

**DEVICE AND METHOD FOR CONTROLLING OPERATION OF ELEVATOR BY
USING MONITOR**

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to and the benefit of Korean Patent Application No. 10-2016-0015710 filed in the Korean Intellectual Property Office on February 11, 2016, the entire contents of which are incorporated herein by reference.

TECHNICAL FIELD

The present invention relates to an apparatus and a method of controlling an operation of an elevator using a monitor, and particularly, to an apparatus and a method of selecting and enlarging a button set displayed on a monitor of an elevator by using a pin camera.

BACKGROUND ART

It is general to install a general hall button on a wall surface of a building next to a door of an elevator for selecting a floor, and up and down of the elevator. However, in order to install the hall button, it is necessary to drill a hole on a wall surface of a building, install the hall button in the opening, and connect various wires. The hall button needs to be installed for every

floor of the building, so that the installation of the hall button requires considerable time and costs.

In a case of a general tall building, floor selection buttons are disposed in the hall button with a small size as many as the number of floors, so that particularly, it is difficult for users having weak eyesight to select floor selection buttons.

SUMMARY OF THE INVENTION

The present invention has been made in an effort to decrease costs and manpower consumed to install a hall button by removing the hall button, which is installed on a wall surface next to a door of an elevator, displaying buttons serving as the hall button on a screen of a monitor installed on a surface of the door of the elevator, and enabling a user to select the hall button by a contactless scheme. As a matter of course, depending on a case, the hall button installed on the wall surface is not removed, and the button of the monitor may also be used together.

The present invention has also been made in an effort to minimize inconvenience of a user by enlarging and displaying a button selected by the user on a monitor.

An exemplary embodiment of the present invention provides an apparatus for controlling an operation of an elevator by using a monitor, including: a monitor M

installed on a door D of an elevator or a wall surface of a cage of the elevator; a first pin camera set Px including three pin cameras Px1 to Px3, which are disposed to be perpendicular to the monitor at a lateral and upper side of the monitor M including an upper door frame or a ceiling of the cage of the elevator at a predetermined interval while having an interval with the monitor M; a second pin camera set Py including another three pin cameras Py1 to Py3, which are disposed to be perpendicular to the monitor in an upper portion of the monitor M at an opposite side of the first pin camera set Px at a predetermined interval; a controller C connected with the first and second pin camera sets Px and Py and the monitor M, and configured to control an image of the monitor M according to a signal of the pin camera set; and an elevator control device EC connected to the controller C and configured to control an operation of the elevator, in which the three pin cameras of the first pin camera set Px sequentially form 2D images x1, x2, and x3 toward the monitor on a front surface of the monitor, respectively, and three pin cameras of the second pin camera set sequentially form 2D images y1, y2, and y3 toward the monitor on the front surface of the monitor, respectively, and the 2D images x1 to x3 and y1 to y3 overlap on the front surface of the monitor, respectively, so that x1 overlaps y1 to form an image z1, x2 overlaps y2

to form an image z_2 , and x_3 overlaps y_3 to form an image z_3 , and the controller C displays a button set BS for selecting a floor and up and down on the monitor M, when an operator including a finger of a user sequentially touches the images z_1 to z_3 , the controller C detects the touch and activates one button in the button set BS, and the elevator control device EC controls an operation of the elevator according to the activated button.

Each of the pin cameras Px_1 to Px_3 and Py_1 to Py_3 may be fixed between a pair of fixing brackets A and B, horizontal holes A1 and A2 may be formed in both side surfaces of the fixing bracket A, respectively, and vertical holes B1 and B2 may be formed at positions of both side surfaces of the fixing bracket B corresponding to the horizontal holes A1 and A2, respectively, so that when the horizontal holes A1 and A2 and the vertical holes B1 and B2 are joined by fasteners F including a screw or a bolt, both fixing brackets A and B may be movable with respect to each other by lengths of the horizontal hole and the vertical holes, and the pin cameras Px_1 to Px_3 and the pin cameras Py_1 to Py_3 fixed to the fixing brackets A and B may be installed in two U-shaped brackets 20, in which elongated slits 10 are horizontally formed in both side plates 12, respectively, to form first and second pin camera sets Px and Py, respectively, and each of the pin cameras may be

movable along the slit 10.

