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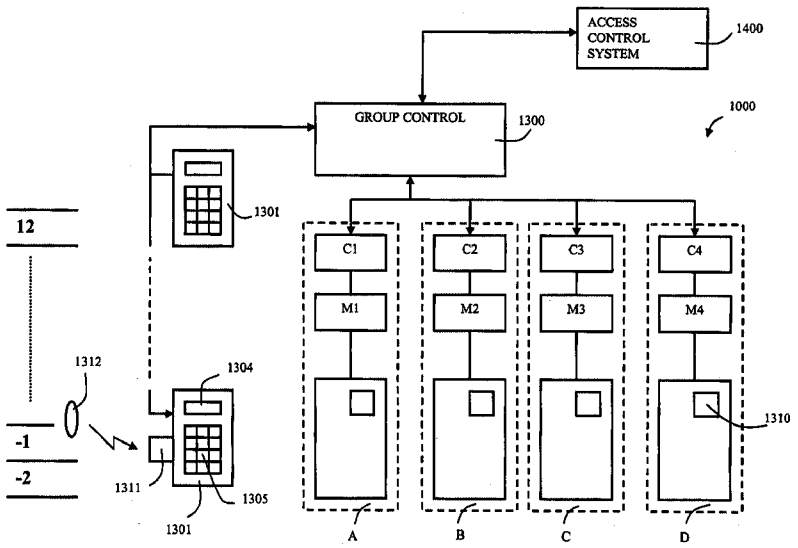

Fig. 1

(57) Abstract: The present invention discloses a method and a system for serving user groups in an elevator group in which the floors to be served are divided into floor zones. Passengers are classified on the basis of call information and determined classification rules into user groups, an elevator car is allocated to each passenger and the calls addressed to each elevator car are served one user group at a time.

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ELEVATOR SYSTEM

FIELD OF THE INVENTION

The invention relates to elevator systems. More particularly, the invention relates to a method and to a system for serving user groups in an elevator system.

BACKGROUND OF THE INVENTION

High-rise buildings typically contain a number of elevators, escalators and other corresponding traveling means for transporting people from one floor to another in the building. When a passenger gives calls to the elevators, the group control of the elevator system allocates an elevator car to the use of the passenger on the basis of the traffic situation prevailing in the elevator system and the given optimization criteria. The giving of calls in a conventional elevator system is arranged by disposing up/down pushbuttons on each floor, by means of which the passenger expresses his/her desired direction of travel and further, after the elevator has reached the floor on which the passenger is located, the passenger expresses his/her desired destination floor by means of the car pushbuttons in the elevator car. The method of giving calls described above is, however, impractical and often inefficient, as a result of which the giving of calls in elevator systems is implemented to an increasing extent by means of a so-called destination call system, in which the passenger gives his/her personal destination floor information already at the departure floor, e.g. in the entrance lobby before going into the elevator car. The giving of a destination call takes place by means of a special destination call terminal, either with pushbuttons or by means of an electrically readable identifier, e.g. an RFID (radio frequency identifier)

tag. Since in connection with a destination call the departure point and terminal point of the travel route of each passenger is identified and therefore available to the group control, the group control is able to determine the travel route of a passenger precisely and optimally compared to a conventional call-giving system.

The objective of allocating calls given by passengers is to assess the different route options for passengers and to give the calls to be served to the elevators in such a way that some performance indicator or a combination of performance indicators describing the elevator system is as good as possible. Conventionally the most commonly used performance indicators are performance indicators relating to the service times of a passenger but optimization criteria relating to energy or to another corresponding property of the elevator system are also possible. A so-called cost function is generally used to compare route options with each other, the minimization of the value (total cost) of which cost function with different route options expresses the optimal allocation. The allocation can also be implemented such that a suitable cost function for the best traffic situation at that time is taken into use in the different traffic situations of the elevator system. This is to give the elevator system the opportunity to adapt to the prevailing traffic situation, e.g. upward peak traffic in a building. The technique in question is described in patent publication FI972937, among others, from where a control method of an elevator group is known in which the control of the elevators is optimized on the basis of the traffic situation, i.e. the traffic type and the traffic intensity prevailing, at any given time, in which case the prevailing traffic situation is

identified and the elevator group is controlled on the basis of the optimization criteria corresponding to the aforementioned traffic situation. In order to identify the prevailing traffic situation, statistical information can be collected about the use of the elevator system according to different 24-hour periods and days of the week, and the future traffic situation of the elevator system can be forecast at any given moment in time on the basis of the statistical data collected. The solution in question is called a traffic forecaster.

