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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : G06F 3/033 — A1

(11) International Publication Number: WO 97/36223

(43) International Publication Date: 2 October 1997 (02.10.97)

(21) International Application Number: PCT/JP97/01038

(22) International Filing Date: 27 March 1997 (27.03.97)

(30) Priority Data:
8/71718 27 March 1996 (27.03.96) JP

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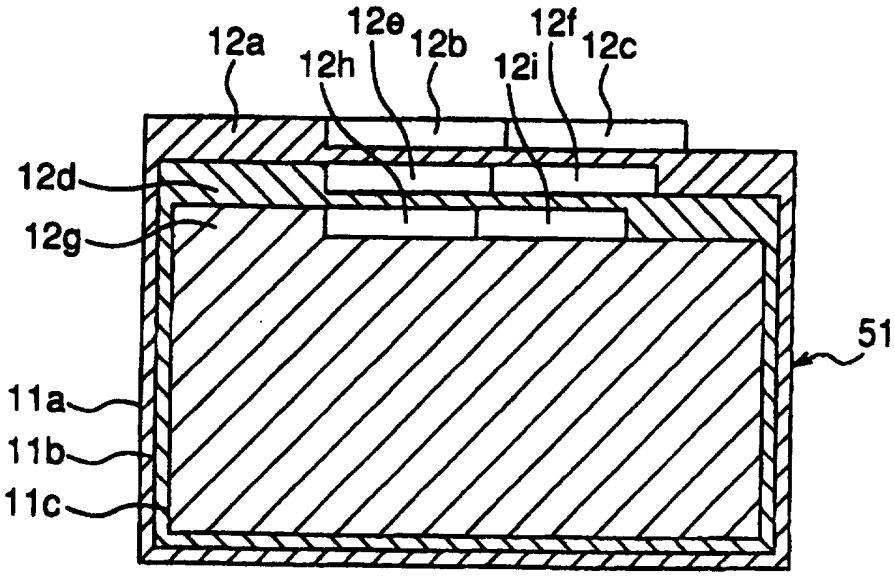
(81) Designated States: CN, KR, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
With international search report.
Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: TAG DIALOG DISPLAY METHOD AND APPARATUS

(57) Abstract

A tag dialog display method includes displaying, as a first hierarchical tag dialog section (1730) in a menu display screen (51), tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, with the dialogs overlapped with each other but with the tag keys not overlapped with each other, displaying, as a second hierarchical tag dialog section (1731) displayed in at least one of the dialogs in the first hierarchical tag dialog section in the menu display screen, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, with the dialogs overlapped with each other but with the tag keys of the second hierarchical tag dialog section not overlapped with each other and with the tag keys of the second hierarchical tag dialog section not overlapped with the tag keys of the first hierarchical tag dialog section, and selecting one of the tag keys in the first or second hierarchical tag dialog section to display the dialog corresponding to the selected tag key on the menu display screen.



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DESCRIPTION

TAG DIALOG DISPLAY METHOD AND APPARATUS

TECHNICAL FIELD

The present invention relates to a tag dialog display method and a tag dialog display apparatus for displaying various kinds of menus including software or various kinds of data on a screen of a personal computer or an operation screen of a production machine such as a mounting machine or the like.

BACKGROUND ART

A conventional example of the tag dialog display method and apparatus for displaying various kinds of menus including software or various kinds of data on a screen of a personal computer or an operation screen of a mounting machine or the like is explained below with reference to Figs. 16 to 20.

In Fig. 16, which shows a conventional example of the tag dialog display apparatus, reference numeral 41 denotes a menu display screen showing software or various kind of data menus, 42 denotes a menu display section for displaying the menu display screen 41, 43 denotes an operating section for an operator to enter operating

data, and 44 denotes a menu display control section for controlling the menu display section 42 based on the input from the operating section 43.

Each dialog 1 displayed on the menu display screen 41 comprises, as shown in Fig. 17, a tag key 2a, and a dialog 2b having one of various kinds of menus including software or various kinds of data. When the tag key 2a is selected, the menu of the dialog 2b of the selected tag key 2a can be displayed. Fig. 18 shows a condition where as one example of the menu display screen 41, three tag dialogs 121, 111, and 101 with they overlapped with each other. The positions of tag keys 102c, 102b, 102a are shifted laterally for each tag dialog, and then even though the three tag dialogs 121, 111, and 110 are overlapped with each other, the tag key 102a of the third tag dialog 101 does not prevent the two tag keys 102b and 102c of the second and first tag dialogs 111 and 121 overlapped with the third tag dialog 101 in the frontmost row from being selected, so that the two tag keys 102b and 102c can be selected. In the condition of Fig. 18, the tag key 102a of the third tag dialog 101 is selected and then a menu of the tag dialog 101 corresponding to the tag key 102a is displayed on the menu display screen 41.

As shown in Fig. 18, in a condition where the tag keys 102a, 102b, and 102c are displayed on the menu display screen 41, when the tag key 102b is selected by the operating section 43 in the menu display screen 41 of Fig. 18, as shown in Fig. 19, a menu of the second tag dialog 111 constructed by the tab key 102b and the dialog showing the menu of the tag key 102b is displayed on the menu display section 42 as the menu display screen 41.

In the menu display screen 41 of Fig. 18 or 19, when the tag key 102c is selected by the operating section 43, as shown in Fig. 20, a menu of the tag dialog 121 constructed by the tab key 102c and the dialog showing the menu of the tag key 102c is displayed on the menu display section 42 as the menu display screen 41.

However, with the above conventional example constitution, since one tag key corresponds to one dialog and a number of tag keys corresponding to the number of tag dialogs need to be provided, the number of tag keys that can be displayed on the menu display screen 41 is limited even though a plurality of tag keys are laterally shifted in position. As a result, there is an issue that the number of tag dialogs that can be treated in the menu display screen 41 is limited and many tag dialogs cannot be treated.

DISCLOSURE OF INVENTION

Accordingly, an object of the present invention is to provide tag dialog display method and apparatus which allows the number of tag keys that can be displayed on the menu display screen to increase and allows menus of a larger number of tag dialogs to display.

In accomplishing these and other aspects, according to a first aspect of the present invention, there is provided a tag dialog display method comprising:

displaying, as a first hierarchical tag dialog section in a menu display screen, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, with the dialogs overlapped with each other but with the tag keys not overlapped with each other;

displaying, as a second hierarchical tag dialog section displayed in at least one of the dialogs in the first hierarchical tag dialog section in the menu display screen, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, with the dialogs overlapped with each other but with the tag keys of the second hierarchical tag dialog section not overlapped with each other and with the tag keys of the second hierarchical

tag dialog section not overlapped with the tag keys of the first hierarchical tag dialog section; and

selecting one of the tag keys in the first or second hierarchical tag dialog section to display the dialog corresponding to the selected tag key on the menu display screen.

According to a second aspect of the present invention, there is provided a tag dialog display method as defined in the first aspect, further comprising:

storing a tag key of a specified tag dialog in the tag dialogs of the first hierarchical tag dialog section and a tag key of a specified tag dialog in the tag dialogs of the second hierarchical tag dialog section in the specified tag dialog of the first hierarchical tag dialog section; and

selecting at least one of the stored tag keys of the first and second hierarchical tag dialog sections to display the specified tag dialog of the second hierarchical tag dialog section.

According to a third aspect of the present invention, there is provided a tag dialog display method as defined in the first or second aspect, further comprising:

storing a combination of the tag key of the first hierarchical tag dialog section and the tag key of

the second hierarchical tag dialog section corresponding to the tag key of the first hierarchical tag dialog section, a number of selection of the combination being larger than others; and

selecting the tag key of the first hierarchical tag dialog section in the combination to automatically display the tag dialog of the tag key of the second hierarchical tag dialog section which is stored as the larger number of selection of the combination.

According to a fourth aspect of the present invention, there is provided a tag dialog display method as defined in any one of the first to third aspects, further comprising:

storing the tag dialog in any one of the first and second hierarchical tag dialog sections as a tag dialog having a function to replace the displayed tag dialog with other non-displayed tag dialog; and

selecting the tag dialog having the function to replace the tag dialog already displayed in the menu display screen with the non-displayed tag dialog not displayed in the menu display screen and to display the replaced tag dialog.

According to a fifth aspect of the present invention, there is provided a tag dialog display apparatus including, as a first hierarchical tag dialog

section, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, and as a second hierarchical tag dialog section displayed in at least one of the dialogs in the first hierarchical tag dialog section, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog,

the apparatus comprising:

a menu display screen;

an operating section for selecting the tag key in the first or second hierarchical tag dialog section;

a menu display control section for controlling to display, on the menu display screen, the tag dialogs with the dialogs overlapped with each other but with the tag keys not overlapped with each other as the first hierarchical tag dialog section, and, as the second hierarchical tag dialog section, the tag dialogs with the dialogs overlapped with each other but with the tag keys of the second hierarchical tag dialog section not overlapped with each other and with the tag keys of the second hierarchical tag dialog section not overlapped with the tag keys of the first hierarchical tag dialog section, and displaying, on the menu display screen, the

tag dialog corresponding to the tag key selected by the operating section.

According to a sixth aspect of the present invention, there is provided a tag dialog display apparatus comprising:

a menu display screen;

a menu storage section for storing, as a first hierarchical tag dialog section, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, and storing, as a second hierarchical tag dialog section displayed in at least one of the dialogs in the first hierarchical tag dialog section, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog;

an operating section for selecting the tag key in the first or second hierarchical tag dialog section;

a menu display control section for controlling to display, on the menu display screen, the tag dialogs with the dialogs overlapped with each other but with the tag keys not overlapped with each other as the first hierarchical tag dialog section, and, as the second hierarchical tag dialog section, the tag dialogs with the dialogs overlapped with each other but with the tag keys of the second hierarchical tag dialog section not

overlapped with each other and with the tag keys of the second hierarchical tag dialog section not overlapped with the tag keys of the first hierarchical tag dialog section, and displaying, on the menu display screen, the tag dialog corresponding to the tag key selected by the operating section.

According to a seventh aspect of the present invention, there is provided a tag dialog display apparatus as defined in the sixth aspect, wherein the menu storage section stores a tag key of a specified tag dialog in the tag dialogs of the first hierarchical tag dialog section and a tag key of a specified tag dialog in the tag dialogs of the second hierarchical tag dialog section in the specified tag dialog of the first hierarchical tag dialog section; and

the menu display control section, when at least one of the tag keys of the first and second hierarchical tag dialog sections stored in the menu storage section is selected by the operating section, displays the specified tag dialog of the second hierarchical tag dialog section.

According to an eighth aspect of the present invention, there is provided a tag dialog display apparatus as defined in the sixth or seventh aspect, wherein the menu storage section stores a combination of the tag key of the first hierarchical tag dialog section

and the tag key of the second hierarchical tag dialog section corresponding to the tag key of the first hierarchical tag dialog section, number of selection of the combination being larger than others; and

the menu display control section, when the tag key of the first hierarchical tag dialog section in the combination is selected by the operating section, automatically displays the tag dialog of the tag key of the second hierarchical tag dialog section which is stored in the menu storage section as the larger number of selection of the combination.

According to a ninth aspect of the present invention, there is provided a tag dialog display apparatus as defined in any one of the sixth to eighth aspects, wherein the menu storage section stores the tag dialog in any one of the first and second hierarchical tag dialog sections as a tag dialog having a function to replace the displayed tag dialog with other non-displayed tag dialog; and

the menu display control section, when the tag dialog having the function is selected by the operating section, replaces the tag dialog already displayed in the menu display screen with the non-displayed tag dialog not displayed in the menu display screen and displays the replaced tag dialog.

BRIEF DESCRIPTION OF DRAWINGS

These and other aspects and features of the present invention will become clear from the following description taken in conjunction with the preferred embodiments thereof with reference to the accompanying drawings, in which:

Fig. 1 is a block diagram showing the arrangement of a tag dialog display apparatus in which a tag dialog display method is used, according to a first embodiment of the present invention;

Fig. 2 is a plan view showing the arrangement of hierarchical tag dialog sections in the first embodiment of the present invention;

Fig. 3 is a plan view showing the arrangement of hierarchical tag dialog sections in the first embodiment of the present invention;

Fig. 4 is a plan view showing the arrangement of hierarchical tag dialog sections in the first embodiment of the present invention;

Fig. 5 is a plan view showing the arrangement of hierarchical tag dialog sections in the first embodiment of the present invention;

Fig. 6 is a plan view showing the arrangement of hierarchical tag dialog sections in the first embodiment of the present invention;

Fig. 7 is a plan view showing the arrangement of hierarchical tag dialog sections in the first embodiment of the present invention;

Fig. 8 is a plan view showing the arrangement of hierarchical tag dialog sections in the first embodiment of the present invention;

Fig. 9 is a plan view showing the arrangement of hierarchical tag dialog sections in the first embodiment of the present invention;

Fig. 10 is a plan view showing the arrangement of hierarchical tag dialog sections in a fourth embodiment of the present invention;

Fig. 11 is a plan view showing the arrangement of hierarchical tag dialog sections in the fourth embodiment of the present invention;

Fig. 12 is a view showing the tree structure showing the arrangement of hierarchical tag dialog sections in the first and a second embodiments of the present invention;

Fig. 13 is a view showing the tree structure showing the arrangement of hierarchical tag dialog

sections in the first and second embodiments of the present invention;

Fig. 14 is a view showing the tree structure showing the arrangement of hierarchical tag dialog sections in the first and second embodiments of the present invention;

Fig. 15 is a view showing the tree structure showing the arrangement of hierarchical tag dialog sections in the first and second embodiments of the present invention;

Fig. 16 is a block diagram showing the arrangement of a tag dialog display apparatus in which a conventional tag dialog display method is used;

Fig. 17 is a plan view showing the arrangement of a tag dialog of the conventional example;

Fig. 18 is a plan view showing the arrangement of three overlapped tag dialogs of the conventional example;

Fig. 19 is a plan view showing the arrangement of three overlapped tag dialogs of the conventional example;

Fig. 20 is a plan view showing the arrangement of three overlapped tag dialogs of the conventional example;

Fig. 21 is a plan view showing the arrangement of hierarchical tag dialog sections in a concrete example of the first embodiment of the present invention;

Fig. 22 is a plan view showing the arrangement of hierarchical tag dialog sections in the concrete example of the first embodiment of the present invention;

Fig. 23 is a plan view showing the arrangement of hierarchical tag dialog sections in the concrete example of the first embodiment of the present invention;

Fig. 24 is a plan view showing the arrangement of hierarchical tag dialog sections in the concrete example of the first embodiment of the present invention;

Fig. 25 is a plan view showing the arrangement of hierarchical tag dialog sections in the concrete example of the first embodiment of the present invention; and

Fig. 26 is a plan view showing the arrangement of hierarchical tag dialog sections in the concrete example of the first embodiment of the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

Before the description of the present invention proceeds, it is to be noted that like parts are designated by like reference numerals throughout the accompanying drawings.