Another exemplary embodiment of the present invention provides a method of controlling an operation of an elevator by using an elevator operation controlling apparatus, the method including: an operation S10 of displaying a button set BS on a monitor M by a controller C; an operation S20 of forming three images z1 to z3 sequentially overlapping toward a front surface of the monitor M by two pin camera sets Px and Py; an operation S30 of determining, by the controller C, whether an operator touches the image z1 in the state where a door of the elevator is closed; an operation S40 of, when it is determined that the operator touches the image z1, displaying, by the controller C, a cursor 30 on the monitor M; an operation S50 of determining, by the controller C, whether the operator touches the image z2 in a state where the door of the elevator is continuously closed; an operation S60 of, when it is determined that the operator touches the image z2, making, by the controller C, the cursor 30 move and overlap any one button so as to correspond to the operation of the operator, and selecting the overlapping button; an operation S70 of determining, by the controller C, whether the operator touches the image z3 in the state where the door of the elevator is closed; an operation S80 of, when it is determined that the operator

touches the image z3, registering, by the controller C, that the button overlapping the cursor is selected; and an operation S90 of making, by the elevator control device EC, the elevator execute an operation corresponding to the registered button.

Yet another exemplary embodiment of the present invention provides a method of controlling an operation of an elevator by using an elevator operation controlling apparatus, the method including: an operation S110 of displaying, by a controller C, a button set BS on a monitor M; an operation S120 of forming three images z1 to z3 sequentially overlapping toward a front surface of the monitor M by two pin camera sets Px and Py; an operation S130 of determining, by the controller C, whether an operator touches the image z1 in the state where a door of the elevator is closed; an operation S140 of, when it is determined that the operator touches the image z1, displaying, by the controller C, a cursor 30 on the monitor M; an operation S150 of determining, by the controller C, whether the operator touches the image z2 in a state where the door of the elevator is continuously closed; an operation S160 of, when it is determined that the operator touches the image z2, making, by the controller C, the cursor 30 move and overlap any one button so as to correspond to the operation of the operator, and enlarging

the button set BS based on the overlapping button; an operation S170 of determining, by the controller C, whether the operator touches the image z3 in the state where the door of the elevator is closed; an operation S180 of, when it is determined that the operator touches the image z3, registering, by the controller C, that the activated button overlapping the cursor is selected; and an operation S190 of making, by the elevator control device EC, the elevator execute an operation corresponding to the registered button.

According to the present invention, it is possible to decrease costs and manpower consumed for installing a hall button on a wall surface of a building, and enlarge and display a button selected by a user, thereby minimizing inconvenience of the user.

According to the present invention, it is possible to prevent a floor button or an up and down button from being erroneously selected by a play or a malfunction.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front view of a door of an elevator viewed from an entrance of a hall door stand for illustrating an apparatus according to the present invention;

FIG. 1A is a perspective view illustrating image configurations of pin cameras;

FIG. 2 is a side view illustrating an image relation formed by a set (P_x, P_y) of two pin cameras;

FIG. 3 is a schematic diagram illustrating a general connection relation of the apparatus according to the present invention;

FIGS. 4A and 4B are exploded perspective views illustrating a structure of a pin camera;

FIG. 5 is a front view illustrating an operation of a button set BS displayed on a monitor M by stages according to the present invention;

FIG. 6 is a flowchart illustrating an example of an operation method of the present invention;

FIG. 7 is a flowchart illustrating another operation method of the present invention; and

FIG. 8 is a front view of a button set illustrating a process of enlarging the button set by the method of FIG. 7.

DETAILED DESCRIPTION

FIG. 1 is a front view of a door of an elevator viewed from an entrance of a hall door stand for illustrating an apparatus according to the present invention.

As illustrated in FIG. 1, a monitor M is installed on a door D of an elevator. A general hall button

installed on a wall surface of a building at a right side of the door may be removed as necessary.

A first pin camera set Px, in which three pin cameras Px1 to Px3 are disposed at a predetermined interval while being perpendicular to the monitor, is installed on an upper door frame, particularly, a door frame at a left side of a lateral surface of the monitor M, while having an interval with the door D of the elevator. Further, a second pin camera set Py, in which other three pin cameras Py1 to Py3 are disposed at a predetermined interval while being perpendicular to the monitor, is installed on an upper door frame at an opposite side of the first pin camera set Px with respect to the monitor M.

Depending on a case, the monitor may be installed on a door of a cage, that is, a surface of the door of the cage of the elevator or a wall surface of the cage, not the door of the hall side, and the first and second pin camera sets Px and Py may be installed at the same positions on a ceiling of the cage.

FIG. 1A is a perspective view illustrating image configurations of the pin cameras, and illustrates image configurations of the pin cameras Px1 to Px3.

