

Method of setting the storey associations of a plurality of operating units of a lift installation

The present invention relates to a method of setting the storey associations of a plurality of operating units of a lift installation, wherein the operating units are distributed over a plurality of storeys and the storeys can be travelled to by a lift cage, which has a transmitter unit.

Within the scope of mounting and installing a lift installation in a building the lift cage is moved during a so-termed learning travel to all stopping positions, i.e. to all storeys, in order to set the stopping positions to the height levels of the respective storeys. In addition, the operating units, for example panels equipped with destination call buttons, distributed over the individual storeys and the communication thereof with the central control unit have to be set or configured. In this connection it is necessary to define these operating panels, which are provided in the lift installation access region of each storey, with respect to their position, i.e. the storey, and to associate the operating unit therewith.

This setting is conventionally carried out by means of several switches which have to be manually set in each instance by an engineer at every storey and at every operating unit. Configurations manually carried out in this manner require a high outlay in terms of time and personnel. Beyond that, such switches represent costly components.

The operating unit normally consists of a printed circuit comprising a panel for the call input and an indicator. The panel for the call input and indicator are in part two different printed circuits. In this case the operating unit consists of two printed circuits which both have to be set.

The invention therefore has the object of so developing a method for setting the storey associations of a plurality of operating units of a lift installation that the storey associations of the operating units can be set more simply.

According to the invention for fulfilment of this object in the case of a method of setting the storey associations of a plurality of operating units of a lift installation, wherein the operating units are distributed over a plurality of storeys and the storeys can be travelled to by a lift cage having a sensor unit, it is provided in correspondence with claim 1 that the

method comprises the following steps:

- a) moving the lift cage to a predetermined storey;
- b) activating the operating unit allocated to the moved-to storey;
- c) communicating position data, which describe the storey in which the operating unit is located, from the transmitter unit to the operating unit or to the central control unit; and
- d) storing the position data in a memory unit of the operating unit or in the central control unit.

A comparatively simple and rapidly performed setting of the storey associations of the operating unit is possible by the method according to the invention. Thus, it is possible to dispense with manual setting of switches of each individual operating unit. In addition, possible erroneous settings of the switches are thereby reduced.

By an "operating unit" in the sense of the present invention there are understood the panels, which are provided in the access region of each storey to the lift installation, with at least one switch, which is operable by the user, for utilisation of the lift installation. Preferably there is concerned in that case the usual destination call direction buttons.

Advantageous developments of the method according to the invention are described in claims 2 to 7.

In an advantageous development of the invention it is provided that the lift cage is moved to the storey by means of automatic control by way of the central control unit. Thus, a setting program can be provided which enables travel to all storeys for the purpose of association of the individual operating units. Alternatively, the storeys can also be travelled to by manual actuation of corresponding destination call switches of the lift cage.

In a development of the method according to the invention it is proposed that the operating unit is activated by transmission of an activation signal from the transmitter unit to the operating unit. Alternatively, however, this activation process can also be carried out manually by actuation of the operating unit.

Advantageously the position data are additionally stored in the central control unit. Moreover, it can be provided that, in addition to the position data, there is also

transmission of data characterising the access to the lift cage. This applies to lift installations in which the lift cage has more than one cage door. Each cage door forms such an access.

In order to achieve setting of the storey associations of all operating units for all storeys in simple manner the above-mentioned steps a) to d) are repeated for all storeys present in the respective building. Equally, the aforesaid steps are repeated in each storey for each access to the lift cage.

The invention is explained in more detail in the following with reference to the drawing.

Fig. 1 schematically shows a building 10 with a lift installation 20. The lift installation 20 comprises a vertically movable lift cage 30 with two cage doors 33, 34 and an operating panel 32 with several destination call switches. A transmitter unit 35 disposed in data exchange communication with a central control unit 40 is provided at the lift cage 30. The central control unit 40 serves for controlling the lift installation 20.

