# ELEVATOR SYSTEM AND METHOD FOR USER-SELF REGISTRATION FOR APP USE

## Description

The technology described herein relates to an elevator system having elevator operation terminals and a method for operating such an elevator system.

In buildings having elevator systems, an elevator operating terminal's principal function is allowing a user to call an elevator while being present on a building floor. For example, an elevator operating terminal arranged on a floor can be adapted to allow a user to input a destination floor. For this purpose, the elevator system is equipped with a destination call control technology, and the elevator operating terminals arranged on the floors each have either a keyboard, a touch-sensitive screen, and/or a data acquisition device (e. g. in the form of an RFID card reader known from EP 0699617 B1) for inputting credentials, destination floors, or both.

In addition to providing the principal elevator-call function, certain operating terminals enable special treatment of certain users. For example, US 8,136,636 B2 discloses the special treatment of a VIP (very important person). Upon a VIP's smart card being within RF range and signaling the VIP's identity, the operating terminal alters its touch screen to display the VIP's possible destinations within the building. Further, certain elevators may be provided with a penthouse package (e. g., provided by Schindler Elevator AG) that provides tenants with full access control by means of a key switch in the elevator. Upon inserting an apartment key into the key-switch lock on the car control panel, a tenant can travel directly up to its floor. Hence, since without a key the elevator will not reach the floor, only the tenant can take the elevator directly to the penthouse apartment.

Although these special-treatment approaches facilitate the operation of an elevator system and control access to certain floors, smart cards and keys may be lost or stolen and, thereafter, used for unauthorized access to the elevator and/or the penthouse apartment. There is therefore a need for a technology that provides for a more secure, yet user-friendly special treatment of certain users.

One aspect of the technology described herein relates to an elevator system having an

elevator control system, a radio unit and an elevator car. The elevator car is movable under control of the elevator control system between floors of a building and has a car operating panel that includes a credential detector. The elevator control system is configured to move the elevator car to an access-restricted floor in response to a valid credential presented to the credential detector by a user. The user has a mobile communications device provided with an elevator software application (App). The radio unit is arranged on one of the floors and configured to transmit a radio signal within a radio range limited to that floor and to an interior of the elevator car when the elevator car is at that floor. The elevator control system is configured to execute a user self-registration procedure enabling use of the App for communications with the elevator system. The user self-registration procedure includes receiving an App signal sent by the mobile communications device in response to the mobile communications device being in the elevator car and receiving the radio signal transmitted by the radio unit. The App signal includes a device identifier assigned to the user. Further, the procedure includes determining the floor the mobile communications device is located based on the radio signal and receiving a detector signal in response to the user presenting the user's valid credential to the credential detector in the elevator car. The procedure includes further registering, based on the App signal and the detector signal being received within a set activation period, the mobile communications device and its App in the elevator system for communications with the elevator system.

Another aspect relates to a method of operating such an elevator system. The method includes steps to execute the user self-registration procedure to enable use of the App for communications with the elevator system. In one step, an App signal sent by the mobile communications device is received in response to the mobile communications device being in the elevator car and receiving the radio signal transmitted by the radio unit, wherein the App signal including a device identifier assigned to the mobile communications device. In another step, the floor the mobile communications device is located is determined based on the radio signal, and in a further step, a detector signal is received in response to the user presenting the user's valid credential to the credential detector in the elevator car. In an additional step, the mobile communications device and its App are registered, based on the App signal and the detector signal being received within a set activation period, in the elevator system for communications with the elevator system.

The various aspects of the technology disclosed herein improve the operation of the elevator system due to an automated additional functionality. The additional functionality provides for a procedure that allows a user to register its mobile communications device with the installed App for communications with the elevator system. The elevator system is configured to execute the procedure without involvement of, for example, a building manager or administrator. The user can self-register if and when the user wishes to use the mobile communications device for communications with the elevator system. Hence, the user is not required to use the mobile communications device; certain users, for whatever reasons, may prefer the credentials they used so far. The procedure is convenient for the user and meets building security requirements because the user is required to present a credential during the self-registration process.

