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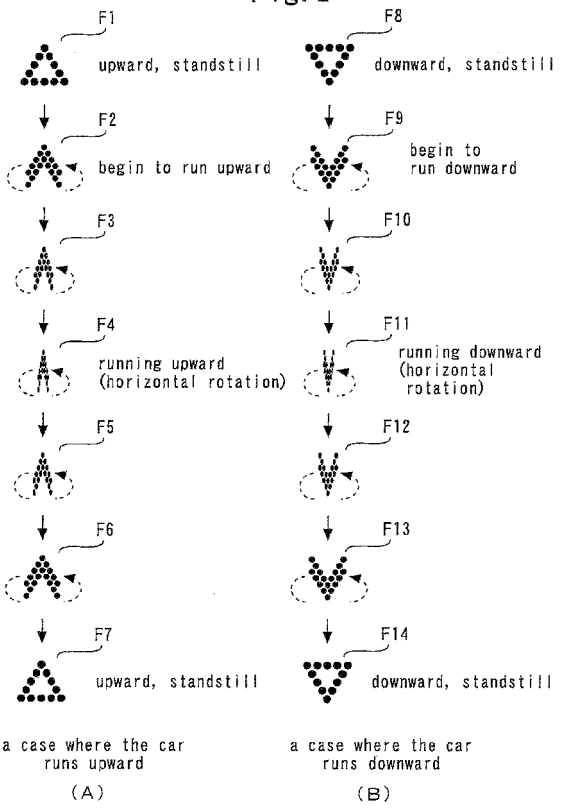
(54) DISPLAY UNIT FOR ELEVATOR

(57) Provided is an indication device of an elevator which enables a user to make an easy and instantaneous judgment as to whether the car is running or at a standstill at the first glance at a running direction indication of the car. For this purpose, the indication device of an elevator includes an indicator provided in at least either a car of an elevator or a hall of a floor at which the car stops, and car information indication means which causes the indicator to indicate running direction indications which indicate the running direction of the car when the car is at a standstill and the car is running. The configuration of the car information indication means is such that the car information indication means ensures that the mode of the running direction indication indicated in the indicator adopted when the car is running is a mode different from the mode of the running direction indication adopted when the car is at a standstill.

Fig. 2



EP 2 392 534 A1

Description

Technical Field

[0001] The present invention relates to an indication device of an elevator.

Background Art

[0002] A car or hall of an elevator is provided with an indication device for indicating the running direction of the car and the present floor position of the car to users. A dot matrix type LED (light emitting diode) has hitherto been widely adopted as indication means of this indication device.
In contrast to this, in recent years indication materials such as LCD (liquid crystal display) have come to be adopted as new indication, means because of achieved cost reductions and the like. Thanks to such conditions, three-dimensional expressions producing a sense of depth in a pseudo manner have become possible in place of conventional elevator status information which has been possible only two-dimensionally, resulting in higher degrees of freedom in expression.

[0003] Against this technological background, as a conventional, indication device of an elevator there is known an indication device of an elevator in which the indication contents of an indicator comprising an indicator formed from dot matrices can be moved vertically and horizontally. In this indication device, different indication modes can be simultaneously indicated (for example, the indication luminance is changed); stripe patterns move vertically in accordance with two kinds of indication contents, for example, the floor position and the like of a car and the running direction of the car, or in group-controlled elevators, the next car and the running direction thereof, are connected by arrows which move horizontally (refer to Patent Document 1, for example).

[0004] Also, as an indication device which provides information on the movement of an elevator car in the two vertical directions in one region there has been known an indication device of an elevator in which LEDs capable of emitting light in two different luminescent colors in one pertinent region are provided to perform the luminescent indication of arrows showing the running direction of a car and the arrows are scroll-indicated in the same direction as the running direction of the car, i.e., vertically (refer to Patent Document 2, for example).

[0005] And as a conventional indication device which indicates the present floor position of a car there is known an indication device in which a frame showing a car position is formed in the middle part of a liquid crystal panel for indication, a character string of digits showing floors is shown in real time vertically in the center of this frame and is vertically scrolled so as to adapt to the running of the car, and the size of characters for floor indication is set in inverse proportion to the speed of the car, whereby the higher the speed of the car, the smaller the size of characters (refer to Patent Document 3, for example).

