Abstract: The object of the invention is a method and an arrangement for modernizing an elevator group, in which method the elevators of the elevator group (1) are modernized in turn such that both modernized elevators and unmodernized elevators can be simultaneously in use in the elevator group, of which elevators the modernized elevators are each provided with individualized identification marks (3) while the old unmodernized elevators in use in the elevator group (1) are each provided with a similar identification mark (3a) to each other.
METHOD AND ARRANGEMENT FOR MODERNIZING AN ELEVATOR GROUP

The object of the invention is a method and an arrangement for modernizing an elevator group, in which elevator group both unmodernized old elevators based on a collective control system and modernized new elevators based on a destination control system can be simultaneously in operation.

Modernization-time solutions are known in the art wherein e.g. an elevator's own old call pushbuttons are left on the floor levels, which pushbuttons comprise only a button for a call upwards and a button for a call downwards while destination call panels are installed on the same floor levels for modernized elevators, with which destination call panels the desired destination floor can be directly given already on the call floor. In this case a problem is that a passenger must make a choice on the floor level as to the elevator of which control method he/she wants to take. In this case the passenger might use both the call pushbuttons of old elevators and the destination call panels of new elevators, in which case both an old and a new elevator can arrive at the floor level essentially simultaneously. Solutions are also known in which the old call pushbuttons are replaced with new destination call panels, with which it is possible to give calls to both unmodernized and modernized elevators. A problem forms in this case in how the user can be reliably guided to either the new or the old elevator or elevator group serving him/her. One known solution is to provide the elevators with identification marks, e.g. with a letter sequence A, B...H or with a number sequence 1, 2...8 and to guide the user to go e.g. to the elevators "E-H" or "5-8", if the user is served with a group consisting of unmodernized elevators that includes in this example case the elevators E,F,G and H (or 5,6,7 and 8). A problem in these solutions is that it is difficult for a user to remember the content of the guidance. After a while the user will perhaps not remember whether the guidance was to the elevators "C-F"
or "D-G", or "3-8" or "4-8". In this case it is generally also difficult for the user to piece together where all the elevators related to the guidance are situated.

Yet another solution used in the modernization phase is of the type that the user is guided verbally to go to an old elevator, e.g. as follows: "Mene vanhalle hissille" or "Go to Old/Existing Elevator". A problem in this case is that it might be difficult for a user to identify which elevators of an elevator group are old and which are new. This can occur particularly if the entrances of the elevator cars are not renewed and the old landing doors are used.

The aim of this invention is to eliminate the aforementioned drawbacks and to achieve a simple and inexpensive solution for modernizing an elevator group, which solution enables the flexible simultaneous use of the old and the new elevators during the modernization phase. Another aim of the invention is to achieve a solution that enables passengers to easily find the correct elevator during the modernization phase of the elevators.

The method according to the invention is characterized by what is disclosed in the characterization part of claim 1.

The arrangement according to the invention is characterized by what is disclosed in the characterization part of claim 8. Other embodiments of the invention are characterized by what is disclosed in the other claims. Some inventive embodiments are also discussed in the descriptive section of the present application. The inventive content of the application can also be defined differently than in the claims presented below. The inventive content may also consist of several separate inventions, especially if the invention is considered in the light of expressions or implicit sub-tasks or from the point of view of advantages or categories of advantages achieved. In this case, some of the attributes contained in the claims below may be superfluous from the...
point of view of separate inventive concepts. Likewise the
different details presented in connection with each
embodiment of the invention can also be applied in other
embodiments. In addition, it can be stated that at least some
of the subordinate claims can in at least some situations be
deemed to be inventive in their own right.

One advantage of the solution according to the invention is
that it is easy for passengers to use both the old and the
new elevators in the elevator group during the modernization
phase. A further advantage is that the solution according to
the invention is simple and inexpensive to implement, and is
also clear to use. A new destination call panel on a floor
level can be used normally to call both new and old elevators
and the guidance for an old and for a new elevator does not
essentially differ from each other. A user experiences the
guidance as essentially similar whether it is guidance to an
old elevator or guidance to a new elevator. Another advantage
is that as the modernization phase progresses it is not
necessary to make essential modifications to the old
elevators. The only visible change is the giving of an
identification mark to each elevator and when the elevator
has been modernized the identification mark is simply changed
to a sequence suitting the identification marks of the
modernized elevators.

