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(54) **METHOD FOR OPERATING PASSENGER CONVEYING APPARATUS BY USING GRAPH CODE, AND PASSENGER CONVEYING APPARATUS**

(57) This disclosure relates to a method for operating a passenger conveying device by using graphic coding, which comprises a conveying unit, a digitizing device and a control device, and is characterized in that the digitizing device is arranged to acquire the graphic coding and extract running instructions from the acquired graphic coding. The control device receives a running instruction from the digitizing device and controls the digitizing device based on the running instruction. A passenger conveying device is characterized in that the passenger conveying device adopts the above method.

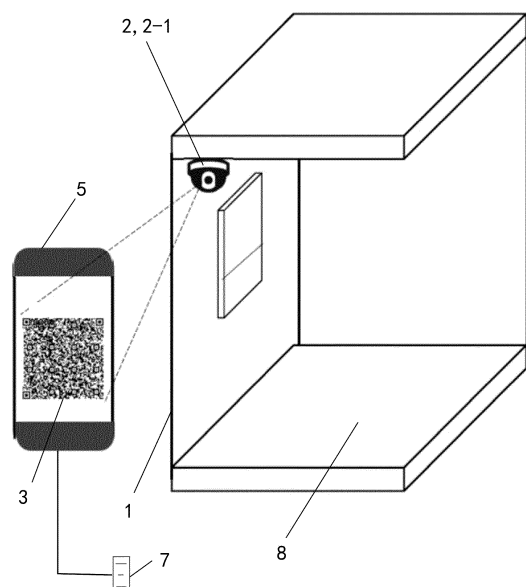


Fig 1

Description

TECHNICAL FIELD

[0001] The present disclosure relates to a method of operating a passenger conveying device using graphic coding. The present disclosure also relates to a passenger conveying device operating using the method.

BACKGROUND

[0002] Two-dimensional code is also called two-dimensional bar code, and the common two-dimensional code is QR Code, which is called Quick Response. It is a popular graphic coding method on mobile devices in recent years. Two-dimensional bar code/two-dimensional code is a black-and-white graphic that records data symbol information, which is distributed on the plane (two-dimensional direction) according to a certain rule with a certain geometric figure. In coding, the concepts of "0" and "1" bit streams, which constitute the internal logic foundation of the computer, are skillfully used, and several geometric shapes corresponding to binary are used to represent the numerical information of characters, which can be automatically read by image input equipment or photoelectric scanning equipment to realize automatic information processing. It has some commonalities of bar code technology: each code system has its own specific character set; each character occupies a certain width; it has certain verification function, etc.

[0003] In the prior art, there is no method for operating a passenger conveying device by using a graphic coding such as a two-dimensional code.

[0004] For example, the state of passenger conveying device generally includes a running state of transporting passengers and a maintenance state of carrying out maintenance work. In the prior art, the switching between the running state and the maintenance state is realized by the technicians of the passenger conveying device pressing the switching button, setting/removing a maintenance enclosure at an entrance and/or exit of the passenger conveying device and other means. This switching method can achieve a single function, that is, it can only achieve a complete stop or resume operation of the passenger conveying device.

[0005] In addition, there are some applications in the existing passenger conveying device, such as enabling or disabling the artificial intelligence algorithm of elevators and/or escalators or checking or changing the lighting state of elevators and/or escalators in the maintenance state, and those skilled in the art need a convenient, safe and accurate switching operation.

[0006] The graphic coding recognition solution such as two-dimensional code provides a feasible solution for field technicians to switch escalators and elevators to maintenance state.

SUMMARY OF THE INVENTION

[0007] In order to solve one or more defects in the prior art, according to one aspect of the present disclosure, a method for operating a passenger conveying device by using graphic coding is proposed, which includes a conveying unit, a digitizing device and a control device, and the digitizing device is arranged to acquire the graphic coding and extract running instructions from the acquired graphic coding. The control device receives the running instruction from the digitizing device and controls the digitizing device based on the running instruction.

[0008] According to the above aspect of the present disclosure, the digitizing device includes an image acquisition device.

[0009] The graphic coding includes a maintenance code representing a maintenance instruction.

[0010] The graphic coding is captured by an image acquisition device and the captured graphic coding is recognized by an artificial intelligence algorithm of the passenger conveying device.

[0011] When the recognized graphic coding is the maintenance code, the maintenance instruction is transmitted to the control device, and the control device switches the conveying unit or the digitizing device to a maintenance state.

[0012] According to the above aspects of the present disclosure, the graphic coding includes a running code representing a running instruction.

[0013] When the recognized graphic coding is the running code, the running instruction is transmitted to the control device, and the control device switches the conveying unit or the digitizing device to a running state.

[0014] According to the above aspects of the present disclosure, a communication connection is provided between the image acquisition device and the control device.

[0015] The artificial intelligence algorithm is provided on the image acquisition device. When the recognized graphic coding is the maintenance code, the image acquisition device generates the maintenance instruction and transmits it to the control device through the communication connection, and the control device switches the conveying unit or the digitizing device to the maintenance state and disables the artificial intelligence algorithm.

[0016] When the recognized graphic coding is the running code, the image acquisition device generates the running instruction and transmits it to the control device through the communication connection, and the control device switches the conveying unit or the digitizing device to the running state and enables the artificial intelligence algorithm.

[0017] According to the above aspects of the present disclosure, a communication connection is provided between the image acquisition device and the control device.

[0018] The image acquisition device transmits the im-

age of the captured graphic coding to the control device through a communication connection.

[0019] The artificial intelligence algorithm is provided on the control device.

[0020] When the recognized graphic coding is the maintenance code, the control device generates the maintenance instruction and switches the conveying unit or the digitizing device to the maintenance state and disables the artificial intelligence algorithm.

[0021] In the maintenance state, the artificial intelligence algorithm is disabled to avoid making some meaningless reports to a client end.

[0022] When the recognized graphic coding is the running code, the control device generates the running instruction and switches the conveying unit or the digitizing device to the running state and enables the artificial intelligence algorithm.

[0023] According to the above aspect of the present disclosure, the image acquisition device is arranged inside the passenger conveying device or at an entrance and exit of the passenger conveying device.

[0024] According to the above aspect of the present disclosure, the maintenance code is provided on a maintenance enclosure or on the work clothes of maintenance personnel.

[0025] The image acquisition device captures the maintenance code provided on the maintenance enclosure or on the work clothes of maintenance personnel. According to the above aspect of the present disclosure, the maintenance personnel are equipped with an intelligent communication equipment.

[0026] Installing an application program on the intelligent communication equipment. The maintenance personnel display the maintenance code on the screen of the intelligent communication equipment by running the application program.

[0027] The image acquisition device captures the maintenance code displayed on the screen of the intelligent communication equipment.

[0028] According to the above aspect of the present disclosure, the maintenance personnel are equipped with intelligent communication equipment.

[0029] Installing an application program on the intelligent communication equipment. The maintenance personnel display the running code on the screen of the intelligent communication equipment by running the application program.

[0030] The image acquisition device captures the running code displayed on the screen of the intelligent communication equipment.

[0031] According to the above aspect of the present disclosure, the passenger conveying device is an elevator or an escalator.