[0006] Furthermore, similarly as conventional indication devices which indicate the present floor position of a car there are known an indication device in which an indication section is caused to indicate an annular icon string obtained by annularly arranging floor name icons in the order of floors and the annular iron string is rotated so as to adapt to the movement of the car in such a manner that the floor name icon of the present floor of the car is constantly arranged on the front side (the downward side) of the relevant indication section and an indication device in which on that occasion, the floor name icon of the present floor arranged on the front side is shown in the largest size and other floor name icons are shown in gradually decreasing size at increasing distance from this floor name icon of the present floor, whereby a sense of depth is expressed in a pseudo manner as three-dimensional expressions (refer to Patent Document 4, for example).

[0007]

Patent Document 1: Japanese Patent Laid-Open No. 59-017474
Patent Document 2: Japanese Patent Laid-Open No. 06-179582
Patent Document 3: Japanese Patent Laid-Open No. 2001-310882
Patent Document 4: International Publication No. WO03/086934

Disclosure of the Invention

Problems to be Solved by the Invention

[0008] However, the conventional indication devices of an elevator described in these patent documents have the problem that it is difficult to make an instantaneous judgment as to whether a car is running or at a standstill only from the running direction indication showing the running direction of the car.
And in this respect the indication devices described in Patent Documents 3 and 4 express the information as to whether the car is running or at a standstill by scrolling the present floor indication. In this case, however, it is possible that at some timing, a user cannot perceive that this indication is being scrolled only at the first glance at this indication. This poses the same problem as described above that it is difficult to make an instantaneous judgment as to whether a car is running or at a standstill.

[0009] Also, all of the indication devices described in these patent documents have the problem that the running direction indication of a car involves only vertically scroll-indicating arrows showing the running direction and is not sophisticated and that with the running direction indication it is impossible to lessen the feeling of being enclosed felt by a user in the car and the feeling of dissatisfaction felt by a user waiting for a car after a call.

[0010] The present invention has been made to solve

the problems described above and a first object of the present invention is to provide an indication device of an elevator which enables a user to make an easy and instantaneous judgment as to whether a car is running or at a standstill at the first glance at a running direction indication of the car.
A second object is to provide an indication device of an elevator which indicates running direction indications in such a manner that it is possible to lessen the feeling of being enclosed felt by a user in the car and the feeling of dissatisfaction felt by a user waiting for a car after a call.

Means for Solving the Problems

[0011] An indication device of an elevator according to the present invention comprises an indicator provided in at least either a car of an elevator or a hall of a floor at which the car stops and car information indication means which causes the indicator to indicate a running direction indication which indicates the running direction of the car when the car is at a standstill and the car is running, wherein the car information indication means ensures that the mode of the running direction indication indicated on the indicator adopted when the car is running is a mode different from the mode of the running direction indication adopted when the car is at a standstill.

Advantages of the Invention

[0012] An indication device of an elevator includes an indicator provided in at least either a car of an elevator or a hall of a floor at which the car stops and car information indication means which causes the indicator to indicate running directions indication which indicate the running direction of the car when the car is at a standstill and the car is running. In this indication device of an elevator, the car information indication means ensures that the mode of the running direction indication indicated in the indicator adopted when the car is running is a mode different from the mode of the running direction indication adopted when the car is at a standstill, whereby the present invention produces the advantage that a user can make an easy and instantaneous judgment as to whether the car is running or at a standstill at the first glance at a running direction indication of the car.

Brief Description of the Drawings

[0013]

Figure 1 is a diagram showing the general configuration of the indication device of an elevator related to Embodiment 1 of the present invention.
Figures 2(A) and 2(B) are diagrams to explain changes in a running direction indication related to Embodiment of the present invention.
Figure 3 is a a flowchart showing the flow of action of the indication device of an elevator related to Embodiment 1 of the present invention.