In the following, the invention will be described in more
detail by the aid of some embodiment examples with reference
to the attached drawings, where

Fig. 1 presents a front view of one elevator group in the
modernization phase on one floor level,
Fig. 2 presents an elevator group according to Fig. 1 and
diagrammatically the control of same, and
Fig. 3 presents a simplified and diagrammatic view of the
different phases of the solution according to the
invention.
Fig. 1 presents a front view of one elevator group 1 that is in the modernization phase, which elevator group comprises five elevators, which are described by the doors 2 of the floor level. All the elevators in use are marked in connection with the door 2 of the floor level, e.g. with an identification mark above the door, which identification mark is in each modernized elevator an individual identification mark 3 and in the old unmodernized elevators the same identification mark 3a in all that differs from the identification marks 3 of the modernized elevators. It is seen from Fig. 1 that the elevator group 1 contains two modernized elevators based on a Destination Control System (DCS), the identification marks 3 of which are A and B, as well as two old elevators based on collective control, the identification mark 3a of both of which is N. Additionally, the elevator group comprises one elevator 4 that is in the modernization phase, which elevator is not right now in use owing to the modernization work and which elevator does not comprise an identification mark 3 or 3a nor a direction indicator 6.

The old call pushbuttons intended for up-calls and down-calls of the collective control are removed from each floor level at the beginning of modernization and one or more new destination call panels 5 are disposed in place of the old call buttons. In addition, the direction indicators 6 that have been in use are left in connection with the doors 2 that are in use by the old elevators N, so that passengers may know which is the correct arriving elevator for his/her call. The direction indicators 6 of each elevator that are on the floor levels are removed only when the elevator is in the modernization phase.

The solution according to the invention is characterized in that both the old unmodernized elevators N in use and also the new, already modernized, elevators A and B receive their
calls only from destination call panels 5. In the situation according to Fig. 1 a passenger wanted to go upwards from the floor level in question and pressed the destination button 5a or symbol of the floor he/she wants on the destination call panel 5. The call went to the group control of the elevator, in which a special actuator decided that the most suitable elevator for the purpose to be sent to the floor level is the second of the old unmodernized elevators, the identification mark of which is N. In this case the letter "N" is shown on the display 5b of the destination call panel 5 as guidance information for the passenger. The display of a destination call panel can also contain other guidance information, such as e.g. an indicator showing direction, illustrating in which direction the elevator in question is with respect to the destination call panel. Additionally, if there are still many old elevators marked with the identification mark N, the upward-indicating direction indicator 6a of the elevator coming to the called floor level is illuminated. Thus it is easy for the passenger to find the elevator N coming to the floor level that is correct for him/her.

In an old elevator N the passenger must still press the destination floor button of the car panel that is in the elevator car in order to be able to go to the floor he/she originally wanted. If he/she had gone into a new elevator A or B, the new elevator would have taken him/her directly to the floor that he/she had selected on the destination call panel 5 when calling the elevator. The elevator cars of the new elevators do not contain car panels guiding to the floors, so that it is no longer possible there to select the floor to which to go.