As illustrated in FIG. 1A, the pin cameras aim a front surface of the monitor M, and configure 3D images obtained by photographing a front side of the monitor as x1

to x_3 which are 2D images parallel to the front surface of the monitor by using software published in a pin camera field. Other pin cameras Py_1 to Py_3 also perform the same function. Accordingly, as illustrated in FIG. 1, three pin cameras form three 2D images parallel to the monitor M at each of both sides.

FIG. 2 is a side view illustrating an image relation formed by a set (Px, Py) of two pin cameras.

Three pin cameras Px_1 to Px_3 of the first pin camera set Px sequentially form 2D images x_1 , x_2 , and x_3 toward the monitor on the front surface of the monitor M , respectively, and three pin cameras Py_1 to Py_3 of the second pin camera set Py sequentially form 2D images y_1 , y_2 , and y_3 toward the monitor on the front surface of the monitor M , respectively, and the 2D images x_1 to x_3 and y_1 to y_3 overlap on the front surface of the monitor M , respectively, so that x_1 overlaps y_1 to form an image z_1 , x_2 overlaps y_2 to form an image z_2 , and x_3 overlaps y_3 to form an image z_3 . In this case, when a user touches the overlapping images z_1 to z_3 with his/her finger, a controller, which is to be described, may accurately determine a position of the finger of the user serving as an operator by angles of both pin cameras, and the user may accurately select a floor selection button displayed on the monitor by the determination of the position, which will be

described below. Further, a size, in which the operator contacts z1 to z3, may be limited, and the function limitation may be implemented by installing existing software in the pin camera. When the aforementioned function is present, when an object, for example, a body or an arm of the user, having a larger size than that of the operator, such as the finger of the user, having a predetermined limited size, is in contact with the images z1 to z3, the contact is recognized as an erroneous operation and the elevator may not be normally operated. If necessary, in this case, a warning image may be displayed on the monitor.

FIG. 3 is a schematic diagram illustrating a general connection relation of the apparatus according to the present invention.

As illustrated in FIG. 3, a controller C is connected to the first and second pin camera sets Px and Py and the monitor M, and the controller C controls an image of the monitor M according to a signal of the pin camera set, and the control method will be described below. Further, an elevator control device EC controlling an operation of the elevator is connected to the controller C.

The controller C displays a button set BS for selecting a floor and up and down on the monitor M (see FIG. 5), when an operator including a finger of a user

sequentially touches images z1 to z3, the controller C detects the touch and activates one button in the button set BS, and the elevator control device EC controls an operation of the elevator, that is, opening/closing of the door, and up and down of the elevator, according to the activated button, which will be described in detail below.

FIGS. 4A and 4B are exploded perspective views illustrating a structure of the pin camera, and FIG. 4A illustrates a relation between the pin camera and a fixing bracket, and FIG. 4B illustrates a relation between the pin camera and a U-shaped bracket.

Each of the pin cameras Px1 to Px3 and Py1 to Py3 is fixed between a pair of fixing brackets A and B, and herein, the present invention will be described based on the pin camera Px1 as an example. Horizontal holes A1 and A2 are formed at both side surfaces of one fixing bracket A for fixing the pin camera Px1, particularly, both sides of a portion having a circular arc shaped cross-section corresponding to an exterior shape of the pin camera, respectively. The other fixing bracket B for fixing the pin camera Px1 is shaped like "⌋", and vertical holes B1 and B2 are formed at positions corresponding to the horizontal holes A1 and A2 of the fixing bracket A in both side surfaces, respectively. Accordingly, when the horizontal holes A1 and A2 and the vertical holes B1 and B2

are joined with fasteners F including a screw and bolt, both fixing brackets A and B may move with respect to each other by the lengths of the horizontal hole and the vertical hole.

As illustrated in FIG. 4B, the pin camera Px1 fixed to both fixing brackets A and B is installed in two U-shaped brackets 20, in which elongated slits 10 are horizontally formed in both side plates 12. In this case, a fastener, such as a bolt and a screw, may be used. The pin camera fixed to the U-shaped bracket 20 is rotatable in a direction of an arrow C and is movable along the slits 10, so that the pin camera may accurately aim a desired position. Through the method, the aforementioned three plane images may be configured by installing three pin cameras in the U-shaped bracket 20 side by side at a predetermined interval. In accordance with the regulation of the elevator, which has to conform to fire protection standards, the pin camera assemblies need to have fire protection functions as a matter of course. Further, the present invention has been described based on the three pin cameras as an example, but as necessary, the number of pin cameras may be smaller or larger than three. In the meantime, if necessary, as illustrated in FIGS. 4A and 4B, required data may be uploaded/downloaded by separately installing a USB port or an I/O port, and a pin camera

operation s/w may be installed and controlled.

