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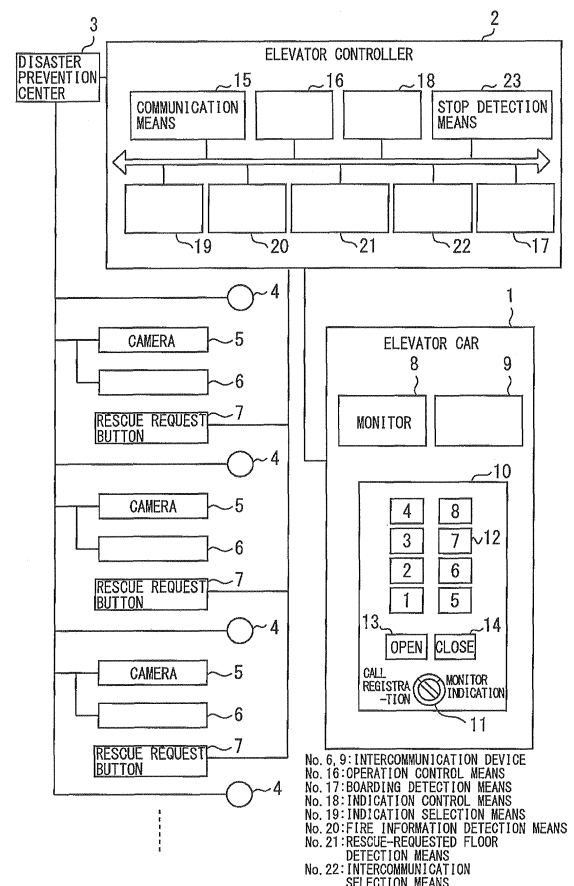
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(54) **MONITOR CONTROL DEVICE FOR ELEVATOR**

(57) It is ensured that in the case where an elevator is used for evacuation purposes during a fire, an operator in a car can easily grasp, from a monitor in a car, various kinds of information necessary for rescuing those who are present in a building.

This monitor control apparatus is provided with a car 1 which ascends and descends in an elevator shaft, a monitor 8 provided in the car 1, indication control means 18 which controls indications of the monitor 8, a camera 5 installed in a hall of an elevator, a fire detector 4 which detects the outbreak of a fire, and operation control means 16 which controls a normal operation of the elevator and an evacuation operation of the elevator during a fire. The indication control means 18 causes the monitor 8 to automatically indicate prescribed evacuation information including an image of the hall photographed by the camera 5 and, information on the floor where the outbreak of a fire has been detected by the fire detector 4, when the control of an evacuation operation is started by the operation control means 16.

Fig. 1



Description

Technical Field

[0001] The present invention relates to a monitor control apparatus capable of appropriately controlling indications of a monitor in a car in an elevator which is used for evacuation purposes in an emergency such as a fire.

Background Art

[0002] Patent Literature 1 below proposes an elevator for evacuation purposes used in rescue activities by fire-fighters when a fire breaks out in a building. Specifically, in the monitor control apparatus described in Patent Literature 1, the configuration is such that a camera is installed on each floor of a building and a monitor is installed in a car of an elevator so that it is possible to cause an image photographed by the camera to show up on the monitor in the car. In the case where the elevator is used for evacuation purposes during a fire, an operator (for example, a firefighter) performs the switching of camera images shown on the monitor by operating a selection switch installed in the car, thereby making sure of the condition of a hall.

Citation List

Patent Literature

[0003]

Patent Literature 1: Japanese Patent Laid-Open No. 64-75378

Summary of Invention

Technical Problem

[0004] In the case where an elevator is used for evacuation purposes during a fire, it cannot be said that information necessary for rescuing those who are present in a building is sufficiently provided to the operator only by causing an image of a hall photographed by the camera to show up on the monitor in the car, and hence it is impossible to carry out rescue activities rapidly and accurately. Furthermore, in the monitor control apparatus described in Patent Literature 1, an operator in the car must carry out the switching of the hall image by himself or herself and, therefore, it is also difficult to cause an appropriate image of a hall to be indicated on the monitor.

[0005] For example, an elevator used for evacuation purposes during a fire is often installed in a relatively high building. In such a building the number of floors at which an elevator car stops is large and, therefore, the number of cameras installed in halls becomes large inevitably. For this reason, an operator in the car must make sure of the condition of each hall by sequentially switching

images appearing on the monitor and this checking work requires much time. Furthermore, given only the images appearing on the monitor, it may sometimes be difficult to identify the place where the fire has broken out and the like and it may be difficult to accurately grasp the present situation.

[0006] The present invention was made in order to solve the problems described above and an object of the invention is to provide a monitor control apparatus of an elevator which enables an operator in a car to easily grasp, from a monitor in a car, various kinds of information necessary for rescuing those who are present in a building in the case where an elevator is used for evacuation purposes during a fire.

Solution to Problem

[0007] A monitor control apparatus of an elevator of the invention is an apparatus which comprises a car which ascends and descends in an elevator shaft, a monitor provided in the car, indication control means which controls indications of the monitor, a camera installed in a hall of the elevator, and operation control means which controls a normal operation of the elevator and an evacuation operation of the elevator during a fire. The indication control means causes the monitor to automatically indicate prescribed evacuation information including an image of the hall photographed by the camera and information on the floor where the outbreak of a fire has been detected from fire detection information when the control of an evacuation operation is started by the operation control means.