Fig. 2 presents the same elevator group 1 in the same modernization phase as in Fig. 1. In addition, Fig. 2 presents the control arrangement of the elevator group 1. For the old elevators N, the elevator group 1 still in the modernization phase comprises an old group control 7 based on
the collective control principle as well as elevator-specific control means 8, which operate still in essentially the same manner as before the commencement of modernization. In addition, a new group control 9 based on destination control, as well as elevator-specific control means 10, have been installed in the elevator group 1 for the new, already modernized, elevators A and B. The elevator group 1 is thus formed, in fact, from two subgroups, of which the unmodernized elevators operating under the control of the old group control form one subgroup and the modernized elevators operating under the control of the new group control form the other subgroup. An actuator 11 is also in connection with the new group control 9, which actuator receives and distributes calls given from a destination call panel between the new group control 9 and the old group control 7 on the basis of some desired division criterion, e.g. a criterion that optimizes the transport capacity of the subgroups. If on the basis of the division criterion a passenger who has given a call will be served by some unmodernized elevator, the actuator 11 sends either an up-call or a down-call to the old group control. The new group control 9 with actuator 11 and destination call panel (5) 5 is fitted to operate such that after a passenger has pressed in the destination call panel 5 a button, pushbutton or point on a touch-sensitive screen that refers to a floor higher than the call floor, the actuator 11 deduces that the passenger wants to go upwards, in which case the call to be sent to the old group control 7 is an up-call corresponding to the call floor. Correspondingly, after a passenger has pressed in the destination call panel 5 a button, pushbutton or point on a touch-sensitive screen that refers to a floor lower than the call floor, the actuator 11 deduces that the passenger wants to go downwards, in which case the call to be sent to the old group control is a down-call. The aforementioned up-call or down-call is transmitted to the old group control via a signal connection 12. As a result of the call the old group control sends any of the unmodernized elevators to the call
floor and at the same time "N" appears on the display of the
destination call panel for guiding the passenger who gave the
call to the old elevators, and also the direction indicator 6
(up-arrow or down-arrow) of the elevator in question is
controlled on (illuminated). If the actuator 11 decides that
the passenger will be served with modernized elevators, the
destination call data (call floor and destination floor) are
conveyed to the new group control 9. On the basis of the call
data the new group control sends a modernized elevator A or B
for the use of the passenger, the identification mark of
which elevator is indicated on the display 5b of the
destination call panel. In the solution according to Fig. 2
the actuator 11 is integrated into connection with the new
group control 9 but it is obvious to the person skilled in
the art that it can also be implemented as a separate unit,
which is connected to both the old and to the new group
control using a signal connection suited to the purpose.

Fig. 3 presents a diagrammatic view of the different phases
of the solution according to the invention. Deviating from
the earlier figures, at issue here is an elevator group of
six elevators L1-L6. The topmost row of identification marks
formed from the squares presents one starting phase PI of the
modernization of an elevator group, which phase has
progressed so far that the first elevator L1 is already
modernized and connected to the new group control 9 and, that
being the case, is operating as destination-controlled.
Correspondingly, the second elevator L2 is currently to be
modernized and not in use. The other elevators L3-L6 still
operate under the control of the old group control 8. The
identification mark A has been given to the modernized
elevator L1 and a common identification mark N has been given
to each of the old elevators that are in use.

In the next phase P2 the elevators L1 and L2 are modernized
and they operate as destination-controlled under the control
of the new group control. The elevator L2 has received the
identification mark B. Correspondingly, the elevator L3 is out of use in this modernization phase and the elevators L4-L6 are operating normally as old elevators under the control of the old group control, as stated above. It is proceeded thus from phase to phase until all the elevators L1-L6 have been modernized and each has been given its own identification mark from the letter sequence A-F. After this the old group control 7 is removed from use and the whole elevator group 1 functions under the control of the new group control 9 as destination-controlled.

The identification marks 3, 3a are e.g. easily changeable signboards or they are e.g. on display means disposed above the elevator doors, in which display means the identification marks to be expressed can be changed under the control of commands sent by the new group control or some other control, or directly manually e.g. by changing the switch data to be connected to the display means.

It is obvious to the person skilled in the art that the invention is not limited solely to the examples described above, but that it may be varied within the scope of the claims presented below. Thus, for example, numbers or different marks can be used as identification marks instead of letters. The letters and numbers are generally in consecutive sequence, i.e. A, B, C,...,N or 1, 2, 3, etc.

It is also obvious to the person skilled in the art that instead of the separate identification mark N of an unmodernized elevator, the identification coming to the last elevator to be modernized can already be used as the identification mark of an unmodernized elevator. In this case, one advantage is that when modernizing the last elevator, a new identification mark does not need to be given to it.
It is further obvious to the person skilled in the art that the various phases of the modernization method to be performed in the arrangement can be in a different sequence to each other than what is described above.
1. Method for modernizing an elevator group, in which method the elevators of the elevator group (1) are modernized in turn such that both modernized elevators and unmodernized elevators can be simultaneously in use in the elevator group, and in which method the modernized elevators are each provided with individualized identification marks (3), characterized in that the old unmodernized elevators in use in the elevator group (1) are each provided with similar identification marks (3a) to each other.

