(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 181 955 A1

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
05.05.2010 Bulletin 2010/18

(21) Application number: **07806139.7**

(22) Date of filing: **28.08.2007**

(51) Int Cl.:
B66B 3/00 *(2006.01)* ***B66B 3/02*** *(2006.01)*

(86) International application number:
PCT/JP2007/066660

(87) International publication number:
WO 2009/028049 (05.03.2009 Gazette 2009/10)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(71) Applicant: **Mitsubishi Electric Corporation**
Chiyoda-ku
Tokyo 100-8310 (JP)

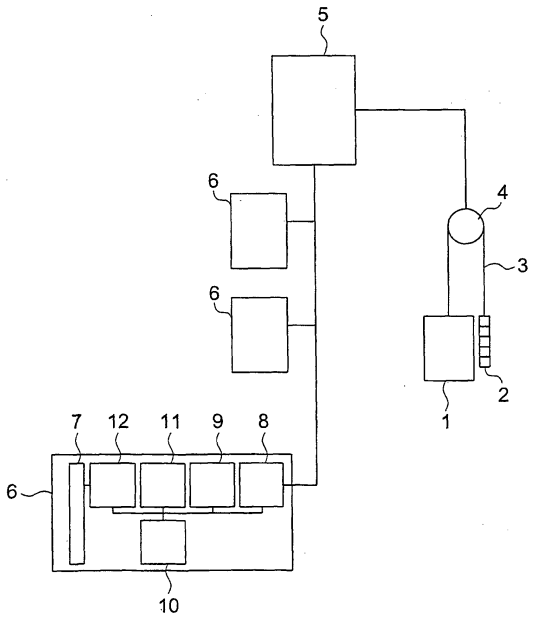
(72) Inventor: **TAKEUCHI, Nobukazu**
Tokyo 100-8310 (JP)

(74) Representative: **HOFFMANN EITLE**
Patent- und Rechtsanwälte
Arabellastrasse 4
81925 München (DE)

(54) INDICATION UNIT OF ELEVATOR

(57) An operation mode of an elevator is switchable between a normal operation mode for controlling a speed of a car according to a set speed pattern that has been previously set and a high-speed operation mode for controlling the speed of the car according to a generated speed pattern different from the set speed pattern. A display device for the elevator is provided to at least any one of a landing and the car. The display device includes an indicator for displaying information of the speed of the car in a speed display area. In the speed display area, a speed reflecting portion moving according to the speed of the car is displayed. The speed display area is set with a high-speed zone that the speed reflecting portion may enter only when the operation mode is the high-speed operation mode and a common speed zone in which the speed reflecting portion is present when the speed of the car is lower than a speed in the high-speed zone. When the speed reflecting portion is present at least in the high-speed zone, a boundary between the high-speed zone and the common speed zone is indicated.

FIG. 1



EP 2 181 955 A1

Description

Technical Field

[0001] The present invention relates to a display device for an elevator, which is provided to a variable-speed elevator whose speed pattern for controlling a speed of a car may be varied.

Background Art

[0002] Conventionally, in order to improve travel efficiency, there has been proposed a variable-speed elevator for obtaining a speed pattern for a car based on each of information of a weight load in the car and information of a destination floor for the car to control a speed of the car according to the obtained speed pattern. When a difference in weight between the car and a counterweight becomes small to result in a reduced driving torque of a hoisting machine, a maximum speed of the speed pattern for the car is increased to enable a high-speed operation. As a result, the car may be moved to the destination floor within a shorter period of time (see Patent Document 1).

[0003] Patent Document 1: JP 2003-238037 A

Disclosure of the Invention

Problem to be solved by the Invention

[0004] Even when the high-speed operation of the elevator is being performed, however, a passenger in the car or at a landing cannot know whether or not the high-speed operation is being performed for the elevator.

[0005] The present invention has been made to solve the problem described above, and has an object of providing a display device for an elevator, which is capable of more reliably informing a passenger of whether or not an operation of the elevator is being performed in a high-speed operation mode.

Means for solving the Problem

[0006] A display device for an elevator according to the present invention is provided to the elevator whose operation mode is switchable between a normal operation mode for controlling a speed of a car according to a set speed pattern that has been previously set and a high-speed operation mode for controlling the speed of the car according to a generated speed pattern different from the set speed pattern, the display device including an indicator provided to at least any one of a landing for the elevator and inside of the car, the indicator including a speed display area to display a speed reflecting portion moving according to the speed of the car in the speed display area, in which: the speed display area is set with a high-speed zone that the speed reflecting portion may enter only when the operation mode is the high-speed operation mode and a common speed zone in which the speed reflecting portion is present when the speed of the car is lower than a speed in the high-speed zone; and when the speed reflecting portion is present at least in the high-speed zone, a boundary between the high-speed zone and the common speed zone is indicated.

