

HALL DESTINATION CONTROLLER

FIELD

Embodiments described herein relate generally to a hall destination controller.

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BACKGROUND

In general, in the hall of each floor of buildings, a hall call button for registering a hall call is provided. When a passenger of the elevator operates the hall call button, a car responds to the registered floor of the hall call. When the passenger gets into the car and operates a destination floor button of a car elevator controller, the destination floor is registered, and the car moves to the destination floor.

15 In recent years, apart from the above hall call button, an elevator system comprising a hall destination controller (HDC) which enables a passenger to register a destination floor in a hall has been put to practical use. This type of elevator system is called a destination control system (DCS). The destination control system selects an optimal car from a plurality of cars based on the destination floor registered by a passenger in a hall and causes the selected car to respond to the hall. In this destination control system, an optimal car can be assigned, thereby improving the transport efficiency.

25 One type of hall destination controller reads destination floor information indicating the destination floor of a passenger by using a camera and registers the destination floor. In this type of hall destination controller, there is no need to provide a numerical keypad, etc., for registering a destination floor. Thus, compared to a hall destination controller

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in which a numerical keypad is provided, the number of components can be reduced, thereby decreasing the size and cost.

Even in this type of hall destination controller, buttons, a touch panel and the like which can be operated by maintenance engineers are provided. A maintenance engineer operates the buttons and touch panel to carry out initial settings when the hall destination controller is provided or to change the settings of the hall destination controller.

However, in terms of the reduction in size or cost, in a manner similar to that of the numerical keypad described above, it is preferable that these buttons or touch panel should not be provided.

Embodiments described herein aim to provide a hall destination floor registration device which can realize the reduction in size and cost.

SUMMARY

According to one embodiment, a hall destination controller is a device which is allowed to scan a two-dimensional code and generate a hall call by using the two-dimensional code. The hall destination controller comprises a scan unit and a control unit. The scan unit scans a two-dimensional code. The control unit determines whether the two-dimensional code scanned by the scan unit is a two-dimensional code for data settings or a two-dimensional code for call registration. The control unit changes, when the two-dimensional code scanned by the scan unit is a two-dimensional code for data settings, settings of the hall destination controller by using the two-dimensional code for data settings. The control unit generates, when the two-dimensional code scanned by the

scan unit is a two-dimensional code for call registration, a hall call by using the two-dimensional code for call registration.

BRIEF DESCRIPTION OF THE DRAWINGS

5 FIG. 1 is a diagram showing a general configuration example of an elevator system according to an embodiment.

 FIG. 2 is a diagram for explaining a hall destination controller in the embodiment.

10 FIG. 3 is a block diagram showing a configuration example of the hall destination controller in the embodiment.

 FIG. 4 is a diagram for explaining an example of display in the hall destination controller in the
15 embodiment.

 FIG. 5 is a flowchart showing an operation example of the hall destination controller in the embodiment.

DETAILED DESCRIPTION

20 Embodiments will be described hereinafter with reference to the accompanying drawings.

 The disclosure is merely an example and is not limited by contents described in the embodiments described below. Modification which is easily conceivable by a person of ordinary skill in the art comes within the scope of the disclosure as a matter of
25 course. In some cases, in order to make the description clearer, the sizes, shapes, etc., of the respective parts are illustrated schematically in the drawings, rather than as an accurate representation of
30 what is implemented. Constituent elements corresponding to each other in a plurality of drawings are denoted by like reference numerals and their detailed descriptions may be omitted unless necessary.

FIG. 1 is a diagram showing a general configuration example of an elevator system according to an embodiment. In the elevator system of the embodiment, the drive operation of a plurality of cars 10 is controlled overall.

As shown in FIG. 1, the elevator system comprises a plurality of cars 10, a hall destination controller 20 and a elevator controller 30. FIG. 1 shows three cars 10, namely, car A, car B and car C. However, the number of cars 10 is not limited to this example and may be an arbitrary number greater than or equal to two. Further, FIG. 1 shows a single hall destination controller 20. However, the number of hall destination controllers 20 is not limited to this example and may be an arbitrary number.

For example, when the hall destination controller 20 scans a two-dimensional code (for example, a QR code [registered trademark]) for call registration displayed in a mobile terminal (for example, a smartphone, a tablet terminal, etc.) 40 owned by a passenger and obtains destination floor information indicating the destination floor of the passenger, the hall destination controller 20 generates a hall call in which the destination floor is associated with the floor on which the registration operation of the destination floor has been conducted (in other words, the floor on which the hall destination controller 20 is provided), and transmits the generated hall call to the elevator controller 30.

