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• **KAWAI, Kiyoji**
Tokyo 100-8310 (JP)
• **KUNITACHI, Masaya**
Tokyo 100-8310 (JP)
• **TAKEUCHI, Nobukazu**
Tokyo 100-8310 (JP)

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

(72) Inventors:
• **FUJIHATA, Yuji**
Tokyo 100-8310 (JP)

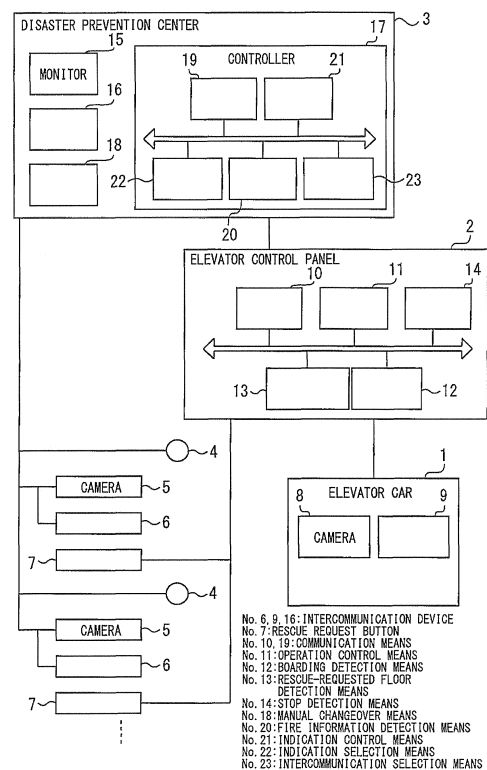
(74) Representative: **HOFFMANN EITL**
Patent- und Rechtsanwälte
Arabellastrasse 4
81925 München (DE)

(54) **MONITOR CONTROL DEVICE**

(57) It is ensured that in the case where an elevator is utilized for evacuation purposes during a fire, a monitor installed in a prescribed remote place can indicate various kinds of information necessary for rescuing those who are present in a building.

This monitor controller is provided with a monitor 15 provided in a disaster prevention center 3 or the like, indication control means 21 which controls indications of the monitor 15, 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 11 which controls a normal operation of the elevator and an evacuation operation of the elevator during a fire. The indication control means 21 causes the monitor 15 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 the evacuation operation is started by the operation control means 11.

Fig. 1



Description

Technical Field

[0001] The present invention relates to a monitor controller which can appropriately control indications of a monitor installed in a disaster prevention center or the like.

Background Art

[0002] Patent Literature 1 below proposes an elevator for evacuation purposes utilized in rescue activities by firefighters when a fire breaks out in a building. Specifically, in the monitor controller 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 to show up on the monitor by operating a switch for selection installed in the car, thereby making sure of the situation in the hall.

Citation List

Patent Literature

[0003] Patent Literature 1: Japanese Patent Laid-Open No. 64-75378

Summary of Invention

Technical Problem

[0004] In the monitor controller described in Patent Literature 1, in the case where an elevator is used for evacuation purposes during a fire, an image of a hall photographed by a camera is caused to show up on a monitor in a car. This poses the problem that an operator in the car (for example, a firefighter) must perform various kinds of operations, such as operating the elevator and making sure of the situation in the hall, and hence it is impossible to perform rescue activities speedily and accurately.

[0005] Incidentally, it cannot be said that information necessary for rescuing those who are present in a building is sufficiently provided only by causing an image of the hall photographed by the camera to show up on the monitor. Furthermore, in the monitor controller described in Patent Literature 1, an operator in the car must perform the switching of the image of the hall by himself or herself and, therefore, it is also difficult to cause an appropriate image of the hall to be indicated on the monitor.

[0006] For example, an elevator utilized 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 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 situation in each hall by sequentially switching images caused to show up on the monitor and this confirmation work requires much time. Furthermore, only with the images caused to show up 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.

[0007] The present invention was made in order to solve the problems described above and an object of the invention is to provide a monitor controller which can cause a monitor installed in a prescribed remote place to indicate various kinds of information necessary for rescuing those who are present in a building in the case where an elevator is utilized for evacuation purposes during a fire.

Solution to Problem

[0008] A monitor controller of the present invention is a monitor controller which comprises a monitor provided in a prescribed remote place away from a car and a hall of an elevator, indication control means which controls indications of the monitor, a first camera installed in the 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 first camera and information on a 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

[0009] According to the present invention, in the case where an elevator is utilized for evacuation purposes during a fire, it becomes possible to cause a monitor installed in a prescribed remote place to indicate various kinds of information necessary for rescuing those who are present in a building. For this reason, when a fire has broken out in a building, it becomes possible to perform speedy and accurate rescue activities utilizing an elevator.

Brief Description of Drawings

[0010]

Figure 1 is a diagram showing the general configuration of a monitor controller in a first embodiment according to the present invention.

Figure 2 is a flowchart showing the operations of the monitor controller 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 disaster prevention center.

Figure 4 is a block diagram showing an essential part of a monitor controller in a second embodiment according to the present invention.

Figure 5 is a flowchart showing an essential part of the operations of the monitor controller in the second embodiment according to the present invention.

Description of Embodiments

[0011] 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

[0012] Figure 1 is a diagram showing the general configuration of a monitor controller 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 control panel which performs the operation control of the whole elevator, such as the run control of the car 1. In normal times, the control panel 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. In addition, this elevator has the function to be utilized for evacuation purposes in an emergency such as a fire, and the control panel 2 also performs control for this purpose as required.

[0013] Reference numeral 3 denotes a disaster prevention center 3 provided on the first floor or the like of a building in which the elevator is provided. The disaster prevention center 3 consists of a facility installed in a prescribed remote place away from the car 1 and an elevator hall, and performs 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 control panel 2 is connected to, for example, a central warning panel (not shown) of the disaster prevention center 3.

[0014] In the building in which the elevator is provided, 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.