Brief Description of the Drawings

[0007]

FIG. 1 is a schematic configuration diagram illustrating an elevator according to a first embodiment of the present invention.
FIG. 2 is a front view illustrating a display screen of an indicator illustrated in FIG. 1.
FIGS. 3 (a) and 3 (b) are front views showing display of floor information and that of direction information performed on the indicator illustrated in FIG. 2 for comparison between a normal operation mode and a high-speed operation mode, in which FIG. 3 (a) is a view showing the display of the floor information, and FIG. 3(b) is a view showing the display of the direction information.
FIG. 4 is a flowchart for illustrating an operation of a display device illustrated in FIG. 1.
FIGS. 5 (a) and 5 (b) are front views each illustrating another example of a speed display area in the display device for the elevator according to the first embodiment of the present invention.
FIGS. 6(a) and 6(b) are front views showing another example of the display of the floor information and that of the direction information on the display device for the elevator according to the first embodiment of the present invention for comparison between the normal operation mode and the high-speed operation mode, in which FIG. 6 (a) is a view showing the display of the floor information, and FIG. 6(b) is a view showing the display of the direction information.

Best Mode for carrying out the Invention

[0008] Hereinafter, a preferred embodiment of the present invention is described referring to the drawings.

First Embodiment

[0009] FIG. 1 is a schematic configuration diagram illustrating an elevator according to a first embodiment of the present invention. In FIG. 1, in a building having a plurality of floors, a hoistway (not shown) for the elevator is provided along a height direction of the building. In the hoistway, a car 1 and a counterweight 2 are provided so as to be able to ascend/descend therein. The car 1 and the counterweight 2 are suspended by a main rope 3. The main rope 3 is looped around a driving sheave of a hoisting machine (driving device) 4. The hoisting machine 4 generates a driving force (driving torque) for ro-

tating the driving sheave. The car 1 and the counterweight 2 are raised and lowered in the hoistway by the rotation of the driving sheave of the hoisting machine 4. The car 1 may stop at a landing of each of the floors.

[0010] A car operating panel is provided inside the car 1, whereas a landing operating panel is provided at each landing (either not shown). Moreover, the car 1 is provided with a weighing device (not shown) for weighing the weight load inside the car 1. Information from each of the car operating panel, the landing operating panel, and the weighing device is transmitted to a controller 5 for controlling an operation of the elevator. The controller 5 registers a call for the car 1 to a destination floor based on the information from each of the car operating panel and the landing operating panel. The car 1 is moved to the destination floor, for which the call has been registered, by the control of the controller 5.

[0011] The operation of the elevator is controlled by the controller 5 based on the information from each of the car operating panel, the landing operating panel, and the weighing device. Moreover, an operation mode of the elevator may be switched between a normal operation mode for controlling a speed of the car 1 according to a set speed pattern that has been previously set and a high-speed operation mode for controlling the speed of the car 1 according to a generated speed pattern which is different from the set speed pattern. The high-speed operation mode is an operation mode for controlling the speed of the car 1 so that the car may arrive at the destination floor within a shorter period of time than that required in the normal operation mode.

[0012] The set speed pattern has been previously set for the controller 5. The generated speed pattern is calculated by the controller 5 at the time of the operation in the high-speed operation mode. The generated speed pattern is a speed pattern with at least any one of a maximum speed and an acceleration rate being set higher than that (those) of the set speed pattern.

[0013] Here, an output frequency of the hoisting machine 4 may be increased as the driving torque which is required to move the car 1 becomes smaller. Moreover, when a travel distance of the car 1 to the destination floor is small, the car 1 arrives at the destination floor within a shorter period of time by increasing the acceleration rate of the car 1 than by increasing the maximum speed of the car 1. Based on the fact described above, the switching between the normal operation mode and the high-speed operation mode is performed by the controller 5 based on each of the information of the weight load inside the car 1 and that of the destination floor for the car 1.