[0032] According to the above aspect of the present disclosure, the digitizing device further comprises a functional component.

[0033] When the control device switches the passenger conveying device to the maintenance state, the con-

trol device instructs the functional component with self-checking function of the passenger conveying device to perform self-checking.

[0034] According to the above aspect of the present disclosure, the functional component includes a lighting device.

[0035] When the control device switches the passenger conveying device to the maintenance state, the control device instructs the lighting device to light up or flash.

[0036] The maintenance personnel detects whether the lighting device is in a normal state based on whether the lighting device is light up or flash.

[0037] According to the above aspect of the present disclosure, the functional component further includes a sensor.

[0038] When the control device switches the passenger conveying device to the maintenance state, the control device detects whether the sensor is in an online state and provides the current state of the sensor to the maintenance personnel through a voice device or a display device of the passenger conveying device. According to the above aspect of the present disclosure, when the control device switches the passenger conveying device to the maintenance state, the image of the passenger conveying device is captured by the image acquisition device and the artificial intelligence algorithm of the passenger conveying device recognizes the captured image of the passenger conveying device.

[0039] The artificial intelligence algorithm determines whether there is a missing or damaged component of the passenger conveying device.

[0040] When the components are missing or damaged, a spare parts ordering instruction is transmitted to the control device, and the control device will inform the maintenance personnel to purchase the parts.

[0041] According to the above aspect of the present disclosure, the digitizing device includes an image acquisition device.

[0042] The graphic coding comprise a trapped person detection code representing an instruction for detecting trapped people.

[0043] The trapped person detection code is captured by the image acquisition device and the captured trapped person detection code is recognized by an artificial intelligence algorithm of the passenger conveying device.

[0044] When the recognized graphic coding is the trapped person detection code, the instruction for detecting trapped people is transmitted to the control device, and the control device switches the passenger conveying device to a state for detecting people trapped.

[0045] According to the above aspect of the present disclosure, the maintenance personnel are equipped with intelligent communication equipment.

[0046] Installing an application program on the intelligent communication equipment. The maintenance personnel display the trapped person detection code on the screen of the intelligent communication equipment by running the application program.

[0047] The image acquisition device captures the trapped person detection code displayed on the screen of the intelligent communication equipment.

[0048] According to the above aspect of the present disclosure, the digitizing device includes an image acquisition device.

[0049] The graphic coding include a spare part ordering code representing an instruction to order spare parts.

[0050] The spare parts ordering code is captured by the image acquisition device and the captured spare parts ordering code is recognized by an artificial intelligence algorithm of the passenger conveying device.

[0051] When the recognized graphic coding is the spare part ordering code, the instruction to order spare parts is transmitted to the control device, and the control device will inform the maintenance personnel to purchase spare parts. According to the above aspect of the present disclosure, the maintenance personnel are equipped with intelligent communication equipment.

[0052] Installing an application program on the intelligent communication equipment.

[0053] The maintenance personnel display the spare parts ordering code on the screen of the intelligent communication equipment by running the application program.

[0054] The image acquisition device captures the spare parts ordering code displayed on the screen of the intelligent communication equipment.

[0055] According to the above aspect of the present disclosure, the digitizing device includes an image acquisition device.

[0056] The graphic coding further include a scene selection code representing an instruction to make a scene selection of the passenger conveying device.

[0057] The scene selection code is captured by the image acquisition device and the captured scene selection code is recognized by an artificial intelligence algorithm of the passenger conveying device.

[0058] When the recognized graphic coding is the scene selection code, a scene selection instruction of the passenger conveying device is transmitted to the control device, and the control device will make corresponding scene settings for the passenger conveying device according to the scene selection code.

[0059] According to the above aspect of the present disclosure, the passengers conveyed by the passenger conveying device are equipped with intelligent communication equipment.

[0060] Installing an application program on the intelligent communication equipment. The passenger displays the scenario selection code on the screen of the intelligent communication equipment by running the application program.

[0061] The image acquisition device captures the scene selection code displayed on the screen of the intelligent communication equipment.

[0062] According to the above aspect of the present disclosure, the scene settings include setting of lights,

sounds, images, temperature and humidity in the passenger conveying device.

[0063] According to the above aspect of the present disclosure, the two-dimensional code is set as the graphic coding.

[0064] According to the above aspect of the present disclosure, the image acquisition device is a camera device or a scanning device.

[0065] According to the above aspect of the present disclosure, the image acquisition device captures an image of the passenger conveying device and the artificial intelligence algorithm of the passenger conveying device recognizes the captured image of the passenger conveying device.

[0066] When the recognized graphic coding is the maintenance code and when the artificial intelligence algorithm judges that there are no passengers in the passenger conveying device, the maintenance instruction is transmitted to the control device, and the control device switches the passenger conveying device to the maintenance state.

[0067] According to another aspect of the present disclosure, a passenger conveying device is proposed, which adopts the method as described above.

[0068] According to the present disclosure, different graphic coding, such as two-dimensional coding, can be used to enter a specific state of the passenger conveying device, such as but not limited to a maintenance state, so that corresponding specific functions can be realized.

[0069] According to the present disclosure, after entering the maintenance state, automatic detection of some functional components or devices on the passenger conveying device can be started, such as various lighting devices, i.e., step lights, comb lights, etc.

[0070] According to the present disclosure, after entering the maintenance state, other functions of the camera device or the camera system can be triggered by the two-dimensional code, for example, after the steps are replaced, the camera device can be used to check whether there are steps missing.

[0071] According to the present disclosure, different two-dimensional coding realize different functions or product modes, such as ordering spare parts and detecting people trapped, and passengers use the two-dimensional coding to realize the selection of different car (car in elevator) scene modes.

[0072] According to the present disclosure, after entering the maintenance state, it is possible to automatically detect whether various sensors or devices are online and prompt the maintenance personnel through the existing voice device or various display devices on the passenger conveying device. Also, for example, when some components or devices are damaged and need to be replaced, the maintenance personnel can directly order remote components on site through QR codes.

[0073] So far, in order that the detailed description of the disclosure herein can be better understood and the contribution of the disclosure to the prior art can be better

realized, the disclosure has outlined the contents of the disclosure quite broadly. Of course, embodiments of the present disclosure will be described below and will form the subject of the appended claims.

[0074] Likewise, those skilled in the art will recognize that the concept on which this disclosure is based can be easily used as a basis for designing other structures, methods and systems for carrying out the several purposes of this disclosure. Therefore, it is important that the appended claims should be regarded as including such equivalent structures as long as they do not exceed the spirit and scope of this disclosure.

BRIEF DESCRIPTION OF DRAWINGS

[0075] Those skilled in the art will have a better understanding of this disclosure through the following drawings, and the advantages of this disclosure can be more clearly reflected. The drawings described here are only for illustrative purposes of selected embodiments, not all possible implementations, and are not intended to limit the scope of the present disclosure.

Fig. 1 is a schematic view of an elevator adopting a method according to the present disclosure;

Fig. 2 is a schematic view of an escalator adopting the method according to the present disclosure;

Fig. 3 shows a flowchart of the method according to the present disclosure;

Figs. 4 and 5 show application scenarios of the method according to the present disclosure, respectively.