The building 10 comprises a first storey 11, a second storey 13, a third storey 15 and a fourth storey 17. A respective lefthand-side access and righthand-side access, which are each closable by means of an access door 12a, 12b, 14a, 14b, 16a, 16b, 18a, 18b, to the lift installation 20 are disposed on each of these storeys 11, 13, 15 and 17. The lift cage 30 can be entered and left from two sides by way of these accesses. Disposed in the region of each access is an operating unit 50 to 57 by way of which a user can summon the lift cage 30 and/or input a destination call. Each operating unit 50 to 57 comprises a memory unit 60 and several destination call buttons. In addition, each operating unit 50 to 57 is disposed in data communication with the central control unit 40.

On the basis of this system two variants of a method of setting the storey associations of the operating units 50 to 57 are explained in the following.

In a first variant of the method according to the invention the central control unit 40 is initially placed in a setting mode. First of all, the lift cage 30 is moved to the fourth storey 17 and the cage door 34 opened. A member of the engineering personnel enters the lift cage 30 and actuates one of the destination call buttons of the operating panel 32 so that the lift cage 30 is moved to the third storey 15. After the lift cage 30 has reached the third

storey 15, the cage door 34 and the access door 16b open. The person leaves the lift cage 30 and actuates a button of the operating unit 54 so as to activate this. After producing a data radio connection between the transmitter unit 35 and the operating unit 54 the transmitter unit 35 communicates position data to the operating unit 54 and/or to the central control unit 40. The position data are filed in the transmitter unit 35 and/or the central control unit 40 or ascertained by the units 35, 40. The position data communicated to the operating unit 54 contain details of the storey number of the building 10 and the designation of the access or the access door 16b. The position data are preferably stored in the memory unit 60 of the operating unit 54. In this manner in later operation of the lift installation 20 the central control unit 40 is able to recognise, on issue of a destination call by way of the operating unit 54, at which storey and in the region of which access the person to be conveyed is located.

Subsequently, the person enters the lift cage 30 and actuates a corresponding button of the operating panel 32 for closing the cage door 34. The person thereafter actuates a further button of the operating panel 32 so as to open the lefthand-side cage door 33 and the access door 16a. After leaving the lift cage 30 in the lefthand-side region of the storey 15 the person actuates the operating unit 54 so as to activate this. After producing a data connection between the transmitter unit 35 and the operating unit 55 the transmitter unit 35 communicates, in correspondence with the above procedure, the position data to the operating unit 55. The position data are filed in the memory unit 60 of the operating unit 55 and/or in the central control unit 40.

After re-entering the lift cage 30 the person actuates the operating panel 30 so as to move the lift cage 30 to the second storey 13. The above-described method steps are correspondingly carried out at this storey 13 as well all remaining storeys concerned so that at the end of the setting method each operating unit 50 to 57 is assigned to the respective storey 11, 13, 15, 17. Thus the central unit 40 in the case of later, normal operation of the lift installation 20 can unambiguously recognise from which operating unit 50 to 57 a corresponding destination call has been issued.

The second variant of the method according to the invention differs from the first variant essentially in that the setting method is carried out largely automatically. In this manner it is not required for a member of the engineering personnel to actuate the individual operating units 50 to 57 and the operating panel 32 of the lift cage 30 during the "setting

travel" in order to make possible communication of the position data and travel of the lift cage 30 between the individual storeys 11, 13, 15, 17.

In this second variant the transmitter unit 35 comprises an RFID transmitter part, which transmits an activation signal over a predetermined time period within a predetermined range. In the present case the range is approximately 1 to 2 metres. In addition, all operating units 50 to 57 comprise a respective RFID receiver part.

The RFID chip can be a printed circuit on the indicator / operating unit, since an RFID chip costs only a couple of cents and the receiver unit is significantly more expensive. The transmitted ID of the RFID chip has to agree with the printed circuit address. This allows, after detection of the RFID chip, the indicator / operating unit to selectively respond by way of the field bus and to be configured.

The rather more expensive transmitter is mounted on the cage and can, if need be, be removed again after the learning travel.