[0014] Display devices 6 each displaying information relating to the operation of the elevator as notification information are respectively provided inside the car 1 and at the landings. Floor information indicating a position of the car 1 (floor at which the car 1 is present), direction information indicating a direction in which the car 1 moves, speed information indicating the speed of the car 1, and operation information indicating whether or not the switching to the high-speed operation mode has been performed are transmitted to each of the display devices 6 from the controller 5. Each of the display devices 6 displays the floor information, the direction information, the speed information, and the operation information as the notification information based on the information from the controller 5.

[0015] Each of the display devices 6 controls a display style of each of the floor information, the direction information, and the operation information based on the operation information. Specifically, each of the display devices 6 uses a different display style of each of the floor information, the direction information, and the operation information, for each of the normal operation mode and the high-speed operation mode. Therefore, the display of each of the floor information, the direction information, and the operation information allows the identification of the operation mode of the elevator, i.e., the normal operationmode or the high-speed operation mode.

[0016] Each of the display devices 6 includes an indicator 7, a communication section 8, a memory 9, a display information storage section 10, a calculation processing section 11, and a display control section 12.

[0017] The indicator 7 has a display screen on which the notification information may be displayed. Examples of the indicator 7 include a liquid crystal display, a plasma display, an LED, and a cathode ray tube.

[0018] The communication section 8 communicates information with the controller 5 and the display devices 6.

[0019] The memory 9 stores programs and working data for controlling an operation of each of the display devices 6.

[0020] The display information storage section 10 stores information, for example, characters, graphics, and the like to be displayed on the indicator 7 as set display information.

[0021] The calculation processing section 11 operates based on the programs and working data stored in the memory 9. The calculation processing section 11 extracts the set display information from the display information storage section 10 based on the information (floor information, direction information, speed information, and operation information) from the communication section 8 and then transmits the extracted set display information to the display control section 12.

[0022] The display control section 12 displays the set display information, which has been extracted from the display information storage section 10 by the calculation processing section 11, on the indicator 7.

[0023] FIG. 2 is a front view illustrating the display screen of the indicator 7 illustrated in FIG. 1. In FIG. 2, a speed display area 13 for displaying the speed information, a floor display area 14 for displaying the floor information, a direction display area 15 for displaying the direction information, and an operation display area 16 for displaying the operation information are provided on the display screen of the indicator 7.

[0024] The speed display area 13 has a horizontally

arranged band-like shape. In the speed display area 13, a speed display bar 17 having a length which horizontally varies according to the speed of the car 1 is displayed. The speed information is specified by the length of the speed display bar 17. Specifically, a distal end (speed reflecting portion) of the speed display bar 17 displayed in the speed display area 13 moves according to the speed of the car 1. The speed information is specified by a position of the distal end of the speed display bar 17 in the speed display area 13.

[0025] In the speed display area 13, a high-speed zone 18 that the distal end of the speed display bar 17 may enter only when the operation is performed in the high-speed operation mode and a common speed zone 19 in which the distal end of the speed display bar 17 is present when the speed of the car 1 is lower than the speed in the high-speed zone 18 are set.

[0026] When the distal end of the speed display bar 17 is present in the high-speed zone 18, a boundary between the high-speed zone 18 and the common speed zone 19 is indicated. As a result, whether or not the car 1 is moving at higher speed than that in the normal speed mode may be identified. In this example, a color of the common speed zone 19 and that of the speed display bar 17 from the boundary to the distal end thereof differ from each other. For example, the color of the speed display bar 17 in the common speed zone 19 is white, whereas the color of the speed display bar 17 in the high-speed zone 18 is red. As a result, the boundary between the high-speed zone 18 and the common speed zone 19 is indicated.

[0027] In the operation display area 16, the operation information is displayed in a character message. In this example, the "high-speed operation mode" is displayed when the operation of the elevator is performed in the high-speed operation mode, whereas the "high-speed operation mode" is not displayed when the operation is performed in the normal operation mode. When the operation is performed in the normal operation mode, the "normal operation mode" may be displayed in the operation display area 16, or information independent of the operation of the elevator (for example, date/time information and the like) may be displayed in the operation display area 16.

[0028] In the floor display area 14, the floor information is displayed in a numerical character(s) specifying the floor. Moreover, in the direction display area 15, the direction information is displayed as an arrow in the form of a triangle.