Description of Symbols

[0014]

1	car
1a	car indicator
1b	car-installed car call button
1c	car-side car information indication means
1d	car communication means
2	from-hall-operated indication device
2a	hall indicator
2b	from-hall call button
2c	hall-side car information indication means
2d	hall communication means
3	controller
3a	controller communication means
3b	operation control means
3c	call registration means

Best Mode for Carrying Out the Invention

[0015] The present invention will be described with reference to the accompanying drawings. In each of the drawings, like numerals refer to like or corresponding parts and overlaps of description of these parts are appropriately simplified or omitted.

Embodiment 1

[0016] Figures 1 to 3 relate to Embodiment 1 of the present invention. Figure 1 is a diagram showing the general configuration of the indication device of an elevator, Figures 2(A) and 2(B) are diagrams to explain changes in a running direction indication, and Figure 3 is a flowchart showing the flow of action of the indication device of an elevator.
[0017] In the figures, reference numeral 1 denotes a car 1 arranged so as to be able to ascend and descend in the shaft (not shown) of the elevator. On a side wall portion lateral to a car entrance provided in the front middle of the car 1 within this car 1, there are provided a car indicator 1a which indicates the present floor position and running direction of the above-described car 1 and a car-installed car call button 1b which a user in the above-described car 1 depresses to register a car call.
This car indicator 1a is formed by using a liquid crystal display (LCD), an EL display (electroluminescence display), a plasma display (PDP: plasma display panel) or the like, and the concrete indication contents thereof are controlled by car-side car information indication means 1c which is provided in the above-described car 1 and is electrically connected to the car indicator 1a.
[0018] A from -hall-operated indication device 2 is installed in the hall (not shown) of each floor at which the above-described car 1 stops, and each from-hall-operated indication device 2 is provided with a hall indicator

2a which indicates the present floor position and running direction of the above-described car 1 and a car-installed car call button 1b which a user in the above-described hall depresses to register a from-hall call in the upward direction or the downward direction.

As with the above-described car indicator 1a, this hall indicator 2a is formed by using a liquid crystal display (LCD), an EL display, a plasma display (PDP) or the like, and the concrete indication contents thereof are controlled by hall-side car information indication means 2c which is provided in each of the above-described halls and is electrically connected to the hall indicator 2a.

[0019] The general action of the relevant elevator is controlled by a controller 3, and this controller 3 is connected to the above-described car 1 and the above-described from-hall-operated indication device 2 via controller communication means 3a so as to be able to communicate therewith.

More specifically, the above-described controller communication means 3a of the above-described controller 3 is connected to car communication means 1d of the above-described car 1, and this car communication means 1d is connected to the above-described car-installed car call button 1b and the above-described car-side car information indication means 1c. The above-described controller communication means 3a of the above-described controller 3 is connected also to hall communication means 2d provided in each of the above-described halls, and this hall communication means 2d is connected to the above-described from-hall call button 2b and the above-described hall-side car information indication means 2c for each hall of each floor.

[0020] The above-described controller 3 is provided with operation control means 3b which mainly performs the control of operation actions of the above-described car 1 and call registration means 3c which performs various kinds of call registrations of car calls and from-hall calls in response to operations responding to the above-described car-installed car call button 1b and the above-described from-hall call button 2b.

[0021] When a user depresses the above-described car-installed car call button 1b, this operation information is sent to the above-described call registration means 3c via the above-described car communication means 1d and the above-described controller communication means 3a, and the above-described call registration means 3c which has received this information registers a car call for a floor corresponding to the above-described depressed car-installed car call button 1b

When a user depresses the above-described from-hall call button 2b, this operation information is sent to the above-described call registration means 3c via the above-described hall communication means 2d and the above-described controller communication means 3a, and the above-described call registration means 3c which has received this information registers a from-hall call for the above-described hall corresponding to the above-described depressed from-hall call button 2b and the running direction.

[0022] The above-described operation control means 3b controls the operation of the above-described car 1 on the basis of various kinds of call registration information registered by the above-described call registration means 3c and information on the condition of the car 1 such as the present floor position and running direction.

