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(54) A LIGHTING SYSTEM FOR A PERSONNEL CONVEYING DEVICE

(57) The present invention relates to an lighting system for a personnel conveying device comprising: a lighting device (1) having a plurality of light sources arranged along a length direction of the personnel conveying device; a lighting controller (3) communicatively connected to the personnel conveying device and the lighting device (1), capable of receiving an operation state of the personnel conveying device and selecting different lighting themes of the lighting device based on the operation state; a remote operation device (4) communicatively connected to the lighting controller (3), the remote operation device having a theme setting module, through which a user can set the lighting theme of the lighting device (1) according to the operation state and send the set lighting theme to the lighting controller, wherein, the lighting controller (3) is configured to control the lighting device (1) according to the set lighting theme.

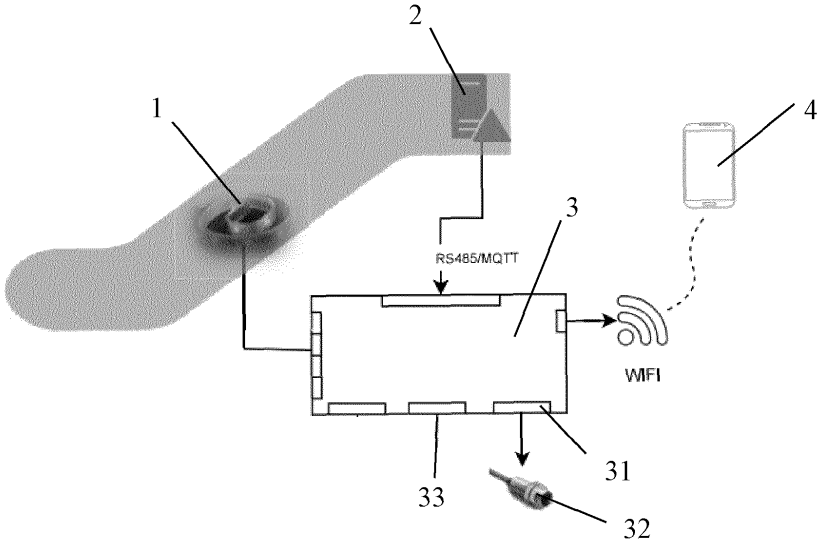

Fig.1

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Description

Technical field

[0001] The present invention relates to a lighting system for a personnel conveying device.

Background

[0002] In escalators and other personnel conveying device, there are light sources to illuminate, and these light sources can display certain colors. However, a lighting theme of the light source cannot be set by the user, and the existing lighting theme does not consider various operating states of the personnel conveying device.

Summary

[0003] Therefore, the present application provides a lighting system for a personnel conveying device, comprising: a lighting device having a plurality of light sources arranged along a length direction of the personnel conveying device; a lighting controller communicatively connected to the personnel conveying device and the lighting device, capable of receiving an operation state of the personnel conveying device and selecting different lighting themes of the lighting device based on the operation state; a remote operation device communicatively connected to the lighting controller, the remote operation device having a theme setting module, through which a user can set the lighting theme of the lighting device according to the operation state and send the set lighting theme to the lighting controller, wherein, the lighting controller is configured to control the lighting device according to the set lighting theme.

[0004] Preferably, the operating state comprises a first operating state and a second operating state, wherein through the theme setting module, the user can set a first lighting theme of the lighting device for the first operation state, but cannot set a second lighting theme of the lighting device for the second operation state, and the second lighting theme for the second operation state is stored in the lighting controller in advance.

[0005] Preferably, the first operation state includes that at least one of the personnel conveying device operates at rated speed and at idle speed, and the second operation state includes at least one of an energized state, a start operation state, a normal shutdown state and an abnormal shutdown state of the personnel conveying device.

[0006] Preferably, the theme setting module comprises a personalized setting sub-module, which comprises a first setting unit and a second setting unit, wherein through the first setting unit, the user can set the first sub-lighting theme of the lighting device under the rated speed of the personnel conveying device, and through the second setting unit, the user can set the second sub-lighting theme of the lighting device under the idle speed of the personnel conveying device.

[0007] Preferably, the first setting unit and the second setting unit each further comprise a synchronization option, which can be switched between an active mode, in which the first sub-lighting theme and the second sub-lighting theme are set in association with the personnel conveying device, and an inactive mode, in which the first sub-lighting theme and the second sub-lighting theme are set independently of the personnel conveying device.

[0008] Preferably, the synchronization option includes a speed sub-option and a direction sub-option, wherein in the active mode, the first sub-lighting theme and the second sub-lighting theme are set to be able to represent the traveling direction and/or the traveling speed of the personnel conveying device, and in the inactive mode, the first sub-lighting theme and the second sub-lighting theme are set independently of the traveling speed and the traveling direction of the personnel conveying device.

[0009] Preferably, the first setting unit and the second setting unit each comprise: a lighting effect option, including a plurality of predetermined lighting effects, wherein the predetermined lighting effects at least include static, marquee and flashing; a light color option, including a plurality of predetermined light colors; a brightness option, including multiple predetermined brightness.

[0010] Preferably, the theme setting module further comprises a first predetermined theme module, and wherein a user can select a first predetermined theme of the first predetermined theme module for a first operation state.

[0011] Preferably, the first predetermined theme has a first primary predetermined theme and a first secondary predetermined theme for the personnel conveying device operating at rated speed and idle speed, respectively.

[0012] Preferably, the first primary predetermined theme includes a first color block located at one end of the personnel conveying device, a second color block located at the other end of the personnel conveying device, and a third color point moving in the same direction as the traveling direction of the personnel conveying device, and wherein the first color block and the second color block present a breathing effect.

[0013] Preferably, the first secondary predetermined theme includes a first color block located at one end of the personnel conveying device and a second color block located at the other end of the personnel conveying device, and wherein the first color block and the second color block present a static effect.

[0014] Preferably, the theme setting module further comprises a second predetermined theme module, and a user can select a second predetermined theme of the second predetermined theme module for the first operation state.

[0015] Preferably, the second predetermined theme has a second primary predetermined theme and a second secondary predetermined theme for the personnel

conveying device operating at rated speed and idle speed, respectively.

[0016] Preferably, the second primary predetermined theme includes a first cool color block, a second cool color block, a first intermediate transition color block from the first cool color block to the second cool color block, and a second intermediate transition color block from the second cool color block to the first cool color block to present an aurora effect, wherein a circulating moving direction of the first cool color block, the first transition color block, the second cool color block and the second transition color block is the same as the traveling direction of the personnel conveying device.

