

Lighting Control Device for an Elevator

FIELD

5 The present invention relates to a lighting control device for an elevator, especially a control device for controlling intensity and colour of top illumination in the elevator's car.

BACKGROUND

10 In a top tray of an elevator's elevator car, a lighting device is installed so as to illuminate the elevator car's interior space. The lighting device has a light-emitting part (for example a fluorescent lamp, a light-emitting diode (LED) or the like) secured to the top tray and a lampshade covering the light-emitting part from below. As the fourth generation light source, an LED has characteristics of energy-efficiency, environmental
15 protection, safety, long lifespan, low power-consumption, low heat-dissipation, high brightness, waterproof, compactness, shake-proof, easy-to-dimming, beam concentration, easy-to-maintenance or the like, and thus is widely used for illumination of the elevator.

However, after a long-term use, an existing LED lighting device may lack freshness for
20 users because of its monochromatic illumination. Moreover, once the elevator car's decoration and environment are altered, the original monochromatic illumination may result in incongruity due to mismatching with its surrounding environment, which thus affects the whole elevator's sense of quality.

Therefore, for single and fixed colour and intensity of illumination of the elevator's
25 existing lighting device, switching on/off of the lighting device can be controlled by its power source and switch, which cannot meet clients' demands for changing the intensity and colour of illumination as a function of the elevator car's changed environment and specific conditions.

SUMMARY

30 The present invention proposes simple and economical illumination control of an elevator such that decorative illumination effects, whose colour and intensity are changeable, can be achieved.

In order to achieve the above effects, a light-and-colour adjustable elevator control
35 system according to the present invention shall comprise a lighting device 1, a control

device 2, and a manipulator 3, wherein the control device 1 can be a part independent of the elevator system or alternatively a constituent part of the elevator system 4, and multi-level control can be carried out by control instructions from the manipulator 3 or special signals from the elevator system 4.

5 The lighting device 1 is connected to the control device 2, and comprises LEDs of at least two colours or colour temperatures, wherein LEDs of different colours or colour temperatures are regularly arranged at intervals so as to ensure the uniformity of illumination. LEDs of the same colour or colour temperature constitute an independent circuit. Either of independent circuit 11, 12 is connected to the controller respectively.

10 The control device 2 comprises a power source and a control module of the lighting device 1, and can be a constituent part of the elevator control system. Depending on specific signal instructions or control instructions from the elevator system 4, the control module switches on/off either of the independent circuits 11, 12 and adjusts their electric currents so as to adjust the illumination intensity as well as collocation and
15 combination of various colours.

The manipulator 3 is a device pairing with the control device 2. It can be an operation panel 33 connected by a cable, or a device wireless-linked by a RF remote controller 31 or BLUETOOTH 32. The illumination intensity and colour can be controlled by instructions from the manipulator 3 or the manipulator 3 and the elevator control system

20 4.

Through programming, the control system of the present invention can make level setting for the control device 2, so as to control the manipulator 3 easily.

BRIEF DESCRIPTION OF THE DRAWINGS

25 Fig. 1 is a control system charting which illustrates illumination intensity and colour control according to an embodiment of the present invention.

Fig. 2 is a control system charting which illustrates illumination intensity and colour control according to a variant 1 of the present invention.

Fig. 3 is a control system charting which illustrates illumination intensity and colour
30 control according to a variant 2 of the present invention.

Fig. 4 is a view illustrating a lighting unit 1a as a variant of a lighting device.

Fig. 5 is a view illustrating a lighting unit 1b as a variant of the lighting device.

Fig. 6 is a view illustrating a large-area lighting device 1' comprised of the lighting unit 1b as the variant of the lighting device.

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List of reference numerals:

1, lighting device; 2, control device; 3, manipulator; 4, elevator control system; 5, client/server; 6, power source; 1a, lighting unit of cool-white and warm-white colours; 1b, lighting unit comprised of LEDs of red, yellow and blue colours; 11, circuit for LEDs of cool-white colour; 12, circuit for LEDs of warm-white colour; 11a, LED of cool-white colour; 12a, LED of warm-white colour; 13a, LED of yellow colour; 14a, LED of red colour; 15a, LED of blue colour; 31, RF remote controller; 32, operation panel; 33, wireless communication device such as a mobile-phone.