Advantageous Effects of Invention

[0008] According to the present invention, it becomes possible for an operator in a car to easily grasp, from a monitor in a car, various kinds of information necessary for rescuing those who are present in a building in the case where an elevator is used for evacuation purposes during a fire. For this reason, when a fire has broken out in a building, it becomes possible to carry out speedy and accurate rescue activities using an elevator.

Brief Description of Drawings

[0009]

Figure 1 is a diagram showing the general configuration of a monitor control apparatus of an elevator in a first embodiment according to the present invention.

Figure 2 is a flowchart showing the actions of the monitor control apparatus of an elevator in the first embodiment according to the present invention. Figure 3 is a diagram showing an example of an indication of a monitor in a car.

Description of Embodiments

[0010] The present invention will be described in more detail with reference to the accompanying drawings. Incidentally, in each of the drawings, like numerals refer to like or corresponding parts and redundant descriptions of these parts are appropriately simplified or omitted.

First embodiment

[0011] Figure 1 is a diagram showing the general configuration of a monitor control apparatus of an elevator in a first embodiment according to the present invention. In Figure 1, reference numeral 1 denotes a car which ascends and descends in an elevator shaft, and reference numeral 2 denotes a controller which performs the operation control of the whole elevator, such as the run control of the car 1. In normal times, the controller 2 performs, by the normal function thereof, normal services which involve causing the car 1 to respond successively to registered hall calls and car calls.

[0012] In addition, the elevator shown in Figure 1 has the function as a fire emergency elevator intended for use in evacuation in an emergency such as a fire. The configuration necessary for realizing this function will be described specifically below.

[0013] Reference numeral 3 denotes a disaster prevention center 3 provided on the first floor or the like of a building where the elevator is provided. The disaster prevention center 3 is a facility installed in order to perform the central control of disaster prevention equipment, fire extinguishing equipment and the like in the building or in a prescribed area (the premises, etc.). Each elevator in the building or each elevator in the prescribed area is collectively controlled in this disaster prevention center 3, and the controller 2 is connected to, for example, a central warning panel (not shown) of the disaster prevention center 3.

[0014] In this building, a fire detector 4 is provided on each floor and a camera 5, an intercommunication device 6, and a rescue request button 7 (rescue request means) are provided in halls where the car 1 stops.

[0015] The fire detector 4 has the function of detecting the outbreak of a fire from heat, smoke or the like. Upon detection of a fire, the fire detector 4 outputs information on the floor where the fire has broken out, the place where the fire has broken out and the like as fire detection information to the disaster prevention center 3. Incidentally, upon receipt of the fire detection information from the fire detector 4, the disaster prevention center 3 outputs the received fire detection information (or information corresponding to the fire detection information) to the controller 2.

[0016] The camera 5 is intended for photographing the condition of a hall. An image of each hall photographed by the camera 5 is inputted to the controller 2 via the disaster prevention center 3 and the disaster prevention center 3. The intercommunication device 6 is a device

by use of which a person in a hall has a conversation with a monitoring staff member of the disaster prevention center 3 and an operator in the car 1 (for example, a firefighter). The intercommunication device 6 is also connected to the disaster prevention center 3, similarly to the camera 5.

[0017] The rescue request button 7 is operated by those who are present in the building in making a request for a rescue by an elevator in an emergency such as a fire. The rescue request button 7 is connected directly to the controller 2 and outputs rescue request information to the controller 2 by being operated (pressed). Incidentally, rescue request information includes, for example, information to the effect that a rescue has been requested, and information on the floor where the rescue request button 7 is installed.

[0018] In order to limit the operation of the rescue request button 7 to specific persons (for example, users with a wheelchair and the aged), the rescue request button 7 may also have the function of an authentication device. For example, the rescue request button 7 is configured in such a manner that the operation of the rescue request button 7 becomes possible only in the case where personal authentication has been made by an authentication device. Also, the rescue request button 7 may be configured in such a manner that a button operation is made unnecessary and when personal authentication has been made by an authentication device, rescue request information is automatically outputted to the controller 2.

[0019] The camera 5, intercommunication device 6, and rescue request button 7 are installed; for example, in a plurality of halls at which the car 1 stops. These pieces of equipment may be installed in all halls at which the car 1 stops or may be installed only in part of the halls.

[0020] A monitor 8, an intercommunication device 9, and an operating panel 10 are provided in the car 1 of an elevator.

The monitor 8 is indented for providing various kinds of information to persons in the car 1, and consists of, for example, a liquid crystal display. During a normal operation of an elevator (i.e., when normal services are provided by the controller 2), prescribed information useful to passengers, for example, information on destination floors, news and weather forecasts (general information) are indicated on the monitor 8.

[0021] On the other hand, when a fire has broken out in the building and an evacuation operation for carrying out an evacuation by an elevator is started, under prescribed conditions, various kinds of information necessary for an operator in the car 1 to rescue those who are present in the building by the elevator (hereinafter referred to also as "evacuation information") is indicated on the monitor 8.

As described above, both general information and evacuation information are indicated on the monitor 8 by being switched therebetween, whereby the monitor 8 is effectively used and the number of monitors 8 can be reduced.

Incidentally, concrete indication contents of the monitor 8 during an evacuation operation will be described later.

[0022] The intercommunication device 9 is a device by use of which persons in the car 1 (a passenger, an operator and other persons) have talks with the outside. That is, when an evacuation operation is being performed, the operator in the car 1 has conversations, using the intercommunication device 9, with a monitoring staff member of the disaster prevention center 3 and a person who is using the intercommunication device 6 in a hall.