[0023] The information on the condition of the car 1 such as the present floor position and running direction is sent also to the above-described car communication means 1d and the above-described hall communication means 2d via the above-described controller communication means 3a. And the information on the condition of the car 1 such as the present floor position and running direction is sent from the above-described car communication means 1d to the above-described car-side car information indication means 1c and is sent also from the above-described hall communication means 2d to the above-described hall-side car information indication means 2c.

On the basis of the information on the condition of the car 1 such as the present floor position and running direction thus obtained, the above-described car-side car information indication means 1c indicates these pieces of information in the above-described car indicator 1a. Also similarly, on the basis of the information on the condition of the car 1 such as the present floor position and running direction thus obtained, the above-described hall-side car information indication means 2c indicates these pieces of information on the condition of the car 1 such as the present floor position and running direction in the above-described hall indicator 2a.

[0024] This information on the condition of the car 1 such as the present floor position is indicated by indicating floor numbers. When the above-described car 1 has approached a floor to within a prescribed distance range, this floor number indication is switched to a number showing the relevant floor.

[0025] Figures 2(A) and 2(B) show examples of change in the running direction indication of the above-described car 1 in the above-described car indicator 1a and the above-described hall indicator 2a. First, a case where the running direction of the above-described car 1 is upward will be described with reference to Figure 2 (A).

[0026] First, when the above-described car 1 is at a standstill at a floor in the condition in which the upward running direction is given to the above-described car 1, a hollow triangle pointing upward as an arrow consisting of only an arrowhead showing the upward direction is indicated as the above-described running direction indication indicated in the above-described car indicator 1a and the above-described hall indicator 2a (F1). Next, when the above-described car 1 begins to run upward, the shape of the above-described running direction indication changes to the shape of approximate upward feathers of the arrow, i.e., a shape obtained by removing the base from the triangle. And at the same time, the

shape of approximate upward feathers of the arrow is indicated in a rotating manner so that the shape of approximate upward feathers of the arrow is seen to rotate horizontally in a three-dimensional space, with the vertical direction serving as an axis (F2).

[0027] In this manner during the running of the above-described car 1 in the upward direction, the shape of approximate upward feathers of the arrow is indicated in horizontal rotation (F3 to F6). When the above-described car 1 arrives at the destination floor and stops there, the shape of the above-described running direction indication is returned from the shape of approximate upward feathers of the arrow to the upward hollow triangle and at the same time a frontal indication is indicated by stopping the horizontal rotation (F7).

[0028] Next, a case where the running direction of the above-described car 1 is downward will be described with reference to Figure 2(B).

First, when the above-described car 1 is at a standstill at a floor in the condition in which the downward running direction is given to the above-described car 1, a hollow inverted triangle pointing downward as an arrow consisting of only an arrowhead showing the downward direction is indicated as the above-described running direction indication indicated in the above-described car indicator 1a and the above-described hall indicator 2a(F8). Next, when the above-described car 1 begins to run downward, the shape of the above-described running direction indication changes to the shape of approximate downward feathers of the arrow, i.e., a shape obtained by removing the upper side from the triangle. And at the same time, the shape of approximate feathers of the arrow is indicated in a rotating manner so that the shape of approximate feathers of the arrow is seen to rotate horizontally in a three-dimensional space, with the vertical direction serving as an axis (F9).

[0029] In this manner during the running of the above-described car 1 in the downward direction, the shape of approximate downward feathers of the arrow is indicated in horizontal rotation (F10 to F13). When the above-described car 1 arrives at the destination floor and stops there, the shape of the above-described running direction indication is returned from the shape of approximate downward feathers of the arrow to the downward hollow inverted triangle and at the same time a frontal indication is indicated by stopping the horizontal rotation (F14).

[0030] In this embodiment, the indication device of an elevator works according to a series of flow actions shown in Figure 3. Although the description is given here of actions performed when the above-described car-installed car call button 1b in the above-described car 1 is depressed by a user, the same applies to actions performed when the above-described from-hall call button 2b of the above-described hall is depressed by a user.

[0031] First, when the above-described car-installed car call button 1b in the car 1 is depressed by a user in the above-described car 1, this operation information is sent to the above-described call registration means 3c via the above-described car communication means 1d and the above-described controller communication means 3a, and upon receipt of this operation information, the above-described call registration means 3c registers a car call on the basis of the received operation information (Step S1).

