authorisations in the building areas is thus not simple to realise.

The continued stay or also the movement of the lift users in the respective building area can now be monitored only with a high level of cost. Thus, for example, it is possible that a non-authorised lift user at the same time enters a lift cage, which travels to a private region, and thus gains access to the private regions. Securing of these private regions for cases of that kind was previously possible only by expensive monitoring or by further access checks in the private regions. Such safeguards require a trained, often armed, security service as well as special and substantial devices. All this is intimidating and regarded as unpleasant.

It is accordingly the lift user of the invention to indicate, in a building area which has regions with different access authorisations, a lift installation and a method by which the stay of lift users in the building area can be monitored and checked without substantial cost in order to enable an effective drive control of the lift installation or intervention of a security service.

A method of operating a lift installation according to patent claim 1 and a lift installation according to patent claim 10 are proposed for fulfilling this lift user.

Advantageous embodiments can be inferred from the subclaims.

An lift user to be transported in the building area can for starting transport by the lift installation trigger either a destination call or a combination of a lift call with a cage call. A cage call is a call in which only the boarding location is communicated to a lift control. The lift control allocates a lift cage to the corresponding lift user. After boarding of the cage the lift user triggers a cage call in the cage. The cage call is communicated to the lift control and the cage thereupon transports the lift user from the boarding location to the appropriate storey corresponding with the destination storey of the cage call. A destination call is a call in which not only the boarding location, but also the destination location are transmitted to a lift control. The lift control allocates to the corresponding lift user a lift cage which transports this lift user from the boarding location to the appropriate storey corresponding with the destination location of the destination call and this without a further cage call being triggered by the lift user.

Patent Claims

1. Method of operating a lift installation for transporting lift users in a building area, the method comprising the steps:

a) detection of positions of lift users in the building area by means of a position detection device;

j) said position detection device being a camera (42) which detects camera signals in the form of digital signals;

k) evaluation of detected positions of lift users by means of an evaluating unit,

l) fixing of detected positions of lift users as spatial and time position data by means of a storage medium; and

m) distinction of different lift users on a camera image by means of distinction criteria.

2. Method according to claim 1, characterised in that distinction criteria are:
the color of lift users
and/or the size and shape of lift users
and/or differences which can be established by image comparison between images of different cameras
and/or differences which can be established by image comparison between images which were recorded at different points in time.

3. Method according to one of claims 1 or 2, characterised in that all routes accessible to lift users are detected by cameras (42); each has a specific detection range; adjacent cameras are so arranged that their detection range overlaps at least in regions; a lift user which moves from a first detection range to an adjacent second detection range is thus initially detected only by the first camera (42), as soon as it crosses through an overlap region it is detected by both cameras (42) and thereafter is detected only by the second camera (42).

4. Method according to one of claims 1 to 3, characterised in that a number of lift user per camera image is determined
and/or that a movement direction and speed of lift users is determined on camera images.

5. Method according to one of claims 1 to 4, characterised in that a lift user is identified by means of an identification unit (43, 44, 45)
and/or that a lift user is identified by means of an identification unit comprising an input terminal (45)
and/or that a lift user is identified by means of an identification unit comprising an input terminal (45) with a numeric keyboard
and/or that a lift user is identified by means of an identification unit comprising a card reader (44)
and/or that a lift user is identified by means of an identification unit comprising a wireless chipcard reader (43) which interogates codes which are stored on radio-frequency identification chips which are carried by the lift users.

6. Method according to claim 5, characterised in that a biometric recognition system authenticates a lift user
and/or that a biometric recognition system authenticates a lift user by detection of a face from the lift user
and/or that a biometric recognition system authenticates a lift user by detection of an iris from the lift user
and/or that a biometric recognition system authenticates a lift user by detection of a fingerprint from the lift user
and/or that a biometric recognition system authenticates a lift user by detection of a speech from the lift user.

7. Method according to one of claims 5 or 6, characterised in that a position of a detected lift user is checked; and that an identification and/or authentication of a lift user is checked.

8. Method according to claim 7, characterised in that if the lift user has been correctly identified or authenticated and its position has been detected, an access athorisation unit grants an access authorisation to the building area
and/or that if the lift user has been correctly identified or authenticated and its position has been detected, an access athorisation unit grants an access authorisation to the building area by opening a door or release of a turnstyle (46)
and/or if the lift user was not identified or authenticated or its position was not detected, a safety measure is initiated

and/or if the lift user was not identified or authenticated or its position was not detected, a safety measure is initiated by blocking or remain blocking entry doors or turnstiles (46) or other kinds of barriers.