A tag dialog display method and an apparatus therefor according to a first embodiment of the present invention are described with reference to Figs. 1 to 9 and Figs. 21 to 26.

Referring to Fig. 1, which shows the arrangement of the tag dialog display apparatus in which the tag dialog display method of the first embodiment is used, reference numeral 51 denotes a menu display screen showing a menu of software or various kinds of data to be specified, 52 denotes a menu display section for displaying the menu display screen 51, 53 denotes an operating section such as a keyboard or a mouse etc. for the operator to enter operating data, 54 denotes a menu display control section for controlling the menu display section 52 based on the input through the operating section 53, and 55 denotes a menu storage section for storing the menus such as dialogs and contents of operations.

Figs. 2 to 5 show screen examples of the menu display screen 51 in the first embodiment. Fig. 12 is a diagram showing the screen example of the menu display screen 51 in tree structure which is stored in the menu storage section 55.

In the tag dialog display method of the first embodiment, as shown in Figs. 2 and 12, totally 27 menus

including software or data etc. are structured in three hierarchical tag dialog sections: a first hierarchical tag dialog section 1730, a second hierarchical tag dialog section 1731, and a third hierarchical tag dialog section 1732. The first hierarchical tag dialog section 1730 is made up by overlapping dialogs of first to third tag dialogs 11a, 121a, and 141a, each of which comprises a tag key for charging over the menu display screen 51 and a dialog for displaying a menu in correspondence with the tag key. The second hierarchical tag dialog section 1731 is displayed in each dialog of the first hierarchical tag dialog section 1730 and comprises first to third tag dialogs 11b, 1706, 1705; 121b, 1704, 1703; 141b, 1702, 1701 to be overlapped in concatenation on the tag dialog of the first hierarchical tag dialog section 1730. The third hierarchical tag dialog section 1732 comprises first to third tag dialogs 11c, 1729, 1728; 1727-1725; 1724-1722; 121c, 131c, 1721; 1720-1718; 1717-1715; 141c, 1714, 1713; 1712-1710; and 1709-1707 to be overlapped in concatenation on each dialog of the second hierarchical tag dialog section 1731.

The terms "made up by overlapping" mean that, as shown in Figs. 2 and 12, whereas the first hierarchical tag dialog section 1730 comprises the tag dialogs 11a, 121a, 141a, the display is such that

selecting any one of tag keys 12a, 12b, 12c of the tag dialogs 11a, 121a, 141a causes the tag dialog of the selected tag key to be displayed with the rest of the dialogs concealed under the displayed dialog.

For example, as shown in Figs. 2 and 12, in the first hierarchical tag dialog section 1730, when the tag key 12a is selected in the tag keys 12a, 12b, and 12c, there is displayed the tag dialog 11a comprising contents of the tag key 12a and a dialog that shows a menu indicating software or data corresponding to the contents of the tag key 12a.

In the second hierarchical tag dialog section 1731, when, for example, a tag key 12d is selected in tag keys 12d, 12e, and 12f of the tag dialogs 11b, 1706, and 1705 displayed in the tag dialog 11a selected by the tag key 12a in the first hierarchical tag dialog section 1730, there is displayed the tag dialog 11b comprising contents of the tag key 12a and the tag key 12d, and a dialog that shows a menu indicating software or data corresponding to the contents of the tag key 12a and the tag key 12d.

In the third hierarchical tag dialog section 1732, when, for example, a tag key 12g is selected in tag keys 12g, 12h, and 12i of the tag dialogs 11c, 1729, and 1728 displayed in the tag dialog 11b selected by, for

example, the tag key 12d in the second hierarchical tag dialog section 1731, there is displayed a tag dialog 11c comprising contents of the tag key 12a, the tag key 12d, and the tag key 12g, and a dialog that shows a menu indicating software or data corresponding to the contents of the tag key 12a, the tag key 12d, and the tag key 12g.

That is, the terms "overlapping tag dialogs or dialogs" mean presenting a plurality of dialogs in overlapping and displaying one selected with a tag key or tag keys from among those dialogs.

In such a manner, in the first embodiment, the first hierarchical tag dialog section 1730 is constructed by the three tag dialogs, the second hierarchical tag dialog section 1731 is constructed by the three tag dialogs for each tag dialog of the first hierarchical tag dialog section 1730, and the third hierarchical tag dialog section 1732 is constructed by the three tag dialogs for each tag dialog of the second hierarchical tag dialog section 1731.

That is, the first hierarchical tag dialog section 1730 is constructed by the tag dialogs 11a, 121a and 141a.

The second hierarchical tag dialog section 1731 is constructed so as to display the three tag dialogs 11b, 1706, and 1705 corresponding to the tag dialog 11a

of the first hierarchical tag dialog section 1730 with each dialog thereof overlapped with each other, the three tag dialogs 121b, 1704, and 1703 corresponding to the tag dialog 121a of the first hierarchical tag dialog section 1730 with each dialog thereof overlapped with each other, and the three tag dialogs 141b, 1702, and 1701 corresponding to the tag dialog 141a of the first hierarchical tag dialog section 1730 with each dialog thereof overlapped with each other.

The third hierarchical tag dialog section 1732 is constructed so as to display the three tag dialogs 11c, 1729, and 1728 corresponding to the tag dialog 11b of the second hierarchical tag dialog section 1731 with each dialog thereof overlapped with each other, the three tag dialogs 1727, 1726, and 1725 corresponding to the tag dialog 1706 of the second hierarchical tag dialog section 1731 with each dialog thereof overlapped with each other, the three tag dialogs 1724, 1723, and 1722 corresponding to the tag dialog 1705 of the second hierarchical tag dialog section 1731 with each dialog thereof overlapped with each other, and similarly the three tag dialogs corresponding to each of the tag dialogs 121b, 1704, 1703, 141b, 1702, 1701 with each dialog thereof overlapped with each other.

The constitution of the first, second, and third hierarchical tag dialog sections 1730, 1731, and 1732 is advantageous to the display of data divided into three hierarchy structure.

Hereinafter, the tag dialog display method according to the first embodiment is described.

As described above, referring to Figs. 2 and 12, the tag keys 12a to 12c as the first hierarchical tag dialog section 1730, the tag keys 12d to 12f as the second hierarchical tag dialog section 1731, the tag keys 12g to 12i as the third hierarchical tag dialog section 1732 are initially displayed and laterally arranged in three rows on the menu display screen 51. Selecting the tag key 12a by the operating section 53 causes the tag dialog 11a to appear on the menu display screen 51. In this state, the leftmost tag key 12d is automatically selected even though any one of the tag keys 12d-12f is not selected by the operating section 53 in the second hierarchical tag dialog section 1731 in the tag dialog 11a, and then the tag dialog 11b is displayed on the menu display screen 51. The leftmost tag key 12g is automatically selected even though any one of the tag keys 12g-12i is not selected by the operating section 53 in the third hierarchical tag dialog section 1732 in the tag dialog 11b, and then the tag dialog 11c is displayed

on the menu display screen 51. Then, the menu of the tag dialog 11c for which conditions have been specified with the tag key 12a, tag key 12d, and tag key 12g is displayed. In this state, data in the menu is displayed and various kinds of keys shown in the menu receive operations with the operating section 53 to display software and data. In such a manner, in the first embodiment, when the tag key is selected by the operating section 53 and the dialog of the tag key is displayed, the leftmost tag key is automatically selected in a plurality of tag keys in the hierarchical tag dialog section displayed in the displayed dialog to display the tag dialog of the selected tag key in the menu display screen. However, the present invention is not limited to this. For example, if any tag key is not selected by the operating section 53, any one of the dialogs may be not displayed and a display for urging the operator to select any one of the tag keys may be performed.

In the menu display screen 51 of Fig. 2 displayed in such a manner, when the tag key 12h instead of the tag key 12g is selected by the operating section 53, as shown in Fig. 3, the tag dialog 1729 is displayed on the menu display screen 51. A menu for which conditions have been specified with the tag keys 12a, the tag key 12d, and the tag key 12h is displayed in the tag

dialog 1729 and the menu of the tag dialog 1729 receives operations of the operating section 53 to display software or data etc.

Similarly, in the menu display screen 51 of Fig. 3, when the tag key 12i instead of the tag key 12h is selected by the operating section 53, as shown in Fig. 4, the tag dialog 1728 is displayed on the menu display screen 51. A menu for which conditions have been specified with the tag keys 12a, the tag key 12d, and the tag key 12i is displayed in the tag dialog 1728 and the menu of the tag dialog 1728 receives operations of the operating section 53 to display software or data etc.

In the menu display screen 51 of Fig. 4, when the tag key 12e instead of the tag key 12d is selected by the operating section 53, as shown in Fig. 5, the tag dialog 1706 is displayed on the menu display screen 51. When the tag dialog 1706 is displayed, the leftmost tag key 82g in the third hierarchical tag dialog section 1732 is automatically selected to display the tag dialog 1727. In the tag dialog 1727, a menu for which conditions have been specified with the tag keys 12a, the tag key 12e, and the tag key 82g is displayed and the menu of the tag dialog 1727 receives operations of the operating section 53 to display software or data etc.

Similarly, in the menu display screen 51 of Fig. 5, when the tag key 82h instead of the tag key 82g is selected by the operating section 53, as shown in Fig. 6, the tag dialog 1726 is displayed on the menu display screen 51. A menu for which conditions have been specified with the tag keys 12a, the tag key 12e, and the tag key 82h is displayed in the tag dialog 1726 and the menu of the tag dialog 1726 receives operations of the operating section 53 to display software or data etc.

Referring to Fig. 2, the tag keys 12a to 12c, the tag keys 12d to 12f, the tag keys 12g to 12i are initially displayed and laterally arranged in three rows on the menu display screen 51. When the tag key 12b instead of the tag key 12a is selected by the operating section 53, as shown in Figs. 7 and 13, the tag dialog 121a is displayed on the menu display screen 51. When the tag dialog 121a is displayed, the leftmost tag key 72d in the second hierarchical tag dialog section 1731 is automatically selected to display the tag dialog 121b on the menu display screen 51. When the tag dialog 121b is displayed, the leftmost tag key 72g in the third hierarchical tag dialog section 1732 is automatically selected to display the tag dialog 121c on the menu display screen 51. A menu for which conditions have been specified with the tag keys 12b, the tag key 72d, and the

tag key 72g is displayed in the tag dialog 121c and the menu of the tag dialog 121c receives operations of the operating section 53 to display software or data etc.

The tag keys 12a to 12c, 72d to 72f, 72g to 72i are initially displayed and laterally arranged in three rows on the menu display screen 51 of Fig. 7. When the tag key 72h instead of the tag key 72g is selected by the operating section 53, as shown in Figs. 8 and 14, the tag dialog 131c is displayed on the menu display screen 51. A menu for which conditions have been specified with the tag keys 12b, the tag key 72d, and the tag key 72h is displayed in the tag dialog 131c and the menu of the tag dialog 131c receives operations of the operating section 53 to display software or data etc.

The tag keys 12a to 12c, 72d to 72f, 72g to 72i are initially displayed and laterally in three rows on the menu display screen 51 of Fig. 8. When the tag key 12c instead of the tag key 12b is selected by the operating section 53, as shown in Figs. 9 and 15, the tag dialog 141a is displayed on the menu display screen 51. When the tag dialog 141a is displayed, the leftmost tag key 62d in the second hierarchical tag dialog section 1731 is automatically selected to display the tag dialog 141b on the menu display screen 51. When the tag dialog 141b is displayed, the leftmost tag key 62g in the third

hierarchical tag dialog section 1732 is automatically selected to display the tag dialog 141c on the menu display screen 51. A menu for which conditions have been specified with the tag keys 12c, the tag key 62d, and the tag key 62g is displayed in the tag dialog 141c and the menu of the tag dialog 141c receives operations of the operating section 53 to display software or data etc.

In this way, sequentially selecting the tag keys 12a to 12c, 12d to 12f or 72d to 72f, 12g to 12i or 82g to 82i or 72g to 72i by the operating section 53 in the order of the first, second, and third hierarchical layers or in any order which is not limited to the first, second, and third hierarchical layers' order allows any one of the twenty-seven tag dialogs consisting of 1707 to 1721, 141c, 131c, 121c, 1722 to 1729, 11c in the third hierarchical tag dialog section as shown in Figs. 12 to 15 to be specified.

In summary, any one of the twenty-seven tag dialogs can be specified with the nine tag keys 12a to 12i, or 12a to 12f and 82g to 82i, or 12a to 12c and 72d to 72i.

Although the hierarchical layer structure is constructed by three layers, the present invention is not limited to this construction, and the number of tag dialogs of each tag dialog in the first and second

hierarchical tag dialog sections is not limited to three. For example, as shown by a dashed line in Fig. 12, a tag dialog 100a in the first hierarchical tag dialog section 1730 may have no tag dialog in the second hierarchical tag dialog section 1731 and may have one tag dialog 100c in the third hierarchical tag dialog section 1732.

One example of a case where the tag dialog display method and apparatus according to the first embodiment is applied to an operation menu of a component mounting machine is shown in Figs. 21 to 26.