For example, when the hall destination controller 20 scans a two-dimensional code (for example, a QR code) for data settings displayed in a mobile terminal 40 owned by a maintenance engineer and obtains a

setting value related to the settings of the hall destination controller 20, the hall destination controller 20 changes the settings of the hall destination controller 20 based on the setting value.

5 The two-dimensional code presented to the hall destination controller 20 by the passenger or maintenance engineer is prepared by using, for example, an application installed on the mobile terminal 40. It should be noted that predetermined use restrictions are
10 placed on the preparation of the two-dimensional code for data settings, such as a request to input a password known to only the maintenance engineer. This configuration can prevent passengers from preparing a two-dimensional code for data settings and changing the
15 settings of the hall destination controller 20 without permission.

 The two-dimensional code which is presented to the hall destination controller 20 by the passenger or maintenance engineer includes an identification pattern
20 for identifying the type of the two-dimensional code. Based on the identification pattern, the hall destination controller 20 identifies whether the scanned two-dimensional code is a two-dimensional code for data settings or a two-dimensional code for call
25 registration.

 The settings of the hall destination controller 20 using a two-dimensional code for data settings include, for example, the following settings:

 to set the device identification number of the
30 hall destination controller 20;

 to set the floor on which the hall destination controller 20 is provided;

 to set the names of floors which can be registered

by the hall destination controller 20 (for example, the first floor, the second floor, . . . , the n-th floor, the first basement floor, the second basement floor, . . . , the m-th basement floor, the lobby floor and the roof floor);

to set the names of the cars (cars 10) displayed in the hall destination controller 20 (for example, car A, car B and car C);

to set the transmission address of the hall destination controller 20; and

to set a buzzer sound output from the speaker of the hall destination controller 20.

Here, the above various types of settings can be conducted by using a two-dimensional code for data settings. However, the data settings are not limited to the above examples. Other types of settings may be carried out by using a two-dimensional code for data settings.

The elevator controller 30 controls the drive operation of each car (car 10). When the elevator controller 30 receives a hall call from the hall destination controller 20, the elevator controller 30 performs an assignment process for selecting the assignment car of the hall call from the managed cars (cars 10). The elevator controller 30 controls the drive operation of the car (car 10) selected as the assignment car so as to cause the car (car 10) to respond to the floor on which the registration operation has been conducted. The elevator controller 30 transmits assignment car information for notifying the passenger of the car selected as the assignment car to the hall destination controller 20.

When the hall destination controller 20 receives

the assignment car information from the elevator controller 30, the hall destination controller 20 notifies the passenger of the assignment car indicated by the assignment car information. By this configuration, the passenger can know on which car the passenger should ride to go to the destination floor.

FIG. 2 is a diagram for explaining the hall destination controller 20 in the embodiment.

As shown in FIG. 2, the hall destination controller 20 comprises a display area 20a in which a display is provided, and a scan area 20b which can scan a two-dimensional code. In the display, an assignment car indicated by assignment car information is displayed. For example, the display example of FIG. 2 allows the passenger to know that the passenger should ride on car A to go to the destination floor. The scan area 20b is an area equivalent to the capturing range of a camera 21 (FIG. 3) incorporated into the hall destination controller 20. The hall destination controller 20 can scan a two-dimensional code held (presented) over the scan area 20b.

FIG. 3 is a block diagram showing a configuration example of the hall destination controller 20 in the embodiment.

As shown in FIG. 3, the hall destination controller 20 comprises the camera 21, a control unit 22, a communication unit 23, a setting storage unit 24 and a display unit 25.

The camera 21 scans a two-dimensional code held over the scan area 20b shown in FIG. 2. Therefore, the camera 21 may be referred to as a scan unit. Here, the two-dimensional code held over the scan area 20b is assumed to be displayed on the screen of the mobile

terminal 40. However, the two-dimensional code is not limited to this example and may be printed on a piece of paper, etc. The two-dimensional code scanned by the camera 21 is output to the control unit 22.

5 The control unit 22 comprises a data conversion function 22a. When the two-dimensional code scanned by the camera 21 is input to the control unit 22, the control unit 22 converts the two-dimensional code into a character string by using the data conversion
10 function 22a and obtains the character string.