9. Method according to claim 8, characterised in that after a lift user has correctly entered the building area, a current position of the lift user is constantly ascertained by the position detection device.

10. Method according to one of claims 1 to 9, characterised in that the position data and an access authorisation of each lift user are communicated to a main control unit (31) and filed in a user profile.

11. Method according to one of claims 1 to 10, characterised in that an input terminal (49, 50) is provided in a plane (30, 40) for the input of a destination call or a lift call by the lift user, and that said destination call or said lift call is communicated to a main control unit (31)
and/or that an input terminal (49, 50) is provided in a plane (30, 40) for the input of a destination call or a lift call by the lift user, that said destination call or said lift call is communicated to a main control unit (31), that the position data and an access authorisation of each lift user are communicated to a main control unit (31) and filed in a user profile, and that the main control unit (31) assigns to each destination call or lift call actuated at an input terminal (49, 50) exactly one lift user position current in terms of time and an access authorisation of the lift user
and/or that an input terminal (49, 50) is provided in a plane (30, 40) for the input of a destination call or a lift call by the lift user, that said destination call or said lift call is communicated to a main control unit (31), and that the main control unit (31) allocates a lift cage (36) to the lift user
and/or that an input terminal (49, 50) is provided in a plane (30, 40) for the input of a destination call or a lift call by the lift user, that said destination call or said lift call is communicated to a main control unit (31), that the main control unit (31) allocates a lift cage (36) to the lift user, and that the allocated lift cage (36) is represented in a display of the input terminal (40, 50).

12. Method according to claim 11, characterised in that the detected lift user enters the lift cage (36) allocated thereto

and/or that the detected lift user enters the lift cage (36) allocated thereto, and that if the lift user has triggered not a destination call but a lift call, the lift user triggers a cage call in the lift cage (36).

13. Method according to claim 12, characterised in that the number or position of the detected lift users in the lift cage (36) is checked
and/or that the number or position of the detected lift users in the lift cage (36) is checked, and that if the number of lift users disposed in the lift cage (36) does not agree with the number of lift users allocated to this lift cage (36), a security measure is triggered
and/or that the number or position of the detected lift users in the lift cage (36) is checked, and that if the position of a lift user in the lift cage (36) does not agree with the position of that lift user which has activated the destination call or lift call, a security measure is triggered.

14. Method according to one of claims 12 or 13, characterised in that the main control unit (31) conducts to each lift a user profile, said user profile comprises constantly updated details about the number of lift calls which are associated with the lift cage (36)
and/or that the main control unit (31) conducts to each lift a user profile, said user profile comprises constantly updated details about the number of lift calls which are associated with the lift cage (36), and that said user profile registers with respect to each lift call a boarding plane and a destination plane
and/or that the main control unit (31) conducts to each lift a user profile, said user profile comprises constantly updated details about the number of lift calls which are associated with the lift cage (36), and that said user profile registers with respect to each lift call the point in time at which the destination call or lift call was triggered
and/or that the main control unit (31) conducts to each lift a user profile, said user profile comprises constantly updated details about the number of lift calls which are associated with the lift cage (36), and that said user profile indicates a sequence in which the lift cages (36) are moved to the destinations.

authorisations in the building areas is thus not simple to realise.

The continued stay or also the movement of the lift users in the respective building area can now be monitored only with a high level of cost. Thus, for example, it is possible that a non-authorised lift user at the same time enters a lift cage, which travels to a private region, and thus gains access to the private regions. Securing of these private regions for cases of that kind was previously possible only by expensive monitoring or by further access checks in the private regions. Such safeguards require a trained, often armed, security service as well as special and substantial devices. All this is intimidating and regarded as unpleasant.

It is accordingly the lift user of the invention to indicate, in a building area which has regions with different access authorisations, a lift installation and a method by which the stay of lift users in the building area can be monitored and checked without substantial cost in order to enable an effective drive control of the lift installation or intervention of a security service.

A method of operating a lift installation according to patent claim 1 and a lift installation according to patent claim 10 are proposed for fulfilling this lift user.

Advantageous embodiments can be inferred from the subclaims.