As shown in Fig. 21, in a menu display screen for operation of the mounting machine, seven tag dialogs indicating production start, production preparation, input/output, edit, production control, system control, and line for network are provided as the first hierarchical tag dialog section 1730. When a power supply of the mounting machine is turned on to initially display a screen of the operation menu thereof, the leftmost tag key of the production start is automatically selected. For example, as the second hierarchical tag dialog section 1731 of the tag dialog of the production control, five tag dialogs indicating production information, nozzle information of nozzles for component-mounting, component information of components to be mounted on boards etc., error information in mounting

operation, and total information are provided. When the tag key of the tag dialog of the production control is selected in the first hierarchical tag dialog section 1730, the leftmost tag key of the production information is automatically selected. As the third hierarchical tag dialog section 1732 of the tag dialog of the production information, two tag dialogs of kind information and accumulation information are provided. When the tag dialog of the production information is selected in the second hierarchical tag dialog section 1731, the leftmost tag key of the kind information is automatically selected.

In such an arrangement, for example, when the tag key corresponding to the tag dialog of the production control is selected in the first hierarchical tag dialog section 1730, the tag key corresponding to the tag dialog of the production information is automatically selected in the second hierarchical tag dialog section 1731. And then, the tag key corresponding to the tag dialog of the kind information is automatically selected in the third hierarchical tag dialog section 1732, thus displaying the screen shown in Fig. 21. In the screen of Fig. 21, when the tag key corresponding to the accumulation information is selected, the screen shown in Fig. 22 is displayed. Then, in Fig. 22, a "table" key is selected which is an

item of recorded production number of its lower hierarchical layer, the screen shown in Fig. 23 is displayed.

When the tag key corresponding to the tag dialog of the production start (for example, corresponding to the tag key 100a in Fig. 12) is selected in the hierarchical tag dialog section 1730, as shown in Fig. 24, only the dialog corresponding to the tag key of the production start in the third hierarchical tag dialog section 1732 (for example, corresponding to the tag key 100c in Fig. 12) is displayed because there is no tag key in the second hierarchical tag dialog section. In the displayed dialog, there are various kinds of keys. For example, when a key of on-line or full automation in operation mode is selected, the display in the dialog is changed from "preparing" into "operating" to start the operation of the machine in the corresponding mode. When a tag key of kind is selected among three keys of kind, condition, and supply section, the screen is shown in Fig. 24. When a tag key of the condition is selected, the screen is shown in Fig. 25. When a tag key of the supply section is selected, the screen is shown in Fig. 26.

Although the tag keys 12a to 12c, 12d to 12f or 72d to 72f, 12g to 12i or 72g to 72i or 82g to 82i have

been displayed in upper part and laterally arranged in three rows in this embodiment, they may be displayed in lower part instead. Moreover, they may be displayed in left-end or right-end part in three columns, in which case similar results are also obtained.

Next, tag dialog display method and apparatus according to a second embodiment of the present invention is described.

In the second embodiment, the menu storage section 55 not only stores menus of software or data etc., but also combinations of selection of the tag keys effected by the operator by the operating section 53. For instance, the menu storage section 55 stores combinations of selection of the tag keys shown in Figs. 2 and 12, Figs. 7 and 13, Figs. 8 and 14, and Figs. 9 and 15. As a result, the menu display control section 54 can be operated based on the combinations of the selection of the tag keys stored in the menu storage section 55 and the operations of the operating section 53.

More specifically, in a case where the menu storage section 55 stores the combination of the selection of the tag keys 12a, 12d, and 12g shown in Figs. 2 and 12, when only one of the tag keys 12a, 12d, and 12g is selected by the operating section 53, the tag dialog 11c in the third hierarchical tag dialog section

which is specified with the tag keys 12a, 12d, and 12g is displayed as a menu.

Also, in a case where the menu storage section 55 stores the combination of the selection of the tag keys 12b, 72d, and 72g shown in Figs. 7 and 13, when only one of the tag keys 12b, 72d, and 72g is selected by the operating section 53, the tag dialog 121c in the third hierarchical tag dialog section which is specified with the tag keys 12b, 72d, and 72g is displayed as a menu.

Also, in a case where the menu storage section 55 stores the combination of the selection of the tag keys 12b, 72d, and 72h shown in Figs. 8 and 14, when only one of the tag keys 12b, 72d, and 72h is selected by the operating section 53, the tag dialog 131c in the third hierarchical tag dialog section which is specified with the tag keys 12b, 72d, and 72h is displayed as a menu.

Also, in a case where the menu storage section 55 stores the combination of the selection of the tag keys 12c, 62d, and 62g shown in Figs. 9 and 15, when only one of the tag keys 12c, 62d, and 62g is selected by the operating section 53, the tag dialog 141c in the third hierarchical tag dialog section which is specified with the tag keys 12c, 62d, and 62g is displayed as a menu.

More specifically, in the menu display screen of the mounting machine of Figs. 21 to 23, in a case

where the combination of the selection of the tag key of the tag dialog of the production control, the tag key of the tag dialog of the production information, and the tag key of the tag dialog of the kind information is stored in the menu storage section 55, when any one of the tag keys of the production control, the production information, and the kind information is selected, the menu of Fig. 23 is displayed.

That is, according to the second embodiment, when the same selection is repeated, the combination of the selection of the tag keys to be selected is stored in the menu storage section 55 and, based on the stored combination of the tag keys and operations of the operating section 53, any one of the tag dialogs in the third hierarchical tag dialog section is automatically displayed. Thus, the number of times of operations by the operating section 53 can be reduced so that the operability can be improved. In addition, when large numbers of hierarchical layers are involved, it is also possible to make selections with a plurality of tag keys.

Next, tag dialog display method and apparatus according to a third embodiment of the present invention is described.

In the third embodiment, combinations of specification of the tag keys which are frequently used

are selected and previously stored in the menu storage section 55. In such an arrangement, the menu display control section 54 is operated, as required, according to the specifications stored in the menu storage section 55.

For example, some of combinations of the selection of the tag keys of the first hierarchical tag dialog section 1730 and the tag keys of the second hierarchical tag dialog section 1731 corresponding to the tag keys of the first hierarchical tag dialog section 1730, the number of selection of which is larger than the number of other selection of the combinations are stored. Then, when the tag key of the first hierarchical tag dialog section 1730 is selected, the dialog of the tag key stored as the larger number of the selection of the combination in the second hierarchical tag dialog section 1731 is automatically displayed.

More specifically, in the menu display screen of the mounting machine in Figs. 21 to 23, in a case where the menu storage section 55 stores a combination of selection of the tag key of the component information and the tag dialog of the production control because the number of selection of the tag key of the component information and the tag dialog of the production control is larger than the number of selection of other keys, when the tag key of the tag dialog of the production

control is selected, the tag key of the tag dialog of the component information may be automatically selected.

As a manner of deciding whether the number of selection of tag keys is larger than other numbers of selection of other tag keys or not and then storing it if larger, the following manner may be used: it is decided that when the number of selection of tag keys is not smaller than a predetermined threshold value, the number of selection is larger than other numbers of selection, and then the combination of the selection of tag keys is stored as the larger number of selection in the manu storage section 55. It is decided that when the number of selection is smaller than the predetermined threshold value, the number of selection is not larger than other numbers of selection, and then the combination of the tag keys is not stored in the manu storage section 55.

According to the third embodiment, when selection previously stored in the menu storage section 55 is effected, the number of times of operation by the operating section 53 is reduced so that the operability can be improved.

Next, tag dialog display method and apparatus according to a fourth embodiment of the present invention is described.

In the fourth embodiment, replacement of tag dialogs is executed.

This replacement is explained with reference to Figs. 2, 10, and 11.

Referring to Fig. 2, assume that the tag key 12f is a tag key for replacement in the second hierarchical tag dialog section. In this case, when the tag key 12f is selected by the operating section 53, the tag key 12f is moved to the left end in the tag dialog 151b by the menu display control section 54 as shown in Fig. 10, where a tag key 152j and a tag key 152k, which have been concealed in Fig. 2, are displayed. Along with this, a tag key 152g, a tag key 152h, and a tag key 152i are displayed in the tag dialog 151c, where automatically selecting the tag key 152g causes the tag dialog 151c to be displayed as a menu.

Next, referring to Fig. 10, when the tag key 152k is selected as a tag key for replacement by the operating section 53, the tag key 152k is moved to the left end in the tag dialog 161b as shown in Fig. 11, where a tag key 162m and a tag key 162n, which have been concealed in Fig. 10, are displayed. Along with this, a tag key 162g, a tag key 162h, and a tag key 162i are displayed in the tag dialog 161c, where automatically

selecting the tag key 162g causes the tag dialog 161c to be displayed as a menu.

As shown above, when a replacement of tag dialogs is executed, the tag key 152j and the tag key 152k as well as the tag key 162m and the tag key 162n, which have been overflowed out of one screen and concealed, are displayed on the menu display screen 51. As a result, except the tag key 152k that is used for the replacement, three of the tag key 152j, tag key 162m, and tag key 162n are substantially added so that nine menus are added because each dialog of each tag key comprises three tag dialogs.

Although the replacement has been executed in the second hierarchical tag dialog section in this embodiment, it may be done in any hierarchical layer.

According to the arrangement, the tag keys of the tag dialogs in the first hierarchical tag dialog section and the tag keys of the tag dialogs in the second hierarchical tag dialog section displayed in the tag dialog of the first hierarchical tag dialog section are shifted to each other so as not to be overlapped with each other and displayed in the menu display screen. Thus, even though a menu display screen of the same size as a conventional one is used, larger number of tag

dialogs can be displayed and treated as compared with the conventional one.

In the above arrangement, when storing the tag key of the specified tag dialog in the tag dialogs of the first hierarchical tag dialog section and the tag key of the specified tag dialog in the tag dialogs of the second hierarchical tag dialog section in the specified tag dialog, selecting at least one of the stored tag keys of the first and second hierarchical tag dialog sections allows the specified tag dialog of the second hierarchical tag dialog section to be displayed. Thus, the number of times of operation for selecting the specified tag dialog is reduced so that the operability can be improved.

In the arrangement, when storing a combination of the tag key of the first hierarchical tag dialog section and the tag key of the second hierarchical tag dialog section corresponding to the tag key of the first hierarchical tag dialog section, a number of selection of the combination being larger than others, selecting the tag key of the first hierarchical tag dialog section in the combination allows to automatically display the tag dialog of the tag key of the second hierarchical tag dialog section which is stored as larger number of selection of the tag key of the first hierarchical tag

dialog section in the combination. Thus, even larger numbers of tag dialogs can be treated for one menu display screen.

The entire disclosure of Japanese Application No. 8-71718 filed on March 27, 1996, including specification, claims, drawings, and summary are incorporated herein by reference in its entirety.

Although the present invention has been fully described in connection with the preferred embodiments thereof with reference to the accompanying drawings, it is to be noted that various changes and modifications are apparent to those skilled in the art. Such changes and modifications are to be understood as included within the scope of the present invention as defined by the appended claims unless they depart therefrom.

CLAIMS

1. A tag dialog display method comprising:

displaying, as a first hierarchical tag dialog section (1730) in a menu display screen (51), tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, with the dialogs overlapped with each other but with the tag keys not overlapped with each other;

displaying, as a second hierarchical tag dialog section (1731) displayed in at least one of the dialogs in the first hierarchical tag dialog section in the menu display screen, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, with the dialogs overlapped with each other but with the tag keys of the second hierarchical tag dialog section not overlapped with each other and with the tag keys of the second hierarchical tag dialog section not overlapped with the tag keys of the first hierarchical tag dialog section; and

selecting one of the tag keys in the first or second hierarchical tag dialog section to display the dialog corresponding to the selected tag key on the menu display screen.

2. A tag dialog display method as defined in claim 1, further comprising:

storing a tag key of a specified tag dialog in the tag dialogs of the first hierarchical tag dialog section and a tag key of a specified tag dialog in the tag dialogs of the second hierarchical tag dialog section in the specified tag dialog of the first hierarchical tag dialog section; and

selecting at least one of the stored tag keys of the first and second hierarchical tag dialog sections to display the specified tag dialog of the second hierarchical tag dialog section.

3. A tag dialog display method as defined in claim 1 or 2, further comprising:

storing a combination of the tag key of the first hierarchical tag dialog section and the tag key of the second hierarchical tag dialog section corresponding to the tag key of the first hierarchical tag dialog section, a number of selection of the combination being larger than others; and

selecting the tag key of the first hierarchical tag dialog section in the combination to automatically display the tag dialog of the tag key of the second hierarchical tag dialog section which is stored as the larger number of selection of the combination.

4. A tag dialog display method as defined in any one of claims 1 to 3, further comprising:

storing the tag dialog in any one of the first and second hierarchical tag dialog sections as a tag dialog having a function to replace the displayed tag dialog with other non-displayed tag dialog; and

selecting the tag dialog having the function to replace the tag dialog already displayed in the menu display screen with the non-displayed tag dialog not displayed in the menu display screen and to display the replaced tag dialog.

5. A tag dialog display apparatus including, as a first hierarchical tag dialog section (1730), tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, and as a second hierarchical tag dialog section (1731) displayed in at least one of the dialogs in the first hierarchical tag dialog section, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog,

the apparatus comprising:

a menu display screen (51);

an operating section (53) for selecting the tag key in the first or second hierarchical tag dialog section;

a menu display control section (54) for controlling to display, on the menu display screen, the tag dialogs with the dialogs overlapped with each other but with the tag keys not overlapped with each other as the first hierarchical tag dialog section, and, as the second hierarchical tag dialog section, the tag dialogs with the dialogs overlapped with each other but with the tag keys of the second hierarchical tag dialog section not overlapped with each other and with the tag keys of the second hierarchical tag dialog section not overlapped with the tag keys of the first hierarchical tag dialog section, and displaying, on the menu display screen, the tag dialog corresponding to the tag key selected by the operating section.

6. A tag dialog display apparatus comprising:

a menu display screen (51);

a menu storage section (55) for storing, as a first hierarchical tag dialog section (1730), tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog, and storing, as a second hierarchical tag dialog section (1731) displayed in at least one of the dialogs in the first hierarchical tag dialog section, tag dialogs each of which comprises a dialog including a menu to be displayed and a tag key corresponding to the dialog;

an operating section (53) for selecting the tag key in the first or second hierarchical tag dialog section;

a menu display control section (54) for controlling to display, on the menu display screen, the tag dialogs with the dialogs overlapped with each other but with the tag keys not overlapped with each other as the first hierarchical tag dialog section, and, as the second hierarchical tag dialog section, the tag dialogs with the dialogs overlapped with each other but with the tag keys of the second hierarchical tag dialog section not overlapped with each other and with the tag keys of the second hierarchical tag dialog section not overlapped with the tag keys of the first hierarchical tag dialog section, and displaying, on the menu display screen, the tag dialog corresponding to the tag key selected by the operating section.

