PANEL UNIT OF DEALING BOARD

Background of the Invention

Field of the Invention

The present invention relates to a panel unit of a dealing board adapted to be employed in terminals of banks and financial organizations. Reference is also made to co-pending application No. 9423118.0 which is a divisional application derived from this application.

Description of the Prior Art

Nowadays, the terminal of the banking organizations uses a dealing system carrying out transactions or dealings of securities, shares, and foreign exchange by means of telephone lines. A unit of such dealing system has a dealing board provided with operating portions and multi-function telephones and the like, a desk on which the dealing board is installed. The dealing system is constructed by installing a plurality of the desks in a dealing room.

FIG. 7 shows a conventional desk 50 installed in the dealing room. The desk 50 has an operation part 51 having various telephoning functions and a dealing board 53 having a hand-set 52, respectively placed on the desk. Further, the desk 50 has a display appliance 54 placed on the rear part of the desk so as to show economic information and the

like.

In order to use the dealing board 53 as a communication means, the dealing board provides a set panel units containing a dial operating portion 55, a displaying portion 56 of, for example, a liquid crystal display and the like showing a name of the sender, a volume dial 57 for controlling sound volume of the hand-set 52 and dark-and-light level of the displaying portion 56, and a set of one-touch dial buttons 58 (hereinafter referred to as a button merely) for calling out the particular or appointed customer in a one-touch manner through the telephoning lines or network.

Each button 58 has a label on which a name of the client is printed and stucked onto its top face in order to shown whom the button relates.

Because the clients whom the dealing board 53 is used are differed from each other, it has been necessary to paste different set of labels for different dealing boards 53 to the top faces of the buttons 58 in accordance with the prior art. It has been difficult to mass-product the dealing boards and cope with a change-demand occurred when personal changes and the similar change are done in client companies.

FIG 9 shows one of the apparatus for solving such problem of the conventional method. According to the prior art, a liquid crystal indicator 59 is installed by a button 58 as shown in FIG 9. Names of the customers are indicated

on the liquid crystal indicator 59 of the panel unit of the conventional dealing board can be easily changed by means of a controlling of the software of the computer.

According to the prior art, due to a narrow space for containing the mounted parts of the panel unit, the indication device is restricted to ones of a liquid crystal, such as the liquid crystal indicator 59. It is noted that the characters displayed on the indicator 59 of such kind is not clear and a viewing angle is narrow. In addition, the liquid crystal indicator 59 must be mounted on every low of the buttons 58, so that an electric wiring of the liquid crystal indicator 59 is made complicated and a mounting operation of the liquid crystal indicator 59 necessitates much hand-work.

According to another indication method of the customer names on the panel unit, a touching panel is placed on the top face of a plasma display device and the like, so that it is possible to recognize the names of the customers without labels attached onto the top faces. According to such panel unit, when light of ultraviolet ray LEDs arranged on the top face of the display device in a matrix shape is interrupted by a finger of the operator, the position of the finger is detected and it is a function of a switch. As a result, there is no feeling of pressing the buttons and an operability of the panel unit is deteriorated. Because the indicator 59 is

directly touched, the indicator 59 is apt to become dirty deteriorating visibility of the indicators.

Additionally, the conventional dealing board 53 used as a terminal of financial organizations or companies deals with financial transactions by means of telephone lines, so that it is necessary to provide telephone functions and a keyboard for using these telephone functions.

In the conventional dealing board 53, the keyboard is made and used as a unit and the united keyboard has operation buttons as shown in FIG 10 and FIG 11.

In detail, the operation button shown in FIG 10 consists of a button 58, an electric conductive contacting rubber 59 placed below the button 58, a printed substrate 61, and a panel 62 covering the printed substrate 61. The button 58 is adapted to be urged upwardly by a resiliency of the electric conductive contact rubber 59. An outwardly projected engagement portion 63 is formed on the lower and outer circumferential portion of the button 58. Because the engagement portion 63 engages with the bottom face of the panel 62, the button 58 doesn't get out of place from a hole 64 of the panel 62.