An lift user to be transported in the building area can for starting transport by the lift installation trigger either a destination call or a combination of a lift call with a cage call. An elevator call is a call in which only the boarding location is communicated to a lift control. The lift control allocates a lift cage to the corresponding lift user. After boarding of the cage the lift user triggers a cage call in the cage. The cage call is communicated to the lift control and the cage thereupon transports the lift user from the boarding location to the appropriate storey corresponding with the destination storey of the cage call. A destination call is a call in which not only the boarding location, but also the destination location are transmitted to a lift control. The lift control allocates to the corresponding lift user a lift cage which transports this lift user from the boarding location to the appropriate storey corresponding with the destination location of the destination call and this without a further cage call being triggered by the lift user.

Patent Claims

1. Method of operating a lift installation for transporting lift users in a building area, the method comprising the steps:

detection of positions of lift users in the building area by means of a position detection device;

said position detection device being a camera (42) which detects camera signals in the form of digital signals;

evaluation of detected positions of lift users by means of an evaluating unit,

fixing of detected positions of lift users as spatial and time position data by means of a storage medium;

distinction of different lift users on a camera image by means of distinction criteria;

checking of a position of a detected lift user;

checking of an authentication of a lift user;

if a lift user has been correctly authenticated and its position has been detected, grant of an access authorisation to the building area by an access authorisation unit;

communication of the position data and the access authorisation of each lift user to a main control unit (31) of the elevator installation; and

filing the position data and the access authorisation of each lift user in a user profile.

2. Method according to claim 1, characterised in that distinction criteria include at least one of the color of lift users, the size and shape of lift users, differences which can be established by image comparison between images of different cameras, and differences which can be established by image comparison between images which were recorded at different points in time.

3. Method according to one of claims 1 or 2, characterised in that all routes accessible to lift users are detected by cameras (42); each has a specific detection range; adjacent cameras are so arranged that their detection range overlaps at least in regions; a lift user which moves from a first detection range to an adjacent second detection range is thus initially detected only by the first camera (42), as soon as it crosses through an overlap region it is detected by both cameras (42) and thereafter is detected only by the second camera (42).

4. Method according to one of claims 1 to 3, characterised in that a number of lift user per camera image is determined, or that a movement direction and speed of lift users is determined on camera images.

5. Method according to one of claims 1 to 4, characterised in that a lift user is identified by means of an identification unit (43, 44, 45).

6. Method according to claim 5, wherein the identification unit (43, 44, 45) includes at least one of an input terminal (45), an input terminal (45) with a numeric keyboard, a card reader (44), and a wireless chipcard reader (43) which interrogates codes which are stored on radio-frequency identification chips which are carried by the lift users.

7. Method according to one of claims 5 or 6, characterised in that a biometric recognition system authenticates a lift user.

8. Method according to claim 7, wherein the biometric recognition system authenticates a lift user by detection of a face from the lift user, an iris from the lift user, a fingerprint from the lift user, or a speech from the lift user.

9. Method according to one of claims 7 or 8, characterised in that if the lift user has been correctly identified or authenticated and its position has been detected, the access authorisation unit grants an access authorisation to the building area by opening a door or release of a turnstile (46).

10. Method according to one of claims 5, 6, 7, 8 or 9, characterized in that if the lift user was not identified or authenticated or its position was not detected, a safety measure is initiated.

11. Method according to claim 10, wherein the safety measure is initiated by blocking entry doors or turnstiles (46) or other kinds of barriers.

12. Method according to claim 9, characterised in that after a lift user has correctly entered the building area, a current position of the lift user is constantly ascertained

by the position detection device.

13. Method according to one of claims 1 to 12, characterised in that an input terminal (49, 50) is provided in a plane (30, 40) for the input of a destination call or a lift call by the lift user, and that said destination call or said lift call is communicated to a main control unit (31).

14. Method according to claim 13, characterised in that the detected lift user enters the lift cage (36) allocated thereto.

15. Method according to claim 14, characterised in that the number or position of the detected lift users in the lift cage (36) is checked, wherein if the number of lift users disposed in the lift cage (36) does not agree with the number of lift users allocated to this lift cage (36), a security measure is triggered, and wherein if the position of a lift user in the lift cage (36) does not agree with the position of that lift user which has activated the destination call or lift call, a security measure is triggered.

16. Method according to one of claims 14 or 15, characterised in that the main control unit (31) conducts a user profile for a lift, said user profile comprises constantly updated details about the number of lift calls which are associated with the lift cage (36).