7. A tag dialog display apparatus as defined in claim 6, wherein the menu storage section stores a tag key of a specified tag dialog in the tag dialogs of the first hierarchical tag dialog section and a tag key of a specified tag dialog in the tag dialogs of the second hierarchical tag dialog section in the specified tag dialog of the first hierarchical tag dialog section; and

the menu display control section, when at least one of the tag keys of the first and second hierarchical tag dialog sections stored in the menu storage section is selected by the operating section, displays the specified tag dialog of the second hierarchical tag dialog section.

8. A tag dialog display apparatus as defined in claim 6 or 7, wherein the menu storage section stores a combination of the tag key of the first hierarchical tag dialog section and the tag key of the second hierarchical tag dialog section corresponding to the tag key of the first hierarchical tag dialog section, number of selection of the combination being larger than others; and

the menu display control section, when the tag key of the first hierarchical tag dialog section in the combination is selected by the operating section, automatically displays the tag dialog of the tag key of the second hierarchical tag dialog section which is stored in the menu storage section as the larger number of selection of the combination.

9. A tag dialog display apparatus as defined in any one of claims 6 to 8, wherein the menu storage section stores the tag dialog in any one of the first and second hierarchical tag dialog sections as a tag dialog

having a function to replace the displayed tag dialog with other non-displayed tag dialog; and

the menu display control section, when the tag dialog having the function is selected by the operating section, replaces the tag dialog already displayed in the menu display screen with the non-displayed tag dialog not displayed in the menu display screen and displays the replaced tag dialog.