[0017] Preferably, the second primary predetermined theme includes a first cool color block, a second cool color block, a first intermediate transition color block from the first cool color block to the second cool color block, and a second intermediate transition color block from the second cool color block to the first cool color block to present an aurora effect, wherein a circulating moving direction of the first cool color block, the first transition color block, the second cool color block and the second transition color block is the same as the traveling direction of the personnel conveying device, wherein a brightness of the second secondary predetermined theme is lower than that of the second primary predetermined theme.

[0018] Preferably, the theme setting module further comprises a third predetermined theme module, and a user can select a third predetermined theme of the third predetermined theme module for the first operation state.

[0019] Preferably, the third predetermined theme has a third primary predetermined theme and a third secondary predetermined theme for the personnel conveying device operating at rated speed and idle speed, respectively.

[0020] Preferably, the third primary predetermined theme includes a warm color block, a cold color block and an intermediate transition color block, and a circulating moving direction of the warm color block, the transition color block and the cold color block is the same as the traveling direction of the personnel conveying device.

[0021] Preferably, the third secondary predetermined theme includes a warm color block, a cold color block and an intermediate transition color block, and a circulating moving direction of the warm color block, the transition color block and the cold color block is the same as the traveling direction of the personnel conveying device, wherein a brightness of the third secondary predetermined theme is lower than that of the third primary predetermined theme.

[0022] Preferably, the theme setting module further comprises a fourth predetermined theme module, and a user can select a fourth predetermined theme of the fourth predetermined theme module for the first operation state.

[0023] Preferably, the fourth predetermined theme has a fourth primary predetermined theme and a fourth secondary predetermined theme for the personnel conveying device operating at rated speed and idle speed, respectively.

[0024] Preferably, the fourth primary predetermined theme includes a plurality of color block groups sequentially arranged from one end to the other end of the personnel conveying device, wherein each color block group gradually transits from blue to white, the lengths of the color block groups are different from each other to present a wave effect, and a moving direction of the color block groups is the same as the traveling direction of the personnel conveying device.

[0025] Preferably, the fourth secondary predetermined theme includes a blue color block that presents a breathing effect along the traveling direction of the personnel conveying device.

[0026] Preferably, the theme setting module further comprises a fifth predetermined theme module, and the user can select a fifth predetermined theme of the five predetermined theme module for the first operation state.

[0027] Preferably, the fifth predetermined theme has a fifth primary predetermined theme and a fifth secondary predetermined theme for the personnel conveying device operating at rated speed and idle speed, respectively.

[0028] Preferably, the fifth primary predetermined theme includes a red color block, an orange color block, a yellow color block, a green color block, a cyan color block, a blue color block and a purple color block arranged in sequence to present a rainbow effect, and a traveling direction of these color blocks is the same as that of the personnel conveying device.

[0029] Preferably, the fifth secondary predetermined theme includes a red color block, an orange color block, a yellow color block, a green color block, a cyan color block, a blue color block and a purple color block arranged in sequence to present a rainbow effect, and a traveling direction of these color blocks is the same as that of the personnel conveying device, wherein a brightness of the fifth secondary predetermined theme is lower than that of the fifth primary predetermined theme.

[0030] Preferably, the second lighting theme has a first sub-theme, a second sub-theme, a third sub-theme and a fourth sub-theme respectively for the electrified state, the starting operation state, the normal shutdown state and the abnormal shutdown state of the personnel conveying device.

[0031] Preferably, the first sub-theme includes color blocks arranged along a length direction of the personnel conveying device, and the color blocks gradually change from blank to full filled.

[0032] Preferably, the second sub-theme includes color blocks arranged along a length direction of the personnel conveying device, which gradually change from blank to full-filled, and breathe for a predetermined number of times.

[0033] Preferably, the third sub-theme is lighting extinction.

[0034] Preferably, the fourth sub-theme includes red color blocks arranged along a length direction of the personnel conveying device, and the red color blocks are blinking.

[0035] Preferably, in the case of a plurality of personnel conveying devices, the remote operation device can be communicably connected to the lighting controller of each personnel conveying device, and is configured to be able to group the personnel conveying devices to uniformly set the first lighting theme for each group of personnel conveying devices.

[0036] Preferably, the lighting device comprises a plurality of first light sources arranged along a handrail of the personnel conveying device and a plurality of second light sources arranged along a skirt plate of the personnel conveying device.

[0037] Preferably, the theme setting module further comprises a light source option configured to be able to select a first light source and a second light source to independently set a first lighting theme for the first light source and the second light source.

[0038] Preferably, the theme setting module further comprises an all-application option to apply the first lighting theme set for one of the first light source and the second light source to the other of the first light source and the second light source.

[0039] Preferably, the lighting controller comprises a sensing interface for connecting to an optical sensor which can be exposed to the external environment and deviates from the lighting direction of the lighting device to sense the brightness of the external environment, so that the lighting controller changes the brightness of the first lighting theme or the second lighting theme based on the brightness of the external environment to adapt to the brightness of the external environment.

Brief description of the drawings

[0040] The above and other features and advantages of exemplary embodiments of the present invention will become more apparent from the following detailed description taken in conjunction with the accompanying drawings, which are for illustrative purposes only and are not intended to limit the scope of the present invention in any way.

Fig. 1 shows a schematic diagram of a lighting system according to the present application.

Fig. 2 shows a schematic diagram of an interface of a remote operation device according to the present application.

Fig. 3 shows a schematic diagram of an interface of a personalized setting sub-module.

Fig. 4 shows a schematic diagram of a setting unit of the personalized setting sub-module.

Fig. 5 shows a schematic diagram associated with a plurality of people conveying devices.

Fig. 6 shows a schematic diagram of an interface for grouping a plurality of people conveying devices.

Detailed description

[0041] In order to make the purpose, technical scheme and advantages of the technical scheme of the present disclosure more clear, the technical scheme of the embodiment of the present disclosure will be described clearly and completely with the accompanying drawings of specific embodiments of the present disclosure. Like reference numerals in the drawings represent like parts. It should be noted that the described embodiment is a part of the embodiment of the present disclosure, not the whole embodiment. Based on the described embodiments of the present disclosure, all other embodiments obtained by ordinary people in the field without creative labor belong to the scope of protection of the present disclosure.

[0042] Compared with the embodiment shown in the drawings, the feasible embodiments within the protection scope of this disclosure may have fewer components, other components not shown in the drawings, different components, components arranged differently or components connected differently, etc. Furthermore, two or more components in the drawings may be implemented in a single component, or a single component shown in the drawings may be implemented as a plurality of separate components.