[0023] The operating panel 10 is provided with a changeover switch 11 (changeover means), a plurality of car call buttons 12, a door open button 13, and a door close button 14.

[0024] The changeover switch 11 is intended for switching the operating panel 10 between a call registration function and a camera selection function. The changeover switch 11 consists of, for example, a key switch.

The call registration function is a function which is provided in an operating panel in the car 1 in a general elevator. In the case where the operating panel 10 is set to the call registration function by the changeover switch 11 (in the case where the changeover switch 11 is set to the "call registration" side in Figure 1), the car call button 12 is used to register a car call. That is, when the car call button 12 is operated (pressed) by a passenger in the car 1, the operating panel 10 transmits a signal corresponding to the operated car call button 12 to the controller 2, and causes the registration of the car call to be performed. Furthermore, in the case where the changeover switch 11 is set to the "call registration" side, the door open button 13 is used to cause a door opening action or open door holding to be performed, and the door close button 14 is used to cause a door closing action to be performed.

[0025] On the other hand, the camera selection function is a function peculiar to this elevator.

This elevator has the function of causing images photographed by the camera 5 to be indicated on the monitor 8 in the car 1 in real time, and is configured in such a manner that the selection of the camera 5 which causes the monitor 8 to indicate images can be made automatically or manually as required. The camera selection function is provided in order to cause an operator in the car 1 to manually make the selection of the camera 5 which causes the monitor 8 to indicate images.

[0026] In the case where the operating panel 10 is set by the changeover switch 11 to the camera selection function (in the case where the changeover switch 11 is set to the "monitor indication" side in Figure 1), the car call button 12 (also the door open button 13 and the door close button 14 if necessary) is used to select the camera 5 which causes the monitor 8 to indicate images. That is, an operator in the car 1 operates (presses) the car call button 12 and the like, whereby an image of a hall, which is photographed by the desired camera, can be caused to show up on the monitor 8.

[0027] The controller 2 has the function of controlling a normal operation and an evacuation operation and the function of controlling indications of the monitor 8. The controller 2 is connected to the disaster prevention center 3, each rescue request button 7, and (each piece of equipment of) the car 1, and the essential part thereof consists of, for example, communication means 15, operation control means 16, boarding detection means 17, indication control means 18, indication selection means 19, fire information detection means 20, rescue-requested floor detection means 21, intercommunication selection means 22, and stop detection means 23.

[0028] The communication means 15 is provided in order that the controller 2 performs the sending and receiving of information with each piece of connected equipment.

[0029] The operation control means 16 has the function of controlling various kinds of operations of an elevator, such as a normal operation and an evacuation operation during a fire. The operation control means 16 performs a normal operation in normal times and performs control which involves causing the car 1 to respond successively to registered hall calls and car calls. When the outbreak of a fire has been detected by any of the fire detectors 4, the operation control means 16 starts prescribed control necessary for performing a rescue of those who are present in the building by switching the elevator from a normal operation to an evacuation operation in the case where prescribed start conditions are satisfied.

[0030] The boarding detection means 17 has the function of detecting persons in the car 1. On the basis of an output of, for example, a load weighing device, a sensor (an infrared sensor or the like) provided in the car 1 or the like, the boarding detection means 17 makes a determination as to whether or not a person is present in the car 1, and detects that a person is present in the car 1 in the case where prescribed conditions are satisfied.

[0031] The indication control means 18 has the function of controlling indications of the monitor 8 installed in the car 1. In a normal operation of an elevator, the indication control means 18 causes the monitor 8 to indicate general information, such as information on destination floors, news and weather forecasts. In addition, when the control of an evacuation operation is started by the operation control means 16, on the basis of information from other means in the controller 2 and the like, the indication control means 18 causes the monitor 8 in the car 1 to automatically indicate the evacuation information.

[0032] The indication selection means 19 has the function of selecting the camera for causing the monitor 8 in the car 1 to indicate an image (hereinafter referred to also as the "image indication camera") from the cameras 5 installed in a plurality of halls. Image indication cameras selected by the indication selection means 19 may be one camera or may be a plurality of cameras (for example, 2 cameras or 4 cameras).

[0033] For example, when during an evacuation oper-

ation of an elevator the changeover switch 11 is set to the "call registration" side, the indication selection means 19 makes the selection of the image indication camera on the basis of information and the like from each means in the controller 2. When during an evacuation operation of an elevator the changeover switch 11 is set to the "monitor indication" side, the indication selection means 19 makes the selection of the image indication camera on the basis of an operation performed on the car call button 12 of the operating panel 10 (i.e., the pressed car call button 12). The indication control means 18 causes the monitor 8 to indicate in real time an image of the hall photographed by the camera 5 selected by the indication selection means 19.

[0034] The fire information detection means 20 has the function of detecting the floor where a fire has broken out and a place where a fire has broken out on the basis of the fire detection information received from the disaster prevention center 3 (i.e., the fire detector 4).

When the outbreak of a fire is detected by the fire detector 4, the indication selection means 19 selects the camera 5 installed on the floor where the fire has broken out as the image indication camera on the basis of the detection result of the fire information detection means 20. As a result of this, an image of the hall on the floor where the fire has broken out is caused to show up automatically on the monitor 8 in the car 1. When the floor where the fire has broken out and/or the place where the fire has broken out has been identified by the fire information detection means 20, the indication control means 18 causes the monitor 8 to indicate the information on the identified floor where the fire has broken out and the like as evacuation information.