[0029] FIGS. 3(a) and 3(b) are front views showing the display of the floor information and that of the direction information, which are performed on the indicator 7 illustrated in FIG. 2, for comparison between the normal operation mode and the high-speed operation mode, in which FIG. 3(a) is a view showing the display of the floor information, and FIG. 3 (b) is a view showing the display of the direction information. In this example, the floor information in the high-speed operation mode is displayed in boldface in comparison with the display in the normal operation mode (FIG. 3 (a)). Moreover, the direction information in the high-speed operation mode is displayed as an arrow in the form of a triangle which has a smaller width and a larger height than those of a triangle displayed in the normal operation mode (FIG. 3(b)). Specifically, the shape of the display of each of the floor information and the direction information in the normal operation mode and that in the high-speed operation mode differ from each other.

[0030] Next, an operation of each of the display devices 6 is described. FIG. 4 is a flowchart for illustrating the operation of each of the display devices 6 illustrated in FIG. 1. As shown in FIG. 4, the display device 6 first displays a necessary initial screen (for example, background screen or the like), which is stored in the display information storage section 10, on the indicator 7 (S1) Thereafter, the display device 6 judges whether or not the information from the controller 5 has been received (S2). If the information from the controller 5 has not been received, the display device 6 repeatedly judges whether or not the information has been received from the controller 5 while maintaining the display of the screen on the indicator 7 (S3).

[0031] If the display device 6 has received the information from the controller 5, the display device 6 then judges based on the operation information from the controller 5 whether or not the operation of the elevator is being performed in the high-speed operation mode (S4). In this case, the display device 6 displays the speed display bar 17 having a length according to the speed information from the controller 5 in the speed display area 13. Specifically, the display device 6 displays the speed information on the indicator 7.

[0032] If it is judged that the operation of the elevator is not being performed in the high-speed operation mode as a result of the judgment for the high-speed operation mode, the display device 6 displays each of the floor information, the direction information, and the operation information in the display style used in the normal operation mode on the indicator 7 (S5). If it is judged that the operation of the elevator is being performed in the high-speed operation mode, the display device 6 displays each of the floor information, the direction information, and the operation information in the display style used in the high-speed operation mode on the indicator 7 (S6).

[0033] After displaying the speed information, the floor information, the direction information, and the operation information on the indicator 7, the display device 6 judges whether or not the information from the controller 5 has been received (S2) and then performs the same operation as that described above. Thereafter, the display device 6 periodically repeats the operation described above.

[0034] In the display device 6 for the elevator as described above, the high-speed zone 18 that the distal end of the speed display bar 17 may enter only when the operation is performed in the high-speed operation mode

and the common speed zone 19 in which the distal end of the speed display bar 17 is present when the speed of the car 1 is lower than the speed in the high-speed zone 18 are set in the speed display area 13. When the distal end of the speed display bar 17 is present in the high-speed zone 18, the boundary between the high-speed zone 18 and the common speed zone 19 is indicated. Therefore, when the distal end of the speed display bar 17 is present in the high-speed zone 18, the operation of the elevator may be identified as being performed in the high-speed operation mode. As a result, it is possible to more reliably inform a passenger of whether or not the operation of the elevator is being performed in the high-speed operation mode.

[0035] Moreover, when the distal end of the speed display bar 17 is present in the high-speed zone 18, the color of the common speed zone 19 and that of the speed display bar 17 from the boundary between the speed zones 18 and 19 to the distal end thereof differ from each other. Therefore, the boundary between the high-speed zone 18 and the common speed zone 19 may be easily identified. As a result, it is possible to more reliably inform the passenger of whether or not the operation of the elevator is being performed in the high-speed operation mode.

[0036] Moreover, the respective display styles of the floor information and the direction information, which are used in the normal operation mode, and those used in the high-speed operation mode differ from each other. Therefore, based on a difference in the display style, the normal operation mode and the high-speed operation mode may be distinguished from each other. As a result, it is possible to more reliably inform the passenger of whether or not the operation of the elevator is being performed in the high-speed operation mode.

[0037] Moreover, the shape of the display of each of the floor information and the direction information in the normal operation mode and that in the high-speed operation mode differ from each other. Therefore, the normal operation mode and the high-seed operation mode may be distinguished from each other in a more reliable manner.

[0038] The speed display area 13 has the horizontally extending band-like shape in the example described above, but the speed display area 13 may also have a vertically extending band-like shape (FIG. 5(a)) or an arc-like (fan-like) shape (FIG. 5(b)), as illustrated in FIGS. 5 (a) and 5(b). In this case, the distal end of the speed display bar 17 moves along the speed display area 13 as the speed of the car 1 changes. Even in this manner, the normal operation mode and the high-speed operation mode may be distinguished from each other.