Fig.1

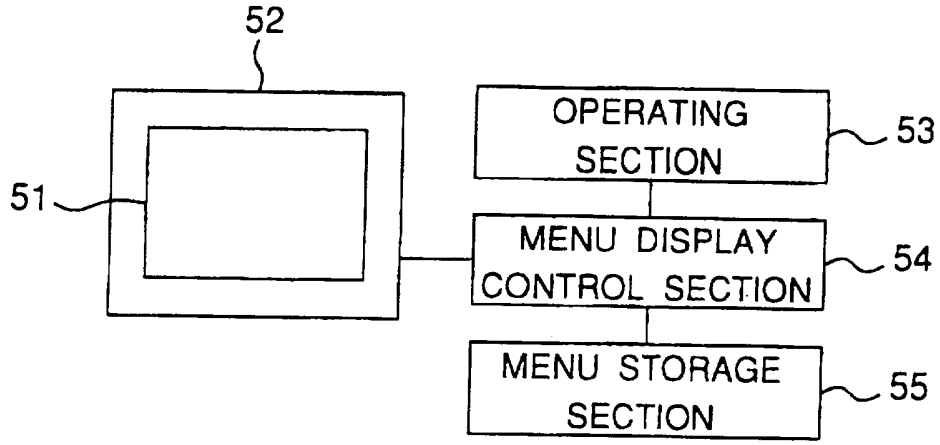

52
51
OPERATING SECTION
53
MENU DISPLAY CONTROL SECTION
54
MENU STORAGE SECTION
55

Fig.2

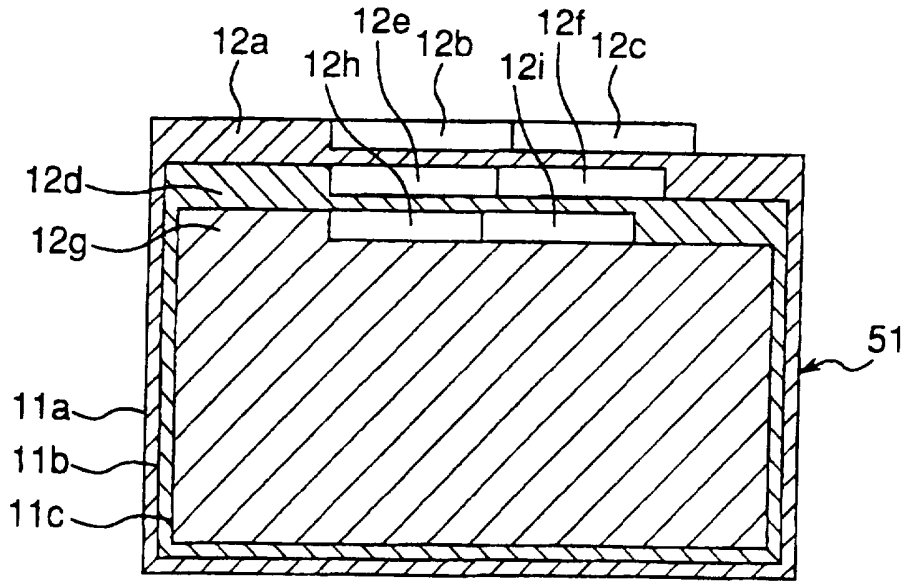

12a
12h
12e
12b
12i
12f
12c
12d
12g
51
11a
11b
11c

Fig.3

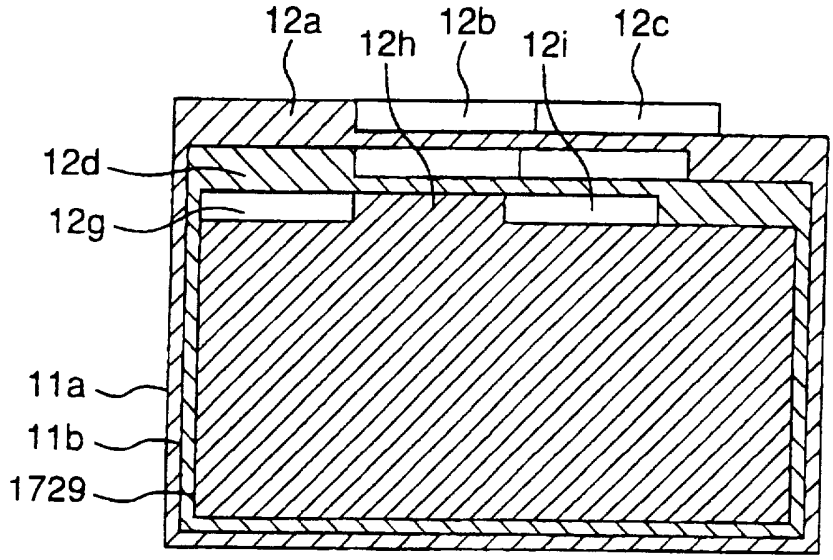

12a
12h
12b
12i
12c
12d
12g
11a
11b
1729

Fig.4

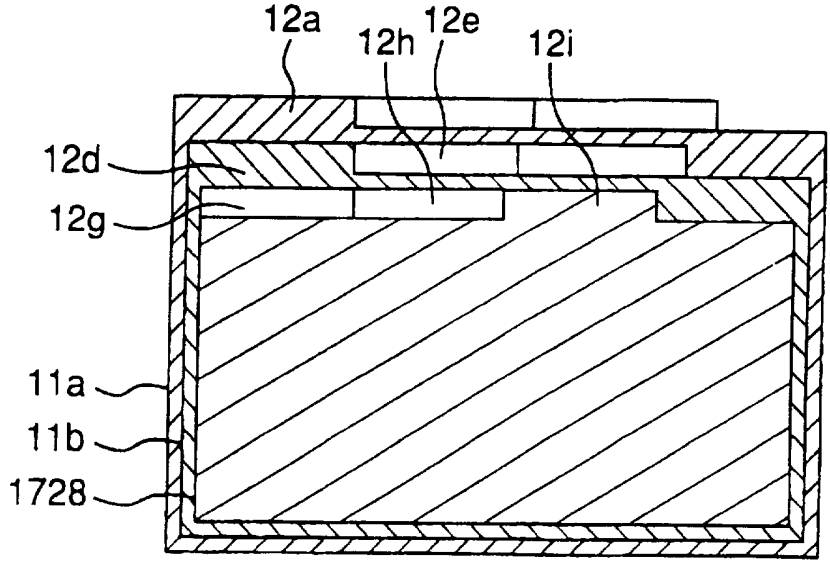

12a
12h
12e
12i
12d
12g
11a
11b
1728

Fig.5

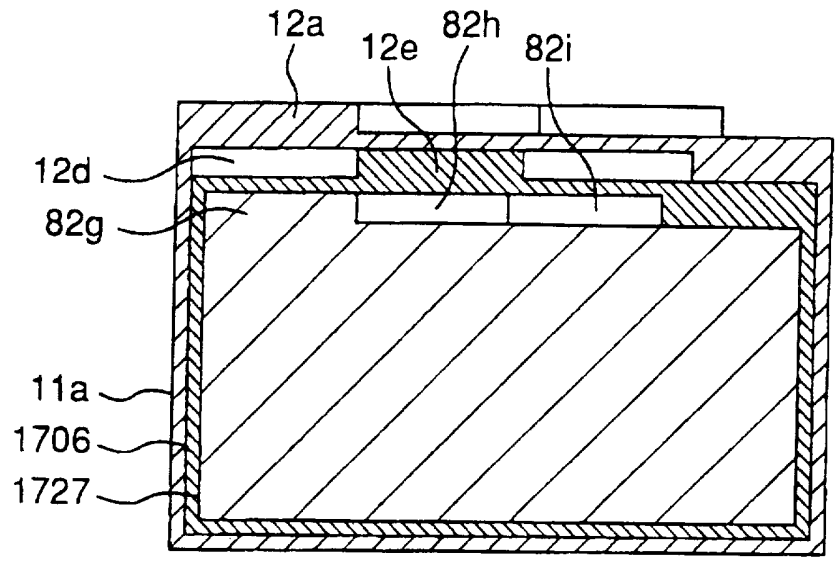

12a
12e
82h
82i
12d
82g
11a
1706
1727

Fig.6

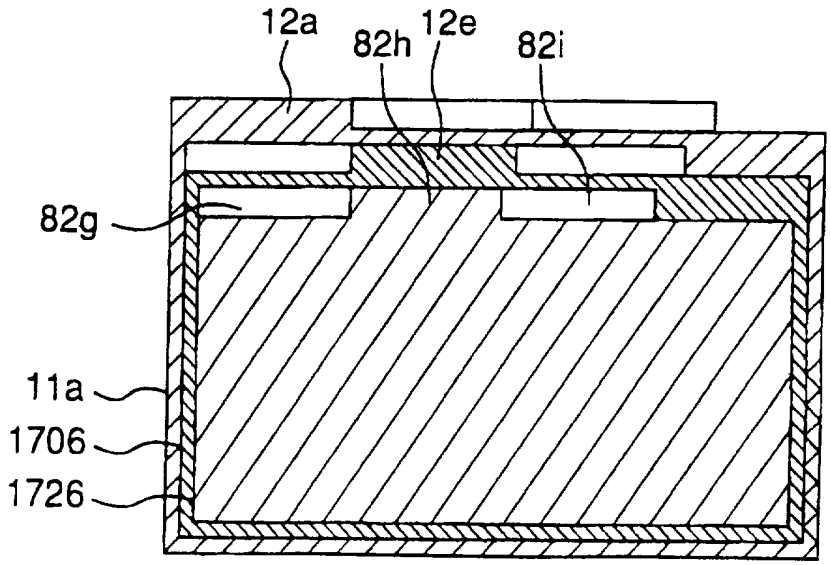

12a
82h
12e
82i
82g
11a
1706
1726

Fig.7

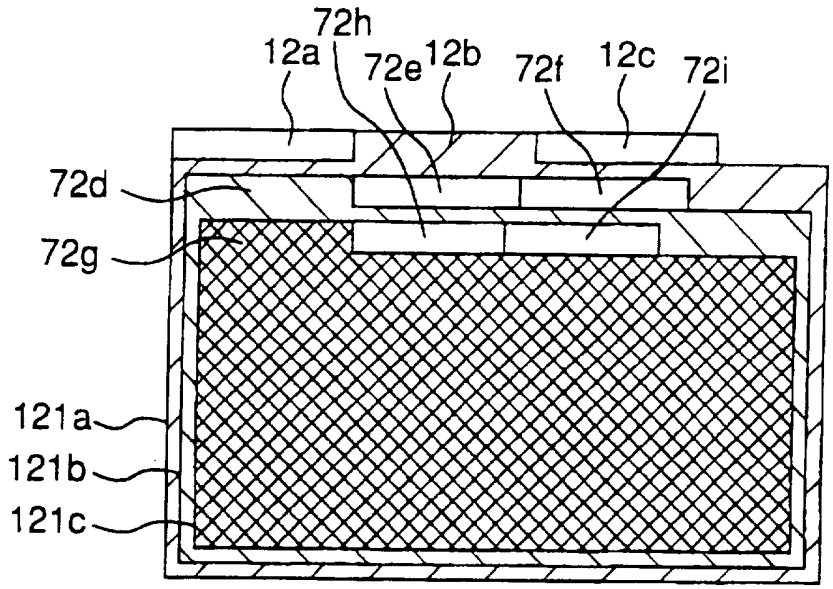

72h
12a
72e
12b
72f
12c
72i
72d
72g
121a
121b
121c

Fig.8

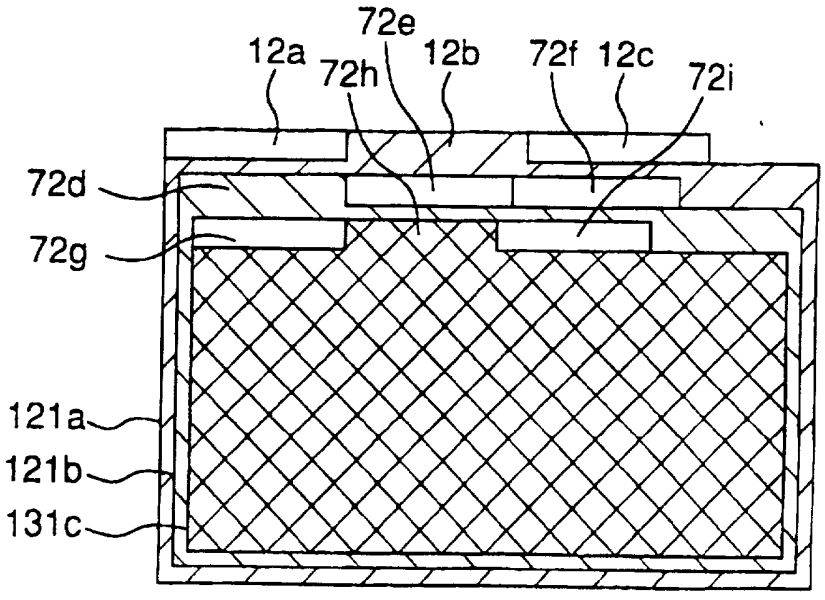

72e
12a
72h
12b
72f
12c
72i
72d
72g
121a
121b
131c

Fig.9

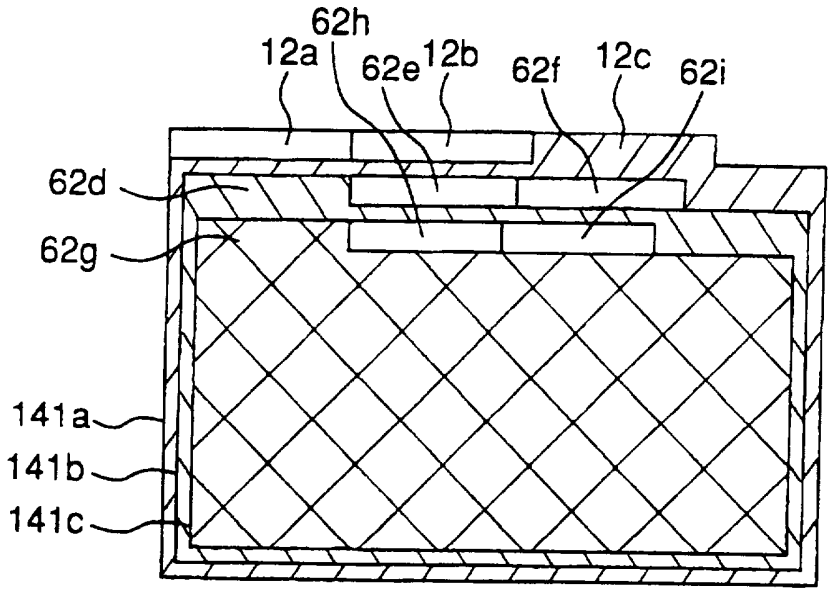

62h
12a
62e
12b
62f
12c
62i
62d
62g
141a
141b
141c

Fig.10

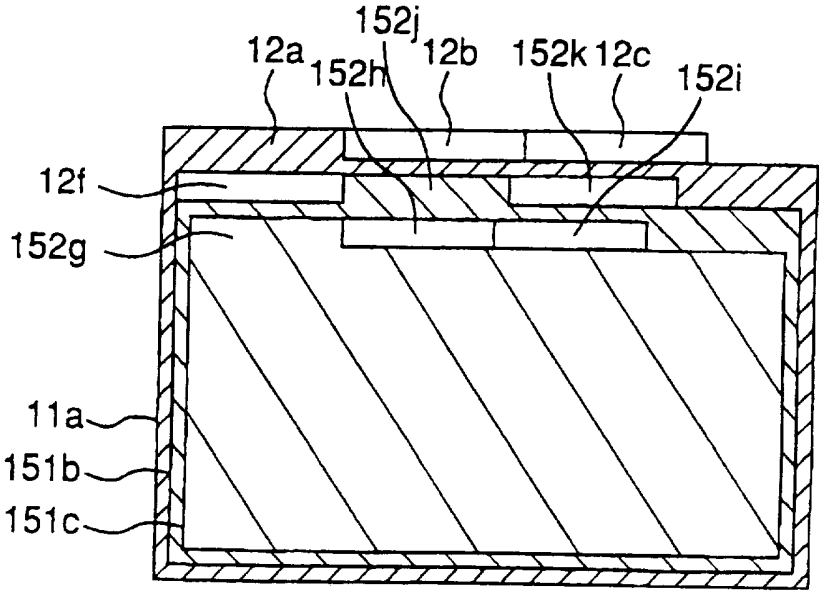

152j
12a
152h
12b
152k
12c
152i
12f
152g
11a
151b
151c

Fig.11

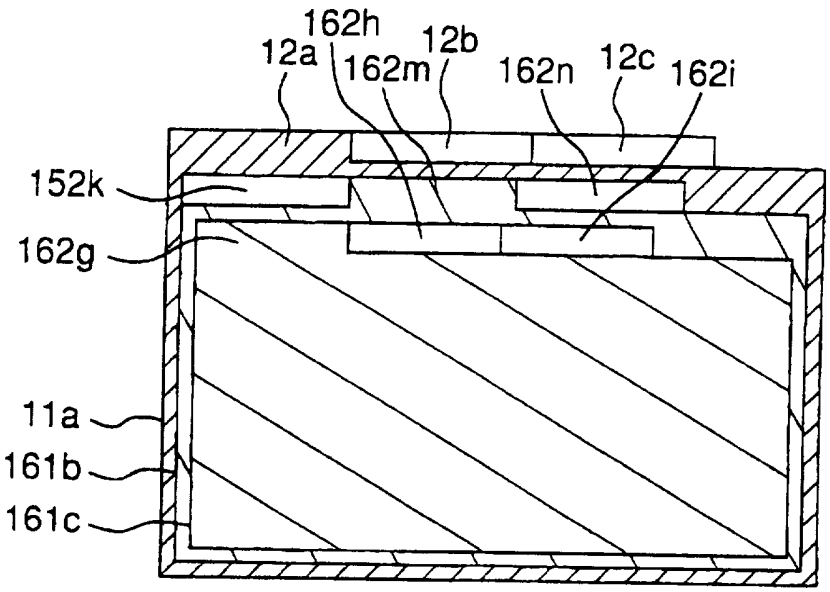
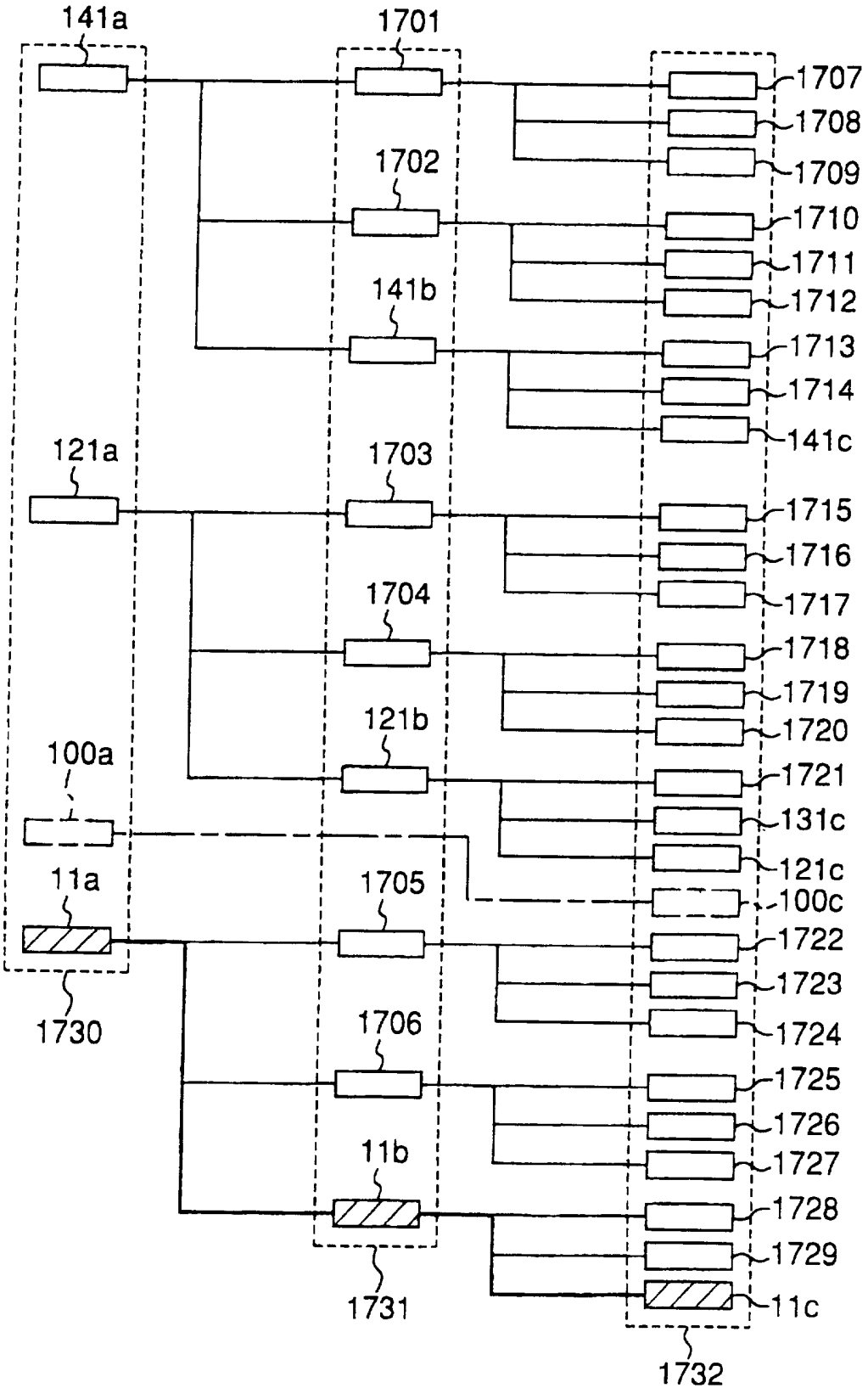


Fig.12


141a
1701
1707
1708
1709
1702
1710
1711
1712
141b
1713
1714
141c
121a
1703
1715
1716
1717
1704
1718
1719
1720
121b
100a
1721
131c
121c
11a
1705
100c
1722
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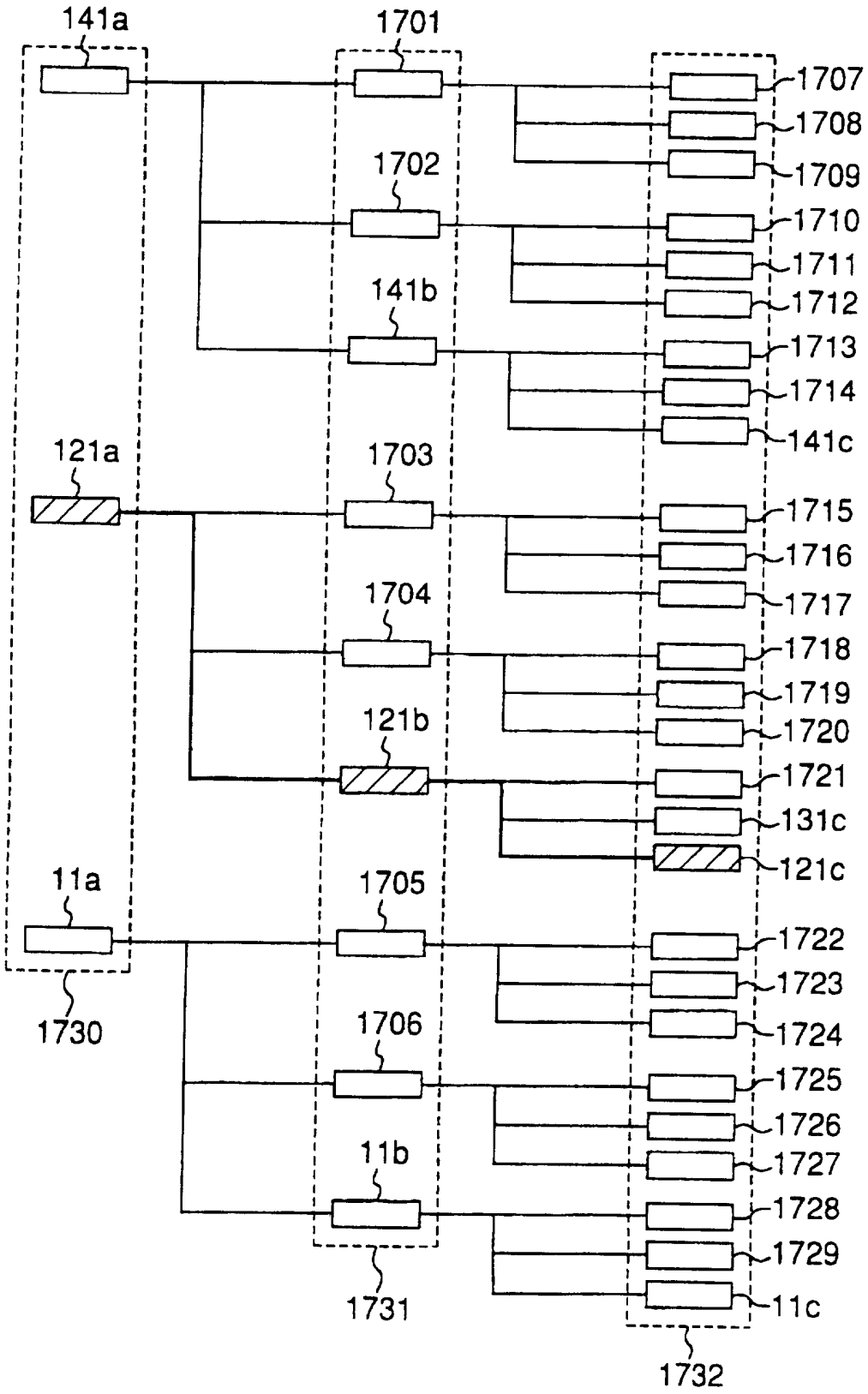
1706
1725
1726
1727
11b
1728
1729
11c
1731
1732