FIG. 5 is a front view illustrating an operation of the button set BS displayed on the monitor M by stages according to the present invention, and the present exemplary embodiment will be described based on a 13 floor building as an example.

FIG. 5A is an example of an initial image of the button set BS, FIG. 5B is an example of an image displayed when an operator touches the image z1, FIG. 5C is an example of an image displayed when the operator touches the image z2, FIG. 5D is an example of an image displayed when the operator touches the image z3, and FIG. 5E is an example of an image illustrating that the door is opening, so that a button selection is prohibited, which will be described below.

Based on the button images, an operation method of the present invention will be described.

FIG. 6 is a flowchart illustrating an example of an operation method of the present invention.

In a state where the apparatus according to the present invention is turned on, and the door D of the elevator D is closed, the initial image of the button set BS of FIG. 5A is displayed on the monitor M by the controller C (S10). Next, three overlapping images z1 to z3 are sequentially formed toward the front surface of the

monitor M by the two pin camera sets Px and Py (S20).

The controller C determines whether an operator touches the image z1 in the state where the door of the elevator is closed (S30). When it is determined that the operator touches the image z1, the image of FIG. 5B is formed and a cursor 30 appears by the controller C (S40). As a matter of course, the cursor 30 is movable according to an operation of the operator. As described above, the controller C may accurately determine a position of the operator by an angle formed by both pin camera sets, and the operator moves and the cursor 30 moves in accordance with the position.

The controller C determines whether the operator touches the image z2 in a state where the door of the elevator is continuously closed (S50). When it is determined that the operator touches the image z2, the cursor 30 moves in accordance with a movement of the operator by the controller C, and any one button and the cursor overlap and the button is selected as illustrated in FIG. 5C (S60). In the present exemplary embodiment, it is considered that the third floor is selected (see FIG. 5C).

The controller C determines whether the operator touches the image z3 in the state where the door of the elevator is closed (S70). Next, when it is determined that the operator touches the image z3, the activated button,

which overlaps the cursor, is selected and registered by the controller C as illustrated in FIG. 5D (S80). When the button is registered, the elevator executes an operation corresponding to the registered button by the elevator control device EC (S90). Particularly, after the door of the elevator is opened and then closed, the elevator is operated toward the third floor.

As illustrated in the flowchart, when the door of the elevator is opened in the middle of each operation, the elevator returns to an initial mode and is re-operated, and in this case, when the door is closed, the monitor is not viewed and thus it is impossible to perform the aforementioned operations, so that the return to the initial mode and the re-operation of the elevator is the natural process.

The present invention also provides a method of enlarging and displaying a selected button in the button set BS displayed on the monitor, and FIG. 7 is a flowchart illustrating the method, and FIG. 8 is a front view of a button set illustrating a process of enlarging the button set by the method of FIG. 7. The function is appropriate for, particularly, a high-rise building, of which an elevator has the great number of floor selection buttons, and the present exemplary embodiment will be described based on a building with seven underground levels and 28

floors above ground as an example.

This method is similar to the method of FIG. 6, but operation S160 is only different, and the method is discriminated from the method of FIG. 6 by adding 100 to the reference numerals.

In a state where the door of the elevator is closed, an initial image illustrated in FIG. 8A is displayed and the controller C determines whether an operator touches an image z1 (S130). When it is determined that the operator touches the image z1, the image of FIG. 8B is formed and a cursor 30 appears by the controller C (S140). The controller C determines whether the operator touches the image z2 (S150), and when it is determined that the operator touches the image z2, the cursor 30 and any one button overlap by the controller C, and the button set BS is enlarged based on the overlapping button (S160). In the present exemplary embodiment, a second floor button and the cursor 30 overlap, and the second floor button and the surrounding buttons of the second floor button are enlarged and displayed as illustrated in FIG. 8C.

Next, the controller C determines whether the operator touches an image z3 (S170), and it is registered that the activated button overlapping the cursor is selected as illustrated in FIG. 8D (S180), and subsequently, the elevator control device EC executes an operation

corresponding to the registered button (S190).

The remaining operations are the same as those of the method of FIG. 6.

As a matter of course, even though an up button or another button is selected on the image of the button set of the monitor, the function may be operated in the same order.