[0043] Unless otherwise defined, technical terms or scientific terms used herein shall have their ordinary meanings as understood by people with ordinary skills in the field to which this disclosure belongs. The words "first", "second" and similar words used in the specification and claims of the patent application of this disclosure do not indicate any order, quantity or importance, but are only used to distinguish different components. When the number of parts is not specified, the number of parts can be one or more; Similarly, similar words such as "one", "the" and "the" do not necessarily mean quantity limitation. Similar words such as "including" or "containing" mean that the elements or objects appearing before the word cover the elements or objects listed after the word and their equivalents, without excluding other elements or objects. "Up", "Down", "Left" and "Right" are only used to indicate the relative orientation relationship when the equipment is used or the orientation relationship shown in the attached drawings. When the absolute position of the described object changes, the relative orientation relationship may also change accordingly.

[0044] Fig. 1 shows a lighting system for a people conveying device such as an escalator, a moving sidewalk, etc. according to the present application. The lighting system includes a lighting device 1 having a plurality of light sources (e.g., LED strip) arranged along a length direction of the personnel conveying device; a control unit 2, configured to control an operation state of the personnel conveying device and generally arranged in a pit of the personnel conveying device; a lighting controller 3,

which is communicably connected to a control unit 2 and the lighting device 1, can receive the operation state of the personnel conveying device from the control unit 2 and select different lighting themes of the lighting device based on the operation state. A remote operation device 4 is communicatively connected to the lighting controller 3 (for example, via wireless WIFI or wired mode), and has a theme setting module, through which a user can set the lighting theme of the lighting device according to the operation state and send the set lighting theme to the lighting controller, so that the lighting controller is configured to control the lighting device according to the set lighting theme.

[0045] In the above description, the lighting controller 3 is communicatively connected to the control unit 2, but it should be understood by those skilled in the art that this is only exemplary. As long as the lighting controller 3 is communicably connected to the personnel conveying device to obtain an operation state from the personnel conveying device.

[0046] Generally speaking, the operation state of the personnel conveying device includes a power-on state, a starting operation state, a normal shutdown state and an abnormal shutdown state of the personnel conveying device, and states in which the personnel conveying device operates at a rated speed and at an idle speed. For the personnel conveying device running at a rated speed and at an idle speed, it is called a first operation state, and for the power-on state, the starting operation state, the normal shutdown state and the abnormal shutdown state of the personnel conveying device, it is called a second operation state. The user can select different lighting themes for the first operation state, as described below. The user cannot select the lighting theme for the second operation state, and the lighting theme for the second operation state is pre-stored in the lighting controller, for example, it is set at the factory or modified by authorized personnel after leaving the factory.

[0047] For the first operation state in which the personnel conveying device running at a rated speed and an idling speed, the user can select different lighting themes via a personalized setting sub-module 41 and five predetermined theme modules of the theme setting module. In the personalized setting sub-module, an user can set lighting themes based on their preferences, and predetermined lighting themes have been stored in the five predetermined lighting theme modules, and users can select the predetermined lighting themes. Next, the personalized setting sub-module and five predetermined theme modules are described respectively.

[0048] The personalized setting sub-module 41 includes a first setting unit 411 and a second setting unit 412. Through the first setting unit 411, the user can set a first sub-lighting theme of the lighting device when the personnel conveying device is running at a rated speed, and through the second setting unit 412, the user can set a second sub-lighting theme of the lighting device when the personnel conveying device is running at an idle speed.

[0049] Both the first setting unit 411 and the second setting unit 412 can be turned on and off by the user. In the case of turning on, the user can use the first setting unit 411 and the second setting unit 412 to set the lighting theme, and in the case of turning off, the corresponding sub-lighting theme for the turned off setting unit is off. For example, when the first setting unit 411 is turned off, the lighting device does not emit light when the personnel conveying device is running at the rated speed, and at this time, the first sub-lighting theme is in a closed state, that is, there is no lighting effect; when the second setting unit 412 is turned off, the lighting device does not emit light when the personnel conveying device is running at the idle speed, and at this time, the second sub-lighting theme is in a closed state, that is, there is no lighting effect.

[0050] The first setting unit 411 and the second setting unit 412 each include a synchronization option 413, which can be switched between an active mode, in which the first sub-lighting theme and the second sub-lighting theme are set in association with the personnel conveying device, and an inactive mode, in which the first sub-lighting theme and the second sub-lighting theme are set independently of the personnel conveying device.

[0051] The synchronization option 413 includes a speed sub-option 4131 and a direction sub-option 4132. In the active mode, the first sub-lighting theme and the second sub-lighting theme are set to be able to represent a traveling direction and a traveling speed of the personnel conveying device. For example, in the active mode, the first sub-lighting theme and the second sub-lighting theme can indicate that the personnel conveying device is upward when the traveling direction of the personnel conveying device is upward. Moreover, the first sub-lighting theme and the second sub-lighting theme can show the traveling speeds of the personnel conveying devices when the traveling speeds of the personnel conveying devices are different. For example, when the traveling speed of the personnel conveying device is faster and slower respectively, the first sub-lighting theme and the second sub-lighting theme respectively show that the personnel conveying device is running at a faster speed and at a slower speed.

[0052] In the inactive mode, the first sub-lighting theme and the second sub-lighting theme are set independently of the travel speed and direction of the personnel conveying device, that is, they cannot show the travel speed and direction of the personnel conveying device.

[0053] Both the first setting unit 411 and the second setting unit 412 include a lighting effect option 414, which includes a plurality of predetermined lighting effects, including at least static, marquee and blinking; a light color option 415 including a plurality of predetermined light colors; a brightness option 416 including a plurality of predetermined brightness. Through the lighting effect option, the light color option and the brightness option, the user can set the first sub-lighting theme and the

second sub-lighting theme, thus realizing a synchronization effect in the active mode of the synchronization option.

[0054] The theme setting module further includes a first predetermined theme module (also called a flowing theme module) 42, and the user can select a first predetermined theme of the first predetermined theme module for the first operation state. Especially, the user can set a first primary predetermined theme and a first secondary predetermined theme respectively for the personnel conveying device running at rated speed and idling speed, that is, the first predetermined theme has the first primary predetermined theme and the first secondary predetermined theme.

[0055] The first primary predetermined theme includes a first color block located at one end of the personnel conveying device, a second color block located at the other end of the personnel conveying device, and a third color point moving in the same direction as the traveling direction of the personnel conveying device, and the first color block and the second color block present a breathing effect. For example, the first color block is a red color block, the second color block is a green color block, and the third color point is a white color point. The white color point moves in the same direction as the traveling direction of the personnel conveying device, and the red color block and the green color block present a breathing effect, similar to a breathing light.