In one embodiment, which may be applicable in connection with one or more of the embodiments disclosed herein, the elevator control system is configured to store the device identifier in a record of a database when registering the mobile communications device. The device identifier is stored in the record together with information of the determined floor. The record, therefore, reflects to which floor the user, who uses the mobile communications device identified by the device identifier, is authorized to travel.

As to the location of the storage device, and, hence, where the record is stored, the technology described herein provides for alternatives. In one embodiment, which may be applicable in connection with one or more of the embodiments disclosed herein, the database is stored in a storage device of or communicatively coupled to the elevator control system. The storage device may be provided locally, e. g., integrated in the elevator control system or placed separate from the elevator control system within the building, e. g., in connection with a building management system or an access control system. In another embodiment, the storage device may be provided at a remote location, e. g., implemented by a so-called cloud-based storage system.

In one embodiment, which may be applicable in connection with one or more of the embodiments disclosed herein, the radio unit is configured to transmit the radio signal according to at least one of a Bluetooth, WiFi/WLAN and ultrawideband (UWB) standard. Therefore, the radio unit can be adapted to the radio technology that is most

suitable for a specific building. The radio unit emits preferably short-range radio signals, for example, to avoid signal overlap/interference with radio signals emitted other radio units on the same or a neighboring floor.

In one embodiment, which may be applicable in connection with one or more of the embodiments disclosed herein, the credential detector includes a key switch configured for insertion of a key, or a keypad configured for entering a numeric or alphanumeric code. In another embodiment, the credential detector includes a reader device configured to read coded information or an optical code from a first carrier medium or to detect a radio credential signal from a second carrier medium. The first carrier medium can be a card-shaped medium with a magnetic stripe or a printed optical code (e. g., barcode, matrix/QR code, color code) or an electronic device that displays such an optical code. The second carrier medium can be configured for RFID/NFC technology, it can be card-shaped medium with an antenna and an electronic chip or a radio-enabled electronic device. The credential reader already installed in the elevator system, therefore, can be maintained and does not need to be changed for the self-registration procedure.

In one embodiment, which may be applicable in connection with one or more of the embodiments disclosed herein, the radio unit is arranged on the access-restricted floor, wherein the elevator control system is configured to register the mobile communications device and its App while the user is at the access-restricted floor. The technology described herein, therefore, provides that the user has to be present on the access-restricted floor (not just inside the building) when registering the mobile communications device. This ensures a certain level of security. Also, the technology described herein provides for selecting individual floors where self-registration is possible; on these floors, radio units are arranged.

In the following, various aspects of the improved technology are explained in more detail by means of exemplary embodiments in connection with the figures. All figures are merely schematic illustrations of methods and system or their components according to exemplary embodiments of the improved technology. In particular, distances and size relations are not reproduced to scale in the figures. In the figures, identical elements have identical reference signs. In the drawings:

Fig. 1 shows a schematic illustration of an exemplary elevator system in a building having several floors;

Fig. 2 shows an example of an embodiment of a method for operating of the elevator system.

**Fig. 1** shows a schematic illustration of an exemplary embodiment of an elevator system 1 in a building; the building can be any type of multilevel building (e. g., residential building, hotel, office building, sports station, etc.). In the following, components and functions of the elevator system 1 are explained as far as they are believed to be helpful for an understanding of the technology described herein. The building shown in **Fig. 1** has a plurality of floors L1, L2, L3 served by the elevator system 1, e. g., a user 8 can be transported from a boarding floor to a destination floor by the elevator system 1 after inputting an elevator call ("call") at an operating terminal 4 while at the boarding floor. In the shown embodiment, the elevator system 1 has an elevator car 10 that is movable along a travel path in the building. For example, the travel path extends along a vertical elevator shaft 26, without being limited to such a travel path. In the following, embodiments of the technology disclosed herein are described with reference to the exemplary elevator system 1 shown in **Fig. 1**.