When the car call has been registered like this, next, the above-described operation control means 3b starts the running of the above-described car 1 in order to respond to this registered car call (Step S2).

[0032] Subsequently, the flow of action proceeds to Step S3, where the above-described car-side car information indication means 1c changes the above-described running direction indication indicated in the above-described car indicator 1a from the hollow triangle frontal at a standstill to the shape of approximate feathers of the arrow and simultaneously indicates the running direction indication in a horizontal rotating manner, with the vertical direction serving as an axis. The above-described hall-side car information indication means 2c changes the above-described running direction indication indicated in the above-described hall indicator 2a from the hollow triangle frontal at a standstill to the shape of approximate fathers of the arrow and simultaneously indicates the running direction indication in a horizontal rotating manner, with the vertical direction serving as an axis.

And during the running of the above-described car 1, the indication of the shape of approximate feathers of the arrow rotating horizontally is continued as the above-described running direction indication and when the above-described car 1 arrives at the destination floor of the above-described car call registration and stops there (Step S4), the above-described car-side car information indication means 1c stops the horizontal rotation indication of the above-described running direction indication indicated in the above-described car indicator 1a and simultaneously changes the above-described running direction indication from the shape of approximate feathers of the arrow to the hollow triangle frontal at a standstill. The above-described hall-side car information indication means 2c stops the horizontal rotation indication of the above-described running direction indication indicated in the above-described hall indicator 2a and simultaneously changes the above-described running direction indication from the shape of approximate feathers of the arrow to the hollow triangle frontal at a standstill (Step S5). And the actions of Steps S2 to S5 are repeated until responses to all call registrations are completed, and actions are started from Step S1 when a new call registration is performed after the completion of the responses to all call registrations,

[0033] Although in this embodiment the indicator indicating the running direction of the above-described car 1 is provided in both the above-described car 1 and the above-described hall as the above-described car indicator 1a and the above-described hall indicator 2a, it is also possible to provide the indicator only either of the two.

These indicators may be formed from large liquid crystal displays or the like by separating the indicators from the operating buttons and the operating panel in which these buttons are housed.

[0034] In the indication device of an elevator configured as described above, the indicator provided in at least either the car of an elevator or the hall of the floor at which the above-described car stops, is caused to indicate, under the control of the car information indication means, running direction indications which show the running directions of the car when the car is at a standstill and when the car is running, and the car information indication means ensures that the mode of the running direction indication indicated on the indicator adopted when the car is running, i.e., the shape of the indication and the rotating condition is a mode different from the mode of the running direction indication adopted when the car is at a standstill, whereby a user can make an easy and instantaneous judgment as to whether the car is running or at a standstill at the first glance at the running direction indication of the car.

[0035] Furthermore, the mode of the running direction indication indicated in the indicator during the running of the car is indicated in such a manner that the running direction indication is seen to a user to rotate horizontally around the vertical axis, whereby the running condition of the car can be very easily and instantaneously judged by a user and at the same time, it is also possible to lessen the feeling of being enclosed felt by a user in the car and the feeling of dissatisfaction felt by a user waiting for a car after a call.

[0036] It is very effective for the grasping of the running condition of the car by a user at the first glance at a running direction indication of the car to make the shape itself of the running direction indication indicated in the indicator during the running of the car different from the shape of the running direction indication at a standstill of the car as a change in the mode of the running direction indication during the stop and running of the car.

Industrial Applicability

[0037] The present invention can be used in an indication device of an elevator which indicates, in a car or hall of the elevator, the running direction of the car.

Claims

1. An indication device of an elevator, comprising:

an indicator provided in at least either a car of an elevator or a hall of a floor at which the car stops; and

car information indication means which causes the indicator to indicate a running direction indication which indicates the running direction of the car when the car is at a standstill and the car is running,

wherein the car information indication means ensures that the mode of the running direction indication indicated on the indicator adopted when the car is running is a mode different from the mode of the running direction indication adopted when the car is at a standstill.