[0056] The first secondary predetermined theme includes a first color block located at one end of the personnel conveying device and a second color block located at the other end of the personnel conveying device, and the first color block and the second color block present a static effect.

[0057] For example, a color block at an entrance end of the personnel conveying device can be green, and a color block at an exit end of the personnel conveying device can be red.

[0058] The theme setting module also includes a second predetermined theme module (also called aurora theme module) 43, and the user can select a second predetermined theme of the second predetermined theme module for the first operation state. In particular, the user can set a second primary predetermined theme and a second secondary predetermined theme respectively for the personnel conveying device running at rated speed and idling speed, that is, the second predetermined theme has the second primary predetermined theme and the second secondary predetermined theme.

[0059] The second primary predetermined theme includes a first cool color block, a second cool color block, a first intermediate transition color block from the first cool color block to the second cool color block, and a second intermediate transition color block from the second cool color block to the first cool color block to present an aurora effect. A circulating moving directions of the first cool color block, the first transition color block, the second cool color block and the second transition color block are the same as the traveling direction of the personnel conveying device.

[0060] The second secondary predetermined theme is basically the same as the second primary predetermined theme, except that a brightness of the second secondary predetermined theme is lower than that of the second primary predetermined theme, for example, 70% of the brightness of the second primary predetermined theme.

[0061] The theme setting module further includes a third predetermined theme module (also called festival theme module) 44, and the user can select a third predetermined theme of the third predetermined theme module for the first operation state. Especially, the user can set a third primary predetermined theme and a third secondary predetermined theme respectively for the personnel conveying device running at rated speed and idling speed, that is, the third predetermined theme has the third primary predetermined theme and the third secondary predetermined theme.

[0062] The third primary predetermined theme includes a warm color block, a cold color block and an intermediate transition color block. The warm color block, cold color block and transition color block are constantly changing, thus presenting a colorful effect, and a moving direction of the warm color block, cold color block and transition color block is the same as that of the personnel conveying device.

[0063] The third sub predetermined theme is basically the same as the third primary predetermined theme, except that the brightness of the third sub predetermined theme is lower than that of the third primary predetermined theme, for example, 70% of the brightness of the third primary predetermined theme.

[0064] The theme setting module further includes a fourth predetermined theme module (also called wave theme module) 45, and the user can select a fourth predetermined theme of the fourth predetermined theme module for the first operation state. Especially, the user can set a fourth primary predetermined theme and a fourth secondary predetermined theme respectively for the personnel conveying device running at rated speed and idling speed, that is, the fourth predetermined theme has the fourth primary predetermined theme and the fourth secondary predetermined theme.

[0065] The fourth primary predetermined theme includes a plurality of color block groups sequentially arranged from one end of the personnel conveying device to the other end, each color block group gradually transits from blue to white, the lengths of the color block groups are different from each other to present a wave effect. Moving directions of the color block groups are the same as the traveling direction of the personnel conveying device.

[0066] The fourth sub predetermined theme includes a blue color block, which presents a breathing effect along the traveling direction of the personnel conveying device.

[0067] The theme setting module further includes a fifth predetermined theme module (also called rainbow

theme module) 46, and the user can select a fifth predetermined theme of the fifth predetermined theme module for the first operation state. Especially, the user can set a fifth main predetermined theme and a fifth sub predetermined theme respectively for the personnel conveying device running at rated speed and idling speed, that is, the fifth predetermined theme has the fifth main predetermined theme and the fifth sub-predetermined theme.

[0068] The fifth main predetermined theme includes a red color block, an orange color block, a yellow color block, a green color block, a cyan color block, a blue color block and a purple color block which are arranged in sequence, that is, seven color blocks are continuously changed to present a rainbow effect, and the traveling directions of these color blocks are the same as those of personnel conveying device.

[0069] The fifth sub predetermined theme is basically the same as the fifth main predetermined theme, except that the brightness of the fifth sub predetermined theme is lower than that of the fifth main predetermined theme, for example, 70% of the brightness of the fifth main predetermined theme.

[0070] The second lighting theme has a first sub-theme, a second sub-theme, a third sub-theme and a fourth sub-theme for the power-on state, the starting operation state, the normal shutdown state and the abnormal shutdown state of the personnel conveying device respectively. These themes cannot be set by the user, but are stored in the lighting controller in advance. The power-on state is closely related to the starting operation state. In fact, the starting operation state includes a part of the power-on state, that is, power-on first and then start running, which can also be seen from the following descriptions of a first sub-theme and a second sub-theme.

[0071] The first sub-theme includes color blocks arranged along the length direction of the personnel conveying device, and the color blocks gradually change from blank to full filling. The second sub-theme includes color blocks arranged along the traveling direction of the personnel conveying device, which gradually changes from blank to full filling and breathes for a predetermined number of times (for example, 3 times), which indicates that the personnel conveying device is ready to run.

[0072] The third sub-theme is that the lighting goes out. The fourth sub-theme includes a red color block arranged along the traveling direction of the personnel conveying device, and the red color block flashes.

[0073] As shown in Fig. 5, in the case of a plurality of personnel conveying devices, a remote operation device 4 can be communicably connected to the lighting controller of each personnel conveying device, and is configured to be able to group a plurality of personnel conveying devices (for example, the personnel conveying devices in a group form a local area network) so as to uniformly set the first lighting theme for each group of personnel conveying devices.

[0074] For example, as shown in Fig. 6, the remote operation device 4 includes a first group S1 including two personnel conveying devices A and B; a second group S2, which includes two personnel conveying devices A' and B'; a third group S3, which includes four people conveying devices A", B", C and D. However, those skilled in the art should understand that people conveying devices can be grouped as needed, and are not limited to the above examples.

[0075] The lighting device comprises a plurality of first light sources arranged along a handrail of the personnel conveying device and a plurality of second light sources arranged along a skirt of the personnel conveying device.

[0076] The theme setting module further includes a first light source option 47 and a second light source option 48 configured to be able to select the first light source and the second light source to independently set the first lighting theme for the first light source and the second light source.

[0077] The theme setting module further includes an all application option 49 to apply the first lighting theme set for one of the first light source and the second light source to the other of the first light source and the second light source.

[0078] The lighting controller can be arranged in a pit of the personnel conveying device. As shown in Fig. 1, the lighting controller includes a sensing interface 31 for connecting to an optical sensor 32, which can be exposed to the external environment and deviate from the lighting direction of the lighting device to sense the brightness of the external environment, so that the lighting controller changes the brightness of the first lighting theme or the second lighting theme based on the brightness of the external environment to adapt to the brightness of the external environment, similar to an automatic brightness adjustment of an electronic screen. In particular, the optical sensor 31 has a higher priority than the brightness option 416.