The elevator system 1 shown in **Fig. 1** also comprises an elevator control system (ECS) 12, a drive machine (M) 14, a counterweight 18, a signal transmission system 30, a suspension means 16 (one or more steel ropes or flat belts) and a plurality of deflection pulleys 24. In **Fig. 1**, the illustrated elevator control system 12 represents several control functions performed in the elevator system 1, including controlling the movement of the elevator car 10, processing and allocating calls to the elevator car 10, and managing access rights to the elevator system 1 or to individual floors of the building. For these functions, the elevator control system 1 includes, for example, one or more computers, processors and storage devices, a representative storage device 12a storing a database is coupled to the elevator control system 1, as shown in **Fig. 1**. The skilled person will appreciate that these functions may be implemented as individual and separate (sub)systems or system components. For example, the storage device 12a can be integrated in the elevator control system 12 or implemented as a cloud-based storage system coupled to the elevator control system 12 via the internet.

In the illustrated embodiment, the suspension means 16 has two ends, each end being attached to a fixed point 22 in the elevator shaft 10. Between the fixed points 22, the suspension means 16 partially wraps around the deflection pulley 24 on the counterweight 18, a traction sheave of the drive machine 14 and the deflection pulleys 24 on the elevator car 10. The elevator system 1 shown is, thus, a traction elevator, wherein further details, such as, for example, guide rails for the elevator car 10 and guide rails for the counterweight 18 are not shown in **Fig. 1**. The elevator control system 12 is connected to the drive machine 14 and controls it to move the elevator car 10 in the shaft 26 in response to an elevator call. The function of a traction elevator, the components of which and the tasks of an elevator control system 12 are generally known to the person skilled in the art. The skilled person will recognize that the technology described here is not limited to a traction elevator. The skilled person will also recognize that the elevator system 1 can comprise a plurality of elevator cars 10 or multi-deck cars in one or more elevator shafts 26, or can comprise one or more groups of elevators controlled by a group controller.

In **Fig. 1**, an operating terminal 4 is arranged on each floor L1, L2, L3 and coupled to the elevator control system 12 by means of a communication connection 32. The communication connection 32 may be implemented using wires/cables (e. g., by individual lines or a communication bus), a wireless technology or a combination thereof. Each of these operating terminals 4 can have, for example, a terminal identifier (also referred to as a terminal ID) by which an operating terminal 4 is identifiable and addressable, in particular if a communication bus is used. For example, the operating terminal 4 can send a call along with its terminal ID to the elevator control system 12 which can then confirm the call to the operating terminal 4 identified by the terminal ID. In this case, information about an elevator allocated to serve the call can also be sent.

As shown in **Fig. 1**, a further operating terminal 20 is arranged in the elevator car 10 and connected to the elevator control system 12 by means of the signal transmission system 30. The floor-side operating terminal 4 may be referred to as floor terminal 4 and the car-side operating terminal 20 may be referred to as car terminal 20. The configurations of these terminals (4, 20) depend on the control technology implemented in the elevator system 1; either a destination call control technology, or a direction call control technology. If the destination call control technology is implemented, the floor-side operating terminal 4 allows a user 8 to enter a destination floor, while the car terminal 4a

may allow the user 8 only, e. g., to signal an emergency and/or to affect the closing of the elevator doors. If the direction call control technology is implemented, the floor-side operating terminal 4 allows the user 8 to enter the travel direction (up or down), and the car terminal 20 allows the user 8 to enter a destination floor. Irrespective of the call control technology, and for illustrative purposes, the terminals (4, 20) are depicted by the same pictogram.