Thus, in a first step the lift cage 30 starting from the uppermost storey 17 is automatically moved to the third storey 15 and the corresponding cage door 34 and access door 16b automatically opened. As soon as the transmitter unit 35 is located within the predetermined range of the operating unit 54 the operating unit 54 receives the activation signal transmitted by the RFID transmitter part, whereby the operating unit 54 is activated. The operating unit 54 subsequently transmits a confirmation signal to the transmitter unit 35. In the next step the transmitter unit 35 communicates, as in the case of the first variant, the position data to the operating unit 54 and/or to the central control unit 40. The position data are in turn filed in the memory unit 60 of the operating unit 54 and/or in the central control unit 40. The access door 16b and cage door 34 are subsequently automatically closed and the access door 16a and cage door 33 oriented towards the other side of the storey 15 automatically opened. The activation signal transmitted by the RFID transmitting part of the transmitter unit 35 is received by the RFID receiving part of the operating unit 55. Thereafter communication of the confirmation signal to the transmitter unit 35 and the position data to the operating unit 55 and/or to the central control unit 40 takes place again. The position data are filed in the memory unit 60 of the operating unit 55 and/or in the central control unit 40. The access door 16a and cage door 33 are subsequently automatically closed and the lift cage 30 moved to the storey 13.

Thereafter, all afore-described method steps are repeated at all storeys 11, 13, 15, 17 for the righthand-side and the lefthand-access. In this manner all operating units 50 to 57 of all storeys 11, 13, 15, 17 can be provided, by means of a fully automatic setting method, with the appropriate data for setting the storey associations.

The two afore-described variants of the method according to the invention are particularly distinguished by the fact that for setting the storey associations of the operating units 50 to 57 it is not necessary to undertake any manual actuation of conventionally present switches of the operating units 50 to 57. This setting can be performed by the method according to the invention with a preferably wire-free data transmission by means of RFID technology. In that case the second variant of embodiment of the method is distinguished particularly by the fact that the RFID receiver parts are mounted at the operating units 50 to 57 only temporarily and can be removed after performance of the setting method and utilised for, for example, configuration of a further lift installation in another building.

In a given case the installer must, after the learning travel, undertake manual actions again in order to remove the transmitters from the indicators / operating units.

What is claimed is:

1. A method of setting floor associations of a plurality of operating units of an elevator installation, wherein the operating units are distributed over a plurality of floors and the floors can be traveled to by an elevator car, wherein the elevator car has a transmitter unit and wherein the method comprises the steps of:

- a. operating the elevator car to travel to a predetermined one of the floors;
- b. activating the operating unit allocated to the traveled-to one floor;
- c. communicating position data, which describe the traveled-to one floor at which the operating unit is located, from the transmitter unit to the operating unit and/or to a central control unit of the elevator installation; and
- d. storing the position data in a memory unit of the operating unit or in the central control unit.

2. The method according to claim 1 including performing said step a. by moving the elevator car to the one floor utilizing automatic control by the central control unit.

3. The method according to claim 1 including performing said step b. by activating the operating unit by transmission of an activation signal from the transmitter unit to the operating unit.

4. The method according to claim 1 including performing said step d. by storing the position data in the memory unit of the operating unit and in the central control unit.

5. The method according to claim 1 including transmitting data which designates an access to the elevator car from the one floor.

6. The method according to claim 1 including repeating said steps a. through d. for all of the floors traveled to by the elevator.

7. The method according to claim 1 including repeating said steps a. through d. for each of the floors for designating each access to the elevator car at the floors.

8. A method of setting floor associations of a plurality of operating units of an elevator installation, wherein the operating units are distributed over a plurality of floors and the floors can be traveled to by an elevator car, wherein the elevator car has a transmitter unit and wherein the method comprises the steps of:

- a. operating the elevator car to travel to a predetermined one of the floors;
- b. activating the operating unit allocated to the traveled-to one floor;
- c. communicating position data, which describe the traveled-to one floor at which the operating unit is located, from the transmitter unit to the operating unit and/or to a central control unit of the elevator installation, the position data including an associated floor number and a designation of each access to the elevator car from the traveled-to one floor; and
- d. storing the position data in a memory unit of the operating unit or in the central control unit.

9. The method according to claim 8 including performing said step a. by moving the elevator car to the one floor utilizing automatic control by the central control unit.

10. The method according to claim 8 including performing said step b. by activating the operating unit by transmission of an activation signal from the transmitter unit to the operating unit.

11. The method according to claim 8 including performing said step d. by storing the position data in the memory unit of the operating unit and in the central control unit.

12. The method according to claim 8 including repeating said steps a. through d. for all of the floors traveled to by the elevator.