[0035] The rescue-requested floor detection means 21 has the function of detecting the floor on which a rescue request has been made (the rescue-requested floor) on the basis of the rescue request information received from the rescue request button 7.

When the rescue request button 7 is pressed in a hall and a rescue request is made, the indication selection means 19 selects the camera 5 installed on the rescue-requested floor as the image indication camera on the basis of the detection result of the rescue-requested floor detection means 21. As a result of this, an image of the hall of the rescue-requested floor is caused to show up automatically on the monitor 8. Besides, when the rescue-requested floor is identified by the rescue-requested floor detection means 21, the indication control means 18 causes the monitor 8 to indicate the information on the identified rescue-requested floor as evacuation information.

[0036] The intercommunication selection means 22 has the function of detecting the intercommunication device whose channel is selected by the intercommunication device 9 of the car 1.

When the intercommunication device 9 has selected the channel of any of the intercommunication devices 6, on the basis of the detection result of the intercommunica-

tion selection means 22, the indication selection means 19 selects the camera 5 on the floor where the intercommunication device 6 is installed as the image indication camera. As a result of this, an image of the hall of the floor on which the channel-selected intercommunication device 6 is installed is caused to show up automatically on the monitor 8.

[0037] The stop detection means 23 has the function of detecting a prescribed landing determination for stopping the car 1 during a run. A prescribed landing determination, such as a deceleration instruction to an elevator traction machine, becomes necessary for stopping the car 1 during a run. The stop detection means 23 detects that such a landing determination has been made, and identifies the floor at which the car 1 stops.

[0038] When a landing determination is detected by the stop detection means 23 as in the case where during an evacuation operation the car 1 stops at a rescue floor, the indication selection means 19 selects the camera 5 installed on the floor at which the car 1 is to stop as the image indication camera. As a result of this, an image of the hall of the rescue floor at which the car 1 stops immediately thereafter and the like is caused to show up automatically on the monitor 8.

[0039] Incidentally, the configuration may be such that each function of each of the above-described means 19 to 23 is effective only when an evacuation operation is being performed.

[0040] Next, referring to also Figures 2 and 3, the actions of the monitor control apparatus having the above-described configuration will be described concretely. Figure 2 is a flowchart showing the actions of the monitor control apparatus of an elevator in the first embodiment according to the present invention, and Figure 3 is a diagram showing an example of an indication of the monitor in the car.

[0041] When the outbreak of a fire is detected by any of the fire detectors 4 in the building during a normal operation of an elevator, the fire detection information from the fire detector 4 is inputted to the controller 2 via the disaster prevention center 3. In the controller 2, upon receipt of the fire detection information by the communication means 15, the outbreak of the fire is made sure of (S101) and the processing described below is performed.

[0042] In the controller 2, first, a determination is made by the operation control means 16 as to whether or not the use of an elevator during a fire is possible (S102). The conditions for starting the use of an elevator during a fire are stored beforehand in the controller 2. By comparing the present condition of the elevator with the start conditions, the operation control means 16 makes the determination of S 102. For example, in the case where the start conditions do not hold as in the case where a prescribed safety device is in action, in S102 a determination is made on that the elevator cannot be used and the action is finished without performing an evacuation operation during a fire (No in S102).

[0043] On the other hand, when in S102 a determination is made on that the elevator can be used, switching of the elevator is performed by the operation control means 16 from a normal operation to an evacuation operation, and various actions for rescuing those who are present in the building by the elevator are started in the controller 2.

[0044] In the indication control means 18, because of the detection of the switching to an evacuation operation the indication contents of the monitor 8 in the car 1 are changed from the existing general information to evacuation information during a fire (S103). For example, in the case where the elevator has the configuration shown in Figure 1, the indication control means 18 causes the monitor 8 to indicate an image of a hall by the camera 5, as well as the information on the floor where the fire has broken out, the place where the fire has broken out, and the rescue-requested floor as evacuation information during a fire (S 104).

[0045] Incidentally, the image of a hall appearing on the monitor 8 is an image photographed by the camera 5 selected by the indication selection means 19. An evacuation operation during a fire is started when the fire detector 4 detects the outbreak of the fire. For this reason, immediately after the start of an evacuation operation (i.e., in S104), the camera 5 of the floor where the fire has broken out is selected by the indication selection means 19 as the image indication camera and an image of the hall of the floor where the fire has broken out is caused to show up on the monitor 8.

[0046] When in S 104 the initial evacuation information is indicated on the monitor 8, the indication selection means 19 makes a determination as to whether or not the intercommunication device 9 of the car 1 has selected the channel of any of the intercommunication devices 6 installed in a hall (S105). When intercommunication between the car 1 and the hall has been established, the indication selection means 19 selects the camera 5 of the floor where the intercommunication device 6 whose channel has been selected by the intercommunication device 9 is installed as the image indication camera, and causes the monitor 8 to preferentially indicate an image of the hall (S106).

[0047] On the other hand, in the case where channel selection of any intercommunication device 9 has not been detected by the intercommunication selection means 22, next, the indication selection means 19 makes a determination as to whether or not a rescue request button 7 of a hall has been operated (S107). If any of the rescue request buttons 7 has been operated, the indication selection means 19 selects the camera 5 of the floor where the operated rescue request button 7 is installed as the image indication camera, and causes the monitor 8 to preferentially indicate an image of the hall (S108).