The car terminal 20 is provided with a credential reader 6. At least one floor terminal 4, e. g., at a building lobby (e. g., at a floor on which a main building entrance is provided), may be provided with such a credential reader 6, as well. In the illustrated embodiment, all floor terminals 4 are provided with a credential reader 6. The credential reader 6 is provided to require the user 8 to present a credential 2 before the car terminal 20 or the floor terminal 4 are enabled for a call input or a call is registered to an access-restricted floor. In **Fig. 1**, a pictogram of a physical key illustrates one embodiment of the credential 2, and a pictogram of an information carrier (e. g., card-shaped with a form factor of a credit card or an employee badge) illustrates another embodiment of the credential 2.

Depending on the building and/or the elevator system 1, the credential reader 6 can include a key switch the user 8 has to operate if the user 8 wants to travel and get access to an access-restricted floor. If the user 8 inserts and turns a (physical) key (which may be the key to the user's apartment) as the credential 2, the elevator control system 12 detects the key switch's operation and controls the elevator system 1 accordingly. For example, if the building has only one access-restricted floor, operating the key switch of the car terminal's credential reader 6 causes a car call to the access-restricted floor. If there are several access-restricted floors, operating the key switch may cause a display of one or more floor identifiers for these floors which the user 8 is authorized to access; the user 8 can then select the applicable floor identifier. The floor terminals 4 may be configured to operate correspondingly.

The (physical) key is as one example of a credential 2. In another embodiment, the credential 2 may be in the form of a biometric feature (e. g., fingerprint, iris pattern, speech/voice characteristics) or an access code captured from a magnetic card, chip card or RFID card or from an electronic terminal (NFC-, Bluetooth- or cellular network-based mobile radio/mobile phone, smartphone, tablet PC). The credential reader 6 is configured

in accordance with the credential 2 used in the elevator system 1. This means that the credential reader 6 has, for example, a terminal for capturing a biometric feature, a terminal for capturing an optical code (a barcode, QR code or color code), a reader for a magnetic stripe card or a chip card, or a transmitting and receiving terminal for radio signals. The optical code, magnetic stripe, chip or RFID antenna may be implemented on the information carrier. The skilled person recognizes that the car terminal 20 and/or the floor terminals 4 may be configured for more than one of these credential and credential reader alternatives.

In one embodiment, and depending on the implemented credential reader 6, the credential 2 captured by the credential reader 6 can be forwarded to the elevator control system 12, which carries out or initiates the authorization check, for example, by checking whether the captured credential 2 is assigned to an authorized user 8 in a database. The check can be carried out, for example, by an access control function of the elevator system 1, e. g., implemented within the elevator control system 12, or of an (separate) access control system. If the user 8 is authorized to access, an elevator call can be registered by the elevator control system 12.

The elevator system 1 is further configured to allow entering a call using a mobile communications device 5. For illustrative purposes, the user 8 on the floor L1 carries a mobile communications device 5, as well as the user 8 in the elevator car 10. The mobile communications device 5 is configured to execute a software application (App) that enables communications with the elevator system 1. The App generates a graphical user interface for display by the mobile communications device 5. Once registered with the elevator system 1, the mobile communications device 5 is enabled for use by the user 8, e. g., to enter credential information and call information and to receive information about the elevator car 10 assigned to serve an entered call. Exemplary Apps are the ElevateMe App and the myPORT App available from the Schindler group.

As shown in **Fig. 1**, a radio unit 28 is installed in the building, e. g., on the access-restricted floor, and configured to transmit a radio signal. In the illustrated embodiment, all floors L1, L2, L3 are provided with a radio unit 28. A radio unit 28 may be installed independent of and separate from a floor terminal 4 on that floor at a suitable location, as shown in **Fig. 1**. In another embodiment, a radio unit 28 may be integrated in a floor

terminal 4. The person skilled in the art recognizes that more than one radio unit 28 can be provided on a floor L1, L2, L3.

In one embodiment, the radio units 28 are networked with the elevator control system 12 by a cable 34 (indicated in **Fig. 1** through dashed lines), each having an individual identifier in the network. The identifier identifies a radio unit 28 in the network, and a fixed location (installation site) in the building is associated with it. Using the identifier of a radio unit 28, information about the location of the radio unit 28 can be determined which can then be used to determine the floor the radio unit 28 is located.