2. The indication device of an elevator according to claim 1, wherein the car information indication means ensures that the mode of the running direction indication indicated in the indicator during the running of the car is a mode in which the running direction indication is seen to a user to rotate horizontally around a vertical axis.

3. The indication device of an elevator according to claim 1 or 2, wherein the car information indication means ensures that the shape of the running direction indication indicated in the indicator adopted when the car is running is a shape different from the shape of the running direction indication adopted when the car is at a standstill,

Fig. 1

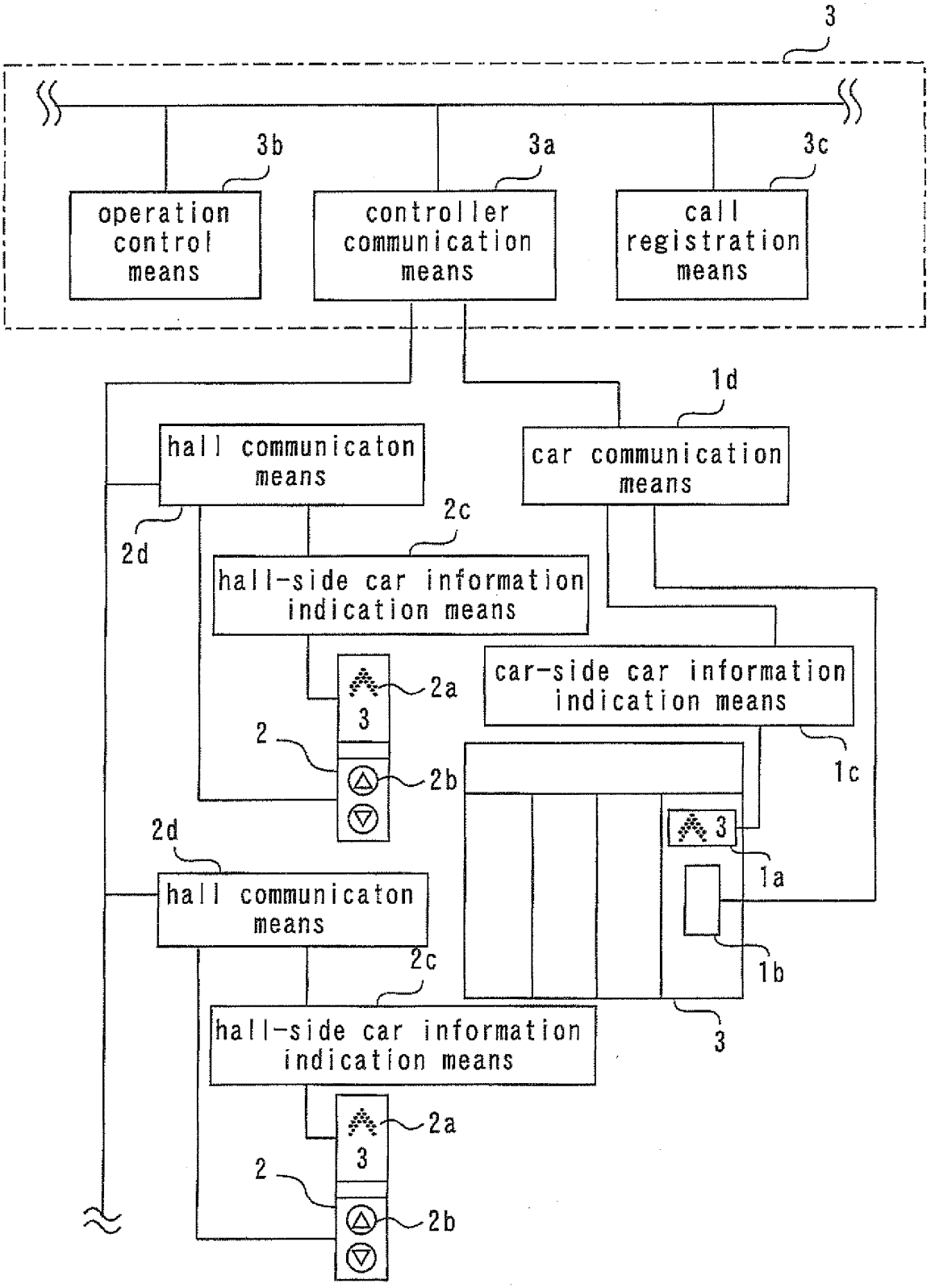

3
3b
3a
3c
operation control means
controller communication means
call registration means
1d
hall communicaton means
car communication means
2d
2c
hall-side car information indication means
car-side car information indication means
2a
3
2
2b
1c
3
1a
1b
2d
hall communicaton means
2c
hall-side car information indication means
3
2a
3
2
2b