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 on which 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 control panel 2.

[0015] The camera 5 is intended for photographing the situation in the hall. An image of each hall photographed by the camera 5 is inputted to the disaster prevention center 3. The intercommunication device 6 is a device by use of which a person in the 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). Also the intercommunication device 6 is connected to the disaster prevention center 3 as is the camera 5.

[0016] 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 control panel 2 and outputs rescue request information to the control panel 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.

[0017] In order to limit the operation of the rescue request button 7 to specific persons (for example, wheelchair users and the elderly), 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 control panel 2.

[0018] 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 a part of the halls.

[0019] A camera 8 and an intercommunication device 9 are provided in the car 1 of an elevator.

The camera 8 is intended for photographing the situation in the car 1. An image of the inside of the car 1 photographed by the camera 8 is inputted to the disaster prevention center 3 via the control panel 2. The intercommunication device 9 is a device by use of which persons in the car 1 (a passenger, an operator and other persons) can communicate with the outside. Using this intercommunication device 9, a person in the car 1 has conversations with a monitoring staff member of the disaster prevention center 3 and a person who is using the intercommunication device 6 in the hall. Like the camera 8 the intercommunication device 9 is also connected to the dis-

aster prevention center 3 via the control panel 2.

[0020] The control panel 2 has the function of controlling a normal operation for performing the normal services and an evacuation operation for performing an evacuation by an elevator when a fire has broken out in the building. The control panel 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 10, operation control means 11, boarding detection means 12, rescue-requested floor detection means 13, and stop detection means 14.

[0021] The communication means 10 is provided in order that the control panel 2 performs the sending and receiving of information with each piece of connected equipment.

[0022] The operation control means 11 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 11 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 11 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.

[0023] The boarding detection means 12 has the function of detecting persons in the car 1. On the basis of an output of, for example, a load weighing device and a sensor (an infrared sensor or the like) provided in the car 1 and the like, or an image photographed by the camera 8, the boarding detection means 12 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. When the boarding detection means 12 has detected the presence of a person in the car 1, the boarding detection means 12 outputs the result also to the disaster prevention center 3 via the communication means 10.

[0024] The rescue-requested floor detection means 13 has the function of detecting the floor on which a rescue request has been performed (the rescue-requested floor) on the basis of the rescue request information received from the rescue request button 7. When the rescue-requested floor detection means 13 identifies the rescue-requested floor on the basis of the received rescue request information, the rescue-requested floor detection means 13 outputs the result also to the disaster prevention center 3 via the communication means 10.

[0025] The stop detection means 14 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 14 detects that such a landing determination has been made, and identifies the floor at which the car 1 stops. When the stop detection means 14 identifies the floor at which the car 1 stops next, the stop detection means 14 outputs the result also to the disaster prevention center 3 via the communication means 10.

[0026] On the other hand, the disaster prevention center 3 is provided with a monitor 15, an intercommunication device 16, a controller 17, and manual changeover means 18.

[0027] The monitor 15 is indented for providing monitoring information of an elevator, disaster prevention information of the building and the like to a monitoring staff member or other persons of the disaster prevention center 3, and consists of, for example, a liquid crystal display. In normal times, general monitoring information is indicated on the monitor 15. When a fire has broken out in the building and an evacuation operation for performing an evacuation by an elevator is started in the control panel 2, under prescribed conditions, various kinds of information necessary for speedily and accurately performing an evacuation operation (hereinafter referred to as "evacuation information") is indicated on the monitor 15. Specifically, various kinds of information necessary for supporting rescue activities utilizing an elevator is indicated as evacuation information on the monitor 15 of the disaster prevention center 3.

As described above, both general monitoring information and evacuation information are indicated on the monitor 15 by being switched therebetween, whereby the monitor 15 is effectively utilized and the number of monitors 15 can be reduced.

Incidentally, concrete indication contents of the monitor 15 during an evacuation operation will be described later.

[0028] The intercommunication device 16 is a device by use of which a monitoring staff member or other persons of the disaster prevention center 3 can communicate with the outside. That is, when an evacuation operation is being performed on the control panel 2, the monitoring staff member of the disaster prevention center 3 has conversations with persons in the car 1 (a passenger, an operator and other persons) and a person who is using an intercommunication device 6 in the hall.

[0029] The controller 17 is provided in the central warning panel or the like of the disaster prevention center 3. The disaster prevention center 3 has the function of causing the monitor 15 to indicate images photographed by the cameras 5 and 8 in real time, and is configured in such a manner that the selection of the camera 5 and/or the camera 8 which causes the monitor 15 to indicate an image can be performed automatically or manually as required. In order to realize such a function, the controller 17 is provided with communication means 19, fire information detection means 20, indication control means 21, indication selection means 22, and intercommunication selection means 23.

[0030] The communication means 19 is provided in or-

der that the disaster prevention center 3 performs the sending and receiving of information with each piece of connected equipment.

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 fire detector 4.

[0031] The indication control means 21 has the function of controlling indications of the monitor 15 installed in the disaster prevention center 3. In normal times when a normal operation is performed in an elevator, the indication control means 21 causes the monitor 15 to indicate general monitoring information, such as the state of each piece of equipment installed in the building and the state of an elevator. On the other hand, when the control of an evacuation operation is started on the control panel 2 (by the operation control means 11), the indication control means 21 causes the monitor 15 to automatically indicate the evacuation information on the basis of information from the control panel 2, information from other means in the controller 17 and the like.

[0032] The indication selection means 22 has the function of selecting the camera for causing the monitor 15 to indicate an image (hereinafter referred to also as the "image indication camera") from the cameras 5 installed in a plurality of halls and the camera 8 installed in the car 1. That is, the indication control means 21 causes the monitor 15 to indicate in real time images photographed by the camera 5 and/or the camera 8 selected by the indication selection means 22.