One prior-art method to improve the transportation capacity of an elevator system is to divide the floors served by the elevator system into zones such that only certain zones are served with a certain elevator or elevators. By applying zoning, especially during peak-traffic periods, the waiting times of passengers and other times connected to travel events can be shortened and at the same time the transportation capacity of the elevator system can be improved. The efficiency of zoning can be further improved by changing the zone limits dynamically on the basis of the traffic situation of the elevator system, in which case the group control of the elevator system can quickly adapt to changes occurring in traffic situations. Since the different floors of buildings are typically reserved for some certain purpose of usage or some use of the user groups, the distribution into zones can also be implemented on the basis of the purpose of usage of the floors and/or on the basis of the user groups using the floors. For example, residential floors, office floors, arrival lobby floors, parking floors, etc., can be determined as their own zones.

In prior-art zoning solutions calls to an elevator serving a certain zone or certain zones are not allocated to other zones. It is obvious that this type of allocation method is inefficient and can result in significant lengthenings of waiting times and a decrease in transportation capacity and/or to an imbalance in the filling rate of elevators in situations in which there are no free elevators in the elevator system for allocating to the calls given by passengers. If an elevator for serving a passenger is not immediately allocated to the passenger, and neither is this fact informed to him/her, this causes the passenger unreasonable uncertainty about the selection of the travel route and about access to the destination floor. When endeavoring to optimize primarily the transportation capacity of the elevator system with zoning without regard to the user groups, passengers belonging to different user groups are allocated to the same elevator car, in which case ride comfort, access control and even travel safety can suffer. There is thus a need to implement service of user groups in zoned elevator systems such that ride comfort, access control and transportation capacity of the elevator system can be kept at the optimal in all situations.

PURPOSE OF THE INVENTION

The purpose of the present invention is to disclose a new kind of solution for serving user groups in an elevator system, in which the floors to be served are divided into floor zones. The purpose of the invention is to eliminate the deficiencies occurring in prior-art solutions and to achieve one or more of the following objectives, among others:

- to improve the level of service of passengers and ride comfort in general,
- to allocate a call given by a passenger immediately irrespective of the status of the elevator system and of the user group of the passenger,
- to optimize the transportation capacity of the elevator system in a zoned elevator system,
- to target passenger information to different user groups better than before,
- to improve access control between the different user groups,
- to utilize the special features of multicar elevators in the service of user groups.

SUMMARY OF THE INVENTION

The method according to the invention is characterized by what is disclosed in the characterization part of claim 1. The elevator system according to the invention is characterized by what is disclosed in the characterization part of claim 12. Other embodiments of the invention are characterized by what is disclosed in the other claims. Some inventive embodiments are also presented in the drawings 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. The features of the various embodiments can be applied within the scope of

the basic inventive concept in conjunction with other embodiments.

In the following the meaning of certain terms used in this context is explained in more detail:

- traffic situation: determines the traffic type as well as the traffic intensity prevailing in the elevator system, e.g. "light mixed traffic". The traffic type indicates the direction of the passenger flows generally prevailing in the elevator system, e.g. upward traffic (from the entrance lobby to the other floors of the building), downward traffic (from the other floors of the building to the entrance lobby), internal traffic (traffic between floors, in which the passenger does not arrive in the building or leave the building), two-way traffic (simultaneous downward traffic and upward traffic), mixed traffic (a combination of different traffic types). The traffic intensity indicates how heavy the traffic prevailing in the elevator system is in relation to the maximum transportation capacity of the elevator system, e.g. light traffic, normal traffic, heavy traffic and intensive traffic. In addition to the above, many other categorizations of traffic types and traffic intensities are possible.

- elevator call: a landing call or destination call given by a passenger on a floor level or a destination call based on identification of a passenger.

- classification rules: determine the data and rules on the basis of which an elevator call given by a passenger on a floor level, and thus

the passenger that gave the call, can be classified into a certain user group.

The present invention discloses a method for serving user groups in an elevator system, wherein the floors to be served are divided into one or more zones. In the first phase of the method the classification rules for classifying elevator calls into different user groups are determined. In the method elevator calls given by passengers on the floor landings are received, the user group of each passenger is determined on the basis of the call information received and also on the basis of the aforementioned classification rules, an elevator car is allocated to each passenger that has given an elevator call, and the passengers allocated to each elevator car are served according to the user group.