[0039] The floor information is displayed in boldface when the operation is performed in the high-speed operation mode in comparison with the display performed in the normal operation mode in the example described above, but the floor information may be displayed in italics when the operation is performed in the high-speed operation mode in comparison with the display performed in the normal operation mode, as illustrated in FIG. 6(a). Moreover, the direction information is displayed as the arrow in the form of the triangle in the example described above, but a different type of arrow from the arrow in the form of the triangle may also be used for the display of the direction information, as illustrated in FIG. 6(b). Further, the color of the display of each of the floor information and the direction information in the normal operation mode and that in the high-speed operation mode may differ from each other. Even in this manner, the normal operation mode and the high-speed operation mode may be distinguished from each other.

[0040] Further, the memory 9 and the display information storage section 10 may be the same storage device or storage element, or may be separate storage devices or storage elements independent of each other. Further, the memory 9 and the display information storage section 10 may be any storage device or storage element such as, for example, a hard disk drive, a non-volatile memory, or a memory needing an operation of retaining write data at each time.

[0041] Further, the communication section 8, the memory 9, the display information storage section 10, the calculation processing section 11, and the display control section 12 may be included in the same microcomputer or may be independent from each other.

[0042] Moreover, the transmission of the operation information from the controller 5 to each of the display devices 6 may be periodically performed or may be performed only when the switching between the normal operation mode and the high-speed operation mode is performed.

[0043] Further, the display styles of the floor information and the direction information, which are used in the normal operation mode, and those used in the high-speed operation mode differ from each other in the example described above, but the display style of only any one of the floor information and the direction information, which is used in the normal operation mode, and that used in the high-speed operation mode may differ from each other.

[0044] Further, the operation information is displayed in the example described above, but the display of the operation information may be omitted when at least any one of the display of the floor information, that of the direction information, and that of the speed information allows the normal operation mode and the high-speed operation mode to be distinguished from each other.

[0045] Further, the boundary between the high-speed zone 18 and the common speed zone 19 is indicated only when the distal end of the speed display bar 17 is present in the high-speed zone 18 in the example described above, but the boundary between the high-speed zone 18 and the common speed zone 19 may be indicated in advance in the speed display area 13.

[0046] Further, the display of the speed information is performed based on a change in length of the speed dis-

play bar 17 in the example described above, but the speed information may also be displayed by, for example, an indicator needle, a luminous point, or the like (speed reflecting portion), which moves within the speed display area 13 according to the speed of the car 1.

[0047] Further, each of the floor information, the direction information, and the operation information is statically displayed during the operation of the elevator in the example described above, but the display of each of the floor information, the direction information, and the operation information may be vertically or horizontally moved (scrolled), or may be enlarged or reduced in size.

Claims

1. A display device for an elevator, which is provided to the elevator whose operation mode is switchable between a normal operation mode for controlling a speed of a car according to a set speed pattern that has been previously set and a high-speed operation mode for controlling the speed of the car according to a generated speed pattern different from the set speed pattern,
the display device comprising an indicator provided to at least any one of a landing for the elevator and inside of the car, the indicator including a speed display area to display a speed reflecting portion moving according to the speed of the car in the speed display area, wherein:

the speed display area is set with a high-speed zone that the speed reflecting portion may enter only when the operation mode is the high-speed operation mode and a common speed zone in which the speed reflecting portion is present when the speed of the car is lower than a speed in the high-speed zone; and
when the speed reflecting portion is present at least in the high-speed zone, a boundary between the high-speed zone and the common speed zone is indicated.

2. A display device for an elevator, according to claim 1, wherein a color of the common speed zone and a color of an area from the boundary to the speed reflecting portion differ from each other when the speed reflecting portion is present in the high-speed zone so that the boundary is indicated.

3. A display device for an elevator, which is provided to the elevator whose operation mode is switchable between a normal operation mode for controlling a speed of a car according to a set speed pattern that has been previously set and a high-speed operation mode for controlling the speed of the car according to a generated speed pattern different from the set speed pattern,
the display device comprising an indicator provided to at least any one of a landing for the elevator and inside of the car, the indicator displaying information of at least any one of a direction in which the car moves and a floor indicating a position of the car,
wherein display styles of the information of the at least any one of the direction in which the car moves and the floor indicating the position of the car differ from each other between in the normal operation mode and in the high-speed operation mode.