Incidentally, image indication cameras selected by the indication selection means 22 may be one camera or may be a plurality of cameras (for example, 2 cameras, 4 cameras or the like).

[0033] For example, when the outbreak of a fire is detected by the fire detector 4, the indication selection means 22 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 15 of the disaster prevention center 3. 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 21 causes the monitor 15 to indicate the information on the identified floor where the fire has broken out and the like as evacuation information.

[0034] Furthermore, for example, when the rescue request button 7 is operated in a hall of the elevator and a rescue request is performed, the indication selection means 22 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 13 of the control panel 2. As a result of this, an image of the hall of the rescue-requested floor is caused to show up automatically on the monitor 15. Be-

sides, when the rescue-requested floor is identified by the rescue-requested floor detection means 13, the indication control means 21 causes the monitor 15 to indicate the information on the identified rescue-requested floor as evacuation information.

[0035] Moreover, for example, when a landing determination is detected by the stop detection means 14 of the control panel 2 as in the case where during an evacuation operation the car 1 stops at a rescue floor, the indication selection means 22 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 is caused to show up automatically.

[0036] Furthermore, for example, when the presence of a person in the car 1 is detected by the boarding detection means 12 when an evacuation operation of an elevator is being performed, the indication selection means 22 selects the camera 8 installed in the car 1 as the image indication camera. As a result of this, an image of the inside of the car 1 is caused to show up automatically.

[0037] The intercommunication selection means 23 has the function of detecting the channel of the intercommunication device 16 of the disaster prevention center 3. When the intercommunication device 16 has selected the channel of either the intercommunication device 6 or the intercommunication device 9, on the basis of the detection result of the intercommunication selection means 23, the indication selection means 22 selects the camera in the place where the channel-selected intercommunication device is installed as the image indication camera. For example, when the intercommunication device 16 has selected the channel of one of the intercommunication devices 6, the indication selection means 22 selects the camera 5 of 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 15. When the intercommunication device 16 has selected the channel of the intercommunication device 9, the indication selection means 22 selects the camera 8 as the image indication camera. As a result of this, an image of the inside of the car 1 is caused to show up automatically on the monitor 15.

[0038] The manual changeover means 18 is provided in order to cause a monitoring staff member or other persons of the disaster prevention center 3 to manually perform the selection of the camera which causes the monitor 15 to indicate images. That is, the monitoring staff member of the disaster prevention center 3 selects one or more of camera 5 and/or camera 8 by the manual changeover means 18, thereby enabling an image of the hall and/or an image of the inside of a car photographed by a desired camera to show up on the monitor 15.

[0039] Next, referring also to Figures 2 and 3, the operations of the monitor controller having the above-de-

scribed configuration will be described concretely. Figure 2 is a flowchart showing the operations of the monitor controller 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 disaster prevention center.

[0040] When the outbreak of a fire is detected by any of the fire detectors 4 in the building while a normal operation is being performed in an elevator, the fire detection information from the fire detector 4 is inputted to the disaster prevention center 3. In the controller 17 of the disaster prevention center 3, upon receipt of the fire detection information by the communication means 19, the outbreak of the fire is made sure of (S101) and the processing shown below is performed.

[0041] In the controller 17, first, a determination is made as to whether or not an evacuation utilizing an elevator during a fire is possible (S102).

The fire detection information from the fire detector 4 is inputted also to the elevator control panel 2 via the disaster prevention center 3. The start conditions for utilizing an elevator during a fire are stored beforehand in the control panel 2, and by comparing the present state of the elevator with the start conditions, the operation control means 11 makes a determination as to whether or not a changeover to an evacuation operation is possible. For example, in the case where the start conditions do not hold as in the case where a prescribed safety device is in operation, an evacuation operation is not started in the elevator. In this case, a determination is made in the controller 17 that the elevator cannot be utilized (No in S102), and the indication control means 21, for example, causes the indication of general monitoring information to be continued.

[0042] On the other hand, when the start conditions have held at the time of receipt of the fire detection information, the operation control means 11 causes the elevator to make a changeover from a normal operation to an evacuation operation. In the disaster prevention center 3, by detecting this changeover to an evacuation operation, in S102 a determination is made that the elevator can be utilized. In the disaster prevention center 3 the monitor control for supporting rescue activities utilizing the elevator is started in the controller 17.

[0043] In the indication control means 21, because of the detection of the switching to an evacuation operation the indication contents of the monitor 15 are changed from the existing general monitoring information to evacuation information during a fire (S103). For example, in the case where the monitor controller has the configuration shown in Figure 1, the indication control means 21 causes the monitor 15 to indicate, as evacuation information during a fire, an image of the hall by the camera 5 and an image of the inside of the car by the camera 8, 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 (S104).

[0044] Incidentally, images caused to show up on the

monitor 15 are those photographed by the camera 5 and/or camera 8 selected by the indication selection means 22 as the image indication camera. An evacuation operation during a fire is started when the fire detector 4 detects the outbreak of a 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 22 as the image indication camera and at least an image of the hall of the floor where the fire has broken out is caused to show up on the monitor 15.

[0045] When in S104 the initial evacuation information is indicated on the monitor 15, the indication selection means 22 makes a determination as to whether or not the intercommunication device 16 of the disaster prevention center 3 has selected the channel of any of the intercommunication devices 6 installed in a hall (S105). When intercommunication between the disaster prevention center 3 and the hall has been established, the indication selection means 22 selects the camera 5 of the floor where the intercommunication device 6 whose channel has been selected by the intercommunication device 16 is installed as the image indication camera, and causes the monitor 15 to preferentially indicate an image of the hall (S106).

[0046] In the case where intercommunication between the disaster prevention center 3 and the hall has not been established, next, a determination is made as to whether or not the intercommunication device 16 of the disaster prevention center 3 has selected the channel of the intercommunication device 9 installed in the car 1 (S107). When intercommunication between the disaster prevention center 3 and the car 1 has been established, the indication selection means 22 selects the camera 8 in the car 1 as the image indication camera, and causes the monitor 15 to preferentially indicate an image of the inside of the car (S108).