Detailed description

[0076] In the following, specific embodiments according to the present disclosure will be described in detail with reference to the accompanying drawings.

[0077] As shown in figs. 1 and 2, according to an embodiment of the present disclosure, a method of operating a passenger conveying device 1 by using a graphic coding 3 is proposed, which includes a conveying unit 8, a digitizing device 2 and a control device (not shown).

[0078] The passenger conveying device 1 may be an elevator as shown in fig. 1 or an escalator as shown in fig. 2.

[0079] The conveying unit 8 includes, but is not limited to, a lift car of an elevator or a passenger pedal of an escalator and a corresponding driving unit.

[0080] The digitizing device 2 is arranged to acquire the graphic coding 3 and extract running instructions from the acquired graphic coding 3.

[0081] The control device receives a running instruction from the digitizing device 2 and controls the digitizing device 2 based on the running instruction.

[0082] According to the above embodiment of the present disclosure, the digitizing device 2 includes an image acquisition device 2-1.

[0083] The graphic coding 3 includes a running code

representing a running instruction and a maintenance code representing a maintenance instruction.

[0084] The graphic coding 3 is captured by the image acquisition device 2-1 and the captured graphic coding 3 is recognized by the artificial intelligence algorithm of the passenger conveying device 1.

[0085] When the recognized graphic coding 3 is the maintenance code, the maintenance instruction is transmitted to the control device, and the control device switches the conveying unit 8 and/or the digitizing device 2 to the maintenance state. When the recognized graphic coding 3 is the running code, the running instruction is transmitted to the control device, and the control device switches the conveying unit 8 and/or the digitizing device 2 to the running state. According to the above embodiment of the present disclosure, a communication connection is provided between the image acquisition device 2-1 and the control device.

[0086] The artificial intelligence algorithm is provided on the image acquisition device 2-1.

[0087] When the recognized graphic coding 3 is the maintenance code, the image acquisition device 2-1 generates a maintenance instruction and transmits it to the control device through the communication connection, and the control device switches the conveying unit 8 and/or the digitizing device 2 to the maintenance state and disables the artificial intelligence algorithm.

[0088] When the recognized graphic coding 3 is the running code, the image acquisition device 2-1 generates a running instruction and transmits it to the control device through the communication connection, and the control device switches the conveying unit 8 and/or the digitizing device 2 to the running state and enables the artificial intelligence algorithm.

[0089] According to the above embodiment of the present disclosure, a communication connection is provided between the image acquisition device 2-1 and the control device.

[0090] The image acquisition device 2-1 transmits the captured image of the graphic coding 3 to the control device through communication connection.

[0091] The artificial intelligence algorithm is provided on the control device.

[0092] When the recognized graphic coding 3 is the maintenance code, the control device generates a maintenance instruction and switches the conveying unit 8 and/or the digitizing device 2 to a maintenance state and disables the artificial intelligence algorithm.

[0093] In the maintenance state, the artificial intelligence algorithm is disabled to avoid making some meaningless reports to the client.

[0094] When the recognized graphic coding 3 is the running code, the control device generates a running instruction and switches the conveying unit 8 and/or the digitizing device 2 to the running state and activates the artificial intelligence algorithm.

[0095] According to the above embodiment of the present disclosure, the image acquisition device 2-1 is

arranged inside the passenger conveying device 1 (as shown in fig. 1) or at an entrance and exit of the passenger conveying device 1 (as shown in figs. 2 and 4).

[0096] According to the above embodiment of the present disclosure, the maintenance code is provided on a maintenance enclosure or on the working clothes of maintenance personnel.

[0097] The image acquisition device 2-1 captures the maintenance code provided on the maintenance enclosure 4 (as shown in figs. 4 and 5) or on the working clothes of maintenance personnel.

[0098] In fig. 4, the maintenance enclosure 4 is arranged at the exit or entrance of the escalator. In fig. 5, the maintenance enclosure 4 is arranged at the exit or entrance of the elevator.

[0099] According to the above embodiment of the present disclosure, the maintenance personnel are equipped with an intelligent communication equipment 5.

[0100] An application program is installed on the intelligent communication equipment 5.

[0101] The maintenance personnel display the maintenance code on the screen of the intelligent communication equipment 5 by running the application program. The image acquisition device 2-1 captures the maintenance code displayed on the screen of the intelligent communication equipment 5.

[0102] According to the above embodiment of the present disclosure, the maintenance personnel are equipped with an intelligent communication equipment 5.

[0103] An application program is installed on the intelligent communication equipment 5.

[0104] The maintenance personnel display the running code on the screen of the intelligent communication equipment 5 by running the application program. The image acquisition device 2-1 captures the running code displayed on the screen of the intelligent communication equipment 5.

[0105] According to the above-mentioned embodiment of the present disclosure, the digitization device further includes a functional component, and when the control device switches the passenger conveying device 1 to the maintenance state, the control device can instruct the functional component of the passenger conveying device 1 with a self-check function to perform a self-check.

[0106] According to the above-described embodiment of the present disclosure, as shown in fig. 3, the functional component includes a lighting device 6.

[0107] In fig. 3, step 8, firstly, the identity of the maintenance personnel is confirmed through the intelligent communication equipment 5 such as a smart phone; step 9, the maintenance personnel display the maintenance code on the screen of the intelligent communication equipment 5 by running the application program on the mobile phone; step 10, the image acquisition device 2-1 captures the maintenance code displayed on the screen of the intelligent communication equipment 5; step 11, the artificial intelligence algorithm of the passenger con-

veying device 1 identifies the captured maintenance code; step 12, when the identified graphic coding 3 is a maintenance code, a maintenance instruction is transmitted to the control device; step 13, the control device switches the passenger conveying device 1 to the maintenance state; step 14, when the control device switches the passenger conveying device 1 to the maintenance state, the control device instructs the lighting device 6 to light up or blink. Maintenance personnel detect whether the lighting device 6 is in a normal state based on whether the lighting device 6 is light up or blink. At the same time of entering the maintenance state, the artificial intelligence algorithm is disabled in step 15.

[0108] The lighting device 6 is, for example, but not limited to, a step lamp, a comb lamp, etc.

[0109] Of course, after entering the maintenance state, as described below, the maintenance personnel can also perform other detection operations 16. According to the above embodiment of the present disclosure, the functional part further includes a sensor (not shown).

[0110] When the control device switches the passenger conveying device 1 to the maintenance state, the control device detects whether the sensor is in the online state and provides the current state of the sensor to the maintenance personnel through a voice device or a display device of the passenger conveying device 1. According to the above embodiment of the present disclosure, when the control device switches the passenger conveying device 1 to the maintenance state, the image of the passenger conveying device 1 is captured by the image acquisition device 2-1 and the artificial intelligence algorithm of the passenger conveying device 1 recognizes the captured image of the passenger conveying device 1. The artificial intelligence algorithm determines whether there is a missing or damaged component in the passenger conveying device 1.

[0111] When components are missing or damaged, a spare parts ordering instruction is transmitted to the control device, and the control device will inform the remote server 7 or maintenance personnel to purchase the components.