4. A display device for an elevator, according to claim 3, wherein colors of the display of the information of the at least any one of the direction in which the car moves and the floor indicating the position of the car differ from each other between in the normal operation mode and in the high-speed operation mode.

5. A display device for an elevator, according to claim 3, wherein shapes of the display of the information of the at least anyone of the direction in which the car moves and the floor indicating the position of the car differ from each other between in the normal operation mode and in the high-speed operation mode.

FIG. 1

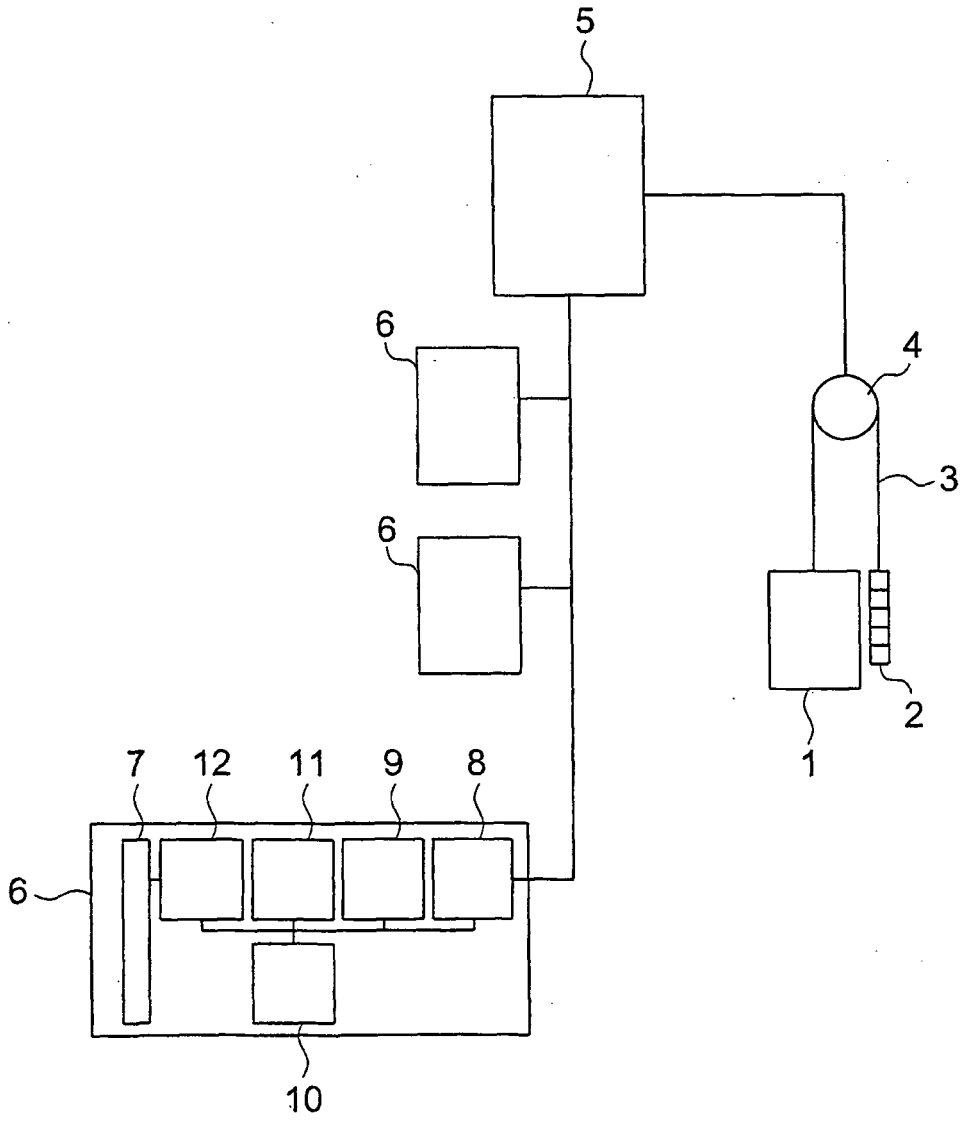


FIG. 2

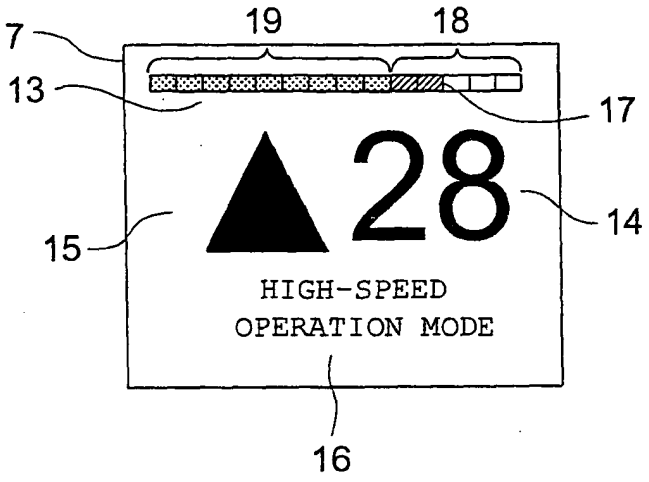


FIG. 3A

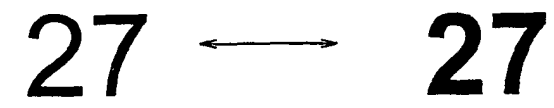
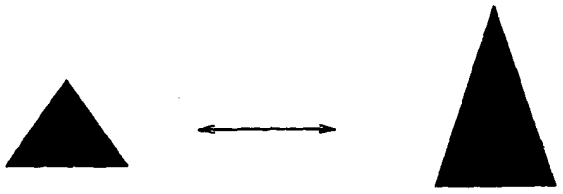