[0048] Figure 3 shows an example of an indication of the monitor 8 in S108. In the example shown in Figure 3, whether or not a request for a rescue has been made is indicated for each floor on the monitor 8. The camera

5 of the 5th floor for which a rescue request button 7 was operated is selected as the image indication camera, and an image of the hall of the 5th floor is indicated on the monitor 8. Incidentally, in the example shown in Figure 3, a rescue request button 7 of the 3rd floor is also operated. In this case, the indication selection means 19 may select both cameras 5 of the 3rd floor and the 5th floor as the image indication camera and an image of the hall of the 3rd floor and an image of the hall of the 5th floor may be indicated separately or may be indicated alternately in a prescribed region of the monitor 8. Furthermore, the indication selection means 19 may select the camera 5 of the floor where a rescue request button 7 operated later is installed as the image indication camera.

[0049] In the case where neither the channel selection by the intercommunication device 9 nor a request for a rescue by the rescue request button 7 has been performed, next, the indication selection means 19 makes a determination as to whether or not a landing determination of an elevator has been made (S 109). When it has been determined that the elevator stops at the rescue floor, the indication selection means 19 selects the camera 5 on the floor where the car 1 stops next as the image indication camera, and causes the monitor 8 to preferentially indicate an image of the hall (S110).

[0050] After in S 106, S108, and S110 the monitor 8 is caused to indicate a new image of a hall or after in S109 a determination is made to the effect that a landing determination has not been made, the indication selection means 19 makes a determination as to whether or not the operating panel 10 has been set to the camera selection function (S111). Incidentally, in the case where the operating panel 10 has been set to the call registration function (S112), the automatic selection processing of the image indication camera shown in S 104 to S 110 above is preferentially performed and an appropriate image of a hall suited to the present situation is indicated on the monitor 8. In this case, the operating panel 10 is used in order that an operator or other person in the car 1 registers a car call.

[0051] On the other hand, in the case where the operating panel 10 is set to the camera selection function (Yes in S111), the operating panel 10 is used by an operator in the car 1 for selecting the camera 5 which causes images to show up on the monitor 8. In this case, the indication selection means 19 selects the camera 5 (of the floor) designated by the operating panel 10 as the image indication camera and causes the monitor 8 to preferentially indicate an image of the hall (S113).

[0052] Incidentally, even in the case where the operating panel 10 is set to the camera selection function, unless an operation on the car call button 12 has been detected, the indication selection means 19 preferentially performs the automatic selection processing of the image indication camera described in S104 to S110 above, and causes the monitor 8 to indicate an appropriate image of a hall suited to the present situation. Furthermore, even

in the case where the camera 5 designated by the operating panel 10 has been selected by the indication selection means 19 as the image indication camera, in the case where the occurrence of a fire, a channel selection by the intercommunication device 6, a request for a rescue, a landing determination and the like have been newly detected, switching of the indication of the monitor 8 may be performed by preferentially performing the automatic selection processing of the image indication camera.

[0053] According to the first embodiment of the present invention, in the case where an elevator is used for evacuation purposes during a fire, it is possible to cause the monitor 8 in the car 1 to appropriately indicate various kinds of information necessary for rescuing those who are present in a building by an elevator. That is, an operator in the car 1 can instantaneously grasp, from the indication contents of the monitor 8 in the car 1, information on the place where the fire has broken out in the building and information on the floor where those who are present in the building and require an evacuation by the elevator (for example, wheelchair users) are present, making it possible to perform speedy and accurate rescue activities using the elevator.

[0054] In a high-rise building, the number of cameras 5 installed in halls becomes inevitably large. However, with a monitor control apparatus of the above-described configuration, it is possible to cause the monitor 8 to indicate appropriate images of a hall according to the condition of the building and the presence or absence of those who are present in the building. Furthermore, because the manual selection of the camera 5 which causes images to show up on the monitor 8 can be made by the operating panel 10 in the car 1, it becomes possible to mount a device necessary for manual selection in various kinds of elevators without an increase in size.

[0055] Incidentally, in this embodiment, concrete descriptions were given of the case where the monitor 8 is caused to indicate an image of a hall by the camera 5, as well as information on the floor where a fire has broken out, the place where a fire has broken out and a rescue-requested floor as evacuation information during a fire. However, in the case where information on a specific place where a fire has broken out is not included in fire detection information from the fire detector 4, only information on the floor where a fire has broken out may be indicated on the monitor 8. In the case where the rescue request button 7 is not installed in a hall of an elevator, information on a rescue-requested floor is not included in the evacuation information, and it is necessary only that other information be indicated on the monitor 8.

[0056] Furthermore, in this embodiment, when an evacuation operation is started, the monitor 8 is caused to indicate evacuation information. However, the indication of evacuation information may be performed only when an operator is present in the car 1. In this case, for example, the indication control means 18 causes the monitor 8 to indicate evacuation information when the

control of an evacuation operation is started by the operation control means 16 and the presence of a person is detected by the boarding detection means 17.

Also in this configuration, it is possible to produce the same effects as described above.

Industrial Applicability

[0057] The monitor control apparatus of an elevator according to the present invention can be applied to an elevator which is used for evacuation purposes in an emergency such as a fire and whose car is provided with a monitor.