Fig.13


141a
1701
1707
1708
1709
1702
1710
1711
1712
141b
1713
1714
141c
121a
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1715
1716
1717
1704
1718
1719
1720
121b
1721
131c
121c
11a
1705
1722
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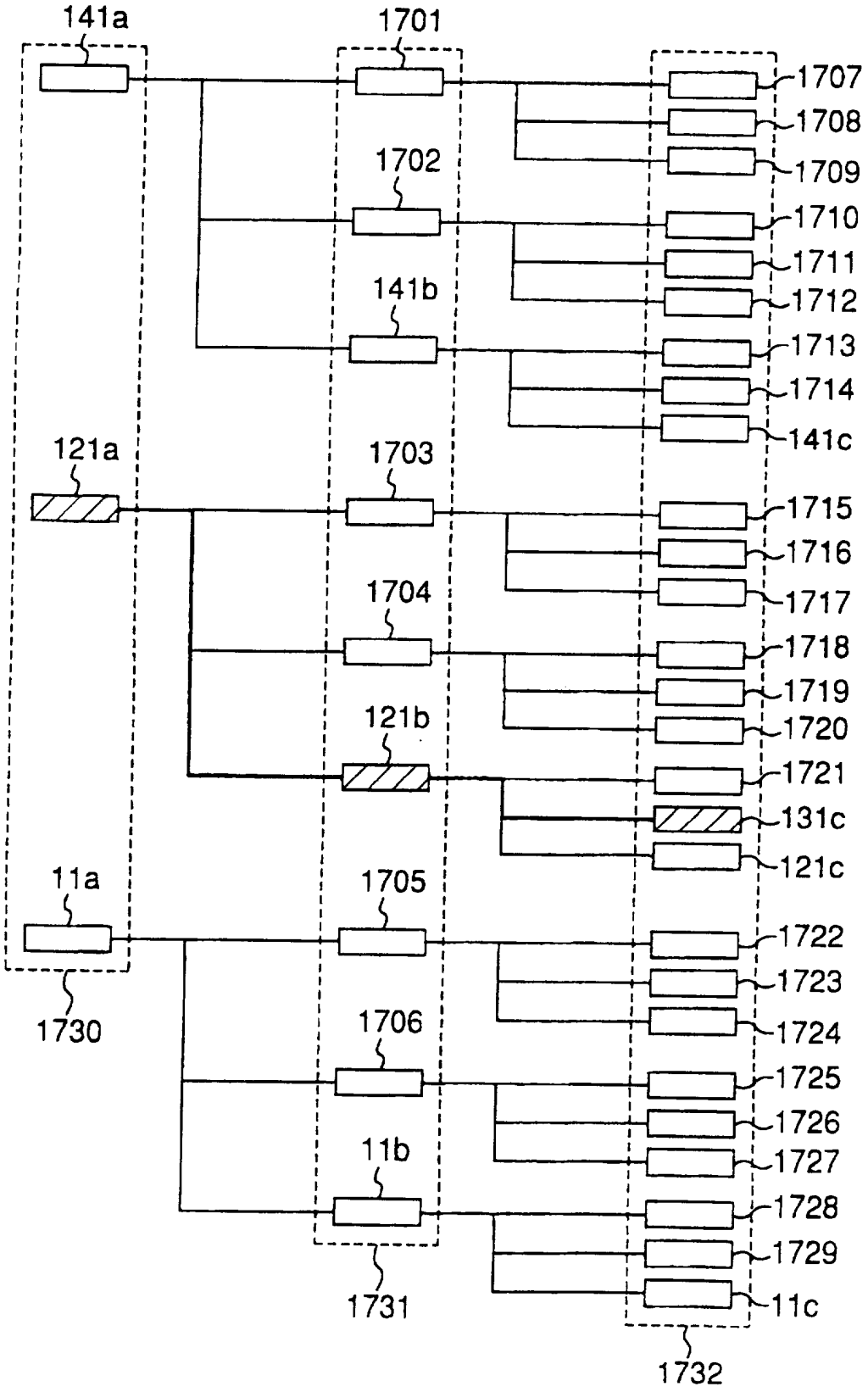
1725
1726
1727
11b
1728
1729
11c
1731
1732

Fig.14


141a
1701
1707
1708
1709
1702
1710
1711
141b
1712
1713
1714
141c
121a
1703
1715
1716
1717
1704
1718
1719
1720
121b
1721
131c
121c
11a
1705
1722
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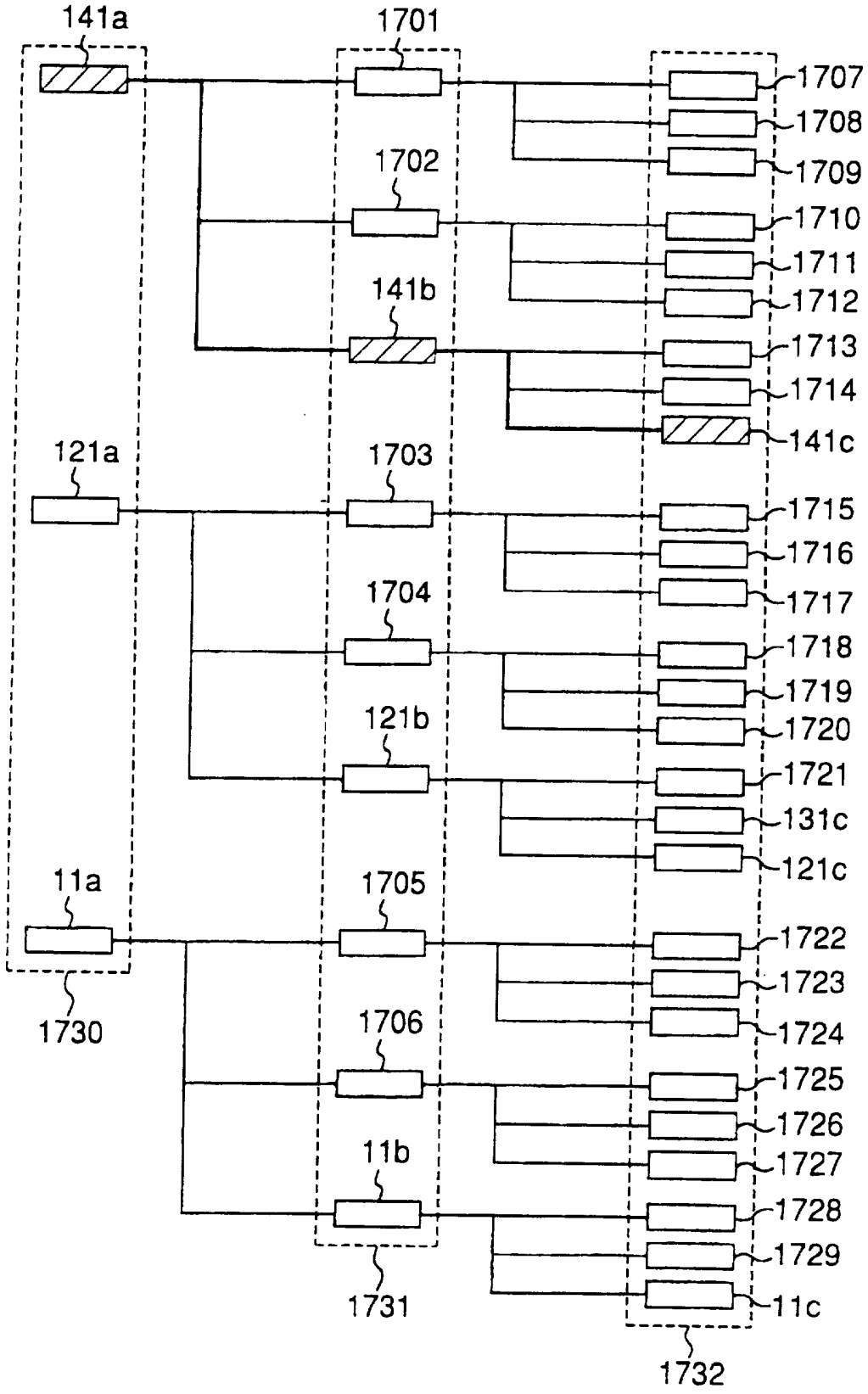
11b
1728
1729
11c
1731
1732

Fig.15


141a
1701
1707
1708
1709
1702
1710
1711
1712
141b
1713
1714
141c
121a
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1715
1716
1717
1704
1718
1719
1720
121b
1721
131c
121c
11a
1705
1722
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1729
11c
1731
1732