When the button 58 such constructed above is pressed, the button 58 lowers by a stroke S and a contact portion 65 placed on the electric conductive contact rubber 59 comes in contact with contacts 66 on the printed substrate 61 leading

electricity between these contacts 66. It is apparent that the low end of the button 58 is separated from a top face of the electric conductive contact rubber 59 by a gap X2, thereby the former cannot come in contact with the latter even when the contact portion 65 comes in contact with these contacts 66.

When a thickness of the panel 62 is shown by D, a height of the engagement portion 63 is C, and a thickness of the electric conductive contact rubber 59 is B, a total of D, C, and B, as well as the stroke S and the gap X2 equals to a thickness size A measured from the top face of the printed substrate 61 to the top face of the panel 62.

Other operation buttons shown in FIG 12 and FIG 13 have been used in the field. The button shown in FIG 12 has a dome-like button 68, and a polyester sheet 67 having its upper surface printed and covering the button 68. Another button shown in FIG 13 has a silicon rubber sheet 69 in addition to the dome-like button 68 and the polyester sheet 67, and a different button 70 connected to the silicoon rubber sheet 69. It is apparent that the flat button 70 is placed on and above the dome-like button 68. A thickness size A of the button shown in FIG 13 measured from the top face of the printed substrate 61 to another top face of the panel 62 is exceedingly shorter than the size A of the operation button shown in FIG 10.

The conventional operation buttons 68 and 70 shown in FIG. 12 and FIG. 13, respectively have strokes S of only about 1 mm because a molding process of polyester material has a restriction and life of the polyester sheet 67 is short.

Consequently, operation or pressing feeling of the buttons 68 and 70 are bad. When these buttons 68 and 70 are employed in the dealing board and they are used frequently, they will be broken before long periods. It is said that they haven't reliability in operation.

When the thickness size measured from the top face of the printed substrate 61 and the top face of the button 58 in the conventional keyboard unit 53 is made small, insulation resistance between the printed substrate 61 and the button 58 becomes low, static electricity noise impressed to around the button 58 through its top side is transferred to a signal pattern 72 connected to an electrode of the contact 71 shown in FIG. 14, and entered into an electronic circuit from a through hole 73 through a connector, thereby generating errors in operation.

Summary of the Invention

According to a first aspect of the present invention, a panel unit of a dealing board provides a keyboard unit which, including a plurality of buttons, is disposed on a display unit, wherein the display unit is a single display, including a plurality of discrete indication regions which are formed by dividing or sectioning the single display into a plurality of regions and which indicate a function name

which, corresponding to each of said plurality of buttons, can be changed programably by software, wherein the keyboard unit comprises: a printed substrate provided with switch contacts for respective buttons, a plurality of further contacts which are engageable with the switch contacts of the printed substrate, the buttons which, disposed on the further contacts can bring the further contacts into contact with the switch contacts on the printed substrate, and click means associated with each of the buttons for generating a click when a button is pushed, and wherein the printed substrate includes through holes for revealing the function name indicated by the discrete indication regions on the display unit.

According to a second aspect of the present invention, a panel unit of a dealing board comprises a display unit having discrete indication regions, and a keyboard unit disposed on the display unit, the keyboard unit including a plurality of buttons, a printed substrate having a plurality of switch contacts at positions corresponding to positions of said plurality of buttons and through holes in the substrate disposed at positions adjacent said plurality of buttons in order to reveal an indication region of the display unit adjacent a corresponding button the discrete indication regions for indicating a function of each button, a contact sheet having a plurality of further contacts, each further contact being engageable with a switch contact of the printed substrate, and click means associated with each of said plurality of buttons for generating a click when a button is pushed.

Brief Description of the Drawings

FIG 1 is a plan view showing a panel unit of the dealing board according to one embodiment of the present invention.

FIG 2 is a plan view of the indication portion constructing the panel unit.

FIG 3 is a side view of the indication portion above.

FIG 4 is an exploded perspective view of the indication portion.

FIG 5 is an enlarged view of the important portion of the indication portion.

FIG 6 is an enlarged sectional view of the important portion.

FIG 7 is a perspective view of the desk installed on the conventional dealing board.

FIG 8 is a perspective view of a panel unit of the conventional dealing board.

FIG 9 is a section of the panel unit shown in FIG 29.

FIG 10 is a section of an operation button installed on the conventional keyboard.