The present invention also discloses an elevator system for serving user groups, which elevator system comprises at least one elevator group and a group control that controls it, call-giving appliances on the floor landings for receiving call information and for transmitting it to the aforementioned group control, and in which elevator system the floors to be served are divided into one or more zones. According to the invention the elevator system is arranged to classify passengers into user groups on the basis of the call information received and the classification rules recorded in the elevator, to allocate an elevator car to each passenger that has given an elevator call and also to serve the passengers allocated to each elevator car according to the user group.

In one embodiment of the invention the user group of the passenger is taken into account in the allocation

phase of the elevator car. As a result of the embodiment the different user groups can be served more equally and at the same time the transportation capacity of the elevator system can be optimized.

In one embodiment of the invention elevator calls on the floors of one or more zones are received as destination calls and on the floors of the other zones as landing calls.

In one embodiment of the invention information determining the user group of the passenger is received from a terminal device in the possession of the passenger or from the access control system of the building.

In one embodiment of the invention the passenger is identified in connection with giving a call, which identification data is used in determining the user group of the passenger.

In one embodiment of the invention the destination floors to which travel is possible from each zone are determined in the classification rules. As a result of the embodiment the access control of the building can be implemented in the elevator system with simple arrangements and at the same time ride safety can be improved.

In one embodiment of the invention the classification rules are changed dynamically on the basis of the time of day and/or the day of the week. As a result of the embodiment the access control of the building can be improved during different times of day.

In one embodiment of the invention the classification rules are changed on the basis of the traffic

situation and/or an exceptional situation prevailing in the elevator system. As a result of the embodiment the transportation capacity of the elevator system and/or another desired property of the elevator system can be dynamically optimized to best correspond to the traffic situation prevailing in the elevator system at any given time. As a result of the embodiment the behavior of the elevator system can be optimized also in exceptional circumstances e.g. when one or more elevators of the elevator system are out of service or when evacuating certain zones e.g. owing to a fire detected in the building.

In one embodiment of the invention information determined on the basis of the user group is presented to passengers in the elevator lobby and/or in the elevator car and/or in connection with the receipt of an elevator call. As a result of the embodiment up-to-date information targeted at the different user groups can be presented to passengers during the elevator trip.

In one embodiment of the invention the elevator system uses the user group information in forming a run profile of the elevator car, and the elevator car is controlled according to the run profile. The run profile determines e.g. the speed of travel of the elevator, the acceleration, the door-open time of the doors of the elevator car, etc. As a result of the embodiment the needs of different user groups can be taken into account better in the passenger service of the elevators and ride comfort can thus be improved.

In one embodiment of the invention two or more user groups are served simultaneously with the different cars of a multicar elevator. As a result of the embodiment the transportation capacity of the elevator

system can be raised compared to all the cars of a multicar elevator serving only one user group at the same time.

As a result of the present invention, in buildings in which it is desired to serve different user groups primarily with their own elevator cars, it is possible to both keep ride comfort optimal and to restrict the simultaneous presence of different user groups in the elevators. Also the transportation capacity of the elevator system can be utilized effectively despite the setting of restrictions on the service of user groups. Owing to its dynamic aspects, the operation of the elevator system according to the invention can adapt to the traffic situation and/or to the exceptional circumstances prevailing in the elevator system at any given time. In addition, the solution according to the invention can be advantageously applied in connection with different types of elevator systems and call-giving systems. The congestion of the building, more particularly the congestion of the arrival lobbies, can also be reduced by directing different user groups to different arrival lobbies from where there is access to only the floors reserved for the user groups in question. Other advantages of the invention in connection with the different embodiments of the invention are also presented above. Overall, the service level for passengers improves when it is possible to take into account the needs of different passenger groups, special groups and organizations in the control of the elevator system.