Fig.16

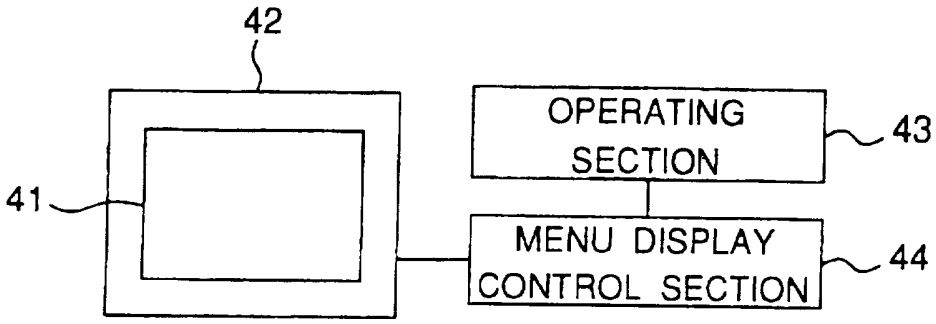

42
41
OPERATING SECTION
43
MENU DISPLAY CONTROL SECTION
44

Fig.17

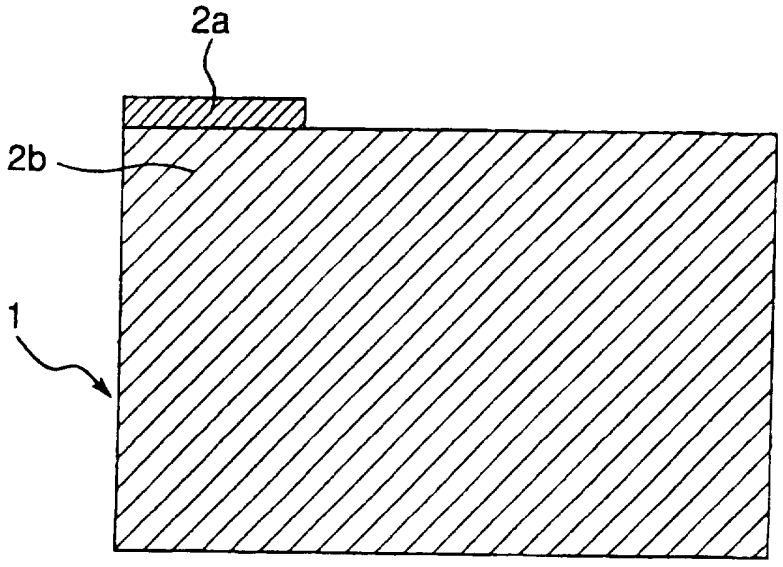

2a
2b
1

Fig.18

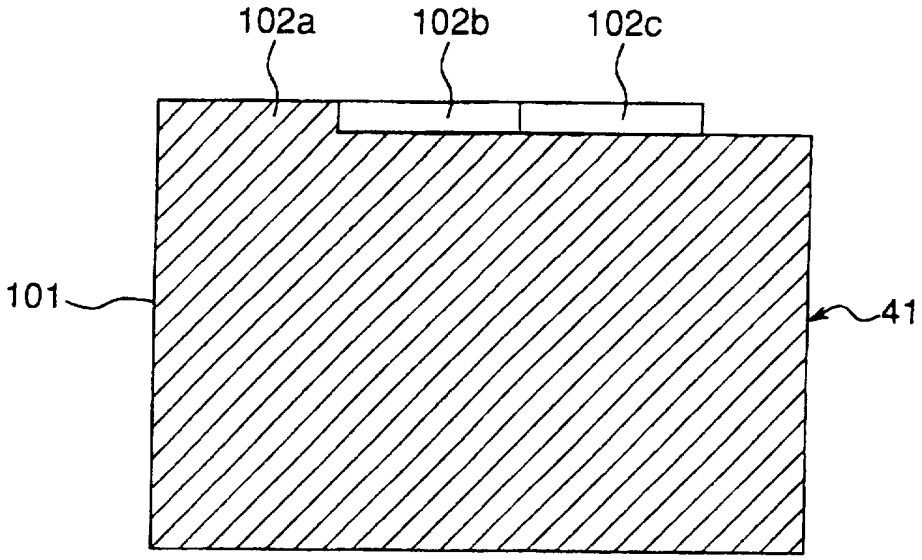


Fig.19

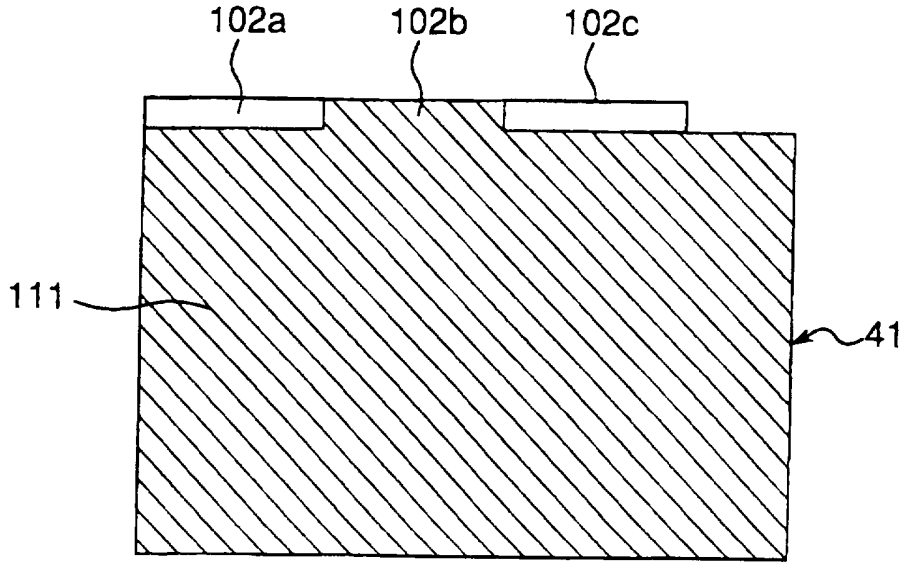


Fig.20

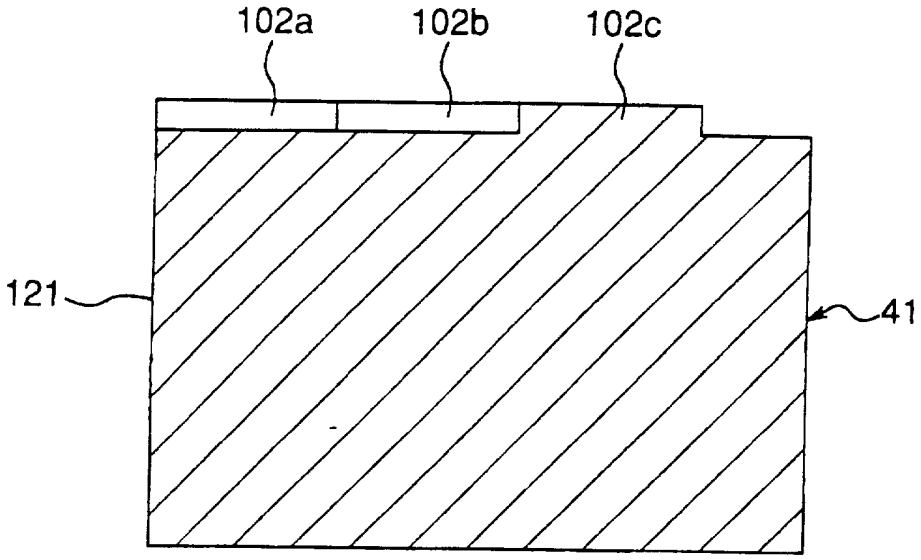
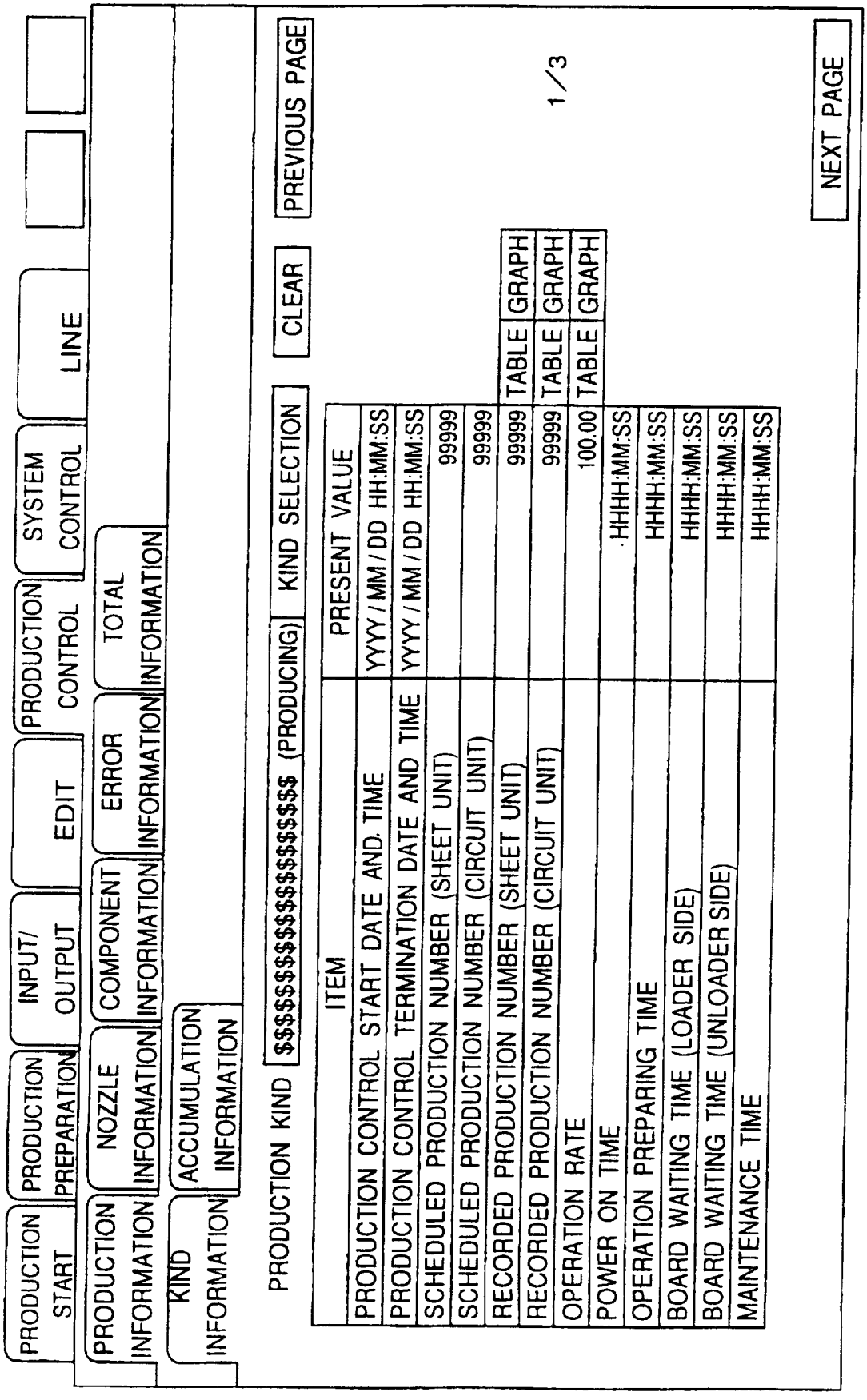


Fig.21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COMPONENT INFORMATION
ERROR INFORMATION
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KIND INFORMATION
ACCUMULATION INFORMATION
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$$$$$$$$$$$$$$$$$$$$ (PRODUCING)
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CLEAR
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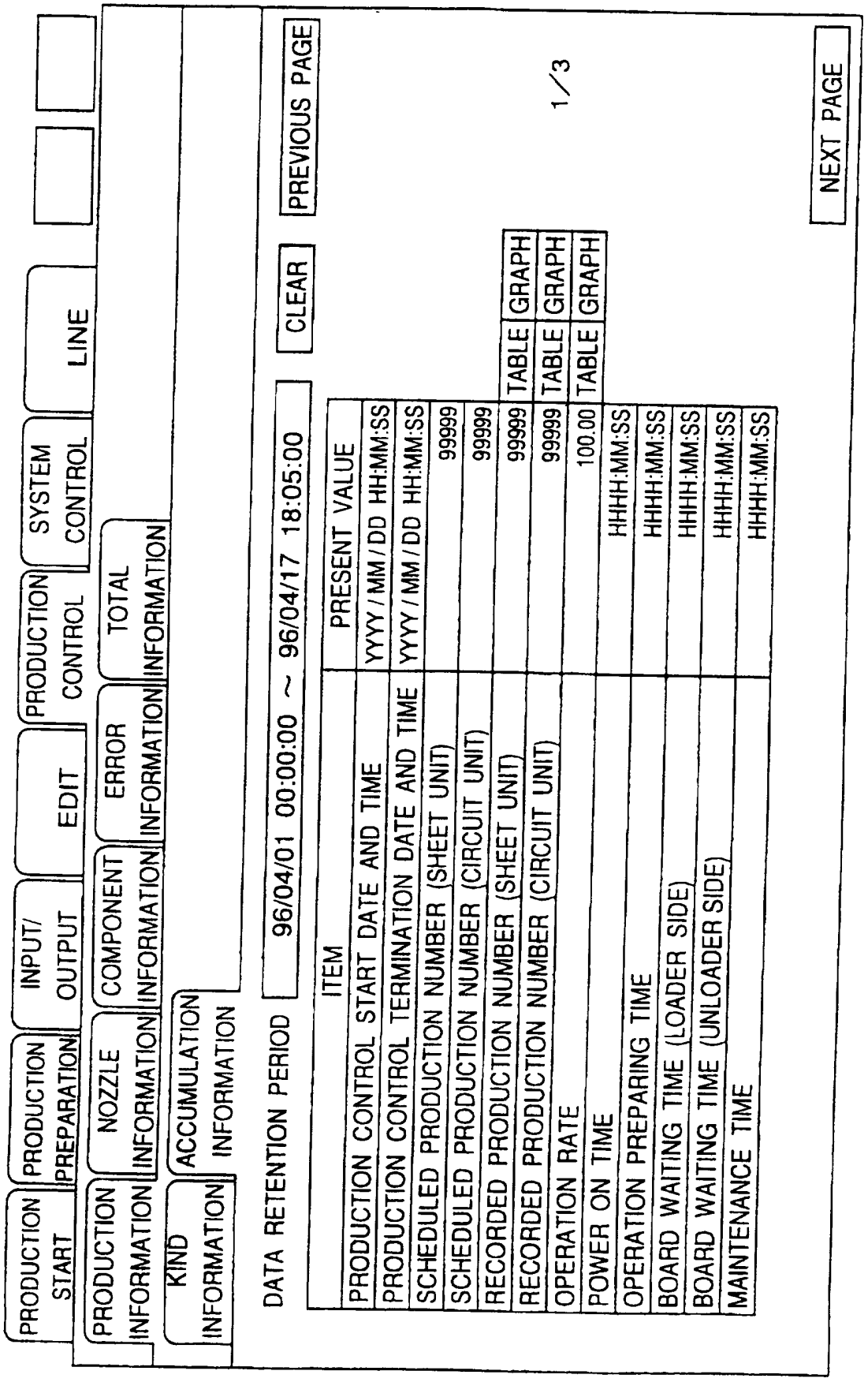
NEXT PAGE

Fig.22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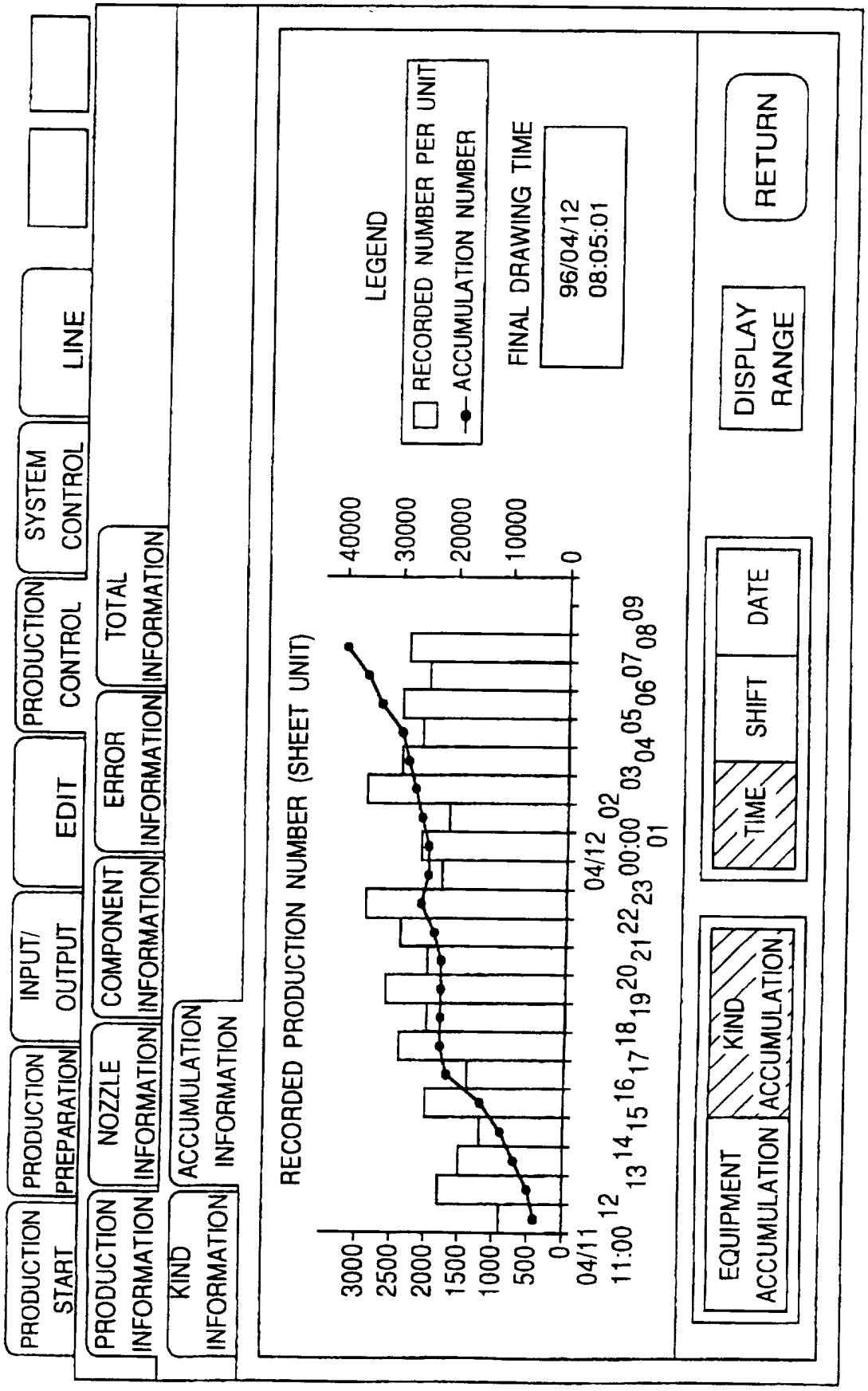
NEXT PAGE