FIG 11 is a section showing an operation condition of the operation button.

FIG 12 is a section of another operation button employed on the conventional keyboard unit.

FIG 13 is a section of still another operation button used on the conventional keyboard unit.

FIG 14 is a detailed view of the contact installed on the conventional keyboard unit.

Description of the Embodiments

As shown in the plan view of FIG 1 of the panel unit used in the operation portion of the dealing board according to the present invention, the main body 1 of the panel unit has a dial operation portion 2, a liquid crystal indicator 3 displaying names and the like of senders, and indicating portion 4, respectively installed on the main body 1.

The indicating portion 4 consists of a single display

unit 5, such as a liquid indicator and a plasma display and etc. and a keyboard unit 6 placed on the display unit 5.

The display unit 5 enables to any information at any position thereon by means of a software. The characters 5a in, for example, two lines and four rows are shown at through holes 7b, each placed adjacent to a number of protruded buttons 7a, and frame indications 5b enclosing these characters 5a. These protruded buttons 7a are formed on a surface sheet 7 consisting of the keyboard unit 6.

These frame indications 5b show one thin line, double thin lines, a thick line, a bold line, or flicking line in order to show various operation conditions of communication receiving, communication sending, and a usage of another machine of the same group. The keyboard unit 6 is placed on the display unit 5 through a reflecting plate 8 in order to make the display unit 5 easy to see. As shown in FIG 4, the keyboard unit 6 is constructed by piling in order a printed substrate 10, an insulation sheet 11, a contacting sheet 12, a click sheet 13, and a top face sheet 7.

The printed substrate 10 has carbon contacts 10a, respectively printed at places corresponding to the positions of a plurality of buttons 7a formed on the top face sheet 7. strip shaped through holes 10b are formed at the positions corresponding to these of the frame indication 5b of the display unit 5, therefore contents of the display unit 5 can

be seen through these holes 10b.

If necessary, a plurality of chips LED 10c are installed on the top face and at both sides of the printed substrate 10 in order to indicate operation condition of the corresponding button 7a through function of the chips LED 10c. A connector 10d of a face-attaching type is attached to a rear face of the printed substrate 10, thereby the carbon contacts 10a and the chips LED 10c on the printed substrate 10 are electrically connected to another printed substrate (not shown) through the connector 10d.

While, the insulation sheet 11 is formed on a non-color transparent film and has a set of through holes 11a and 11b of square and round at positions corresponding to that of the carbon contacts 10a and the chips LEDs 10c formed on the printed substrate 10. The carbon contacts 10a on the printed substrate 10 and other carbon contacts 12a formed on the bottom face of the contact sheet 12 are insulated from each other so as to prevent these contacts 10a and 12a from coming in contact with each other while the button 7a on the top face sheet 7 is not pressed.

The contact sheet 12 is made of a non-color transparent film similar to that of the insulation sheet 11 and has a set of carbon contacts 12a placed at positions corresponding to the carbon contacts 10a of the lower printed substrate 10. These carbon contacts 12a are apparently formed by printing

in order to construct a switching function between the carbon contacts 12a and other carbon contacts 10a on the printed substrate 10. The contact sheet 12 has also a set of through holes 12b at positions corresponding to the chips LED 10d on the printed substrate 10.

The click sheet 13 is made of a non-color transparent film and has a dome-like protrusion 13a formed at positions corresponding to the carbon contact 10a of the printed substrate 10 and the carbon contact 12a of the contact sheet 12. The protrusion 13a is adapted to be resiliently deformed when the button 7a of the top face sheet 7 is pressed giving a click-feeling to a finger of the operator, and return to raise the button 7a to its original position when the finger is left from the button 7a.

In addition, the click sheet 13 has a number of through holes 13b formed at positions corresponding to the chips LED 10d on the printed substrate 10.

While, the top face sheet 7 is made of a silicone rubber, and has buttons 7a formed at positions corresponding to the carbon contacts 10a and 12a and long or strip through holes 7b formed at positions corresponding to the positions corresponding to the frame indications 5b of the display unit 5 enabling to see the contents of the display unit 5 therethrough.

A number of protrusions 7c a little larger than the

chips LED 10c are formed at positions of the printed substrate 10a corresponding to the chips LED 10c so as to accommodate the chips LED 10d.