2. Method according to claim 1, characterized in that the identification mark (3a) to be given to the old unmodernized elevators is completely separate with respect to the identification mark (3) of modernized elevators or it is already the same as the identification mark (3) coming to the last elevator to be modernized.

3. Method according to claim 1 or 2, characterized in that the old call buttons intended for up-calls and for down-calls are replaced with a destination call panel on at least one floor level, and the destination calls to be given from the aforementioned call panel are distributed on the basis of the desired division criterion between the old group control controlling the unmodernized elevators and the new group control controlling the modernized elevators.

4. Method according to the preceding claim 3, characterized in that a destination call received from a destination call panel is sent to the old group control controlling the unmodernized elevators as an up-call or as a down-call on the basis of the travel direction expressed by the destination call.
5. Method according to any of the preceding claims 1 - 4, characterized in that the passengers are guided in essentially the same manner to both modernized elevators and to unmodernized elevators by notifying to each passenger the identification mark (3, 3a) of the elevator serving him/her and possible location or other guidance information connected to the elevator in question.

6. Method according to any of the preceding claims 1 - 6, characterized in that it is indicated to passengers by means of direction indicators (6) connected to the unmodernized elevators which of the old elevators is coming to the call floor.

7. Method according to any of the preceding claims, characterized in that the direction indicators (6) of each elevator that are on the floor levels are removed when the elevator is in the modernization phase.

8. Arrangement for modernizing an elevator group, in which arrangement the elevators of the elevator group (1) are modernized in turn such that both modernized elevators and unmodernized elevators in the elevator group can be simultaneously in use, and in which arrangement the modernized elevators are each provided with individualized identification marks (3), characterized in that the old unmodernized elevators in use in the elevator group (1) are each provided with similar identification marks (3a) to each other.

9. Arrangement according to claim 8, characterized in that the identification mark (3a) to be given to the old unmodernized elevators is completely separate with respect to the identification marks (3) of modernized elevators or it is already the same as the identification mark (3) coming to the last elevator to be modernized.
10. Arrangement according to claim 8 or 9, **characterized** in that the old call buttons intended for up-calls and for down-calls are replaced with a destination call panel (5) on at least one floor level, which is connected to an actuator (11) for receiving and distributing destination calls given from the call panel (5) on the basis of the desired division criterion between the group control (7) controlling the unmodernized elevators and the group control (9) controlling the modernized elevators.

11. Arrangement according to claim 8, 9 or 10, **characterized** in that the actuator (11) is fitted to send destination calls received from a destination call panel (5) to the group control (7) controlling the old elevators as an up-call or as a down-call on the basis of the travel direction expressed by the destination call.

12. Arrangement according to claim 10 or 11, **characterized** in that the actuator (11) is integrated into connection with the new group control (9).

13. Arrangement according to any of the preceding claims 8 - 12, **characterized** in that the arrangement is fitted to guide passengers in essentially the same manner to both modernized elevators and to unmodernized elevators by notifying to each passenger the identification mark (3, 3a) of the elevator serving him/her and possible location or other guidance information connected to the elevator in question.

14. Arrangement according to any of the preceding claims 8 - 13, **characterized** in that the direction indicators (6), which indicate to passengers which of the old elevators is coming to the call floor, are left in the unmodernized elevators.

15. Arrangement according to any of the preceding claims, **characterized** in that the direction indicators (6) of each
elevator on the floor levels are removed in the modernization phase of the elevator.
Fig. 3
A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: B66B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

FI, SE, NO, DK

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Relevant to claim No.</th>
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<td>WO 2009068725 A 1 (KONE CORP et al.) 04 J une 2009 (04.06.2009) abstract, page 23 line 9 page 24 line 10, claims, and figures</td>
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<td>P, A</td>
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:
  "A" document defining the general state of the art which is not considered to be of particular relevance
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  "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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Date of the actual completion of the international search: 12 January 201 1 (12.01.2011)
Date of mailing of the international search report: 08 March 201 1 (08.03.20 11)

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