 Based on the identification pattern included in the obtained character string, the control unit 22 determines whether the two-dimensional code scanned by the camera 21 is a two-dimensional code for data
15 settings or a two-dimensional code for call registration. As a result, when the two-dimensional code scanned by the camera 21 is a two-dimensional code for data settings, the control unit 22 changes the settings of the hall destination controller 20 based on
20 a setting value included in the obtained character string and related to the settings of the hall destination controller 20. More specifically, the control unit 22 changes the settings of the hall destination controller 20 by storing the desired
25 setting data in the setting storage unit 24 or updating the desired setting data stored in the setting storage unit 24 based on the above setting value.

 When the two-dimensional code scanned by the camera 21 is a two-dimensional code for call
30 registration, the control unit 22 generates a hall call corresponding to the two-dimensional code for call registration based on the destination floor information included in the obtained character string.

When the two-dimensional code scanned by the camera 21 is neither a two-dimensional code for data settings nor a two-dimensional code for call registration, the control unit 22 outputs an
5 instruction signal for displaying an error message in the display provided in the display area 20a to the display unit 25.

The communication unit 23 is a communication interface for communicating with an external device
10 (for example, the elevator controller 30), and transmits a hall call generated by the control unit 22 to the elevator controller 30. The communication unit 23 receives assignment car information which is transmitted by the elevator controller 30 based on the
15 transmitted hall call. The received assignment car information is output to the display unit 25.

In the setting storage unit 24, various types of setting data related to the settings of the hall destination controller 20 are stored. Specifically,
20 the following types of setting data are stored:

setting data indicating the device identification number of the hall destination controller 20;

setting data indicating the floor on which the hall destination controller 20 is provided;

25 setting data indicating the names of floors which can be registered by the hall destination controller 20;

setting data indicating the names of the cars (cars 10) displayed in the hall destination controller
30 20;

setting data indicating the transmission address of the hall destination controller 20; and

setting data related to a buzzer sound output from

the speaker of the hall destination controller 20.

When the assignment car information received by the communication unit 23 is input to the display unit 25, as shown in FIG. 2, the display unit 25 causes the display provided in the display area 20a to display the car indicated by the assignment car information. When an instruction signal indicating that an error message should be displayed is input from the control unit 22 to the display unit 25, for example, as shown in FIG. 4, the display unit 25 causes the display provided in the display area 20a to display an error message such as "Error: Go back and prepare two-dimensional code again".

FIG. 5 is a flowchart showing an operation example of the hall destination controller in the embodiment. The process shown in the flowchart of FIG. 5 is performed by the hall destination controller 20 (or the control unit 22).

When the mobile terminal 40 which is in a state where a two-dimensional code is displayed on the screen is held over the scan area 20b, the hall destination controller 20 scans the two-dimensional code by the camera 21, converts the two-dimensional code into a character string by using the data conversion function 22a of the control unit 22 and obtains the character string. The hall destination controller 20 confirms whether or not the obtained character string includes an identification pattern indicating a two-dimensional code for data settings as the identification pattern indicating the type of the scanned two-dimensional code. Thus, the hall destination controller 20 confirms whether or not the two-dimensional code scanned by the camera 21 is a two-dimensional code for

data settings (step S1).

As a result of the process of step S1, when the hall destination controller 20 confirms that the two-dimensional code scanned by the camera 21 is a two-dimensional code for data settings (Yes in step S1),
5 the hall destination controller 20 changes the settings of the hall destination controller 20 based on the setting value included in the obtained character string and related to the settings of the hall destination
10 controller 20 (step S2).

When the settings of the hall destination controller 20 are changed by the above process of step S2, the hall destination controller 20 outputs a first buzzer sound for notifying the maintenance engineer
15 that the two-dimensional code scanned by the camera 21 is a two-dimensional code for data settings and the setting change of the hall destination controller 20 based on the two-dimensional code is completed (step S3). The hall destination controller 20 terminates the
20 process here.

As a result of the above process of step S1, when the hall destination controller 20 confirms that the two-dimensional code scanned by the camera 21 is not a two-dimensional code for data settings (No in step S1),
25 the hall destination controller 20 confirms whether or not the obtained character string includes an identification pattern indicating a two-dimensional code for call registration as the identification pattern indicating the type of the scanned two-
30 dimensional code. Thus, the hall destination controller 20 confirms whether or not the two-dimensional code scanned by the camera 21 is a two-dimensional code for call registration (step S4).