The radio units 28 transmit radio signals based on a known radio technology, such as RFID, NFC, WiFi/WLAN or Bluetooth standards; the latter is described in greater detail below. In one embodiment, the elevator control system 12 detects a communicative (radio) link between a radio unit 28 and a mobile communications device 5 carried by a user 8; the communicative link indicates that the mobile communications device 5 and, thus, the user 8 are within radio range of the radio unit 28.

In another embodiment, the radio units 28 are not linked with the elevator control system 12, and so the connection/cable 34 can be omitted. The radio units 28 operate in one embodiment according to the Bluetooth technology; such radio units 28 may be referred to as radio beacons. Communications between the mobile communications device 5 (smartphone), which is Bluetooth-enabled, and the radio units 28 take place in accordance with a version of a Bluetooth standard, e. g. Bluetooth standard 4.0 (Bluetooth Low Energy (BLE)). According to one version of the Bluetooth standard, the radio unit 28 continuously transmits its unit ID. As soon as the mobile communications device 5 is within reception range of the radio unit 28, the mobile communications device 5 receives the unit ID and can forward it to the elevator control system 12. As the elevator control system 12 maintains a database in which the location of each unit ID is stored, the elevator control system 12 can determined the floor the mobile communications device 5 is located.

The radio units 28 emit preferably short-range radio signals, for example, to avoid signal overlap/interference with radio signals emitted by other radio units 28 on the same or a neighboring floor. The radio units 28 may be arranged and/or configured (e. g., with a

suitable antenna diagram and transmission power) to emit the radio signals towards the shaft 26, its shaft doors and the car door 10a.

The communication network 32 connects the floor terminals 4 to the elevator control system 12 and thus makes communication possible between the elevator control system 12 and the floor terminals 4. For this communication, the floor terminals 4 and the elevator control system 12 can be directly or indirectly connected to the communication network 32. The communication network 32 can comprise a communication bus system, individual data lines, a wireless communications system or a combination thereof. Depending on the implementation of the communication network 32, individual addresses and/or identifiers can be allocated to the elevator control system 12 and each floor terminal 4, such that, for example, the elevator control system 12 can send a message to a desired floor terminal 4 in a targeted manner. Communications can take place in accordance with a protocol for wired or wireless communication, for example, the Ethernet protocol. In one embodiment, the floor terminals 4 are supplied with electrical energy via the communication network 32 using power of Ethernet (PoE) technology.

In one exemplary embodiment, the signal transmission system 30 shown in **Fig. 1** includes an electric cable provided, for example, in a traction elevator for transmitting electrical energy and electrical signals and extending between the elevator car 10 and a fixed point to which the elevator control system 12 is coupled. For this purpose, the electrical cable has electrical power and signal lines. For example, the electrical cable supplies electrical energy to the elevator car 10 and transmits signals (e. g., load, status, and/or car call information) to and from the elevator car 10. The electrical cable is also known to the person skilled in the art as a traveling cable. Terminals that couple the traveling cable, on the one hand, to the elevator control system 12 and its power/voltage supply and, on the other hand, to the elevator car 10 and its electrical and electronic components are therefore known to the person skilled in the art. The person skilled in the art will recognize that the car terminal 20 is in one embodiment electrically coupled to the traveling cable.

With the understanding of the above-described system components of the elevator system 1 and their functionalities, a description of an exemplary method for operating the elevator system 1 is provided below with reference to **Fig. 2**. The exemplary description

is provided with reference to the situation shown in **Fig. 1** wherein the user 8 wants to transition to a different way of communicating with the elevator system 1. The user 8 may reside in a penthouse apartment of the building or be user who benefits from special treatment in the building (VIP). More particularly, instead of using a key or an information as the credential 2, the user 8 wants to use a mobile communications device 5 and the installed App. For purposes of the following description of the method, the elevator system 1, the mobile communications device 5 and the App are in operation, wherein the user 8 has selected a self-registration feature of the App. The method described with reference to **Fig. 2** starts in a step **S1** and ends in a step **S6** and is described from the perspective of the elevator control system 12. The person skilled in the art will recognize that the division into the steps shown is exemplary, and that one or more of these steps can be divided into one or more sub-steps, or that several of the steps can be combined into one step.