FIG. 3B



NORMAL OPERATION MODE

HIGH-SPEED OPERATION MODE

FIG. 4

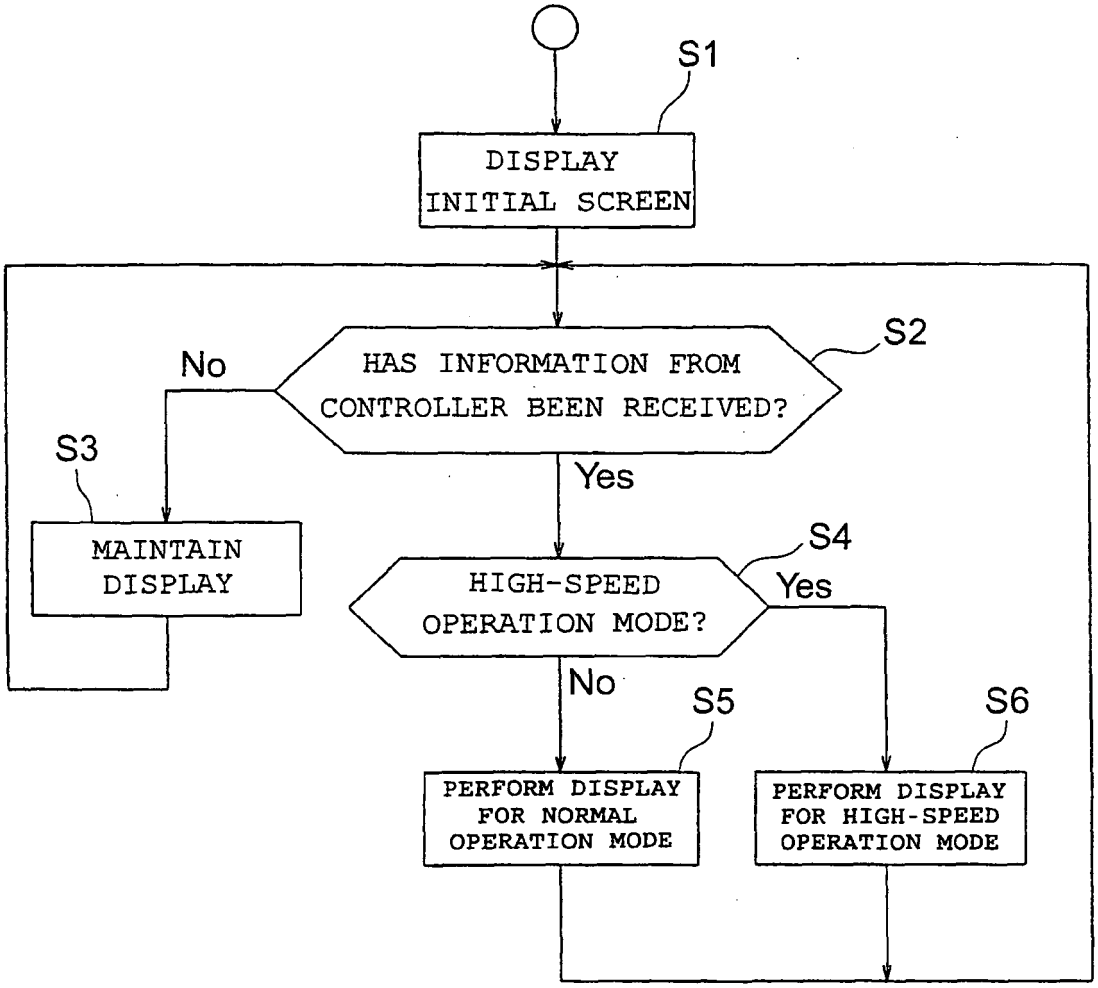

S1
DISPLAY INITIAL SCREEN
S2
HAS INFORMATION FROM CONTROLLER BEEN RECEIVED?
No
Yes
S3
MAINTAIN DISPLAY
S4
HIGH-SPEED OPERATION MODE?
Yes
No
S5
PERFORM DISPLAY FOR NORMAL OPERATION MODE
S6
PERFORM DISPLAY FOR HIGH-SPEED OPERATION MODE

FIG. 5A

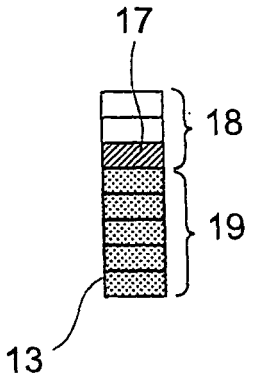


FIG. 5B

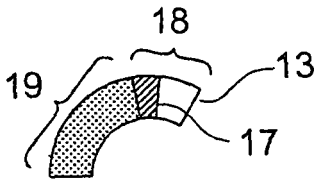
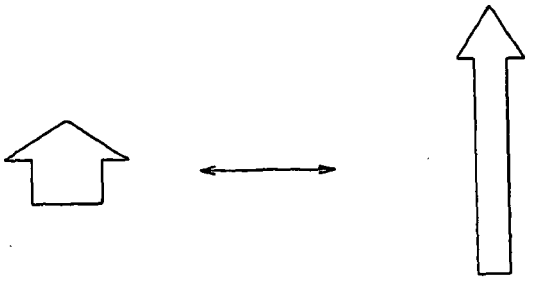


FIG. 6A

27 ⟷ 27

FIG. 6B



NORMAL OPERATION MODE

HIGH-SPEED OPERATION MODE

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2007/066660

A. CLASSIFICATION OF SUBJECT MATTER
B66B3/00(2006.01)i, *B66B3/02*(2006.01)i

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)
B66B3/00-B66B3/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2008
Kokai Jitsuyo Shinan Koho 1971-2008 Toroku Jitsuyo Shinan Koho 1994-2008

Electronic data base consulted during the international search (name of data base and, where practicable, 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.
A Y	WO 2005/102896 A1 (Mitsubishi Electric Corp.), 03 November, 2005 (03.11.05), Description, page 5, line 14 to page 8, line 12; Figs. 1 to 2 & EP 1731468 A1	1-2 3-5