10 DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 is a control system charting illustrating how to control illumination intensity and colour according to an embodiment of the present invention. As shown by Fig. 1, a light-and-colour adjustable elevator control system according to the present application mainly comprises a lighting device 1, a control device 2, and a manipulator 3 (which is illustrated for example as a “RF remote controller 31” in Fig. 1). The lighting device 1 is generally comprised of LEDs. The LEDs are connected to each other via wires and finally to a power source 6 through the control device 2. The control device 2 is operated by the manipulator 3 so as to adjust illumination intensity and colour of an elevator car’s car roof. The control device 2 comprises a controller. The controller is an independent control part or alternatively a constituent part of the elevator control system 4. Furthermore, in the embodiment, the manipulator 3 can be the RF remote controller 31 or alternatively an operation panel 32 directly coupled to the control device 2, or alternatively a wireless communication device 33 such as a mobile phone which can be wireless linked to the control device 2 through BLUETOOTH, WIFI or the like.

In the embodiment, a combination where the illumination colour includes cool colour and warm colour and the intensity is divided into 10 levels is taken for example. However, practical applications are not limited to this combination. Distribution of 10 levels for the intensity and colour is formed by the control device 2 powering on/off a circuit 11 for LEDs of cool-white colour or powering on/off a circuit 12 for LEDs of warm-white colour and controlling and adjusting electric current flowing through the powered-on circuit 11 for LEDs of cool-white colour or the powered-on circuit 12 for LEDs of warm-white colour. Therefore, illumination change of switching the cool-colour or warm-colour and adjusting the intensity can be realized. In the embodiment shown by Fig. 1, the light-and-colour adjustable control device 2 can

adjust the illumination colour and intensity independently of the elevator control system 4 or alternatively can be a constituent part of the elevator control system 4.

In order to facilitate understanding, controlling operations made by the light-and-colour adjustable elevator control system according to the embodiment will be explained by examples below.

For instance, during the daytime, a command for cool-white colour can be sent to the control device 2 by the RF remote controller 31 such that the control device 2 can adjust powering-on/off the circuits 11 and 12 for LEDs of cool-colour and warm-colour and their electric currents to enable the lighting device 1 on the car roof to display a bright cool-white colour. Furthermore, when it's cloudy, the illumination intensity can be adjusted to be greater than the 6th level. When it's sunny, the illumination intensity can be adjusted to be greater than the 5th level. During the night time, a command for warm-white colour can be sent to the control device 2 by the RF remote controller 31 such that the control device 2 can adjust powering-on/off the circuits 11 and 12 for LEDs of cool-colour and warm-colour and their electric currents to enable the lighting device on the car roof to display soft warm-white colour.

Therefore, depending on various environmental temperature and brightness, the illumination of the elevator car can be adjusted to be corresponding intensities and colours such that passengers can feel comfortable and thus the elevator's quality can be improved.

VARIANT 1

In the above embodiment, the illumination intensity and colour of the elevator's car roof can be controlled only by operation of the manipulator 31 sending a command to the control device 2. Alternatively, as shown by Fig. 2, signals of the elevator control system 4 can be also connected into the control device 2, such that the illumination can be controlled according to the elevator's operating status and the operation of the manipulator 31. That is to say, under special conditions of the elevator, a certain illumination adjustment can be carried out by cooperation of the manipulator 3 and the elevator control system 4.

For instance, when the manipulator 3 is the operation panel 32 directly coupled to the control device and is securely installed in the elevator, if desired, one can operate the operation panel to change the illumination colour and intensity of the car roof. However, if all passengers who enter the elevator can freely alter the illumination colour and intensity of the car roof by operating the panel, it will bring chaos to management. In order to prevent this from happening, the control device 2 is also connected to the elevator control system 4. When an administrative staff operates the operation panel 32 to send a command for illumination adjustment to the control device 2, the control device 2 will transfer the same command to the elevator control system 4 to inquire whether the adjustment operation is authorized. The elevator control system 4 will ask for access password. When a correct password is input by the administrative staff using the operation panel 32, the elevator control system 4 will allow the control device 2 to make control to it. Therefore, the illumination colour and intensity of the lighting device can be adjusted depending on instructions input from the operation panel 32.

According to this variant, the reliability of adjustment is ensured while the lighting device of the elevator is being adjusted.

VARIANT 2

In the above variant, the illumination adjustment of the car roof by the cooperation of the manipulator 3 and the elevator control system 4 is explained. However, in order to be adapted to environmental changes, more flexible illumination adjustment can be carried out by a client/server 5, which sends adjustment instructions to the control device 2 by way of the elevator control system 4, under operation of the mobile phone 33 wireless-linked via BLUE or WIFI.