Fig. 2

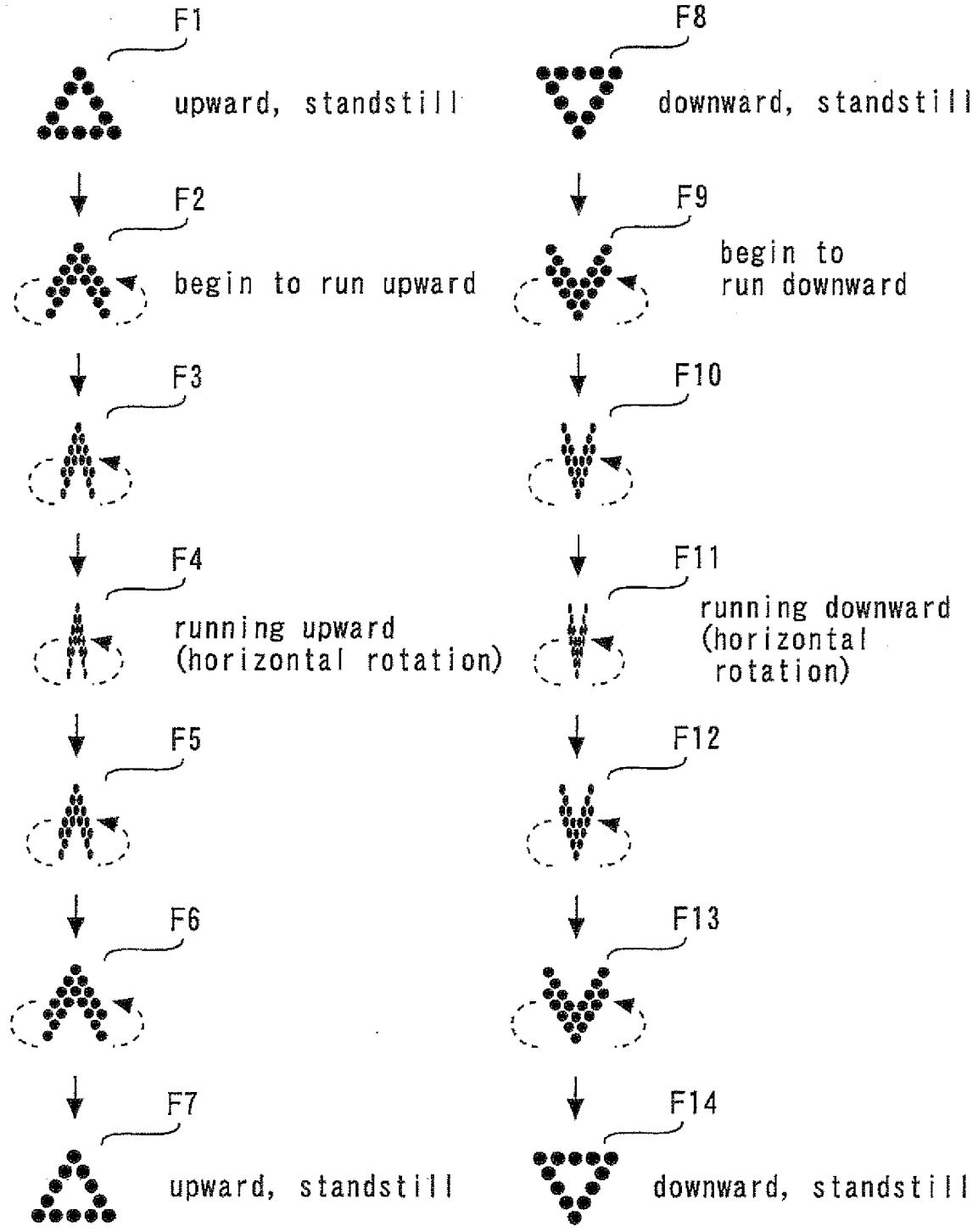
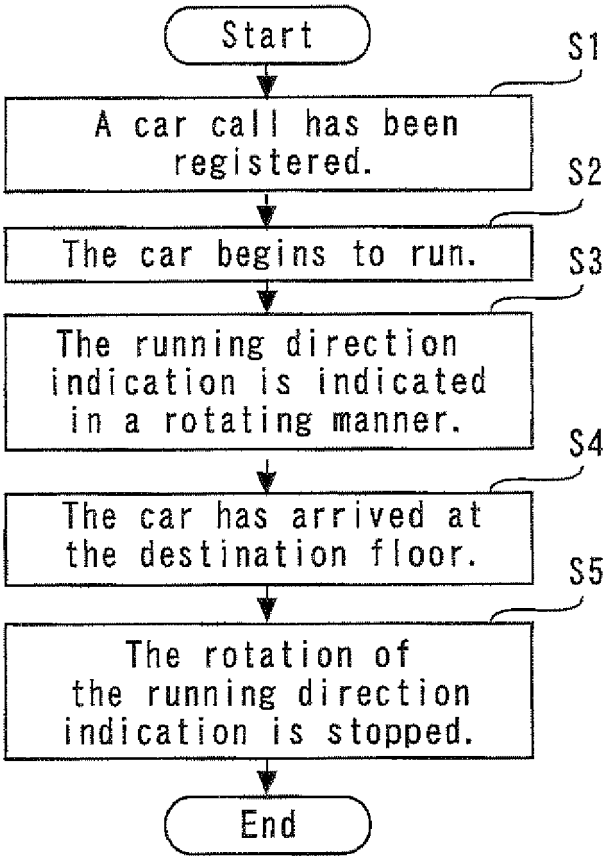