[0047] On the other hand, in the case where channel selection of any intercommunication device 9 by the intercommunication selection means 23 has not been detected (No in S107), next, the indication selection means 22 makes a determination as to whether or not a rescue request button 7 of a hall has been operated (S109). If any of the rescue request buttons 7 has been operated, the indication selection means 22 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 15 to preferentially indicate an image of the hall (S110).

[0048] Figure 3 shows an example of an indication of the monitor 15 in S110. In the example shown in Figure 3, whether or not a rescue request has been performed is indicated for each floor on the monitor 15. 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 15. Incidentally, in the example shown in Figure 3, a rescue request button 7 of the 3rd floor is also op-

erated. In this case, the indication selection means 22 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 by split-screen display or may be indicated alternately in a prescribe region of the monitor 15. Furthermore, the indication selection means 22 may select the camera 5 of the floor where a rescue request button 7 operated later is installed as the image indication camera.

[0049] Figure 3 shows an example in which the manual changeover means 18 is caused to show up on the monitor 15. As in this example, the manual changeover means 18 may be composed of a touch panel type button so that the manual selection of cameras can be performed in the monitor 15.

[0050] In the case where neither the channel selection by the intercommunication device 16 nor a rescue request by the rescue request button 7 has been performed (No in S109), next, the indication selection means 22 makes a determination as to whether or not a landing determination of an elevator has been made (S111). When it has been determined that the elevator stops at the rescue floor, the indication selection means 22 selects the camera 5 on the floor where the car 1 stops next as the image indication camera, and causes the monitor 15 to preferentially indicate an image of the hall (S112).

[0051] After in S106, S108, S110, and S112 the monitor 15 is caused to indicate a new image of the hall or a new image of the inside of a car or after in S111 a determination is made to the effect that a landing determination has not been made, the indication selection means 22 makes a determination as to whether or not the manual selection of a camera has been performed by the manual changeover means 18 (S113). Incidentally, in the case where no operation has been performed on the manual changeover means 18 (S114), the automatic selection processing of the image indication camera shown in the above-described S104 to S112 is preferentially performed and an appropriate image suited to the present situation is indicated on the monitor 15.

[0052] On the other hand, when the selection of a camera is performed by the manual changeover means 18 as in the case where the touch panel type input button shown in Figure 3 is pressed, the indication selection means 22 selects the camera 5 (of the floor) identified by the manual changeover means 18 as the image indication camera, and causes the monitor 15 to preferentially indicate an image of the hall (S115). Incidentally, in the case where the outbreak of a fire, a channel selection by the intercommunication device 16, a rescue request, a landing determination and the like have been newly detected even after the manual selection of a camera by the manual changeover means 18 is performed, a switching of the indication of the monitor 15 may be performed by preferentially performing the automatic selection processing of the image indication camera.

[0053] According to the first embodiment according to

the present invention, in the case where an elevator is utilized for evacuation purposes during a fire, it is possible to cause the monitor 15 of the disaster prevention center 3 to indicate various kinds of information necessary for rescuing those who are present in a building by an elevator (that is, in order to support rescue activities utilizing an elevator). That is, a monitoring staff member of the disaster prevention center 3 can instantaneously grasp, from the indication contents of the monitor 15, 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. As a result of this, the monitoring staff member of the disaster prevention center 3 can give appropriate instructions to an operator and other persons in the car 1, making it possible to realize speedy and accurate rescue activities utilizing the elevator.

[0054] In a high-rise building, the number of cameras installed in halls becomes inevitably large. However, with a monitor controller of the above-described configuration, it is possible to cause the monitor 15 to indicate appropriate images according to the situation in the building and the presence or absence of those who are present in the building.

[0055] Incidentally, in this embodiment, concrete descriptions were given of the case where the monitor 15 is caused to indicate an image of the hall by the camera 5 and an image of the inside of the car 1 by the camera 8, as well as each 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 15. In the case where the rescue request button 7 is not installed in the 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 15. Furthermore, the monitor 15 may be caused to constantly indicate an image of the inside of the car by the camera 8 as evacuation information and the monitor 15 may be caused to indicate this information as required (according to the detection result of each means). Furthermore, in the case where the camera 8 is not installed in the car 1, an image of the inside of the car is not included in the evacuation information and it is necessary only that other information be indicated on the monitor 15.

[0056] In this embodiment, the case where the monitor 15 and the controller 17 are installed in the disaster prevention center 3 was described concretely. However, this is only an example, and the installation place of the monitor 15 may be any place so long as this place is away from the car 1 and halls and is a place where rescue activities utilizing an elevator can be supported. For example, it is possible that the monitor 15, the intercommu-

nication device 16, the controller 17 and the like are provided in monitoring centers run by an elevator maintenance company, nearby facilities related to firefighting, facilities related to firefighting which are temporarily installed in an emergency and the like.

Second embodiment

[0057] Figure 4 is a block diagram showing an essential part of a monitor controller in the second embodiment according to the present invention. Figure 4 shows the configuration of the disaster prevention center 3.

The disaster prevention center 3 is provided with a call registration device 24 in addition to the monitor 15, the intercommunication device 16, and the controller 17. The call registration device 24 is provided in order that an elevator (the control panel 2) is remotely operated in the disaster prevention center 3. The call registration device 24 is provided with changeover means 25, a plurality of destination call buttons 26 and the like.

[0058] The changeover means 25 is intended for switching the call registration device 24 between a call registration function and a camera selection function. The changeover means 25 consists of, for example, a key switch, or a mechanical type or touch panel type operating button.

[0059] In the case where the call registration device 24 is set at the call registration function by the changeover means 25, the destination call button 26 is used in order that a destination call of an elevator is remotely registered in the disaster prevention center 3. That is, when the destination call button 26 is operated (pressed) by a monitoring staff member or other persons of the disaster prevention center 3, the call registration device 24 transmits a signal corresponding to the operated destination call button 26, and causes the registration of the destination call to be performed.