For instance, if the passenger frequently using the elevator is allowed to adjust the illumination, a QR code can be provided in the elevator. The mobile phone can be used to scan the QR code to connect the client/server 5 and thus to generate an adjustment instruction. Then, the adjustment instruction can be transmitted by the client/server 5 to the elevator control system 4 which controls the control device 2 to adjust the illumination intensity and colour of the lighting device.

According to this variant, the adjustment of the elevator's lighting device can be carried

out and simultaneously people of different identities can carry out the adjustment so as to enhance the elevator's controllability and provide high-quality feeling for passengers.

OTHER VARIANTS

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In the above variant, LEDs are configured to be divided into warm-colour and cool-colour sets to explain how they are controlled. However, those LEDs are not limited to be configured in that way. They can be also configured in the following way.

10 As shown, Fig. 4 is a view illustrating a lighting unit 1a as a variant of the lighting device. The lighting unit 1a is constituted by two adjacent sets of LEDs 11a and 12a of cool-white and warm-white colours. LEDs of the same colour or colour temperature constitute independent circuits respectively. The control device 2 can be used to adjust the LEDs' cool-colour and warm-colour and their illumination intensity, so as to adjust
15 the illumination intensity and colour of the lighting device of the elevator's car roof.

Furthermore, as shown, Fig. 5 is a view illustrating a lighting unit 1b as a variant of the lighting device. The lighting unit 1b is constituted by LEDs of three colours, i.e. LEDs 13a of yellow colour, LEDs 14a of red colour and LEDs 15a of blue colour. The control
20 device 2 can be used to power on/off these LEDs and adjust their illumination intensity, so as to display various illumination colours and intensities to be adapted to the elevator car's decoration style, and to alter the illumination colour and intensity depending on real-time environmental conditions.

25 Furthermore, as shown, Fig. 6 is a view illustrating a large-area lighting device 1' comprised of the lighting unit 1b as the variant of the lighting device. Several sets of lighting units 1b are provided in such a way that they are regularly distributed to constitute the large-area lighting device 1'. In practice, through programming, the control device 2 can be used to power on/off the LEDs of the lighting device 1' constituted by the lighting units 1b and adjust their illumination intensity, so as to be
30 adapted to the elevator car's decoration style and alter the illumination colour and intensity as a function of the real-time environmental conditions. In this way, diversely changing the illumination colour and intensity can be carried out.

35 Although some embodiments have been explained above, they are given as examples

only and are not intended to limit the scope of the present invention. These embodiments can be implemented in various manners without departing from the scope aimed by the present invention and various omissions, substitutions and modifications can be carried out. These embodiments or their variants are included in the scope of the
5 present invention or its subject, and also in the scope of the invention recited by the appended claims and its equivalents.

CLAIMS

1. A lighting control device for an elevator, characterized in that the lighting control
5 device comprises:
a lighting device (1), a control device (2) coupled to the lighting device (1), and a
manipulator (3) for controlling operation of the control device (2),
wherein the lighting control device for the elevator is configured such that depending on
operation of the manipulator (3), the control device (2) is controlled so as to adjust the
10 illumination intensity and colour of the lighting device (1).
2. The lighting control device for the elevator as recited in claim 1, wherein the lighting
control device for the elevator is configured such that depending on the operation of the
manipulator (3) and instructions from an elevator control system (4), the control device
15 (2) is cooperatively controlled so as to adjust the illumination intensity and colour of the
lighting device (1).
3. The lighting control device for the elevator as recited in claim 1, wherein the lighting
control device for the elevator is configured such that operating instructions from the
20 manipulator (3) are sent to the elevator control system (4) via a client/server (5) and the
control device (2) is controlled by the elevator control system (4) to adjust the
illumination intensity and colour of the lighting device (1).
4. The lighting control device for the elevator as recited in any one of claims 1 to 3,
25 wherein the control device (2) comprises a controller, and wherein the controller can be
an independent control part or a constituent part of the elevator control system.
5. The lighting control device for the elevator as recited in claim 4, wherein outputs of
the controller are connected to independent LED circuits of different sets of colours or
30 colour temperatures respectively.
6. The lighting control device for the elevator as recited in claim 4, wherein the lighting
device (1) is a light-emitting part comprised of a set of LEDs of at least two colours or
colour temperatures, wherein adjacent LEDs have different colours or colour
35 temperatures, wherein the LEDs are regularly and alternately arranged, and wherein

LEDs of the same colour or colour temperature constitute an independent circuit respectively.

7. The lighting control device for the elevator as recited in any one of claims 1 to 3,
5 wherein the manipulator (3) is an apparatus matching with the control device (2), and
wherein the manipulator is connectable to the control device (2) via a cable or a wireless
linking manner.