DETAILED DESCRIPTION OF THE INVENTION

Fig. 1 presents an elevator group 1000, in which the solution according to the invention is applied. The elevator group comprises four elevators (A, B, C, D),

which serve the floors -2, -1, 0, 1 - 12 of the building. Each elevator comprises an elevator car, a hoisting machine (M1, M2, M3, M4) and an elevator control (C1, C2, C3, C4) that controls the elevator. Call-giving appliances 1301, which are connected to the group control 1300 of the elevator group, are installed on the floor landings in the waiting lobbies of the elevators. In the case according to Fig. 1 the call-giving appliances are destination call panels comprising destination call pushbuttons 1305 and also a display means 1304, but they can be landing call appliances provided with up/down pushbuttons on one or more floors, or call-giving appliances based on identification of the passenger, with which the passenger is identified on the basis of an electronic identifier, a bio-identifier or corresponding unique identifier and his/her destination floor and/or his/her user group is determined on the basis of the aforementioned identification. For transmitting an electrical identifier to the elevator system, the passenger can have a terminal device (1312) in his/her possession, e.g. a mobile phone or RFID transponder which sends the identification code of the passenger and/or information about the user group of the passenger to the receiving means (1311) on the floor landings and onwards to the group control. The access control system 1400 of the building, which can also transmit the identification code of the passenger and/or information about the user group of the passenger to the elevator system, is also connected to the group control.

When the passenger arrives in the waiting lobby of the elevators on the floor and gives an elevator call using the call-giving appliance 1301, the call data connected to the call is transmitted to the group control. If the call is given as a landing call as in

Fig. 1, the call information determines the departure floor and also the destination floor (target floor) of the passenger. If the call is given as a landing call, the call information determines the departure floor and also the direction of travel of the passenger. In elevator systems comprising elevator cars with two doors, door information is also connected to the call information for collecting the passenger from the correct waiting lobby and/or leaving the passenger in the correct waiting lobby. If the call-giving is based on identification of the passenger, the identification code that identifies the passenger is transmitted to the group control, on the basis of which the group control can determine indirectly the destination floor and/or the user group of the passenger. The passenger can be provided with a personal terminal device, which transmits the identification code and or the user group information of the passenger to the receiving means on the floor and onwards to the group control.

When the group control has received the call information connected to an elevator call of the passenger, it determines the user group of the passenger. Classification rules are recorded in the group control for determining the user group of a passenger, on the basis of which classification rules an elevator call given by a passenger can be classified into a certain user group. Table 1 presents exemplary classification rules of the elevator system according to Fig. 1, in which the following are determined:

- the zones and the floors that belong to the zones (zone limits),
- the user groups that use the zones,
- the permitted destination floors of the zones for each user group by determining the floors to which travel is possible from each zone,

- the bases of classification for specific zones zones, wherein it is determined whether information about the departure floor or the destination floor of the passenger is used to determine the user group.

In Table 1 the floors to be served are divided into zones according to the purpose of use of the floors as follows:

- zone 8: restaurant floor 12
- zone 7: residential floors 10, 11
- zone 6: floors 9-6 used by company "Company 1"
- zone 5: floors 5-2 used by company "Company 2"
- zone 4: arrival lobby floor 1
- zone 3: arrival lobby floor 0
- zone 2: parking floor -1
- zone 1: parking floor -2

On the basis of the departure floor expressed by the call information, the group control identifies the zone from which the passenger gave his/her call. If the zone on the basis of the classification rules is used by only one user group, the passenger is classified into the user group in question (classification basis = departure floor). For example, calls given from zone 7 can be classified on the basis of the departure floor into the class "Resident", because the floors 11 and 10 of zone 7 are reserved exclusively for use by the residents of the building. If, on the other hand, the zone is used by two or more user groups, additional information is needed, on the basis of which the classification can be performed. The destination floor (classification basis = destination floor) can function as the additional information, which can be associated with a certain user group on the basis of the zone division. For

example zone 2 (parking floor -1) is for use both by employees of the company 1 and by residents of the building. The division between the user groups "Company 1" and "Resident" is performed on the basis of the destination floor given by the passenger such that passengers going to floors 9, 8, 7 and 6 (zone 6) are classified into the user group "Company 1" and correspondingly passengers going to floors 11 and 10 are classified into the user group "Resident". The additional information that determines the user group can also function as information that directly determines the user group connected to the call information, which is received e.g. from a terminal device in the possession of a passenger. The user group of a free elevator determines the up-and-down or down-and-up trip (the so-called round trip) on the basis of the first passenger allocated to the elevator.