[0112] According to the above embodiment of the present disclosure, the digitizing device 2 includes an image acquisition device 2-1.

[0113] The graphic coding 3 comprise a trapped person detection code representing an instruction for detecting trapped people.

[0114] The trapped person detection code is captured by the image acquisition device 2-1 and the captured trapped person detection code is recognized by the artificial intelligence algorithm of the passenger conveying device 1.

[0115] When the recognized graphic coding 3 is the trapped person detection code, the trapped person detection instruction is transmitted to the control device, and the control device switches the passenger conveying device 1 to the trapped person detection state.

[0116] According to the above embodiment of the

present disclosure, the maintenance personnel are equipped with the intelligent communication equipment 5.

[0117] An application program is installed on the intelligent communication equipment 5. The maintenance personnel display the trapped person detection code on the screen of the intelligent communication equipment 5 by running the application program. The image acquisition device 2-1 captures the trapped person detection code displayed on the screen of the intelligent communication equipment 5. According to the above embodiment of the present disclosure, the digitizing device 2 includes an image acquisition device 2-1.

[0118] The graphic coding 3 includes a spare part ordering code representing a spare parts ordering instruction.

[0119] The spare parts ordering code is captured by the image acquisition device 2-1 and the captured spare parts ordering code is recognized by the artificial intelligence algorithm of the passenger conveying device 1.

[0120] When the identified graphic coding 3 is the spare parts ordering code, a spare parts ordering instruction is transmitted to the control device, and the control device will inform the maintenance personnel or the remote server 7 to purchase spare parts. According to the above embodiment of the present disclosure, the maintenance personnel are equipped with the intelligent communication equipment 5.

[0121] An application program is installed on the intelligent communication equipment 5. The maintenance personnel display the spare parts ordering code on the screen of the intelligent communication equipment 5 by running the application program. The image acquisition device 2-1 captures the spare parts ordering code displayed on the screen of the intelligent communication equipment 5.

[0122] According to the above embodiment of the present disclosure, the digitizing device 2 includes an image acquisition device 2-1.

[0123] The graphic coding 3 also includes a scene selection code representing a scene selection instruction for the passenger conveying device.

[0124] The scene selection code is captured by the image acquisition device 2-1 and the captured scene selection code is recognized by the artificial intelligence algorithm of the passenger transport device 1.

[0125] When the identified graphic coding 3 is the scene selection code, a scene selection instruction for the passenger conveying device is transmitted to the control device, and the control device will make corresponding scene settings for the passenger conveying device 1 according to the scene selection code.

[0126] According to the above-described embodiment of the present disclosure, the passengers conveyed by the passenger conveying device 1 are equipped with the intelligent communication equipment 5.

[0127] An application program is installed on the intelligent communication equipment 5. The passenger dis-

plays the scene selection code on the screen of the intelligent communication equipment 5 by running the application program.

[0128] The image acquisition device 2-1 captures the scene selection code displayed on the screen of the intelligent communication equipment 5.

[0129] According to the above-mentioned embodiment of the present disclosure, the scene setting includes settings of lights, sounds, images, temperature and humidity in the passenger conveying device 1.

[0130] According to the above embodiment of the present disclosure, the two-dimensional code is set as the graphic coding 3.

[0131] According to the above embodiment of the present disclosure, the image acquisition device 2-1 is an imaging device or a scanning device.

[0132] According to the above embodiment of the present disclosure, the image acquisition device 2-1 captures an image of the passenger conveying device 1 and the artificial intelligence algorithm of the passenger conveying device 1 recognizes the captured image of the passenger conveying device 1.

[0133] As shown in fig. 1, when the recognized graphic coding 3 is the maintenance code and when the artificial intelligence algorithm judges that there are no passengers in the passenger conveying device 1, the maintenance instruction is transmitted to the control device, and the control device switches the passenger conveying device 1 to the maintenance state.

[0134] According to another embodiment of the present disclosure, a passenger conveying device 1 is proposed, which adopts the method as described above.

[0135] According to the present disclosure, different graphic coding 3, such as two-dimensional coding, can be used to enter a specific state of the passenger conveying device 1, such as but not limited to a maintenance state, so that corresponding specific functions can be realized.

[0136] According to the present disclosure, after entering the maintenance state, the automatic detection of some functional components or devices on the passenger conveying device 1, such as various lighting devices, i.e., step lights, comb lights, etc., can be started.

[0137] According to the present disclosure, after entering the maintenance state, other functions of the camera device or the camera system can be triggered by the two-dimensional code, for example, after the steps are replaced, the camera device can be used to check whether there are steps missing.

[0138] According to the present disclosure, different two-dimensional coding realize different functions or product modes, such as ordering spare parts and detecting people trapped, and the passengers use the two-dimensional coding to realize the selection of different car (car in elevator) scene modes.

[0139] According to the present disclosure, after entering the maintenance state, it is possible to automatically detect whether various networked sensors or de-

vices are online and prompt the maintenance personnel through the existing voice device or various display devices on the passenger conveying device 1. In addition, for example, when some components or devices are damaged and need to be replaced, maintenance personnel can directly order the components through QR coding on site.

[0140] The foregoing disclosure provides illustration and description, but is not intended to be exhaustive or to limit the embodiments to the precise forms disclosed. Modifications and variations are possible in light of the above disclosure, or may be acquired from practice of the embodiments.

Claims

1. A method for operating a passenger conveying device by using graphic coding, the passenger conveying device comprising a conveying unit, a digitizing device and a control device, wherein,

the digitizing device is arranged to acquire the graphic coding and extract running instructions from the acquired graphic coding;
the control device receives the running instruction from the digitizing device and controls the digitizing device based on the running instruction.

2. The method according to claim 1, wherein,

the digitization device comprises an image acquisition device;
the graphic coding comprises a maintenance code representing a maintenance instruction;
capturing the graphic coding by the image acquisition device and recognizing the captured graphic coding by an artificial intelligence algorithm of the passenger conveying device;
when the recognized graphic coding is the maintenance code, a maintenance instruction is transmitted to the control device, and the control device switches the conveying unit or the digitizing device to a maintenance state.

3. The method according to claim 2, wherein,

the graphic coding comprises a running code representing a running instruction;
when the recognized graphic coding is the running code, the running instruction is transmitted to the control device, and the control device switches the conveying unit or the digitizing device to the running state.

4. The method according to claim 3, wherein,

setting a communication connection between the image acquisition device and the control device;

the artificial intelligence algorithm is provided on the image acquisition device; when the identified graphic coding is the maintenance code, the image acquisition device generates the maintenance instruction and transmits it to the control device through the communication connection, and the control device switches the conveying unit or the digitizing device to the maintenance state and disables the artificial intelligence algorithm;

when the recognized graphic coding is the running code, the image acquisition device generates a running instruction and transmits it to the control device through the communication connection, and the control device switches the conveying unit or the digitizing device to the running state and enables the artificial intelligence algorithm.