Referring to a step **S2**, an App signal is received. The App signal is sent by the mobile communications device 5 in response to the mobile communications device 5 being in the elevator car 10 and receiving the radio signal transmitted by the radio unit 28. The App signal includes a device identifier assigned to the mobile communications device 5; the device identifier allows the elevator control system 12 to identify the user 8. The radio unit 28 is positioned on one of the floors L1, L2, L3 and configured so that the mobile communications device 5 inside the elevator car 10 is within radio range of the radio unit 28 once the elevator car 10 is at that floor. This includes, for example, that a transmission power and a radiation diagram of the radio unit 28 are set accordingly. Depending on the configuration of the elevator system 1, the transmission power and a material of doors 10a of the elevator car 10, the doors 10a may be open or closed.

At a step **S3**, the floor L2, L3 the mobile communications device 5 is located is determined based on the radio signal. As mentioned above, in one embodiment, the radio unit 28 transmits its unit ID in the radio signal. The App is configured to include the unit ID in the App signal sent to the elevator control system 12. The elevator control system 12 determines the unit ID from the received App signal and uses it to search a database to determine the floor the unit ID is assigned to. In another embodiment, where the radio unit 28 is wired to the elevator control system 12, the elevator control system 12 recognizes the radio unit 28 that is in communication with the mobile communications

device 5 time the App signal is received.

At a step **S4**, a detector signal is received in response to the user 8 presenting the user's valid credential 2 to the credential detector 6 in the elevator car 10. In one embodiment, the App is configured to prompt the user 8 to present the credential 2 within a set activation period. For example, the user 8 may insert a key into a key switch and turn the key which then triggers the detector signal. Requiring the user 8 to react to the prompt within the set activation period ensures that the user 8 is still present in the elevator car 10 at the access restricted floor. The activation period may be set to about 10 seconds.

At a step **S5**, the mobile communications device 5 and its app are registered in the elevator control system 12 for communications with the elevator system 1. The elevator control system 12 performs this registration based on the received App signal and the received detector signal. The detector signal indicates that the user 8 is authorized to have access to the floor (is in the elevator car 10), the radio signal and its unit ID provide for the determination of the floor the mobile communications device 5 is located and the App signal (with the device ID) allows linking the user's authorization to the mobile communications device 5 used by the user 8. Once the registration is completed, the App's self-registration feature may communicate the successful registration to the user 8 and indicate that it is ready for use in connection with the elevator system 1. The illustrated method ends in the step **S6**.

Claims

1. An elevator system (1), comprising:

an elevator control system (12),

an elevator car (10) movable under control of the elevator control system (12) between floors (L1, L2, L3) of a building, and having a car operating panel (20) that includes a credential detector (6), wherein the elevator control system (12) is configured to move the elevator car (10) to an access-restricted floor (L2, L3) in response to a valid credential presented to the credential detector (6) by a user (8), wherein the user (8) has a mobile communications device (5) provided with an elevator software application (App); and

a radio unit (28) arranged on one of the floors (L1, L2, L3) and configured to transmit a radio signal within a radio range limited to that floor (L1, L2, L3) and to an interior of the elevator car (10) when the elevator car (10) is at that floor (L1, L2, L3),

wherein the elevator control system (12) is configured to execute a user self-registration procedure enabling use of the mobile communications device (5) and its App for communications with the elevator system (1), the user self-registration procedure comprising:

receiving an App signal sent by the mobile communications device (5) in response to the mobile communications device (5) being in the elevator car (10) and receiving the radio signal transmitted by the radio unit (28), the App signal including a device identifier assigned to the user (8),

determining the floor (L2, L3) the mobile communications device (5) is located based on the radio signal,

receiving a detector signal in response to the user (8) presenting the user's valid credential to the credential detector (6) in the elevator car (10), and

registering, based on the App signal and the detector signal being received within a set activation period, the mobile communications device (5) and its App in the elevator system (1) for communications with the elevator system (1).