When the user group of the passenger is determined, the group control allocates an elevator car for the use of the passenger, e.g. using the genetic allocation method in which the optimization criteria are e.g. travel time, waiting time, energy, the fill ratio of the car or some combination of these. Passengers that belong to one or more user groups can be allocated to each elevator. If the allocated passengers belong to several user groups, the user group of a passenger is taken into account in the sequence of serving the calls. The user group connected to a call in the allocation phase can be taken into account such that e.g. the calls possibly already allocated to each elevator car and classified into other user groups, as well as the sequence of serving them specific to the user group, are taken into account in calculating the waiting time of a passenger. In this case the waiting time of the call to be allocated is affected by which calls the

elevator car must serve before it can serve the passenger that gave the call. When the elevator car to serve the passenger has been allocated, the passenger can be informed of this immediately in connection with giving the call with the display means 1304 of the call giving appliance for guiding the passenger to the allocated elevator.

The calls addressed to elevator cars are divided in the group control into the elevator cars to provide service by user group such that the passengers allocated to each elevator car and belonging to the same user group are served at one time. The restriction lasts at the most for one round trip at a time. The restriction is removed when the elevator has served the calls of the user group and is released to serve any user group whatsoever, depending on the service demand and the allocated calls at that time. Thus only passengers belonging to one user group at a time can travel in each elevator car. Each user group can be served with one or more elevators simultaneously depending on the amount of calls per user group and on the optimization criteria of the allocation. If multicar elevators are in use in the elevator system, two or more user groups can be served simultaneously with the same multicar elevator such that the passengers allocated to each elevator car of the multicar elevator are served as their own user groups independently of each other.

For implementing access control, permitted destination floors or zones are determined for the zones to which travel is possible from the zone. For example, in the zoning according to Table 1 it is possible to travel from zone 7 (residential floors 11 and 10) to the arrival lobby 0 (zone 3), to the parking floor -1 (zone 2), to the restaurant floor 12 (zone 8) and to

the residential floors 11 and 10 (zone 7). On the basis of the permitted destination floors determined in the classification rules, the giving of destination calls is activated in the destination call panels for only the aforementioned permitted destination floors and correspondingly the giving of destination calls to other destination floors is prevented. If the elevator cars are provided with car pushbuttons for registering the destination floor in the elevator car, only the permitted destination floor calls (call buttons) according to those zones from which the elevator is serving collected passengers are activated in the car panel. When serving a certain user group the elevator thus stops only at those floors permitted to this user group. Since each passenger belongs to some user group, he/she can travel only to the permitted floors determined for his/her user group.

If the determination of the user group is based on identification of the passenger or on user group information received from a terminal device of the passenger, the permitted destination floors of the passenger are restricted immediately at the departure floor to apply to only the destination floors in the use of the user group in question. For example, if a passenger in zone 2 (parking floor -1) is classified into the user group "Resident", he/she can travel from the parking floor -1 only to floors 11 and 12 (see Table 1). The elevator allocated to the passenger can stop during the time of the service at only the floors permitted to the user group in question.

The determination of permitted destination floors can be fixed or it can change dynamically according to the time of day and/or the day of the week. The access

control can thus be changed dynamically, e.g. such that it is possible to travel to certain zones only in the daytime during working hours but otherwise travel is not possible. Since the determination of the permitted destination floors is specific to the zone, travel can if necessary be permitted from a certain zone to another but opposite traffic between the zones can be prevented. An access control system can also be installed in the building, with which access to only certain floors, e.g. to arrival lobbies, is permitted to passengers belonging to certain user groups, from where passengers can travel to only to the permitted floors of each arrival lobby. By dividing the user groups optimally into different arrival lobbies, congestion of the arrival lobbies is avoided and ride comfort in general is improved.

According to one embodiment of the invention the elevator cars are provided with display means or other such information means for notifying passengers in the elevator car of information specific to the user groups. When the elevator car is serving a certain user group, information targeted on the user group in question, such as e.g. information about topical events in the building, company-specific news, guidance information, etc., is transmitted to the information means. Correspondingly, information means can be arranged in connection with the waiting lobbies and/or call-giving appliances, with which information based on which user group the passengers are classified into is transmitted to the passengers. In the elevator system according to Fig. 1 information that is specific to the user group can be presented in connection with the giving of a call with the display means 1304 of the destination call panel as well as with the information means 1310 in the elevator car

during the elevator trip. The information presented can be auditory and/or visual information.