Fig.23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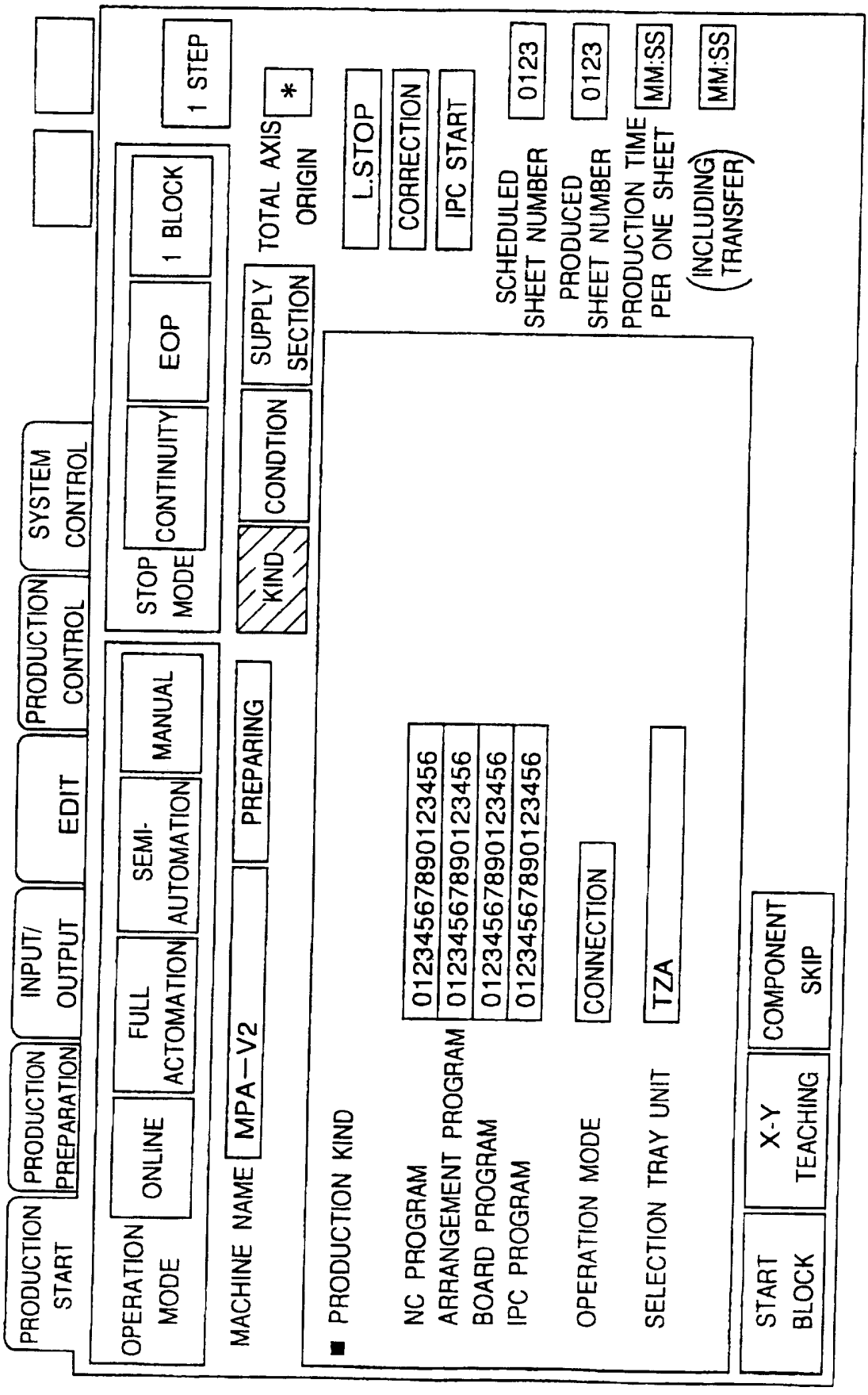
DISPLAY RANGE
RETURN

Fig.24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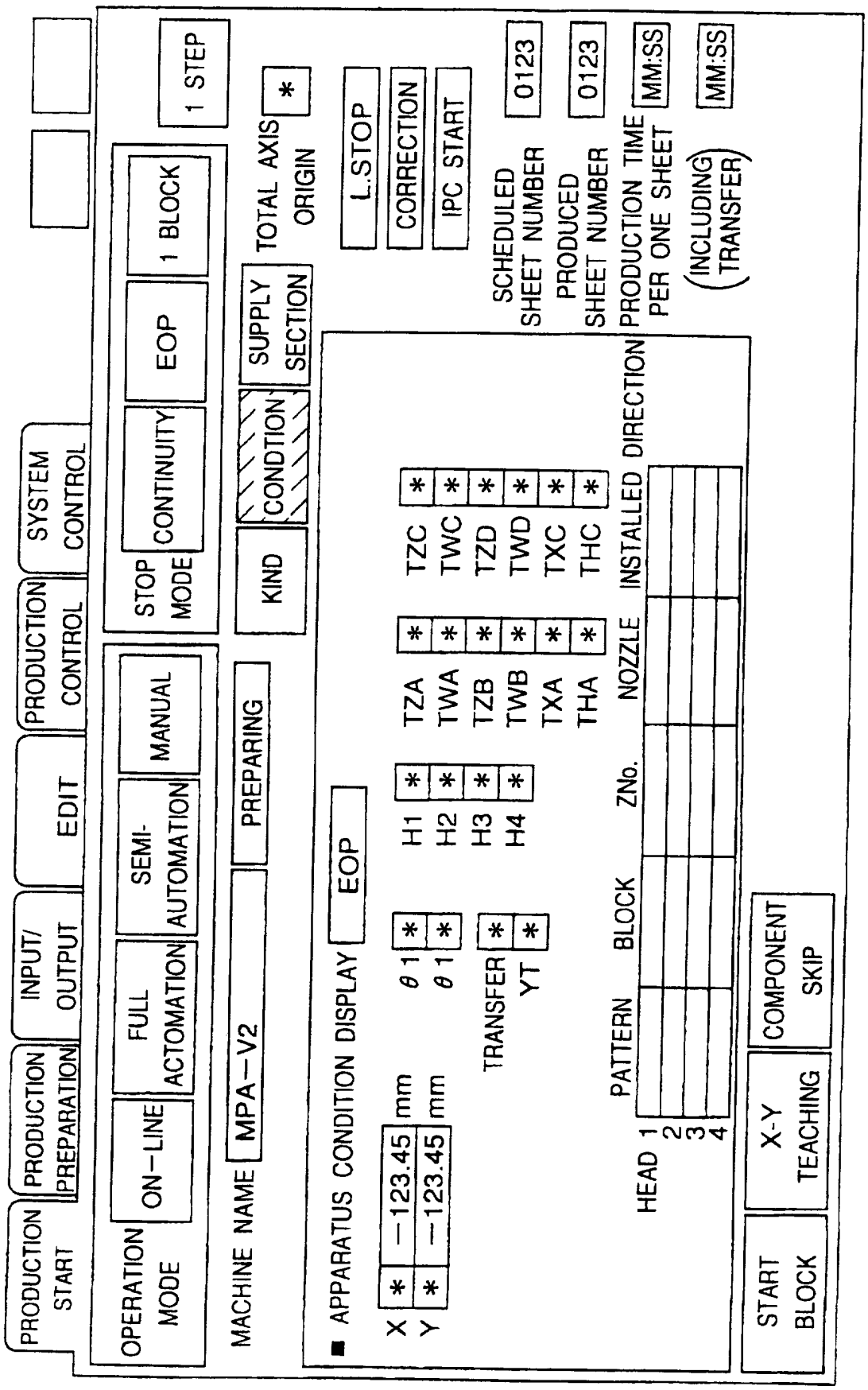
COMPONENT SKIP

Fig.25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STOP MODE
CONTINUITY
EOP
1 BLOCK
1 STEP
MACHINE NAME
MPA-V2
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KIND
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*
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CORRECTION
IPC START
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0123
PRODUCTION TIME PER ONE SHEET
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* −123.45 mm
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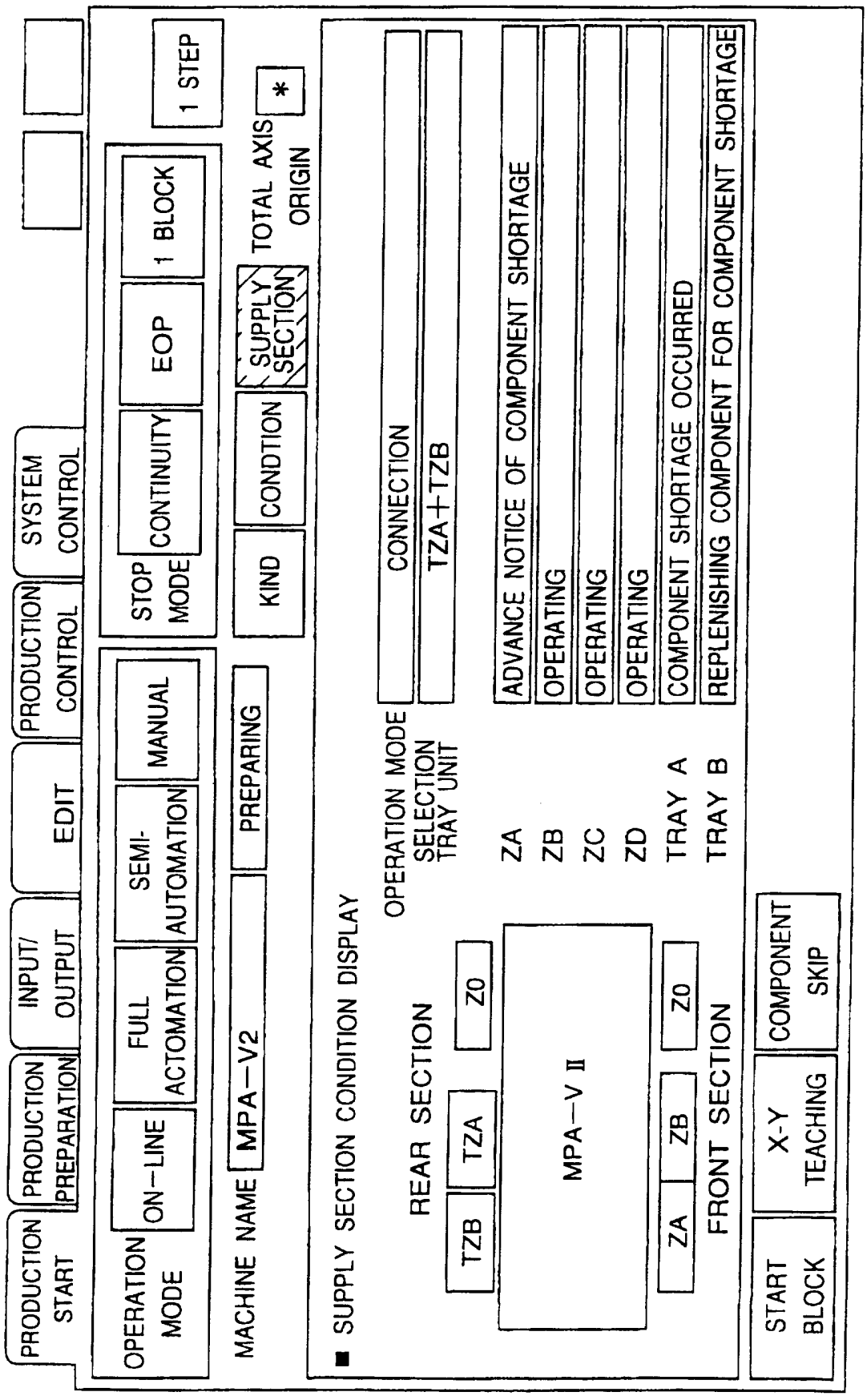
θ1 * *
TRANSFER * *
YT
H1 * TZA * TZC *
H2 * TWA * TWC *
H3 * TZB * TZD *
H4 * TWB * TWD *
TXA * TXC *
THA * THC *
PATTERN BLOCK ZNo. NOZZLE INSTALLED DIRECTION
HEAD 1
2
3
4
START BLOCK
X-Y TEACHING
COMPONENT SKIP

Fig.26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MANUAL
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PREPARING
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TOTAL AXIS ORIGIN
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REAR SECTION
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Z0
MPA-V II
ZA
ZB
ZC
ZD
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OPERATING
OPERATING
ZA
ZB
Z0
FRONT SECTION
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TRAY B
COMPONENT SHORTAGE OCCURRED
REPLENISHING COMPONENT FOR COMPONENT SHORTAGE
START BLOCK
X-Y TEACHING
COMPONENT SKIP

INTERNATIONAL SEARCH REPORT

Inter ional Application No
PCT/JP 97/01038

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G06F3/033

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)
IPC 6 G06F

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 practical, 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	EP 0 331 329 A (XEROX CORP) 6 September 1989 see abstract see page 6, line 58 - page 7, line 31; figure 6	1-3,5-8
Y		4,9

X	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 35, no. 2, 1 July 1992, pages 181-183, XP000313262 "TABULAR REPRESENTATION OF NOTEBOOK INFORMATION" see the whole document	1-3,5-8
Y		4,9

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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

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

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Date of the actual completion of the international search	Date of mailing of the international search report
28 July 1997	04.08.97
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl, Fax (+ 31-70) 340-3016	Authorized officer Bravo, P

Form PCT ISA 210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inten nal Application No
PCT/JP 97/01038

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	COMMUNICATIONS OF THE ASSOCIATION FOR COMPUTING MACHINERY, vol. 32, no. 10, 1 October 1989, pages 1164-1173, XP000072102 GRUDIN J: "THE CASE AGAINST USER INTERFACE CONSISTENCY" see page 1168, Par. 'Design exercise #3: Default menu selections'; figure 3 ---	2,3,6-8
A	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 35, no. 4B, 1 September 1992, pages 284-286, XP000313947 "NOTEBOOK CONTROL CASCADING TAB CHOICES" see page 285, line 1 - line 5 ---	2,3,6-8
A	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 36, no. 8, 1 August 1993, pages 649-653, XP000390365 "USER INTERFACE TO MULTI-VALUED GRAPHICAL NOTEBOOK TABS" see the whole document ---	4,9
A	WO 92 08199 A (GO CORP) 14 May 1992 see page 15, line 6 - line 21; figures 24,25 ---	4,9
P,Y	IBM TECHNICAL DISCLOSURE BULLETIN, vol. 39, no. 7, July 1996, page 73/74 XP000627928 "SCROLLING TAB FEATURE FOR A NOTEBOOK CONTROL" see the whole document -----	4,9

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inter nal Application No
PCT/JP 97/01038

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0331329 A	06-09-89	US 5079723 A	07-01-92
		DE 68918132 D	20-10-94
		DE 68918132 T	13-04-95
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