[0079] The lighting controller also includes an external port 33 that can be connected to an external controller through which an authorized person can set or change the second lighting theme.

[0080] Although the present invention has been described in the specification and illustrated in the drawings on the basis of referring to various embodiments, those skilled in the art can understand that the above-mentioned embodiments are only preferred embodiments, and some technical features in the embodiments may not be necessary for solving specific technical problems, so these technical features may not be needed or omitted without affecting the solution of technical problems or the formation of technical solutions; Moreover, the features, elements and/or functions of one embodiment can be combined, combined or coordinated with those of one or more other embodiments as appropriate, unless the combination, combination or coordination is obviously impracticable.

Claims

1. A lighting system for a personnel conveying device, comprising:

   a lighting device (1) having a plurality of light sources arranged along a length direction of the personnel conveying device;
   a lighting controller (3) communicatively connected to the personnel conveying device and the lighting device (1), capable of receiving an operation state of the personnel conveying device and selecting different lighting themes of the lighting device (1) based on the operation state;
   a remote operation device (4) communicatively connected to the lighting controller (3), the remote operation device having a theme setting module, through which a user can set the lighting theme of the lighting device according to the operation state and send the set lighting theme to the lighting controller,
   wherein, the lighting controller (3) is configured to control the lighting device (1) according to the set lighting theme.

2. The lighting system according to claim 1, wherein the operating state comprises a first operating state and a second operating state,
   wherein through the theme setting module, the user can set a first lighting theme of the lighting device (1) for the first operation state, but cannot set a second lighting theme of the lighting device for the second operation state, and the second lighting theme for the second operation state is stored in the lighting controller (3) in advance.

3. The lighting system according to claim 2, wherein the first operation state includes that at least one of the personnel conveying device operates at rated speed and at idle speed, and the second operation state includes at least one of an energized state, a start operation state, a normal shutdown state and an abnormal shutdown state of the personnel conveying device.

4. The lighting system according to claim 3, wherein the theme setting module comprises a personalized setting sub-module (41), which comprises a first setting unit (411) and a second setting unit (412), wherein through the first setting unit, the user can set the first sub-lighting theme of the lighting device (1) under the rated speed of the personnel conveying device, and through the second setting unit, the user can set the second sub-lighting theme of the lighting device under the idle speed of the personnel conveying device.

5. The lighting system according to claim 4, wherein the first setting unit (411) and the second setting unit (412) each further comprise a synchronization option (413), which can be switched between an active mode, in which the first sub-lighting theme and the second sub-lighting theme are set in association with the personnel conveying device, and an inactive mode, in which the first sub-lighting theme and the second sub-lighting theme are set independently of the personnel conveying device.

6. The lighting system according to claim 5, wherein the synchronization option (413) includes a speed sub-option (4131) and a direction sub-option (4132), wherein in the active mode, the first sub-lighting theme and the second sub-lighting theme are set to be able to represent the traveling direction and/or the traveling speed of the personnel conveying device, and in the inactive mode, the first sub-lighting theme and the second sub-lighting theme are set independently of the traveling speed and the traveling direction of the personnel conveying device.

7. The lighting system according to claim 5,
   wherein the first setting unit and the second setting unit each comprise:

   a lighting effect option (414), including a plurality of predetermined lighting effects, wherein the predetermined lighting effects at least include static, marquee and flashing;
   a light color option (415), including a plurality of predetermined light colors;
   a brightness option (416), including multiple predetermined brightness.

8. The lighting system according to any one of claims 1 to 7, wherein the theme setting module further comprises a first predetermined theme module (42), and wherein a user can select a first predetermined theme of the first predetermined theme module for a first operation state,

   wherein preferably the first predetermined theme has a first primary predetermined theme and a first secondary predetermined theme for the personnel conveying device operating at rated speed and idle speed, respectively,
   and preferably
   the first primary predetermined theme includes a first color block located at one end of the personnel conveying device, a second color block located at the other end of the personnel conveying device, and a third color point moving in the same direction as the traveling direction of the personnel conveying device, and wherein the first color block and the second color block present a breathing effect, and/or

the first secondary predetermined theme includes a first color block located at one end of the personnel conveying device and a second color block located at the other end of the personnel conveying device, and wherein the first color block and the second color block present a static effect.

9. The lighting system according to any one of claims 1 to 7, wherein the theme setting module further comprises a second predetermined theme module (43), and a user can select a second predetermined theme of the second predetermined theme module for the first operation state,

wherein preferably the second predetermined theme has a second primary predetermined theme and a second secondary predetermined theme for the personnel conveying device operating at rated speed and idle speed, respectively,
and preferably the second primary predetermined theme includes a first cool color block, a second cool color block, a first intermediate transition color block from the first cool color block to the second cool color block, and a second intermediate transition color block from the second cool color block to the first cool color block to present an aurora effect, wherein a circulating moving direction of the first cool color block, the first transition color block, the second cool color block and the second transition color block is the same as the traveling direction of the personnel conveying device,
and preferably the second primary predetermined theme includes a first cool color block, a second cool color block, a first intermediate transition color block from the first cool color block to the second cool color block, and a second intermediate transition color block from the second cool color block to the first cool color block to present an aurora effect, wherein a circulating moving direction of the first cool color block, the first transition color block, the second cool color block and the second transition color block is the same as the traveling direction of the personnel conveying device, wherein a brightness of the second secondary predetermined theme is lower than that of the second primary predetermined theme.

10. The lighting system according to any one of claims 1 to 7, wherein the theme setting module further comprises a third predetermined theme module (44), and a user can select a third predetermined theme of the third predetermined theme module for the first operation state,

wherein preferably the third predetermined theme has a third primary predetermined theme and a third secondary predetermined theme for the personnel conveying device operating at rated speed and idle speed, respectively,
and preferably the third primary predetermined theme includes a warm color block, a cold color block and an intermediate transition color block, and a circulating moving direction of the warm color block, the transition color block and the cold color block is the same as the traveling direction of the personnel conveying device (1), and preferably the third secondary predetermined theme includes a warm color block, a cold color block and an intermediate transition color block, and a circulating moving direction of the warm color block, the transition color block and the cold color block is the same as the traveling direction of the personnel conveying device, wherein a brightness of the third secondary predetermined theme is lower than that of the third primary predetermined theme.