Only when three overlapping images $z1$ to $z3$ are sequentially touched, a desired floor is selected or enlarged and displayed, so that it is expected to minimize a possibility that a button is erroneously selected by a play or malfunction.

In the above, the present invention has been described based on the case where the two cameras Px and Py are disposed at both sides of the monitor and form a predetermined angle, and photograph images as an example, but according to the development of the technology, it shall be considered that a case of detecting an operator by using only a camera disposed at any one side between the cameras Px and Py is included in the scope of the present invention.

The present invention has been described based on an elevator as an example, but the apparatus and the method of the present invention may be applied to other places, for example, all of the doors using a plurality of contactless

selective buttons, not an elevator.

WHAT IS CLAIMED IS:

1. An apparatus for controlling an operation of an elevator by using a monitor, comprising:

a monitor M installed on a door D of an elevator or a wall surface of a cage of the elevator;

a first pin camera set Px including three pin cameras Px1 to Px3, which are disposed to be perpendicular to the monitor at a lateral and upper side of the monitor M including an upper door frame or a ceiling of the cage of the elevator at a predetermined interval while having an interval with the monitor M;

a second pin camera set Py including other three pin cameras Py1 to Py3, which are disposed to be perpendicular to the monitor in an upper portion of the monitor M at an opposite side of the first pin camera set Px at a predetermined interval with respect to the monitor M;

a controller C connected with the first and second pin camera sets Px and Py and the monitor M, and configured to control an image of the monitor M according to a signal of the pin camera set; and

an elevator control device EC connected to the controller C and configured to control an operation of the elevator,

wherein the three pin cameras of the first pin

camera set Px sequentially form 2D images x1, x2, and x3 toward the monitor on a front surface of the monitor M, respectively, and the three pin cameras of the second pin camera set Py sequentially form 2D images y1, y2, and y3 toward the monitor on the front surface of the monitor M, respectively, and the 2D images x1 to x3 and y1 to y3 overlap on the front surface of the monitor M, respectively, so that x1 overlaps y1 to form an image z1, x2 overlaps y2 to form an image z2, and x3 overlaps y3 to form an image z3, and

the controller C displays a button set BS for selecting a floor and up and down on the monitor M, when an operator including a finger of a user sequentially touches the images z1 to z3, the controller C detects the touch and activates one button in the button set BS, and the elevator control device EC controls an operation of the elevator according to the activated button.

2. The apparatus of claim 1, wherein each of the pin cameras Px1 to Px3 and Py1 to Py3 is fixed between a pair of fixing brackets A and B, horizontal holes A1 and A2 are formed in both side surfaces of the fixing bracket A, respectively, and vertical holes B1 and B2 are formed at positions of both side surfaces of the fixing bracket B corresponding to the horizontal holes A1 and A2,

respectively, so that when the horizontal holes A1 and A2 and the vertical holes B1 and B2 are joined by fasteners F including a screw or a bolt, both fixing brackets A and B are movable with respect to each other by lengths of the horizontal hole and the vertical holes, and the pin cameras Px1 to Px3 and the pin cameras Py1 to Py3 fixed to the fixing brackets A and B are installed in two U-shaped brackets 20, in which elongated slits 10 are horizontally formed in both side plates 12, respectively, to form the first and second pin camera sets Px and Py, respectively, and each of the pin cameras is movable along the slit 10.

3. A method of controlling an operation of an elevator by using an elevator operation controlling apparatus by using a monitor, the elevator operation controlling apparatus including: a monitor M installed on a door D of an elevator or a wall surface of a cage of the elevator; a first pin camera set Px including three pin cameras Px1 to Px3, which are disposed to be perpendicular to the monitor at a lateral and upper side of the monitor M including an upper door frame or a ceiling of the cage of the elevator at a predetermined interval while having an interval with the monitor M; a second pin camera set Py including other three pin cameras Py1 to Py3, which are disposed to be perpendicular to the monitor in an upper

portion of the monitor M at an opposite side of the first pin camera set Px with respect to the monitor M at a predetermined interval; a controller C connected with the first and second pin camera sets Px and Py and the monitor M, and configured to control an image of the monitor M according to a signal of the pin camera set; and an elevator control device EC connected to the controller C and configured to control an operation of the elevator, in which the three pin cameras of the first pin camera set Px sequentially form 2D images x1, x2, and x3 toward the monitor on a front surface of the monitor M, respectively, and the three pin cameras of the second pin camera set Py sequentially form 2D images y1, y2, and y3 toward the monitor on the front surface of the monitor M, respectively, and the 2D images x1 to x3 and y1 to y3 overlap on the front surface of the monitor M, respectively, so that x1 overlaps y1 to form an image z1, x2 overlaps y2 to form an image z2, and x3 overlaps y3 to form an image z3, and the controller C displays a button set BS for selecting a floor and up and down on the monitor M, when an operator including a finger of a user sequentially touches the images z1 to z3, the controller C detects the touch and activates one button in the button set BS, and the elevator control device EC controls an operation of the elevator according to the activated button, the method comprising:

an operation S10 of displaying, by the controller C, the button set BS on the monitor M;

an operation S20 of forming three images z1 to z3 sequentially overlapping toward a front surface of the monitor M by the two pin camera sets Px and Py;

an operation S30 of determining, by the controller C, whether an operator touches the image z1 in the state where the door of the elevator is closed;

an operation S40 of, when it is determined that the operator touches the image z1, displaying, by the controller C, a cursor 30 on the monitor M;

an operation S50 of determining, by the controller C, whether the operator touches the image z2 in a state where the door of the elevator is continuously closed;

an operation S60 of, when it is determined that the operator touches the image z2, making, by the controller C, the cursor 30 move and overlap any one button so as to correspond to the operation of the operator, and selecting the overlapping button;

an operation S70 of determining, by the controller C, whether the operator touches the image z3 in the state where the door of the elevator is closed;

an operation S80 of, when it is determined that the operator touches the image z3, registering, by the controller C, that the button overlapping the cursor is

selected; and

an operation S90 of making, by the elevator control device EC, the elevator execute an operation corresponding to the registered button.

4. A method of controlling an operation of an elevator by using an elevator operation controlling apparatus, the elevator operation controlling apparatus including: a monitor M installed on a door D of an elevator or a wall surface of a cage of the elevator; a first pin camera set Px including three pin cameras Px1 to Px3, which are disposed to be perpendicular to the monitor M at a lateral and upper side of the monitor including an upper door frame or a ceiling of the cage of the elevator at a predetermined interval while having an interval with the monitor M; a second pin camera set Py including another three pin cameras Py1 to Py3, which are disposed to be perpendicular to the monitor in an upper portion of the monitor M at an opposite side of the first pin camera set Px with respect to the monitor M at a predetermined interval; a controller C connected with the first and second pin camera sets Px and Py and the monitor M, and configured to control an image of the monitor M according to a signal of the pin camera set; and an elevator control device EC connected to the controller C and configured to

control an operation of the elevator, in which the three pin cameras of the first pin camera set P_x sequentially form 2D images x_1 , x_2 , and x_3 toward the monitor on a front surface of the monitor M , respectively, and the three pin cameras of the second pin camera set P_y sequentially form 2D images y_1 , y_2 , and y_3 toward the monitor on the front surface of the monitor M , respectively, and the 2D images x_1 to x_3 and y_1 to y_3 overlap on the front surface of the monitor M , respectively, so that x_1 overlaps y_1 to form an image z_1 , x_2 overlaps y_2 to form an image z_2 , and x_3 overlaps y_3 to form an image z_3 , and the controller C displays a button set BS for selecting a floor and up and down on the monitor M , when an operator including a finger of a user sequentially touches the images z_1 to z_3 , the controller C detects the touch and activates one button in the button set BS , and the elevator control device EC controls an operation of the elevator according to the activated button, the method comprising:

an operation $S110$ of displaying, by the controller C , the button set BS on the monitor M ;

an operation $S120$ of forming three images z_1 to z_3 sequentially overlapping toward a front surface of the monitor M by the two pin camera sets P_x and P_y ;

an operation $S130$ of determining, by the controller C , whether an operator touches the image z_1 in the state

where the door of the elevator is closed;

an operation S140 of, when it is determined that the operator touches the image z1, displaying, by the controller C, a cursor 30 on the monitor M;

an operation S150 of determining, by the controller C, whether the operator touches the image z2 in a state where the door of the elevator is continuously closed;

an operation S160 of, when it is determined that the operator touches the image z2, making, by the controller C, the cursor 30 move and overlap any one button so as to correspond to the operation of the operator, and enlarging the button set BS based on the overlapping button;

an operation S170 of determining, by the controller C, whether the operator touches the image z3 in the state where the door of the elevator is closed;

an operation S180 of, when it is determined that the operator touches the image z3, registering, by the controller C, that the activated button overlapping the cursor is selected; and

an operation S190 of making, by the elevator control device EC, the elevator execute an operation corresponding to the registered button.