Y	JP 11-209013 A (Toshiba Corp.), 03 August, 1999 (03.08.99), Par. Nos. [0019] to [0042]; Figs. 1 to 4 (Family: none)	3-4
Y	JP 2001-310882 A (Otis Elevator Co.), 06 November, 2001 (06.11.01), Par. Nos. [0011] to [0026]; Figs. 1 to 5 (Family: none)	3,5

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"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
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 April, 2008 (16.04.08)	01 May, 2008 (01.05.08)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2007/066660

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2005-145685 A (Toshiba Elevator and Building Systems Corp.), 06 August, 2005 (06.08.05), Par. Nos. [0035] to [0045]; Fig. 3 & US 2006/0191750 A1 & WO 2005/049465 A1	1-2
A	JP 6-11449 Y2 (Toshiba Corp.), 23 March, 1994 (23.03.94), Page 2, right column, line 31 to page 4, left column, line 27; Figs. 1 to 2 (Family: none)	1-2
A	JP 3053758 B2 (Kone Corp.), 19 June, 2000 (19.06.00), Fig. 2 & US 5679934 A & DE 19539288 A	1-5
A	JP 2647205 B2 (Toshiba Corp.), 27 August, 1997 (27.08.97), Claim 1; Figs. 1 to 5 (Family: none)	1-5

Form PCT/ISA/210 (continuation of second sheet) (April 2007)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 2003238037 A **[0003]**