[0058]

Reference Signs List

1	car
2	controller
3	disaster prevention center
4	fire detector
5	camera
6,9	intercommunication device
7	rescue request button
8	monitor
10	operating panel
11	changeover switch
12	car call button
13	door open button
14	door close button
15	communication means
16	operation control means
17	boarding detection means
18	indication control means
19	indication selection means
20	fire information detection means
21	rescue-requested floor detection means
22	intercommunication selection means
23	stop detection means

Claims

1. A monitor control apparatus of an elevator, comprising:

a car which ascends and descends in an elevator shaft;
a monitor provided in the car;
indication control means which controls indications of the monitor;
a camera installed in a hall of the elevator; and
operation control means which controls a normal operation of the elevator and an evacuation operation of the elevator during a fire,
wherein the indication control means causes the

- monitor to automatically indicate prescribed evacuation information including an image of the hall photographed by the camera and information on the floor where the outbreak of a fire has been detected from fire detection information when the control of an evacuation operation is started by the operation control means.
2. The monitor control apparatus of an elevator according to claim 1, further comprising:
- indication selection means which selects a camera causing the monitor to indicate an image from cameras installed in a plurality of halls at which the car stops, wherein the indication control means causes the monitor to indicate an image of the hall photographed by the camera selected by the indication selection means when the control of an evacuation operation is started by the operation control means.
3. The monitor control apparatus of an elevator according to claim 2, wherein the indication selection means selects a camera installed on the floor where a fire has broken out as a camera which causes the monitor to indicate an image when the outbreak of a fire has been detected from the fire detection information.
4. The monitor control apparatus of an elevator according to claim 2 or 3, further comprising:
- a first intercommunication device provided in the car; and
a second intercommunication device provided in the hall of the elevator, wherein the indication selection means selects a camera on the floor where the second intercommunication device is installed as a camera which causes the monitor to indicate an image when the first intercommunication device has selected a channel of the second intercommunication device.
5. The monitor control apparatus of an elevator according to claim 2 or 3, further comprising:
- rescue request means which is provided in the hall of the elevator and is intended for use in requesting a rescue by the elevator, wherein when a request for a rescue has been made by the rescue request means, the indication selection means selects a camera installed on the rescue-requested floor as a camera which causes the monitor to indicate an image.
6. The monitor control apparatus of an elevator according to claim 5, wherein the indication control means causes the monitor to automatically indicate information on the rescue-requested floor as the evacuation information when a request for a rescue has been made by the rescue request means.
7. The monitor control apparatus of an elevator according to claim 2 or 3, further comprising:
- stop detection means which detects a prescribed landing determination for stopping the car during a run, wherein the indication selection means selects a camera installed on the floor at which the car is to stop as a camera which causes the monitor to indicate an image when a landing determination has been detected by the stop detection means.
8. The monitor control apparatus of an elevator according to any of claims 2 to 7, further comprising:
- an operating panel installed in the car, wherein
- the operating panel has a plurality of car call buttons for registering a car call; and the indication selection means selects a camera which causes the monitor to indicate an image on the basis of an operation performed on the car call buttons.
9. The monitor control apparatus of an elevator according to claim 8, further comprising:
- changeover means which is provided in the car and switches the operating panel between a call registration function and a camera selection function, wherein
- the operating panel performs registration of a car call on the basis of an operation on the car call buttons when the call registration function has been set by the changeover means; and the indication selection means selects a camera which causes the monitor to indicate an image on the basis of an operation on the car call buttons when the operating panel has been set to the camera selection function by the changeover means.
10. The monitor control apparatus of an elevator according to any of claims 1 to 9, further comprising:
- boarding detection means for detecting persons

in the car,
wherein the indication control means causes the
evacuation information to be automatically indi-
cated on the monitor when the control of an
evacuation operation is started by the operation
control means and the presence of a person has
been detected by the boarding detection means.