[0060] On the other hand, the camera selection function is provided in order that a monitoring staff member or other persons of the disaster prevention center 3 are caused to manually perform the selection of the camera for causing the monitor 15 to indicate images.

In the case where the call registration device 24 is set at the camera selection function by the changeover means 25, the destination call button 26 is used in order to select the camera which causes the monitor 15 to indicate images. That is, a monitoring staff member or other persons of the disaster prevention center 3 operate (press) the destination call button 26, whereby an image of the hall and/or an image of the inside of a car, which is photographed by the desired camera, can be caused to show up on the monitor 15.

[0061] Incidentally, components of the monitor controller other than the disaster prevention center 3 are the same as in the first embodiment.

[0062] Next, referring also to Figure 5, a concrete description will be given of the operations of the monitor controller having the above-described configuration. Fig-

ure 5 is a flowchart showing an essential part of the operations of the monitor controller in the second embodiment according to the present invention. Incidentally, S201 to S203 shown in Figure 5 correspond to S113 to S115 shown in Figure 2. That is, each process shown in Figure 5 is performed after each process shown in S101 to S112 is performed.

[0063] In S201, the indication selection means 22 makes a determination as to whether or not the call registration device 24 has been set at the camera selection function (S201). Incidentally, in the case where the call registration device 24 has been set at the call registration function (S202), the automatic selection processing of the image indication camera is preferentially performed. That is, on the basis of the input information from each of the means in the controller 17 and the control panel 2 and the like, the indication selection means 22 performs a selection of the image indication camera and causes the monitor 15 to indicate an appropriate image suited to the present situation. In this case, the call registration device 24 is used in order that a monitoring staff member or other persons of the disaster prevention center 3 remotely register a destination call.

[0064] On the other hand, in the case where the call registration device 24 has been set at the camera selection function (Yes in S201), the call registration device 24 is used in order that a monitoring staff member of the disaster prevention center 3 selects the camera which causes images to show up on the monitor 15. In this case, on the basis of the operation performed on the destination call button 26 of the call registration device 24 (i.e., the pressed destination call button 26), the indication selection means 22 performs a selection of the image indication camera and causes the monitor 15 to preferentially indicate an image by the selected camera (S203).

[0065] According to the second embodiment according to the present invention, in the disaster prevention center 3 capable of performing the remote operation of an elevator, it is possible to cause the monitor 15 to indicate various kinds of information necessary for speedily and accurately performing evacuation operations. For this reason, a monitoring staff member of the disaster prevention center 3 can instantaneously grasp, from the indication contents of the monitor 15, 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, and the monitoring staff member becomes able to speedily and accurately perform rescue activities utilizing an elevator.

[0066] Because the manual selection function for causing an image to show up on the monitor 15 can be provided in the call registration device 24, there is no concern of a device required for manual selection increasing in size.

In other respects, the same effects as in the first embodiment can be produced.

Industrial Applicability

[0067] The monitor controller according to the present invention can be applied to a controller which controls a monitor installed in a prescribed remote place away from the car or hall of an elevator, such as a disaster prevention center.

[0068]

Reference Signs List

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

Claims

1. A monitor controller, comprising:

a monitor provided in a prescribed remote place away from a car and a hall of an elevator;
indication control means which controls indications of the monitor;
a first camera installed in the 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 first camera and information on a 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 controller according to claim 1, further comprising:

a second camera installed in the car, wherein the indication control means causes the monitor to automatically indicate an image of the inside of the car photographed by the second camera as required when the control of an evacuation operation is started by the operation control means.

3. The monitor controller according to claim 2, further comprising:

indication selection means which selects a camera causing the monitor to indicate an image from first cameras installed in a plurality of halls at which the car stops and a second camera provided in the car, wherein the indication control means causes the monitor to indicate an image photographed by the camera selected by the indication selection means when the control of an evacuation operation is started by the operation control means.

4. The monitor controller according to claim 1, further comprising:

indication selection means which selects a camera causing the monitor to indicate an image from first 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.

5. The monitor controller according to claim 3 or 4, wherein the indication selection means selects a first 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 the fire has been detected from the fire detection information.

6. The monitor controller according to any of claims 3 to 5, further comprising:

a first intercommunication device provided in the remote place, and
a second intercommunication device provided in the hall of the elevator, wherein the indication selection means selects a first 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 the channel of the second intercommunication device.

7. The monitor controller according to any of claims 3 to 5, 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 the indication selection means selects a first camera installed on a rescue-requested floor as a camera which causes the monitor to indicate an image when a request for a rescue has been performed by the rescue request means.

8. The monitor controller according to claim 7, 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 performed by the rescue request means.

9. The monitor controller according to any of claims 3 to 5, 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 first camera installed on a 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.

10. The monitor controller according to claim 3, further comprising:

a first intercommunication device provided in the remote place; and
a third intercommunication device provided in the car,
wherein the indication selection means selects the second camera as a camera which causes the monitor to indicate an image when the first intercommunication device has selected the channel of the third intercommunication device.

11. The monitor controller according to claim 3, further comprising:

boarding detection means for detecting persons in the car,
wherein the indication selection means selects the second camera as a camera which causes the monitor to indicate an image when the presence of a person has been detected by the

boarding detection means.

12. The monitor controller according to any of claims 3 to 11, further comprising:

a call registration device provided in the remote place, wherein
the call registration device has a plurality of destination call buttons for remotely registering a destination call; and
the indication selection means performs selection of a camera which causes the monitor to indicate an image on the basis of an operation performed on the destination call buttons.