5. The method according to claim 3, wherein,

setting a communication connection between the image acquisition device and the control device;

the image acquisition device transmits the captured the image of the graphic coding to the control device through the communication connection;

the artificial intelligence algorithm is provided on the control device;

when the identified graphic coding is the maintenance code, the control device generates the maintenance instruction and switches the conveying unit or the digitizing device to the maintenance state and disables the artificial intelligence algorithm;

when the recognized graphic coding is the running code, the control device generates a running instruction and switches the conveying unit or the digitizing device to the running state and enables the artificial intelligence algorithm.

6. The method according to claim 4 or 5, wherein, the image acquisition device is arranged inside the passenger conveying device or at an entrance and an exit of the passenger conveying device.

7. The method according to claim 6, wherein,

the maintenance code is arranged on a maintenance enclosure or on the working clothes of maintenance personnel;

the image acquisition device captures the maintenance code on the maintenance enclosure or on the working clothes of maintenance personnel.

nel.

8. The method according to claim 6, wherein,

the maintenance personnel are equipped with an intelligent communication equipment; installing an application program on the intelligent communication equipment; the maintenance personnel display the maintenance code on the screen of the intelligent communication equipment by running the application program; the image acquisition device captures the maintenance code displayed on the screen of the intelligent communication equipment.

9. The method according to claim 6, wherein,

the maintenance personnel are equipped with an intelligent communication equipment; installing an application program on the intelligent communication equipment; the maintenance personnel display the running code on the screen of the intelligent communication equipment by running the application program; the image acquisition device captures the running code displayed on the screen of the intelligent communication equipment.

10. The method according to claim 4 or 5, wherein, the passenger conveying device is an elevator or an escalator.

11. The method according to claim 4 or 5, wherein,

the digitizing device also comprises functional components; when the control device switches the passenger conveying device to the maintenance state, the control device instructs the functional component with self-checking function of the passenger conveying device to perform self-checking.

12. The method according to claim 11, wherein,

the functional component comprises a lighting device; when the control device switches the passenger conveying device to the maintenance state, the control device instructs the lighting device to light up or blinked; the maintenance personnel detects whether the lighting device is in a normal state based on whether the lighting device is light up or blinked.

13. The method according to claim 11, wherein,

the functional component further comprises a sensor;

when the control device switches the passenger conveying device to the maintenance state, the control device detects whether the sensor is in the online state and provides the current state of the sensor to the maintenance personnel through a voice device or a display device of the passenger conveying device.

14. The method according to claim 4 or 5, wherein,

when the control device switches the passenger conveying device to the maintenance state, the image acquisition device captures the image of the passenger conveying device and the artificial intelligence algorithm of the passenger conveying device recognizes the captured image of the passenger conveying device; the artificial intelligence algorithm determines whether there is a missing or damaged component in the passenger conveying device; when components are missing or damaged, a spare parts ordering instruction is transmitted to the control device, and the control device will inform the maintenance personnel to purchase the parts.

15. The method according to claim 1, wherein,

the digitization device comprises an image acquisition device; the graphic coding comprise a trapped person detection code representing an instruction for detecting trapped people; capturing the trapped person detection code by the image acquisition device and identifying the captured trapped person detection code by the artificial intelligence algorithm of the passenger conveying device; when the recognized graphic coding is the code for detecting people trapped, the instruction for detecting trapped people is transmitted to the control device, and the control device switches the passenger conveying device to the state for detecting people trapped.

16. The method according to claim 15, wherein,

the maintenance personnel are equipped with an intelligent communication equipment; installing an application program on the intelligent communication equipment; the maintenance personnel display the trapped person detection code on the screen of the intelligent communication equipment by running the application program; the image acquisition device captures the trapped person detection code displayed on the screen of the intelligent communication equipment;

ment.

17. The method according to claim 1, wherein,

the digitization device comprises an image acquisition device; 5
the graphic coding comprise a spare part ordering code representing an instruction for ordering spare parts;
capturing the spare parts ordering code by the image acquisition device and identifying the captured spare parts ordering code by an artificial intelligence algorithm of the passenger conveying device; 10
when the identified graphic coding is the spare parts ordering code, a spare parts ordering instruction is transmitted to the control device, and the control device will inform the maintenance personnel to purchase spare parts. 15

18. The method according to claim 17, wherein,

the maintenance personnel are equipped with an intelligent communication equipment; 25
installing an application program on the intelligent communication equipment;
the maintenance personnel displays the spare parts ordering code on the screen of the intelligent communication equipment by running the application program; 30
the image acquisition device captures the spare parts ordering code displayed on the screen of the intelligent communication equipment.

19. The method according to claim 1, wherein, 35

the digitization device comprises an image acquisition device;
the graphic coding further comprise a scene selection code representing an instruction to perform scene selection for the passenger conveying device; 40
the scene selection code is captured by the image acquisition device and the captured scene selection code is recognized by an artificial intelligence algorithm of the passenger conveying device; 45
when the identified graphic coding is the scene selection code, the instruction to perform scene selection for the passenger conveying device is transmitted to the control device, and the control device will make corresponding scene settings for the passenger conveying device according to the scene selection code. 50

20. The method according to claim 19, wherein, 55

the passengers conveyed by the passenger

conveying device are equipped with an intelligent communication equipment;
installing an application program on the intelligent communication equipment;
the passenger displays the scene selection code on the screen of the intelligent communication equipment by running the application program;
the image acquisition device captures the scene selection code displayed on the screen of the intelligent communication equipment.

21. The method according to claim 19, wherein, the scene setting includes settings for lights, sounds, images, temperature and humidity in the passenger conveying device.

22. The method according to claim 4 or 5, wherein, setting the two-dimensional code as the graphic coding.

23. The method according to claim 3, wherein, the image acquisition device is a camera device or a scanning device.

24. The method according to claim 3, wherein,

the image acquisition device captures an image of the passenger conveying device and an artificial intelligence algorithm of the passenger conveying device identifies the captured image of the passenger conveying device;
when the recognized graphic coding is the maintenance code and when the artificial intelligence algorithm judges that there are no passengers in the passenger conveying device, the maintenance instruction is transmitted to the control device, and the control device switches the passenger conveying device to a maintenance state.

25. A passenger conveying device, wherein the passenger conveying device adopts the method according to any one of claims 1 to 24.