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Fig. 1

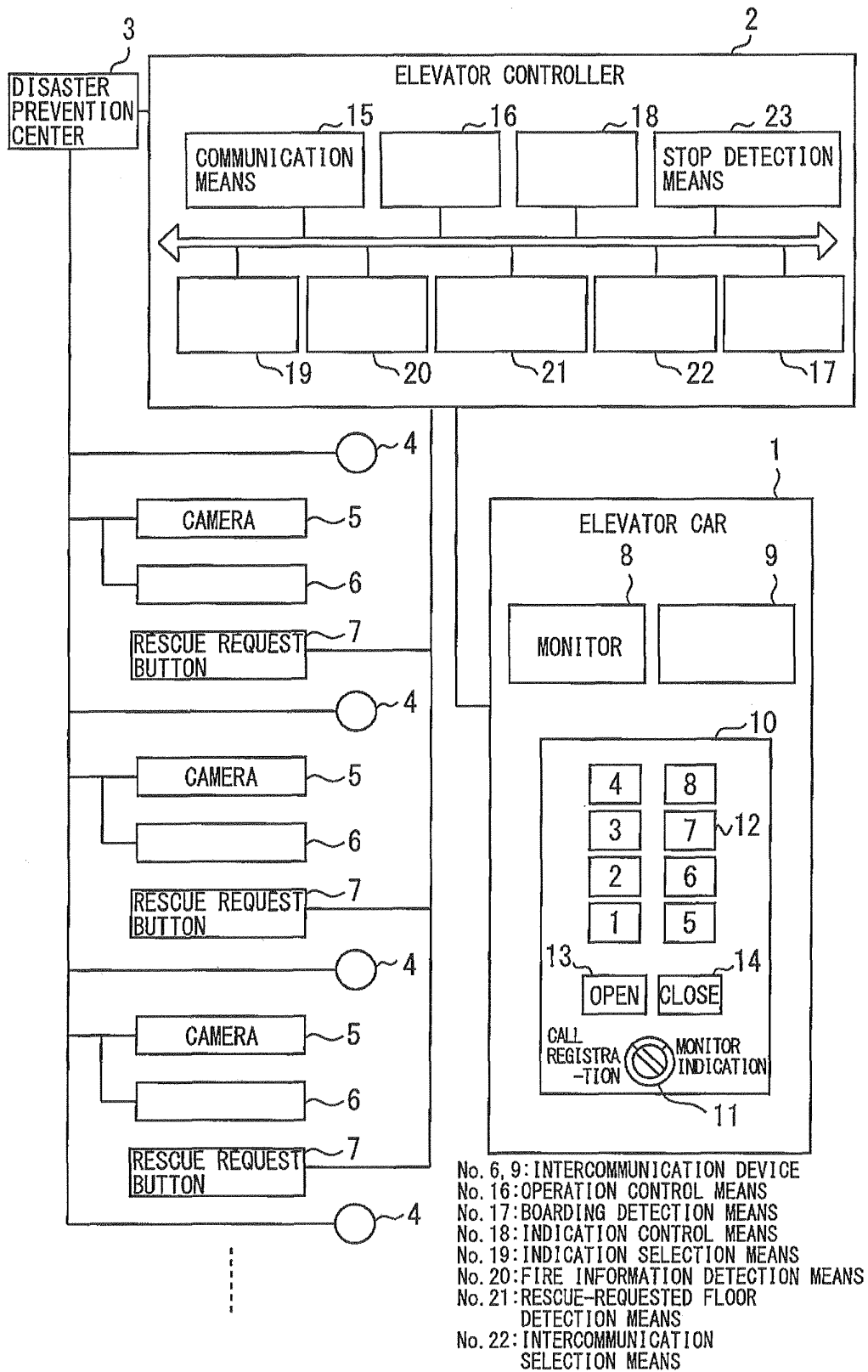


Fig. 2

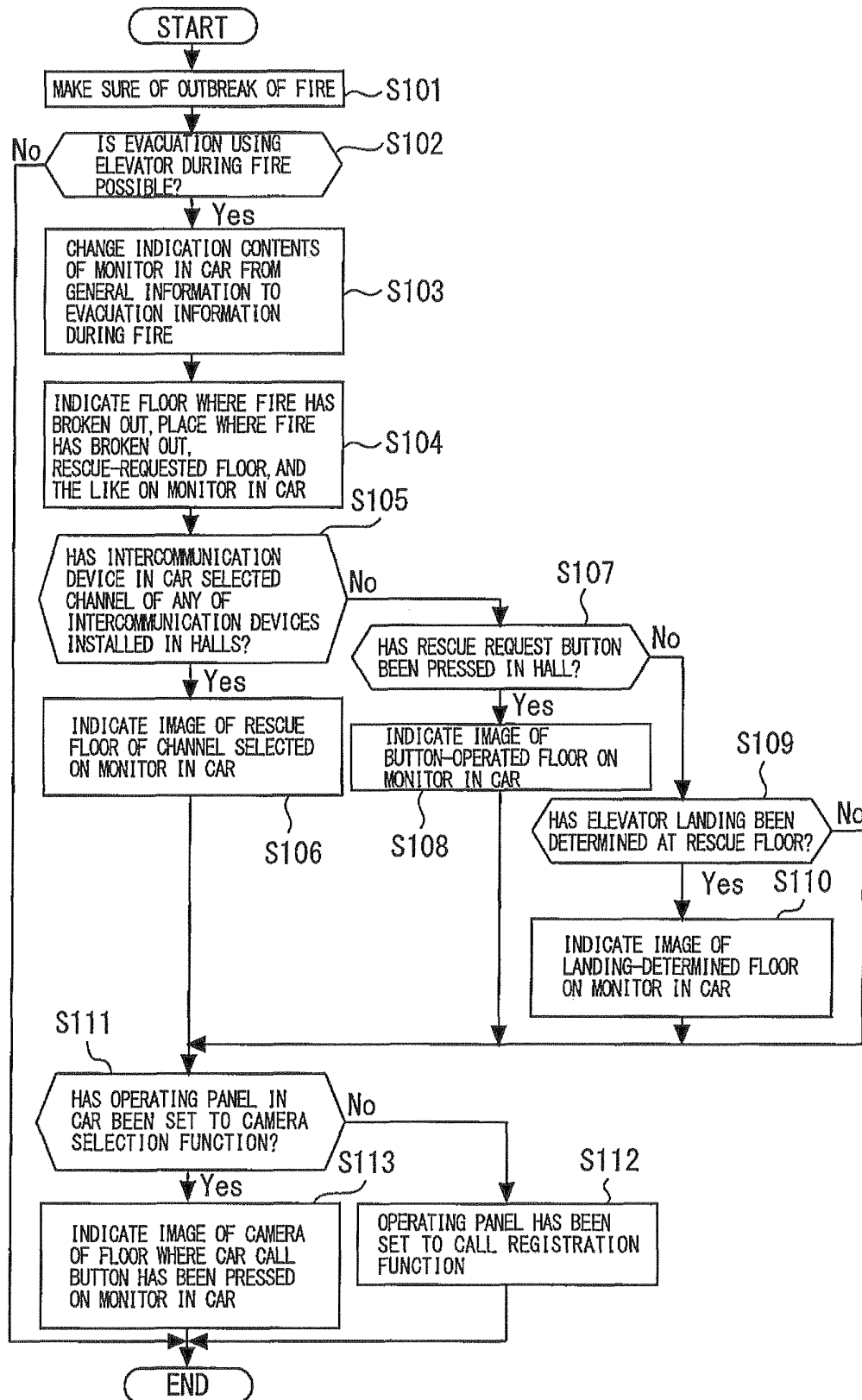
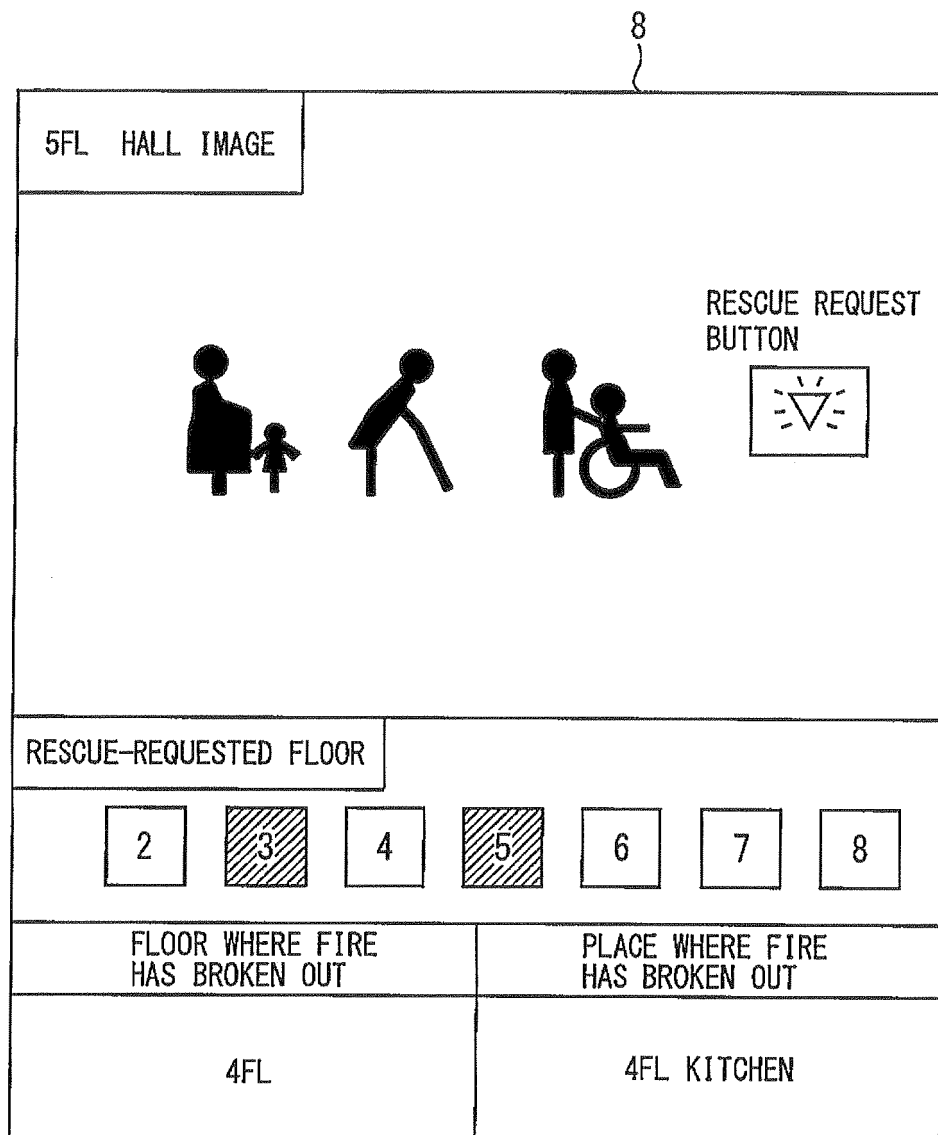


Fig. 3



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/064472

A. CLASSIFICATION OF SUBJECT MATTER

B66B5/02 (2006.01) i, 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)

B66B5/02, 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	1996-2010
Kokai Jitsuyo Shinan Koho	1971-2010	Toroku Jitsuyo Shinan Koho	1994-2010

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.
Y A	JP 7-237834 A (Sanyo Electric Co., Ltd., Fujitec Co., Ltd.), 12 September 1995 (12.09.1995), paragraphs [0011], [0025]; fig. 1 (Family: none)	1-4, 7-10 5-6
Y A	JP 64-75378 A (Toshiba Corp.), 22 March 1989 (22.03.1989), page 2, upper right column, line 17 to page 3, upper left column, line 19 (Family: none)	1-4, 7-10 5-6
Y	JP 5-2693 A (Tetsuya MURAOKA), 08 January 1993 (08.01.1993), paragraphs [0005], [0018] (Family: none)	3-4, 7-10

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

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"&" document member of the same patent family

Date of the actual completion of the international search
18 November, 2010 (18.11.10)Date of mailing of the international search report
30 November, 2010 (30.11.10)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/064472

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 2008-189413 A (Japan Otis Elevator Co.), 21 August 2008 (21.08.2008), paragraphs [0022] to [0033] (Family: none)	4, 8-10
Y	JP 2006-8332 A (Mitsubishi Electric Corp.), 12 January 2006 (12.01.2006), claims 1 to 2 (Family: none)	7-8, 10
A	JP 58-144080 A (Mitsubishi Electric Corp.), 27 August 1983 (27.08.1983), page 1, lower right column, line 19 to page 2, upper right column, line 1 (Family: none)	7

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 6475378 B [0003]