11. The lighting system according to any one of claims 1 to 7, wherein the theme setting module further comprises a fourth predetermined theme module, and a user can select a fourth predetermined theme of the fourth predetermined theme module for the first operation state,

wherein preferably the fourth predetermined theme has a fourth primary predetermined theme and a fourth secondary predetermined theme for the personnel conveying device operating at rated speed and idle speed, respectively,
and preferably
the fourth primary predetermined theme includes a plurality of color block groups sequentially arranged from one end to the other end of the personnel conveying device, wherein each color block group gradually transits from blue to white, the lengths of the color block groups are different from each other to present a wave effect, and a moving direction of the color block groups is the same as the traveling direction of the personnel conveying device,
and/or the fourth secondary predetermined theme includes a blue color block that presents a breathing effect along the traveling direction of the personnel conveying device.

12. The lighting system according to any one of claims 1 to 7, wherein the theme setting module further comprises a fifth predetermined theme module (46), and the user can select a fifth predetermined theme of the five predetermined theme module for the first operation state,

wherein preferably the fifth predetermined theme has a fifth primary predetermined theme and a fifth secondary predetermined theme for the personnel conveying device operating at rated speed and idle speed, respectively,
and preferably the fifth primary predetermined theme includes a red color block, an orange color block, a yellow color block, a green color block, a cyan color block, a blue color block and a purple color block arranged in sequence to present a rainbow effect, and a traveling direction of these color blocks is the same as that of the personnel conveying device,
and preferably the fifth secondary predetermined theme includes a red color block, an orange color block, a yellow color block, a green color block, a cyan color block, a blue color block and a purple color block arranged in sequence to present a rainbow effect, and a traveling direction of these color blocks is the same as that of the personnel conveying device, wherein a brightness of the fifth secondary predetermined theme is lower than that of the fifth primary predetermined theme.

13. The lighting system according to any one of claims 1 to 7, wherein the second lighting theme has a first sub-theme, a second sub-theme, a third sub-theme and a fourth sub-theme respectively for the electrified state, the starting operation state, the normal shutdown state and the abnormal shutdown state of the personnel conveying device,

wherein preferably
the first sub-theme includes color blocks arranged along a length direction of the personnel conveying device, and the color blocks gradually change from blank to full filled,
and/or
the second sub-theme includes color blocks arranged along a length direction of the personnel conveying device, which gradually change from blank to full-filled, and breathe for a predetermined number of times,
and/or
the third sub-theme is lighting extinction,
and/or
the fourth sub-theme includes red color blocks arranged along a length direction of the personnel conveying device, and the red color blocks are blinking.

14. The lighting system according to any one of claims 1 to 7, wherein, in the case of a plurality of personnel conveying devices, the remote operation device (4) can be communicably connected to the lighting controller (3) of each personnel conveying device, and is configured to be able to group the personnel conveying devices to uniformly set the first lighting theme for each group of personnel conveying devices.

15. The lighting system according to any one of claims 1 to 7, wherein the lighting device (1) comprises a plurality of first light sources arranged along a handrail of the personnel conveying device and a plurality of second light sources arranged along a skirt plate of the personnel conveying device,

wherein preferably the theme setting module further comprises a light source option (47) configured to be able to select a first light source and a second light source to independently set a first lighting theme for the first light source and the second light source, and
wherein preferably the theme setting module further comprises an all-application option (49) to apply the first lighting theme set for one of the first light source and the second light source to the other of the first light source and the second light source.

16. The lighting system according to any one of claims 1 to 7, wherein the lighting controller (3) comprises a sensing interface (31) for connecting to an optical sensor (32) which can be exposed to the external environment and deviates from the lighting direction of the lighting device (1) to sense the brightness of the external environment, so that the lighting controller (3) changes the brightness of the first lighting theme or the second lighting theme based on the brightness of the external environment to adapt to the brightness of the external environment.