13. The monitor controller according to claim 12, further comprising:

changeover means which is provided in the remote place and switches the call registration device between a call registration function and a camera selection function, wherein
the call registration device performs remote registration of a destination call on the basis of an operation on the destination call buttons when the call registration function has been set by the changeover means, and
the indication selection means performs selection of a camera which causes the monitor to indicate an image on the basis of an operation on the destination call buttons when the call registration device has been set at the camera selection function by the changeover means.

14. The monitor controller according to any of claims 1 to 13, wherein the monitor is installed in any of a disaster prevention center which performs the control of elevators, a monitoring center of an elevator maintenance company, and a prescribed facility related to firefighting.

Fig. 1

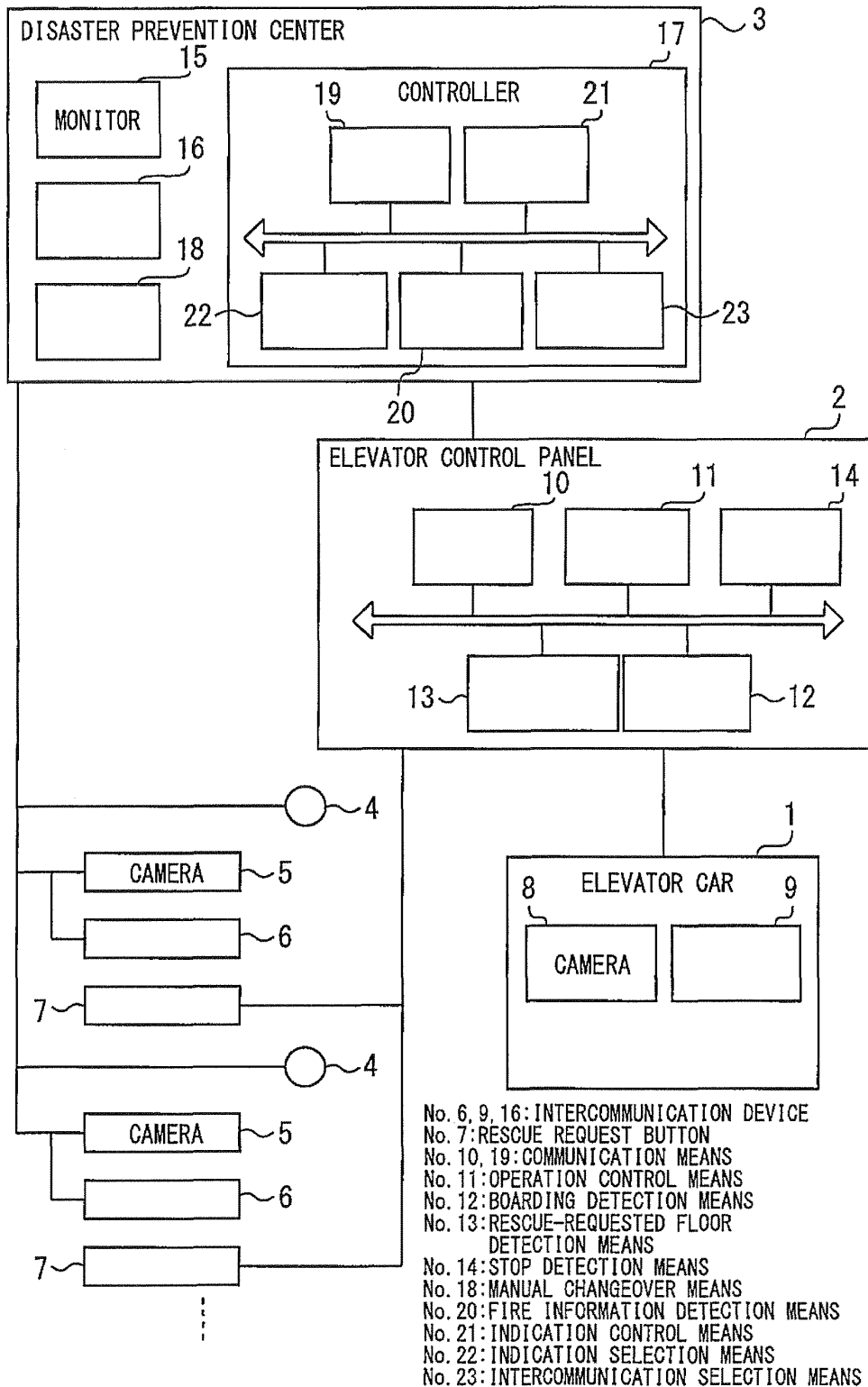


Fig. 2

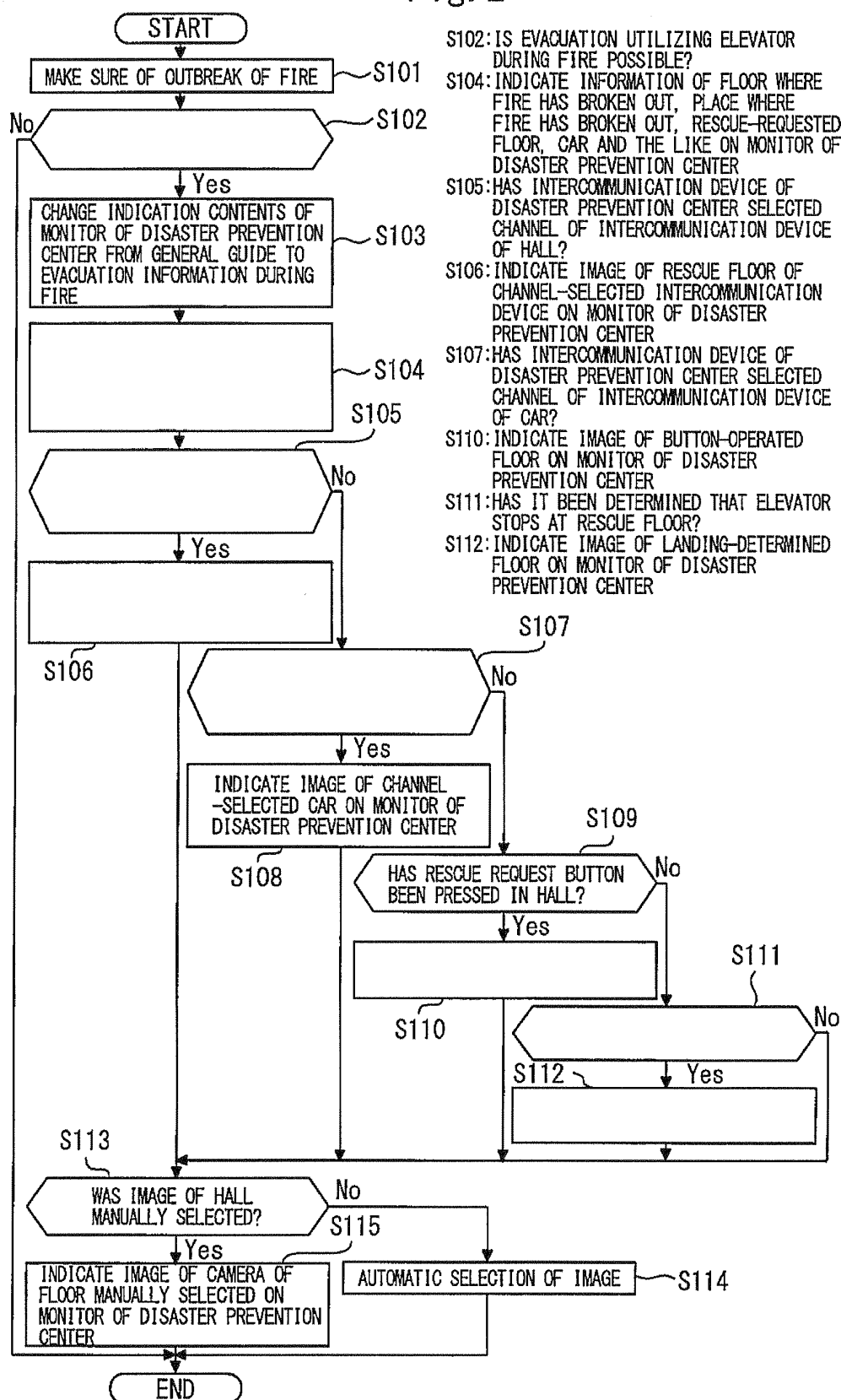


Fig. 3

15

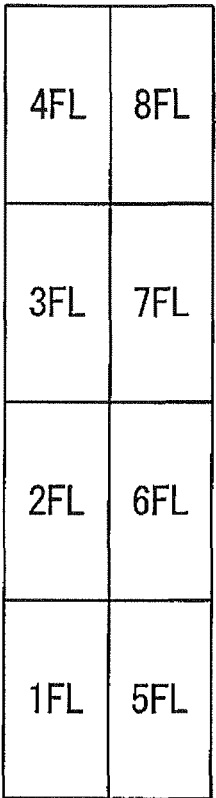
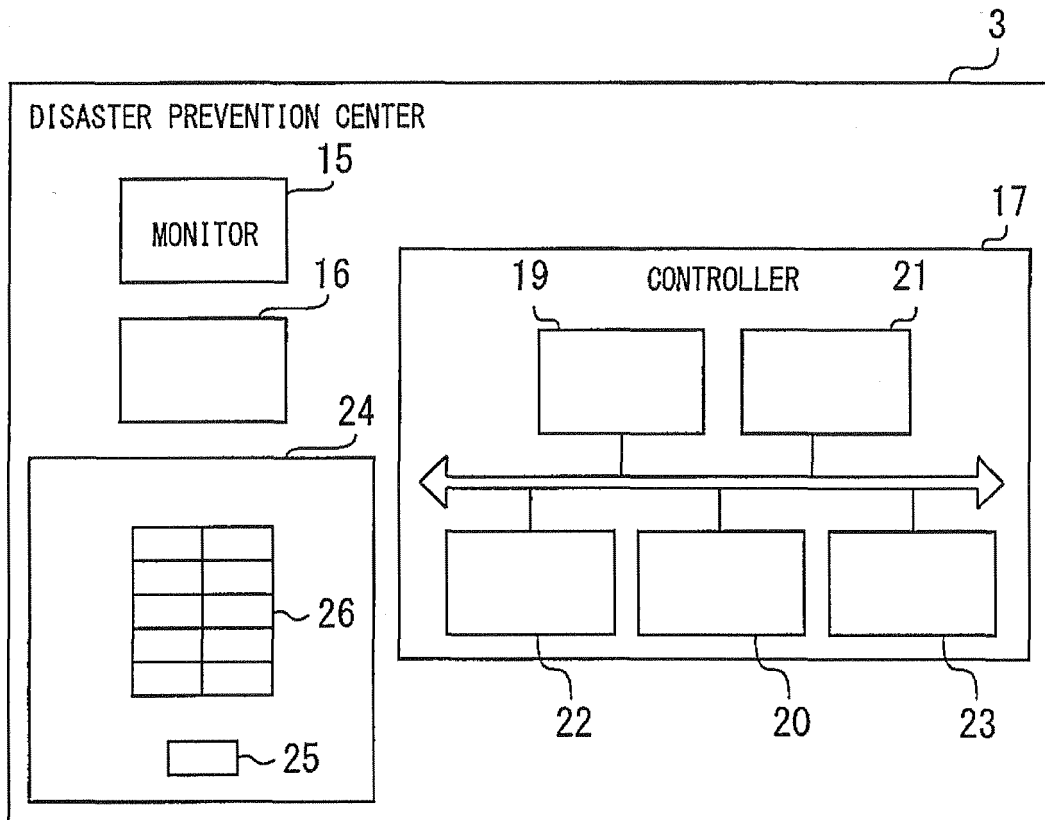
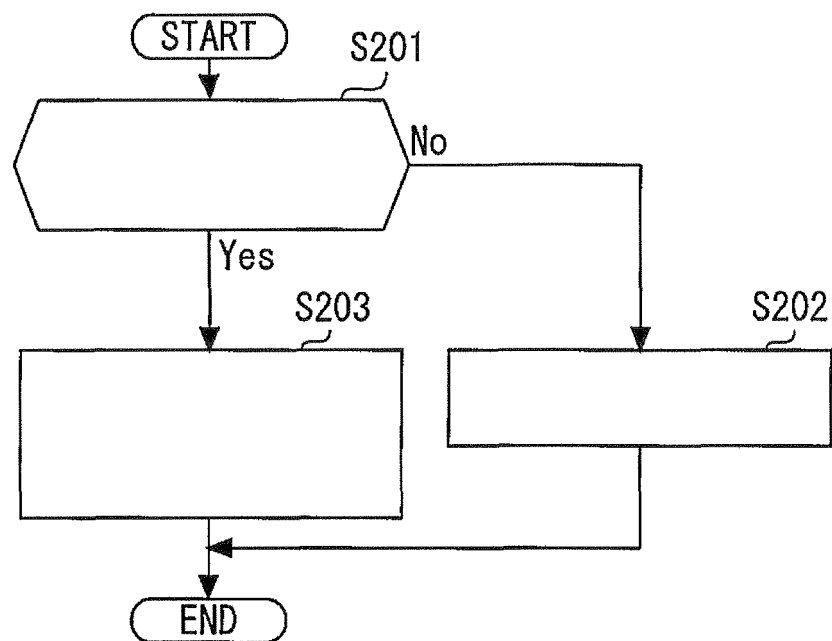
5FL HALL IMAGE		SELECTION OF HALL IMAGE			
 RESCUE REQUEST BUTTON 		 18			
RESCUE-REQUESTED FLOOR					
2 3 4 5 6 7 8					
FLOOR WHERE FIRE HAS BROKEN OUT	PLACE WHERE FIRE HAS BROKEN OUT				
4FL	4FL KITCHEN				