2. The elevator system (1) according to claim 1, wherein the elevator control system (12) is configured to store the device identifier in a record of a database when registering the mobile communications device (5), wherein the device identifier is stored in the record together with information of the determined floor.

3. The elevator system (1) according to claim 2, wherein the database is stored in a storage device (12a) of or communicatively coupled to the elevator control system (12).

4. The elevator system (1) according to any preceding claim, wherein the radio unit (28) is configured to transmit the radio signal according to at least one of a Bluetooth, WiFi/WLAN and ultrawideband (UWB) standard.

5. The elevator system (1) according to one of the preceding claims, wherein the credential detector (6) includes a key switch configured for insertion of a key, or a keypad configured for entering a numeric or alphanumeric code.

6. The elevator system (1) according to one of claims 1 – 4, wherein the credential detector (6) includes a reader device configured to read an optical code from a first carrier medium or to detect a radio credential signal from a second carrier medium.

7. The elevator system (1) according to one of the preceding claims, wherein the radio unit (28) is arranged on the access-restricted floor (L2, L3) and wherein the elevator control system (12) is configured to register the mobile communications device (5) and its App while the user (8) is at the access-restricted floor (L2, L3).

8. A method of operating an elevator system (1) having an elevator control system (12), a radio unit (28) and an elevator car (10) movable under control of the elevator control system (12) between floors (L1, L2, L3) of a building, and having a car operating panel (20) that includes a credential detector (6), wherein the elevator control system (12) is configured to move the elevator car (10) to an access-restricted floor (L2, L3) in response to a valid credential (2) presented to the credential detector (6) by a user (8), wherein the user (8) has a mobile communications device (5) provided with an elevator software application (App), wherein the radio unit (28) is arranged on one of the floors (L1, L2, L3) and configured to transmit a radio signal within a radio range limited to that floor (L1, L2, L3) and to an interior of the elevator car (10) when the elevator car (10) is at that floor (L1, L2, L3), the method comprises:

receiving an App signal sent by the mobile communications device (5) in response to the mobile communications device (5) being in the elevator car (10) and receiving the

radio signal transmitted by the radio unit (28), the App signal including a device identifier assigned to the mobile communications device (5),

determining the floor (L2, L3) the mobile communications device (5) is located based on the radio signal,

receiving a detector signal in response to the user (8) presenting the user's valid credential (2) to the credential detector (6) in the elevator car (10), and

registering, based on the App signal and the detector signal being received within a set activation period, the mobile communications device (5) and its App in the elevator system (1) for communications with the elevator system (1).

9. The method according to claim 8, wherein registering includes storing the device identifier in a record of a database, wherein the device identifier is stored in the record together with information of the determined floor.

10. The method according to claim 9, wherein storing the device identifier and the information of the determined floor includes storing the record in a storage device (12a) of or communicatively coupled to the elevator control system (12).

11. The method according to one of claims 8 – 10, wherein the radio unit (28) is configured to transmit the radio signal according to at least one of a Bluetooth, WiFi/WLAN and ultrawideband (UWB) standard.

12. The method according to one of claims 8 – 11, wherein the credential detector (6) includes a key switch configured for insertion of a key, or a keypad configured for entering a numeric or alphanumeric code.

13. The method according to one of claims 8 – 12, wherein the credential detector (6) includes a reader device configured to read an optical code from a first carrier medium or to detect a radio credential signal from a second carrier medium.

14. The method according to one of claims 8 – 13, wherein the radio unit (28) is arranged on the access-restricted floor (L2, L3) and wherein the elevator control system (12) is configured to register the mobile communications device (5) and its App while the user (8) is at the access-restricted floor (L2, L3).