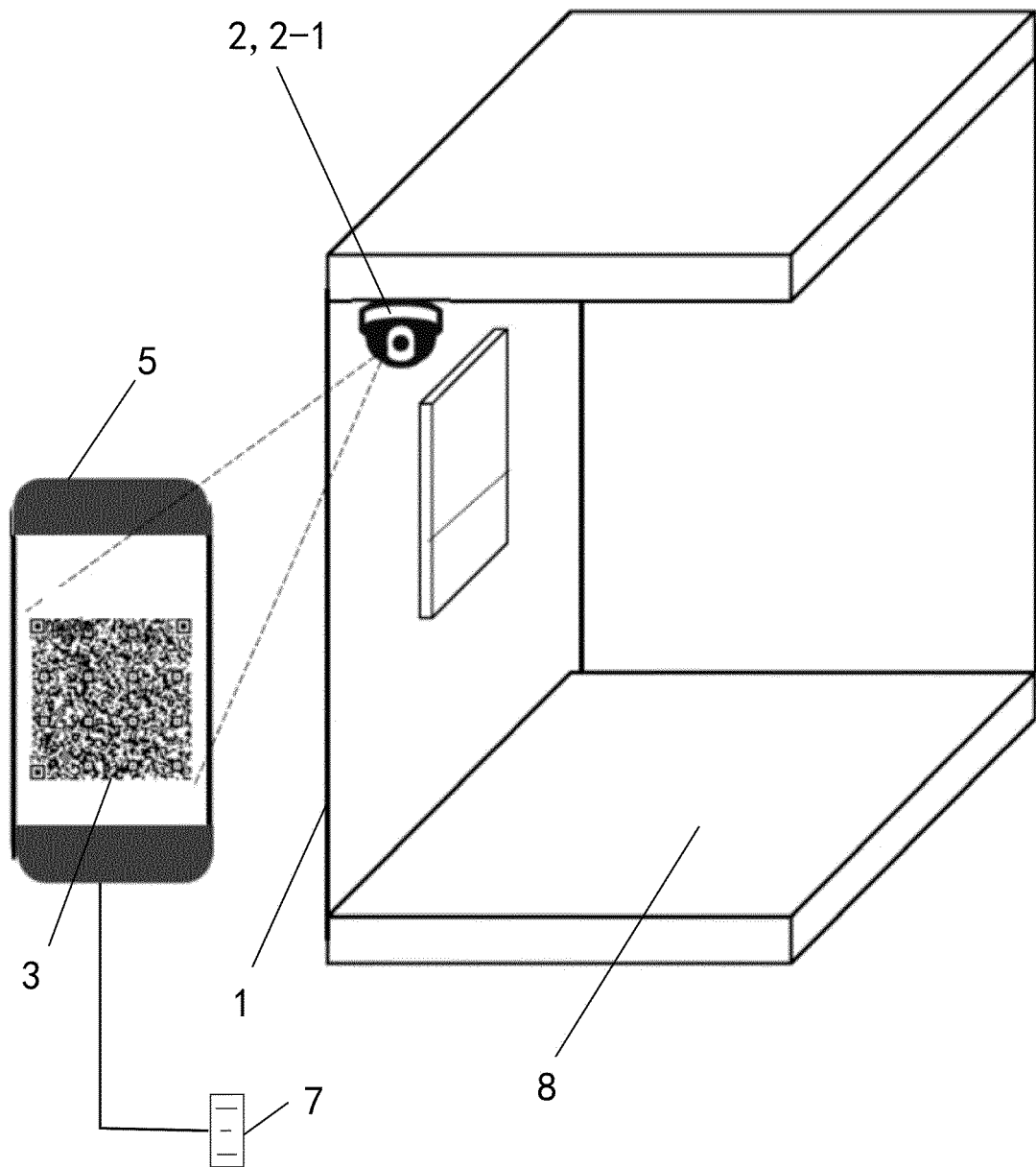


Fig 1

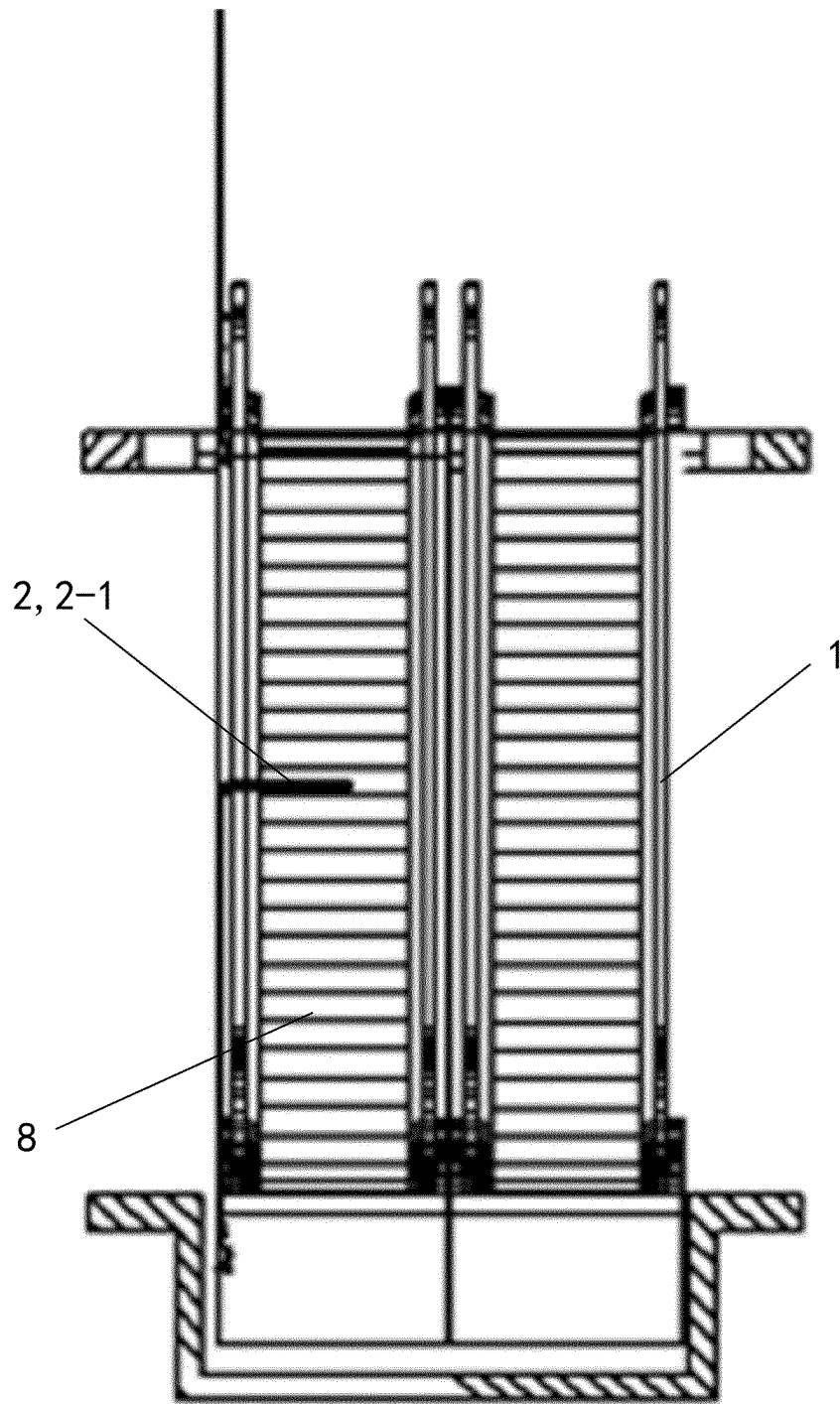


Fig 2

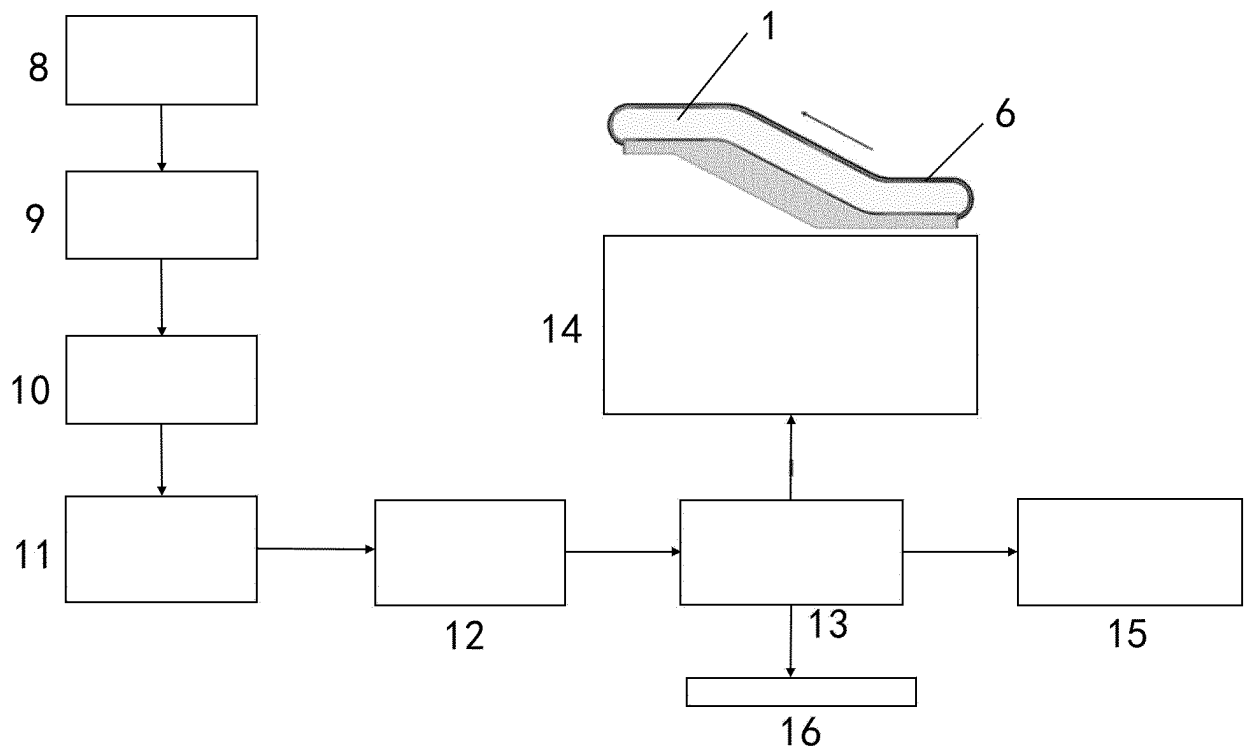


Fig 3

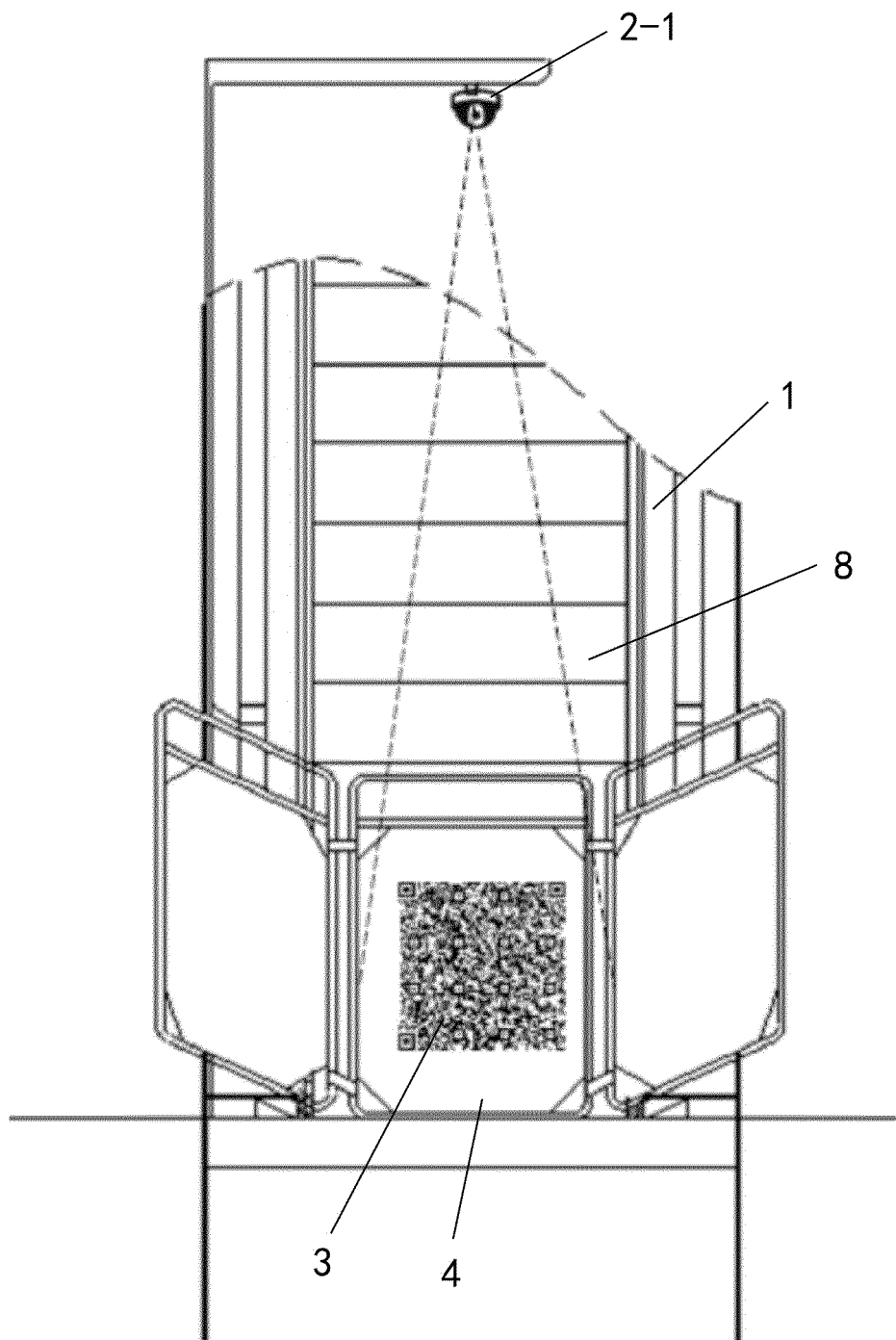


Fig 4

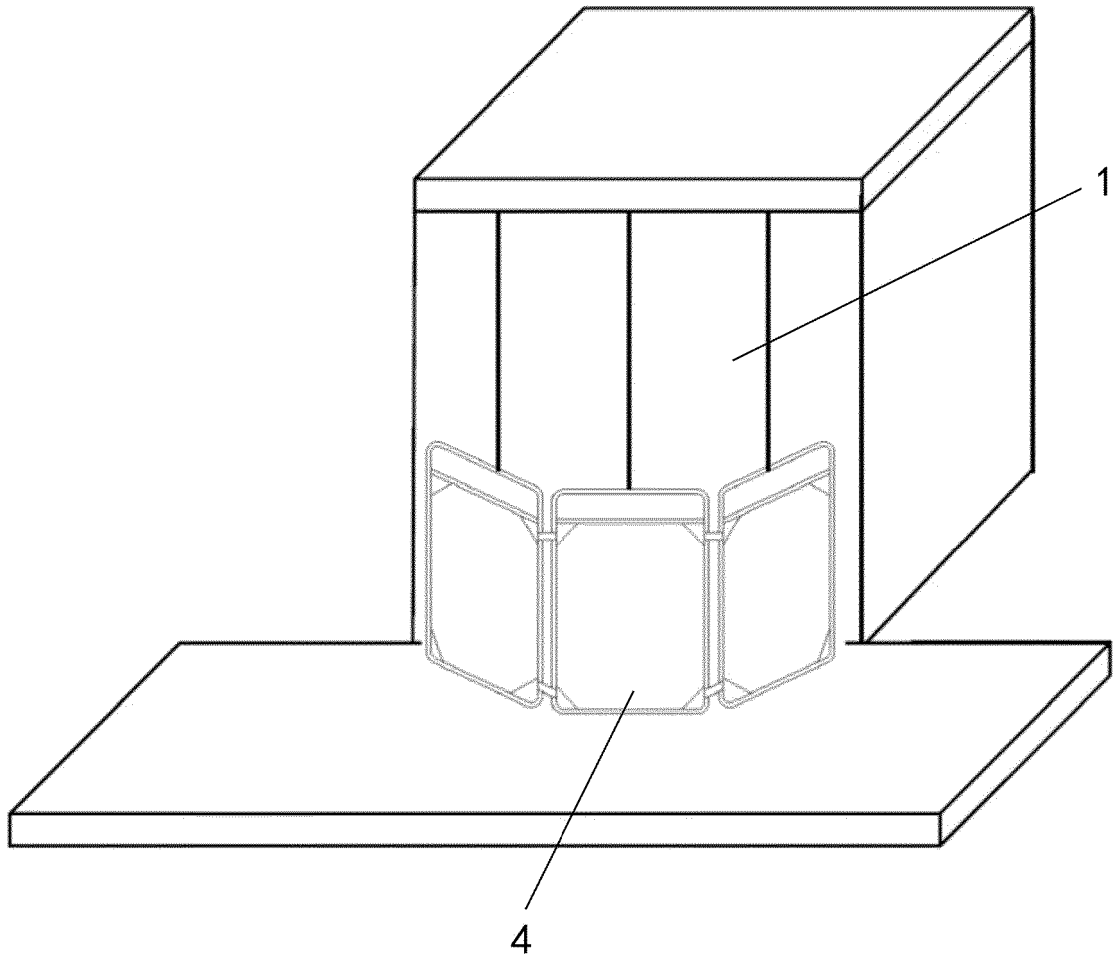


Fig 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/132535

A. CLASSIFICATION OF SUBJECT MATTER B66B 5/00(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) B66B																								
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched																								
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNKI; CNTXT; VEN; DWPI: 二维码, 条形码, 编码, 维保, 维修, 保养, 维护, 检修, 图像, 摄像, 控制, 电梯, 扶梯, 手机; code, maintenance, maintain, check, camera, control																								
C. DOCUMENTS CONSIDERED TO BE RELEVANT																								
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>PX</td> <td>CN 114084763 A (KONE ELEVATORS CO., LTD. et al.) 25 February 2022 (2022-02-25) see claims 1-25</td> <td>1-25</td> </tr> <tr> <td>X</td> <td>CN 106698126 A (HITACHI BUILDING SYSTEMS CO., LTD.) 24 May 2017 (2017-05-24) see description, paragraphs 9-60, and figures 1-4</td> <td>1-25</td> </tr> <tr> <td>X</td> <td>CN 104495545 A (NINGXIA DIANTONG IOT TECHNOLOGY CO., LTD.) 08 April 2015 (2015-04-08) see description, paragraphs 12-23, and figures 1-2</td> <td>1-25</td> </tr> <tr> <td>A</td> <td>CN 206751128 U (LIUPANSHUI SPECIAL EQUIPMENT INSPECTION INSTITUTE) 15 December 2017 (2017-12-15) see