Fig. 4



No. 16: INTERCOMMUNICATION DEVICE
 No. 19: COMMUNICATION MEANS
 No. 20: FIRE INFORMATION DETECTION MEANS
 No. 21: INDICATION CONTROL MEANS
 No. 22: INDICATION SELECTION MEANS
 No. 23: INTERCOMMUNICATION SELECTION MEANS
 No. 24: CALL REGISTRATION DEVICE

Fig. 5



S201: HAS CALL REGISTRATION DEVICE BEEN SET AT CAMERA SELECTION FUNCTION?
 S202: CALL REGISTRATION DEVICE HAS BEEN SET AT CALL REGISTRATION FUNCTION
 S203: INDICATE IMAGE BY CAMERA ON FLOOR WHERE DESTINATION CALL
 BUTTON HAS BEEN OPERATED ON MONITOR OF DISASTER PREVENTION CENTER

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/064474

A. CLASSIFICATION OF SUBJECT MATTER <i>B66B5/02 (2006.01) i, B66B3/00 (2006.01) i</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) <i>B66B5/02, B66B3/00</i>										
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched <table border="0"> <tr> <td><i>Jitsuyo Shinan Koho</i></td> <td><i>1922-1996</i></td> <td><i>Jitsuyo Shinan Toroku Koho</i></td> <td><i>1996-2010</i></td> </tr> <tr> <td><i>Kokai Jitsuyo Shinan Koho</i></td> <td><i>1971-2010</i></td> <td><i>Toroku Jitsuyo Shinan Koho</i></td> <td><i>1994-2010</i></td> </tr> </table>			<i>Jitsuyo Shinan Koho</i>	<i>1922-1996</i>	<i>Jitsuyo Shinan Toroku Koho</i>	<i>1996-2010</i>	<i>Kokai Jitsuyo Shinan Koho</i>	<i>1971-2010</i>	<i>Toroku Jitsuyo Shinan Koho</i>	<i>1994-2010</i>
<i>Jitsuyo Shinan Koho</i>	<i>1922-1996</i>	<i>Jitsuyo Shinan Toroku Koho</i>	<i>1996-2010</i>							
<i>Kokai Jitsuyo Shinan Koho</i>	<i>1971-2010</i>	<i>Toroku Jitsuyo Shinan Koho</i>	<i>1994-2010</i>							
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 A	JP 2007-131362 A (Mitsubishi Electric Corp.), 31 May 2007 (31.05.2007), paragraphs [0010] to [0017], [0040] to [0051] (Family: none)	1-4, 14 5-6, 9-13 7-8								
Y	JP 5-2693 A (Tetsuya MURAOKA), 08 January 1993 (08.01.1993), paragraphs [0005], [0018] (Family: none)	5-6, 9, 12-13								
Y	JP 2008-189413 A (Japan Otis Elevator Co.), 21 August 2008 (21.08.2008), paragraphs [0022] to [0033] (Family: none)	6, 9-10, 12-13								
☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.										
<table border="0"> <tr> <td> * 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 </td> <td> "I" 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 </td> </tr> </table>			* 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	"I" 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						
* 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	"I" 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 25 November, 2010 (25.11.10)		Date of mailing of the international search report 07 December, 2010 (07.12.10)								
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer								
Facsimile No.		Telephone No.								

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2010/064474

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 2006-8332 A (Mitsubishi Electric Corp.), 12 January 2006 (12.01.2006), claims 1 to 2 (Family: none)	9, 11-13
Y	JP 7-215617 A (Toshiba FA System Engineering Kabushiki Kaisha, Toshiba Corp.), 15 August 1995 (15.08.1995), paragraphs [0013] to [0017] (Family: none)	12-13
A	WO 2010/023735 A1 (Mitsubishi Electric Corp.), 04 March 2010 (04.03.2010), paragraph [0019] (Family: none)	1-14

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 6475378 B [0003]