Operation of the keyboard panel unit of the present invention will be described.

When the panel unit main body 1 is employed to the dealing board, the contents of every button 7a displayed in the display unit 5 can be seen through the through holes 10b and 7b formed in the keyboard unit 6.

As a result, it is possible to easily know the name of the client to which the particular button 7a led by displaying information of the clients at every button 7a.

When a telephone call is made to a client, it is necessary to push the button 7a showing the particular client's name. The button 7a makes the protrusion 13a of the click sheet 13 resiliently deform, a finger feels a clicking, the contact sheet 12 is pressed making the carbon contact 12a on the bottom of the contact sheet 12 come into contact with the carbon contacts 10a on the printed substrate 10. Therefore, the switch is made ON. Thus, it is possible to call up the client by one-touch operation.

While, the client indications of respective buttons 7a can be easily changed by changing software, therefore it is very easy to carry out a change operation of the clients or customers which is due to personnel changes in the companies.

It is noted that, in order to improve operability of the panel unit of the embodiment above, the top face sheet 7 provided with a number of buttons 7a is employed. It is possible to print the buttons on the click sheet 13 and a finger of the operator directly pushes the click sheet 13 according to an alternation of the panel unit. Also, it is possible to use a flat sheet having the buttons 7a printed thereon or another flat sheet provided with the buttons 7a thermally formed thereon in place of the top face sheet 7. When the top face sheet 7 is made of a transparent material number, it is possible to see the displayed contents of the display unit 5 without any through openings, such as through holes 7b.

According to the present invention, the keyboard unit 6 is installed on the display unit 5, the display unit 5 can be seen through the through holes 10b open in the keyboard unit 6, a plurality of the buttons 7a are formed on the keyboard unit 6, and respective clients names of each button 7a are displayed on the display unit 5, therefore watching the display unit 5 through the keyboard unit 6 recognizes the particular customer of the particular button 7a making communication with the customers easy and sure.

Because the contents displayed on the display unit 5 can be easily changed by changing software, it is possible to previously mass produce the dealing board 6 and decide

the particular contents displayed on the button according to the particular customer after purchase ordering of the customer. Again, it is easy to set the display contents of the button according to respective customers, change the display contents after they are changed due to personnel changes in the client companies by means of changing software.

When the operator pushes the button 7a, he or she feels a clicking sound and can recognize the button 7a is surely pressed, therefore operability of the panel unit is exceedingly improved. In addition, when the top face sheet is made of a transparent material, it is possible to easily obtain a panel unit of water-proof construction preventing water, foreign matter or wetty air from invading or entering to the keyboard unit 6 and the display unit 5.

CLAIMS

1. A panel unit of a dealing board provides a keyboard unit which, including a plurality of buttons, is disposed on a display unit,

wherein the display unit is a single display, including a plurality of discrete indication regions which are formed by dividing or sectioning the single display into a plurality of regions and which indicate a function name which, corresponding to each of said plurality of buttons, can be changed programably by software,

wherein the keyboard unit comprises: a printed substrate provided with switch contacts for respective buttons, a plurality of further contacts which are engageable with the switch contacts of the printed substrate, the buttons which, disposed on the further contacts can bring the further contacts into contact with the switch contacts on the printed substrate, and click means associated with each of the buttons for generating a click when a button is pushed, and

wherein the printed substrate includes through holes for revealing the function name indicated by the discrete indication regions on the display unit.

2. A panel unit of a dealing board, the panel unit comprising a display unit having discrete indication



regions, and a keyboard unit disposed on the display unit, the keyboard unit including:

a plurality of buttons;

a printed substrate having a plurality of switch contacts at positions corresponding to positions of said plurality of buttons and through holes in the substrate disposed at positions adjacent said plurality of buttons in order to reveal an indication region of the display unit adjacent a corresponding button, the discrete indication regions for indicating a function of each button;

a contact sheet having a plurality of further contacts, each further contact being engageable with a switch contact of the printed substrate; and

click means associated with each of said plurality of buttons for generating a click when a button is pushed.

3. A panel unit according to claim 2 wherein the keyboard unit includes a surface sheet having protruding buttons which constitute the plurality of buttons.

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