entire document</td> <td>1-25</td> </tr> <tr> <td>A</td> <td>CN 105417306 A (NANJING UNIVERSITY OF POSTS AND TELECOMMUNICATIONS) 23 March 2016 (2016-03-23) see entire document</td> <td>1-25</td> </tr> <tr> <td>A</td> <td>CN 107915098 A (FENG KAI et al.) 17 April 2018 (2018-04-17) see entire document</td> <td>1-25</td> </tr> <tr> <td>A</td> <td>CN 1847132 A (TOSHIBA ELEVATOR CO., LTD.) 18 October 2006 (2006-10-18) see entire document</td> <td>1-25</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	PX	CN 114084763 A (KONE ELEVATORS CO., LTD. et al.) 25 February 2022 (2022-02-25) see claims 1-25	1-25	X	CN 106698126 A (HITACHI BUILDING SYSTEMS CO., LTD.) 24 May 2017 (2017-05-24) see description, paragraphs 9-60, and figures 1-4	1-25	X	CN 104495545 A (NINGXIA DIANTONG IOT TECHNOLOGY CO., LTD.) 08 April 2015 (2015-04-08) see description, paragraphs 12-23, and figures 1-2	1-25	A	CN 206751128 U (LIUPANSHUI SPECIAL EQUIPMENT INSPECTION INSTITUTE) 15 December 2017 (2017-12-15) see entire document	1-25	A	CN 105417306 A (NANJING UNIVERSITY OF POSTS AND TELECOMMUNICATIONS) 23 March 2016 (2016-03-23) see entire document	1-25	A	CN 107915098 A (FENG KAI et al.) 17 April 2018 (2018-04-17) see entire document	1-25	A	CN 1847132 A (TOSHIBA ELEVATOR CO., LTD.) 18 October 2006 (2006-10-18) see entire document	1-25
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.																								
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<table border="1"> <tr> <td>Date of the actual completion of the international search 08 December 2022</td> <td>Date of mailing of the international search report 11 January 2023</td> </tr> </table>	Date of the actual completion of the international search 08 December 2022	Date of mailing of the international search report 11 January 2023																						
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<table border="1"> <tr> <td> Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451 </td> <td> Authorized officer Telephone No. </td> </tr> </table>	Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China Facsimile No. (86-10)62019451	Authorized officer Telephone No.																						
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/132535

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2009051641 A (MITSUBISHI ELECTRIC BUILDING TECHNO-SERVICE CO., LTD.) 12 March 2009 (2009-03-12) see entire document	1-25

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2022/132535

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 114084763 A	25 February 2022	None	
CN 106698126 A	24 May 2017	JP 2017095191 A	01 June 2017
CN 104495545 A	08 April 2015	None	
CN 206751128 U	15 December 2017	None	
CN 105417306 A	23 March 2016	None	
CN 107915098 A	17 April 2018	None	
CN 1847132 A	18 October 2006	JP 2006264889 A	05 October 2006
JP 2009051641 A	12 March 2009	None	

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