As a result of the process of step S4, when the hall destination controller 20 confirms that the two-dimensional code scanned by the camera 21 is a two-dimensional code for call registration (Yes in step
5 S4), the hall destination controller 20 refers to the setting data stored in the setting storage unit 24 and confirms whether or not the destination floor indicated by the destination floor information included in the
10 obtained character string is a floor which can be registered (displayed) by the hall destination controller 20 (step S5). As a result of the process of step S5, when the hall destination controller 20 confirms that the destination floor indicated by the destination floor information is not a floor which can
15 be registered (displayed), in other words, confirms that the destination floor is a floor which cannot be registered (displayed) (for example, when the destination floor indicated by the destination floor information is the lobby floor although the floors
20 which can be registered (displayed) are the first floor to the tenth floor) (No in step S5), the hall destination controller 20 performs the process of step S8 described later.

As a result of the process of step S5, when the
25 hall destination controller 20 confirms that the destination floor indicated by the destination floor information is a floor which can be registered (displayed) (Yes in step S5), the hall destination controller 20 generates a hall call corresponding to
30 the destination floor indicated by the destination floor information and transmits it to the elevator controller 30. More specifically, the hall destination controller 20 generates a hall call in which the

destination floor indicated by the obtained destination floor information is associated with the floor on which the hall destination controller 20 is provided (more specifically, the floor on which the hall destination controller 20 is provided and which is indicated by the setting data stored in the setting storage unit 24), and transmits the generated hall call to the elevator controller 30 (step S6).

When the hall call is transmitted to the elevator controller 30 by the above process of step S6, the hall destination controller 20 outputs a second buzzer sound for notifying the passenger that the two-dimensional code scanned by the camera 21 is a two-dimensional code for call registration and the registration of the hall call based on the two-dimensional code is completed (step S7). The hall destination controller 20 terminates the process here.

As a result of the above process of step S4, when the hall destination controller 20 confirms that the two-dimensional code scanned by the camera 21 is not a two-dimensional code for call registration (No in step S4), the hall destination controller 20 causes the display provided in the display area 20a to display the error message shown in FIG. 4 as the two-dimensional code is neither a two-dimensional code for data settings nor a two-dimensional code for call registration (step S8). The hall destination controller 20 terminates the process here.

It should be noted that the hall destination controller 20 may further perform a process of confirming whether or not the setting value included in the obtained character string and related to the settings of the hall destination controller 20 is an

abnormal value (in other words, whether or not the setting value is a normal value) between the above process of step S1 and the above process of step S2.

As a result of this process, when the hall destination controller 20 confirms that the setting value is not an abnormal value, the hall destination controller 20 performs the above process of step S2. When the hall destination controller 20 confirms that the above setting value is an abnormal value, the hall destination controller 20 performs the above process of step S8 and prompts the maintenance engineer to prepare a two-dimensional code for data settings again. This process can prevent an undesired abnormal setting for the hall destination controller 20.

The hall destination controller 20 may be configured to change the settings of the hall destination controller 20 only when the camera 21 successively scans a two-dimensional code including specific information and a two-dimensional code for data settings. In this configuration, even if a maintenance engineer accidentally holds a two-dimensional code for data settings over the scan area 20b, the settings of the hall destination controller 20 are not changed unless a two-dimensional code including specific information and the two-dimensional code for data settings are successively held over the scan area 20b. Thus, the possibility that the settings of the hall destination controller 20 are accidentally changed can be reduced.

The hall destination controller 20 of the embodiment explained above comprises the camera 21 which scans a two-dimensional code, and the control unit 22 which determines whether the two-dimensional

code scanned by the camera 21 is a two-dimensional code for data settings or a two dimensional code for call registration. When the two dimensional code scanned by the camera 21 is a two-dimensional code for data
5 settings, the control unit 22 changes the settings of the hall destination controller 20 by using the two-dimensional code for data settings. When the two-dimensional code scanned by the camera 21 is a two-dimensional code for call registration, the control
10 unit 22 generates a hall call by using the two-dimensional code for call registration.

In this configuration, when the camera 21 which can scan a two-dimensional code is provided, both the settings of the hall destination controller 20 and the
15 generation of a hall call can be conducted. Thus, in addition to a numerical keypad which is used to register a destination floor, the provision of buttons or a touch panel which is used by a maintenance engineer to carry out the initial settings or setting
20 change of the hall destination controller can be omitted. In this way, the number of components of the hall destination controller can be decreased, thereby realizing the reduction in the size and cost of the hall destination controller.

25 In addition, the hall destination controller 20 of the present embodiment can change the settings of the hall destination controller 20 by only holding a two-dimensional code for data settings over the scan area 20b. Thus, compared to a hall destination controller
30 which changes settings by operating the above buttons or touch panel, the settings of the hall destination controller can be easily changed. In this way, the maintenance property can be improved.

