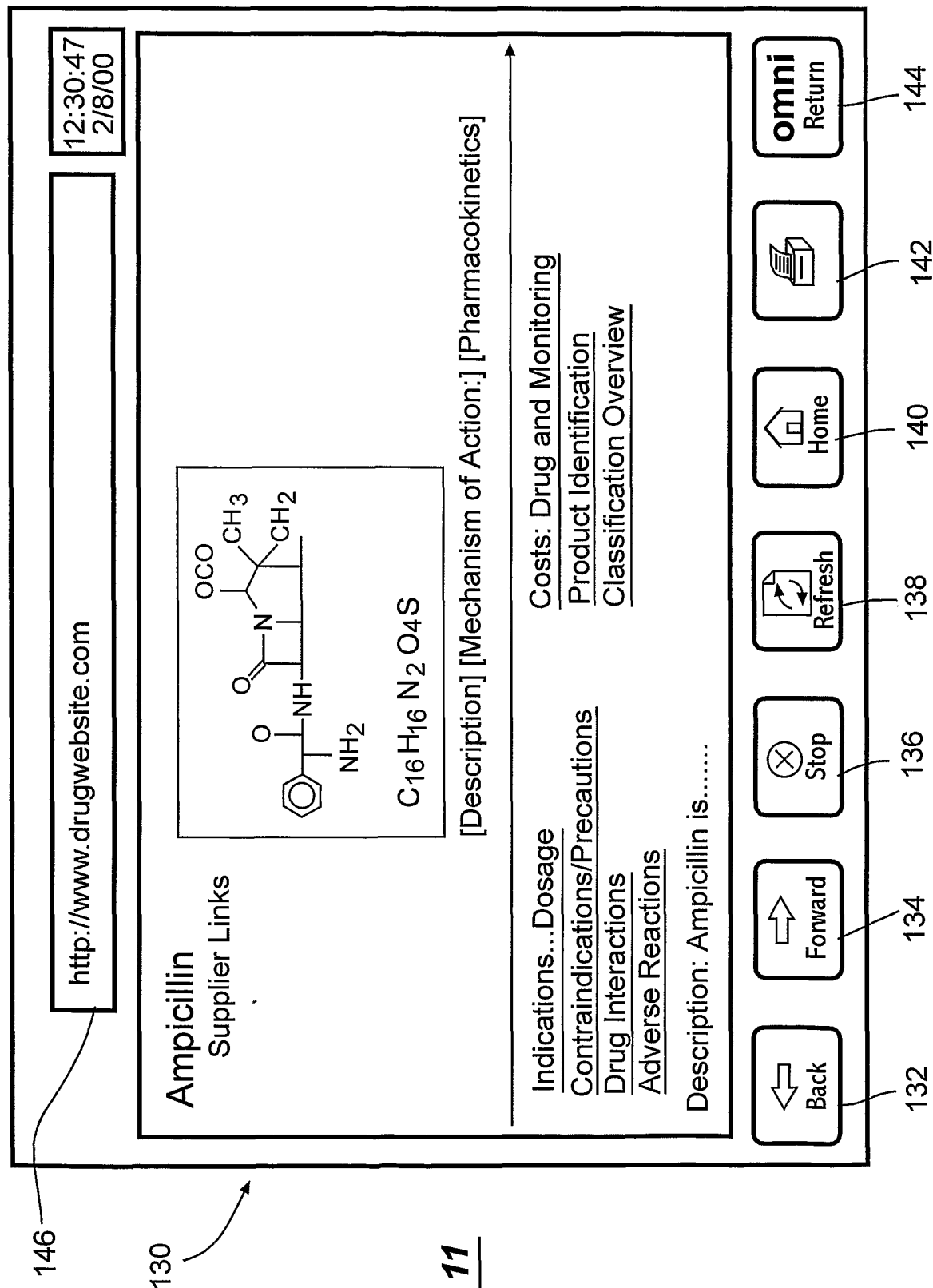


Fig. 11

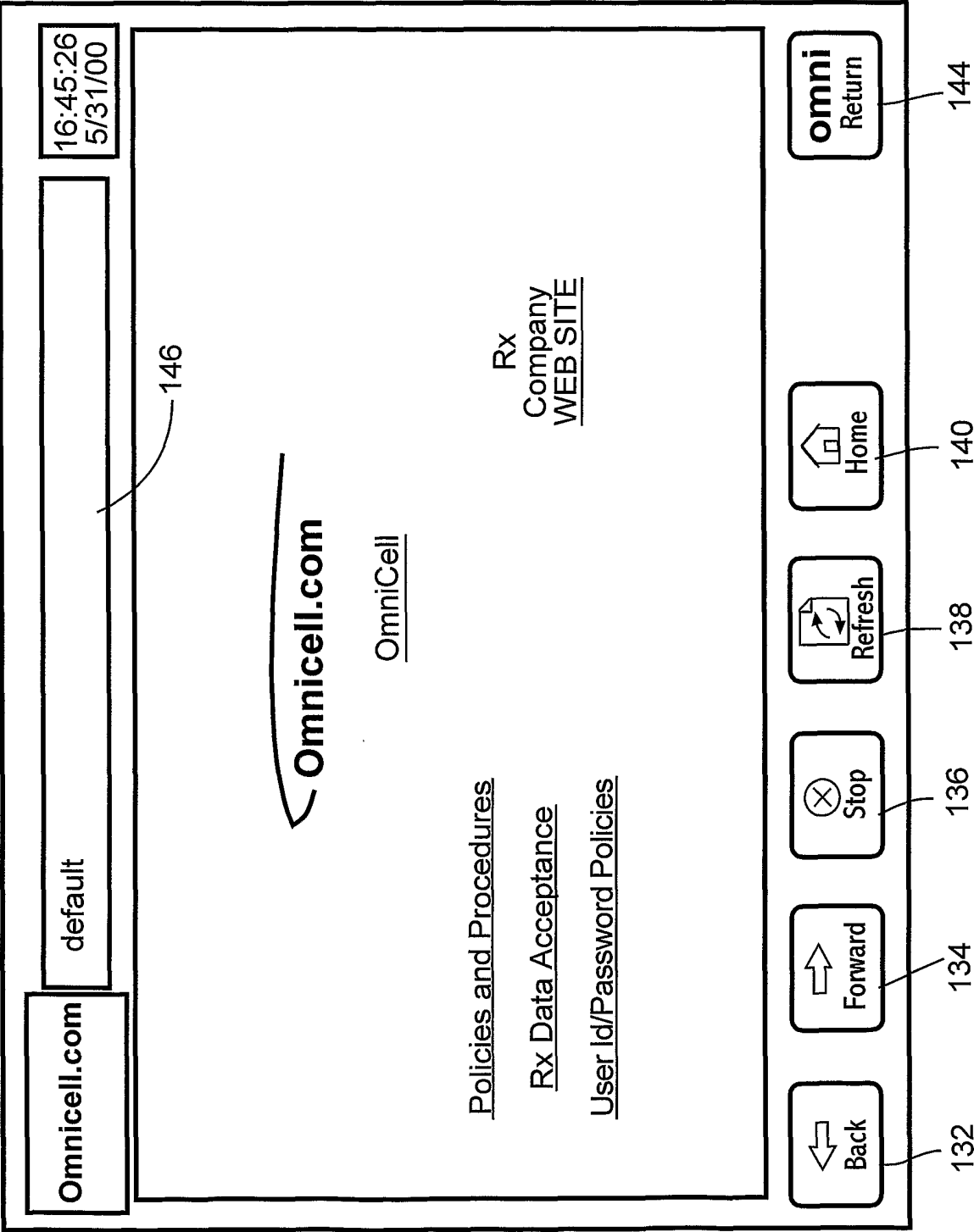


Fig. 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/20616

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06F 17/00

US CL : 700/233

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. : 700/214-216, 221, 225, 233, 236, 237, 242

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)
EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,068,156A (LIFF ET AL) 30 MAY 2000 (30/05/00), SEE ENTIRE DOCUMENT.	1-26
A	US 6,011,999A (HOLMES) 04 JANUARY 2000 (04/01/00), SEE ENTIRE DOCUMENT.	1-26
A	US 5,377,864A (BLECHL T AL) 03 JANUARY 1995 (03/01/95), SEE ENTIRE DOCUMENT.	1-26
A, P	US 6,151,536A (ARNOLD ET AL) 21 NOVEMBER 2000 (21/11/00), SEE ENTIRE DOCUMENT.	1-26
A, P	US 6,112,181A (SHEAR ET AL) 29 AUGUST 2000 (29/08/00), SEE ENTIRE DOCUMENT.	1-26

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"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)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

24 July 2001 (24.07.2001)

Date of mailing of the international search report

28 AUG 2001

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer

Christopher P. Ellis

Telephone No. 703/308-1113