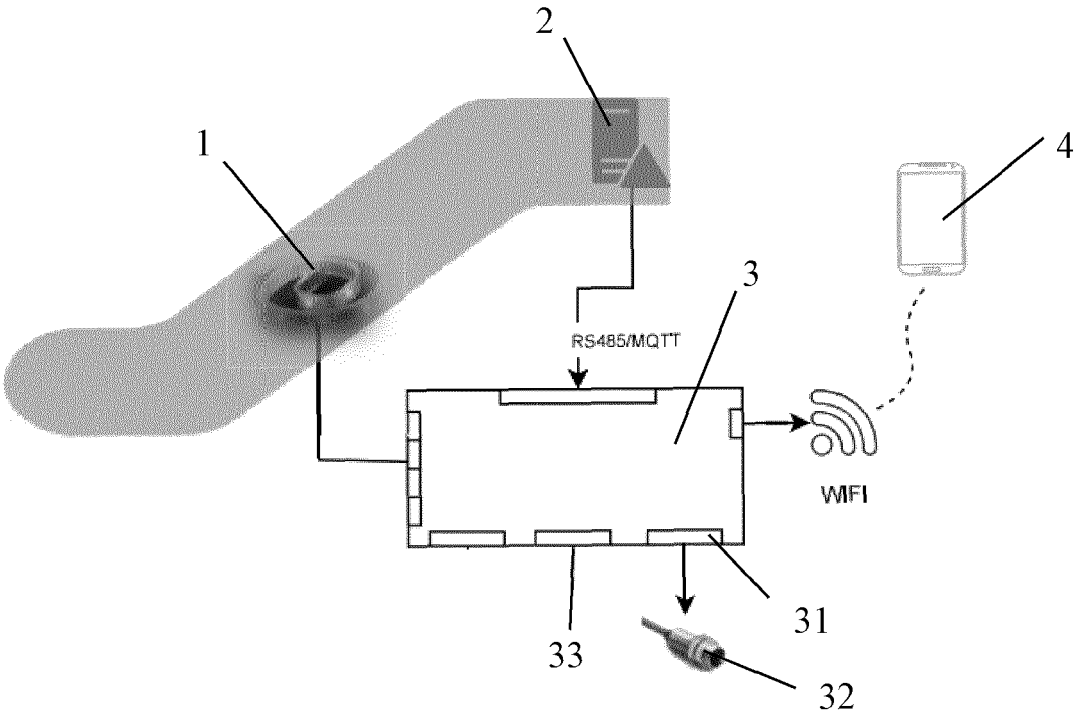

Fig.1

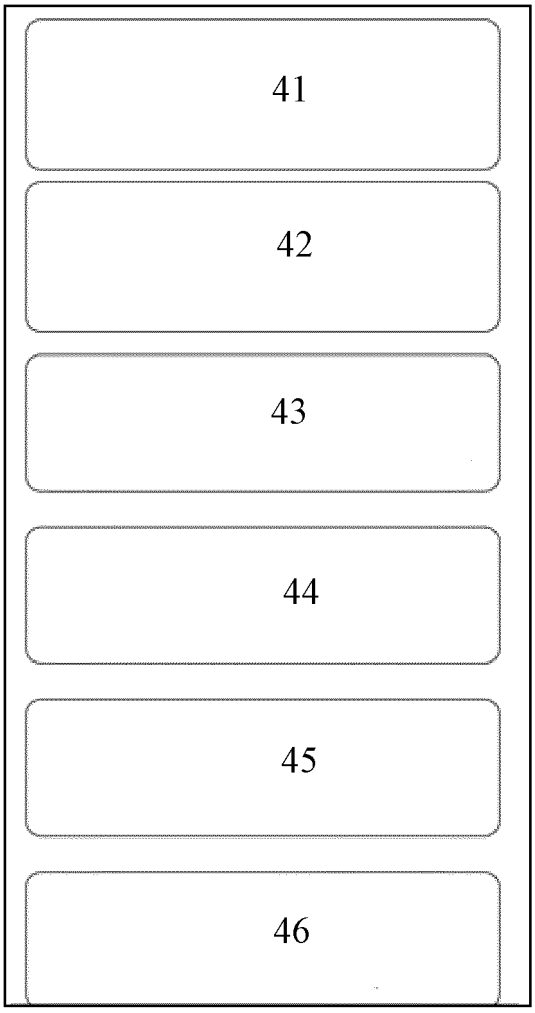

Fig.2

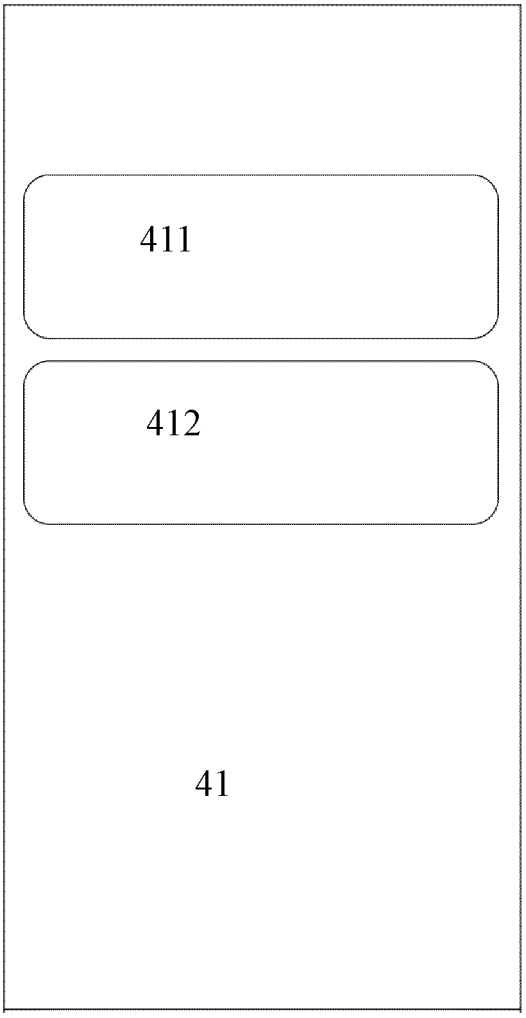

Fig.3

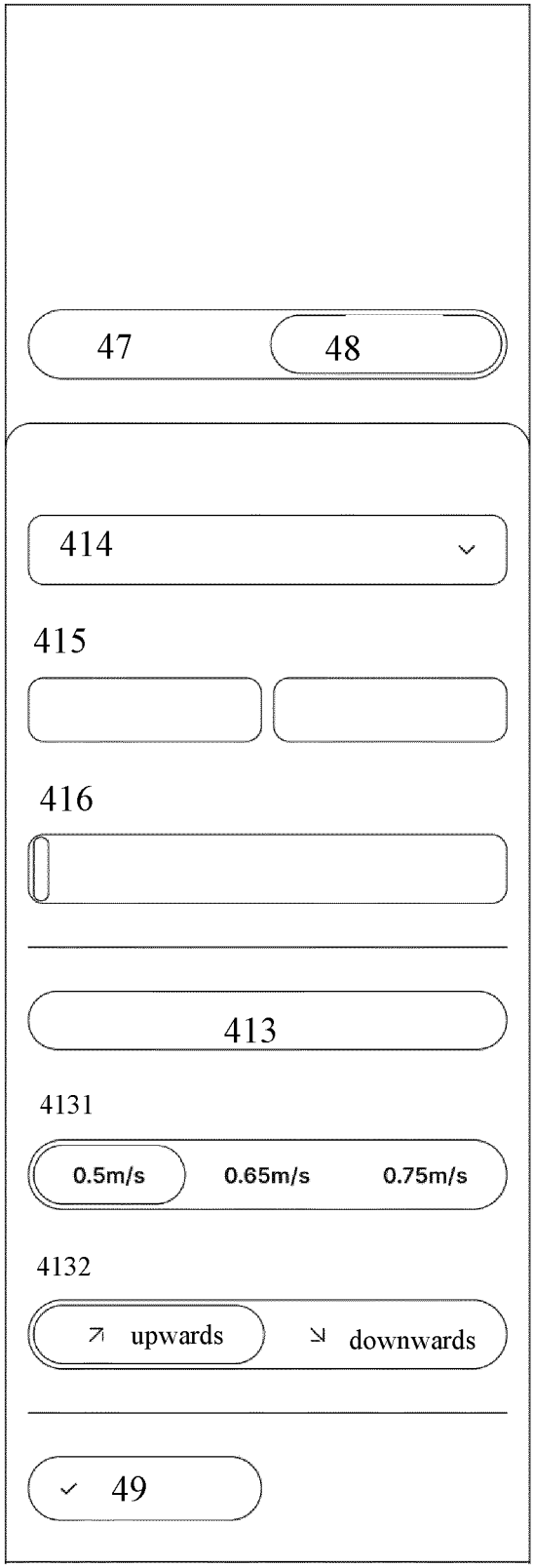
47
48
414
415
416
413
4131
0.5m/s
0.65m/s
0.75m/s
4132
upwards
downwards
49