F1
upward, standstill
F2
begin to run upward
F3
F4
running upward
(horizontal rotation)
F5
F6
F7
upward, standstill
a case where the car runs upward
(A)
F8
downward, standstill
F9
begin to run downward
F10
F11
running downward
(horizontal rotation)
F12
F13
F14
downward, standstill
a case where the car runs downward
(B)

Fig. 3


Start
S1
A car call has been registered.
S2
The car begins to run.
S3
The running direction indication is indicated in a rotating manner.
S4
The car has arrived at the destination floor.
S5
The rotation of the running direction indication is stopped.
End

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2009/051686

A. CLASSIFICATION OF SUBJECT MATTER
B66B3/00(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

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 1996-2009
Kokai Jitsuyo Shinan Koho 1971-2009 Toroku Jitsuyo Shinan Koho 1994-2009

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.
X Y	JP 63-235278 A (Hitachi, Ltd.), 30 September, 1988 (30.09.88), Page 3, lower left column, line 2 to page 4, upper left column, line 10; Figs. 3 to 6 (Family: none)	1,3 2
X	JP 60-77079 A (Toshiba Corp.), 01 May, 1985 (01.05.85), Page 2, upper right column, line 13 to lower left column, line 4 (Family: none)	1
X	JP 4-201959 A (Hitachi, Ltd.), 22 July, 1992 (22.07.92), Page 2, lower left column, lines 8 to 17; Fig. 1 (Family: none)	1

☒ 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
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
14 April, 2009 (14.04.09)	28 April, 2009 (28.04.09)
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/JP2009/051686

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2000-259104 A (Azuma Systems Co., Ltd.), 22 September, 2000 (22.09.00), Full text; all drawings (Family: none)	2
A	JP 2001-310882 A (Otis Elevator Co.), 06 November, 2001 (06.11.01), Full text; all drawings (Family: none)	1-3

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 59017474 A **[0007]**
- JP 6179582 A **[0007]**
- JP 2001310882 A **[0007]**
- WO 03086934 A **[0007]**