In the embodiment explained above, a two-dimensional code (QR code) including the various types of information described above is presented to the hall destination controller 20 by a passenger or a maintenance engineer. However, a passenger and a maintenance engineer can present other types of codes. For example, a barcode including the various types of information described above may be presented by a passenger or a maintenance engineer. Even in this case, the various types of information included in the barcode is the same as the various types of information included in a two-dimensional code. Therefore, the hall destination controller 20 can perform the above operation shown in FIG. 5. Effects similar to the various effects described above can be obtained.

Further, the hall destination controller 20 of the present embodiment may comprise a camera which can capture a passenger in addition to the camera 21. In this case, the hall destination controller 20 may further comprise a function of, when a specific passenger whose destination floor is set in advance is detected from an image captured by the above camera, generating a hall call corresponding to the specific passenger based on the destination floor set in advance.

The embodiment explained above can provide a hall destination controller 20 which can realize the reduction in size and cost.

While certain embodiments have been described, these embodiments have been presented by way of example only, and are not intended to limit the scope of the inventions. Indeed, the novel embodiments described herein may be embodied in a variety of other forms;

furthermore, various omissions, substitutions and changes in the form of the embodiments described herein may be made without departing from the spirit of the inventions. The accompanying claims and their
5 equivalents are intended to cover such forms or modifications as would fall within the scope and spirit of the inventions.

WHAT IS CLAIMED IS:

1. A hall destination controller allowed to scan a two-dimensional code and generate a hall call by using the two-dimensional code, comprising:

5 a scan unit which scans a two-dimensional code;
and

 a control unit which
 determines whether the two-dimensional code
scanned by the scan unit is a two-dimensional code for
10 data settings or a two-dimensional code for call
registration,

 changes, when the two-dimensional code scanned by
the scan unit is a two-dimensional code for data
settings, settings of the hall destination controller
15 by using the two-dimensional code for data settings,
and

 generates, when the two-dimensional code scanned
by the scan unit is a two-dimensional code for call
registration, a hall call by using the two-dimensional
20 code for call registration.

2. The hall destination controller of claim 1,
wherein

 the control unit determines whether the two
dimensional code scanned by the scan unit is a two-
25 dimensional code for data settings or a two-dimensional
code for call registration based on an identification
pattern included in the two-dimensional code scanned by
the scan unit.

3. The hall destination controller of claim 1,
30 wherein

 the control unit causes, when the two-dimensional
code scanned by the scan unit is neither a two-
dimensional code for data settings nor a

two-dimensional code for call registration, a display provided in the hall destination controller to display an error message indicating this result.

4. The hall destination controller of claim 1,
5 wherein

the control unit

outputs, when the two-dimensional code scanned by the scan unit is a two-dimensional code for data settings, a first buzzer sound indicating this result
10 from a speaker provided in the hall destination controller, and

outputs, when the two-dimensional code scanned by the scan unit is a two-dimensional code for call registration, a second buzzer sound indicating this
15 result from the speaker provided in the hall destination controller.

5. The hall destination controller of claim 1,
wherein

the control unit

determines, when the two-dimensional code scanned by the scan unit is a two-dimensional code for call registration, whether a destination floor indicated by the two-dimensional code for call registration is a floor which can be registered by the hall destination
20 controller,
25 controller,

generates, when the control unit determines that the destination floor is a floor which can be registered by the hall destination controller, a hall call corresponding to the destination floor, and

causes, when the control unit determines that the destination floor is not a floor which can be registered by the hall destination controller, a display provided in the hall destination controller to
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display an error message indicating this result.

6. The hall destination controller of claim 1, wherein

5 the settings of the hall destination controller include to set a device identification number of the hall destination controller, to set a floor on which the hall destination controller is provided, to set a name of a floor which can be registered by the hall destination controller, to set a name of a car
10 displayed in the hall destination controller, to set a transmission address of the hall destination controller, and to set a buzzer sound output from a speaker provided in the hall destination controller.

7. The hall destination controller of claim 1,
15 further comprising a capture unit which captures a passenger, wherein

the control unit generates, when a specific passenger whose destination floor is set in advance is detected from an image captured by the capture unit,
20 generates a hall call corresponding to the specific passenger based on the destination floor set in advance.

8. The hall destination controller of claim 1, wherein

25 the control unit which changes, only when the scan unit successively scans a two-dimensional code including specific information and a two-dimensional code for data settings, the settings of the hall destination controller by using the two-dimensional
30 code for data settings.