Fig.4

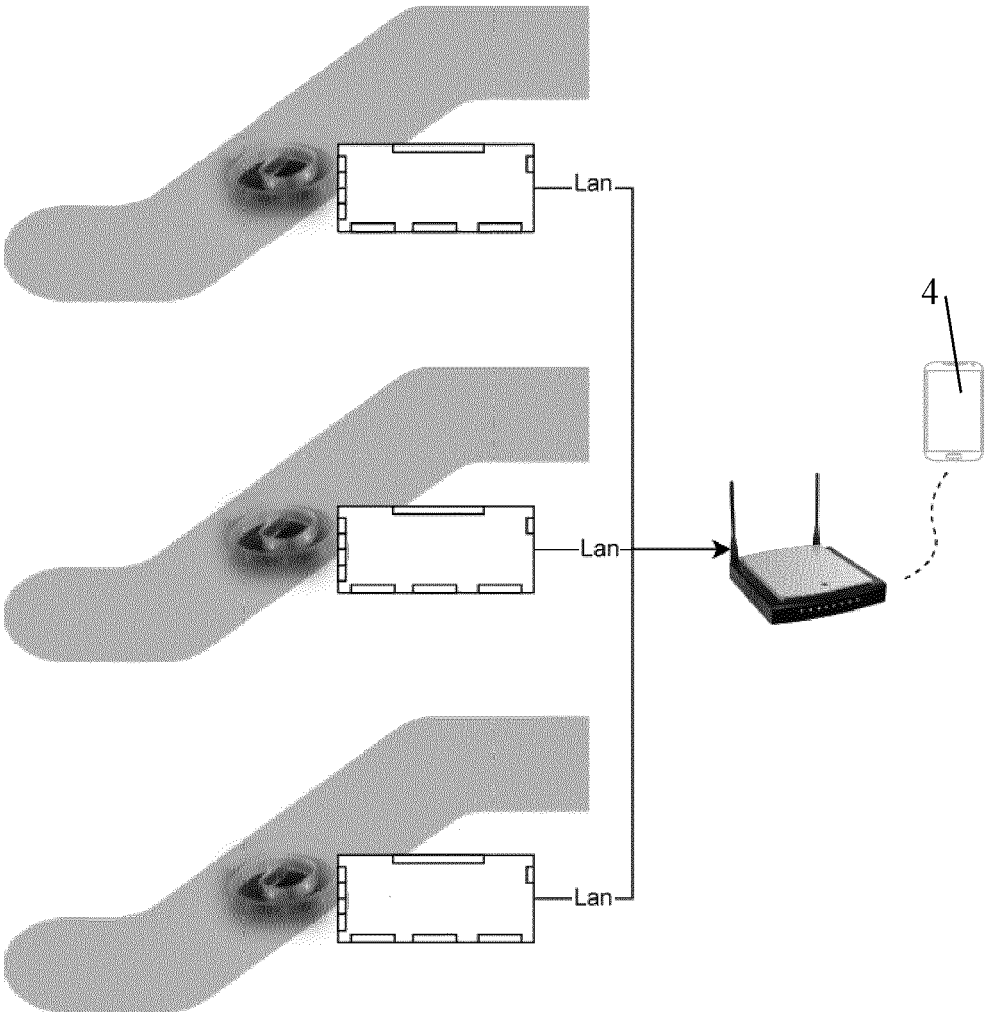

Fig.5

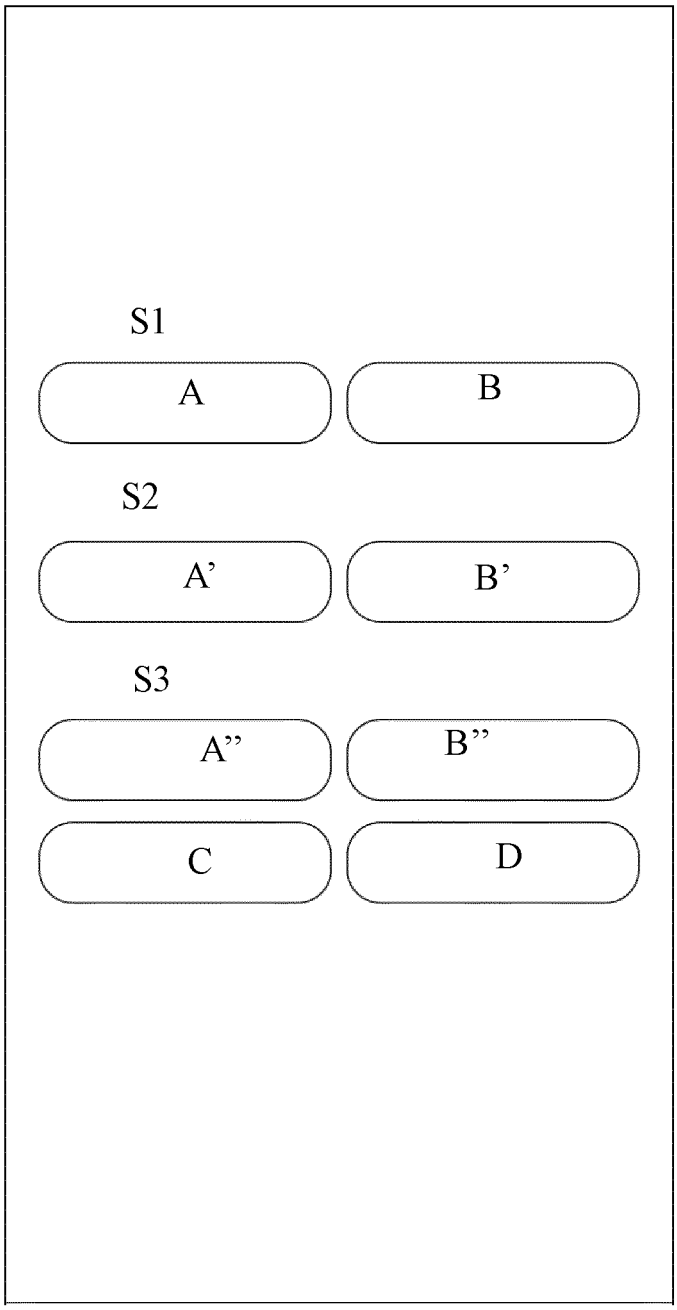

Fig.6

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EUROPEAN SEARCH REPORT

Application Number
EP 24 22 3504

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2017/129638 A1 (INVENTIO AG [CH]) 3 August 2017 (2017-08-03) * figure 1 * * page 8, lines 18-27 * * page 9, lines 8-13 *	1-16	INV. B66B31/00 ADD. B66B23/22
A	WO 2018/008107 A1 (MITSUBISHI ELECTRIC CORP [JP]) 11 January 2018 (2018-01-11) * paragraphs [0030], [0040], [0041]; figures 2,4,5 *	1-16	

TECHNICAL FIELDS SEARCHED (IPC)

B66B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	19 May 2025	Miklos, Zoltan

CATEGORY OF CITED DOCUMENTS

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19-05-2025

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		WO 2017129638 A1	03-08-2017
WO 2018008107 A1	11-01-2018	JP WO2018008107 A1	12-07-2018
		WO 2018008107 A1	11-01-2018

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