According to one embodiment of the invention, the traffic situation and/or possible exceptional situations prevailing in the elevator system are monitored in the group control. When the traffic situation prevailing in the elevator system changes, or when detecting an exceptional situation in the elevator system, the group control changes the classification rules such that the elevator system uses the best applicable, dynamically changing zone limits and/or other information affecting the classification of passengers for each traffic situation and/or exceptional situation. For example, during peak traffic periods of the elevator system, the group control can in the classification rules connect two or more user groups into one user group, in which case the allocation and service sequence of calls van be better optimized and thereby the transportation capacity of the elevator system can be improved. In order to determine the traffic situation prevailing in the elevator system, the group control comprises a so-called traffic forecaster, which records statistical information about the travel events of the elevator system at different times over the 24-hour period and on weekdays. Information about travel events is obtained on the basis of the calls given by passengers but also the monitoring and statistical recording of different movement detectors, such as the car load weighing signals and/or the car photocell signals, are possible. Utilizing statistical data collected about travel events and the calls given, the traffic forecaster determines the traffic situation prevailing in the elevator system at any given time.

According to one embodiment of the invention, run profiles that are specific to the user groups are determined and recorded in the group control, on the basis of which the elevator car is controlled when serving a certain user group with an elevator. For example, if elderly people live in the building, in the run profile the door-open times of the doors of the elevator car can be lengthened and/or the acceleration, etc., of the elevator car reduced when the elevator is serving the user group "Elderly people"

The invention can also be applied to elevator systems comprising two or more elevator groups in large buildings. For example, if a passenger has to use an elevator of two different groups to get to the destination floor, the user group information determined for the passenger in connection with call-giving that occurred on the departure floor as well as the destination floor can be transmitted to both elevator groups and the elevator cars can be allocated (and informed) to serve him/her from both elevator groups according to the classification principles presented above. In this case the passenger can conveniently travel to the exchange floor and on the exchange floor move from the elevator of the first elevator group to the elevator of the second elevator group, both of which elevators are allocated to serve the user group into which the passenger is classified.

The invention is not limited solely to the embodiments described above, but instead many variations are possible within the scope of the claims. Although in the embodiments presented above the classification of passengers into user groups and the management of the service sequence of the user groups is implemented in

the group control of the elevator system, the solution according to the invention can also be implemented in other ways, e.g. by classifying passengers into user groups in some system that is outside the group control or by integrating the management of the service sequence into the elevator control of each elevator.

CLAIMS

1. Method for serving user groups in an elevator system, in which elevator system the floors served are divided into one or more zones, **characterized in that** the method comprises the phases:

the classification rules of elevator calls are determined;

the elevator calls given by passengers on the floor landings are received;

the user group of each passenger is determined on the basis of the call information received and the aforementioned classification rules;

an elevator car is allocated to each passenger that has given an elevator call; and

the passengers allocated to each elevator car are served according to the user group.

2. Method according to claim 1, **characterized in that** the user group of the passenger is taken into account in the allocation phase.

3. Method according to claim 1 or 2, **characterized in that** elevator calls on the floor of one or more zones are received as destination calls and on the floors of the other zones as landing calls.

4. Method according to any of claims 1-3 above, **characterized in that** information determining the user group of the passenger is received from a terminal device in the possession of the passenger or from the access control system of the building.

5. Method according to any of claims 1-4 above, **characterized in that** the method comprises the phases:

the passenger is identified in connection with giving a call; and

the identification data is used in determining the user group of the passenger.

6. Method according to any of claims 1-5 above, **characterized in that** the permitted destination floors or zones to which travel is possible from each zone are determined in the classification rules.

7. Method according to any of claims 1-6 above, **characterized in that** the classification rules are changed on the basis of the time of day and/or the day of the week.

8. Method according to any of claims 1-7 above, **characterized in that** the classification rules are changed on the basis of the traffic situation and/or an exceptional situation prevailing in the elevator system.

9. Method according to any of claims 1-8 above, **characterized in that** it comprises the phases:

run profiles of the elevators that are specific to the user group are determined;

the run profile of the elevator is selected on the basis of the user group to be served; and

the elevator car is controlled according to the selected run profile.

10. Method according to any of claims 1-9 above, **characterized in that** information is presented to passengers in the elevator lobby and/or in the elevator car and/or in connection with giving a call on the basis of the determined user group.

11. Elevator system according to any of claims 1-11 above, **characterized in that** two or more user groups are served simultaneously with the different cars of a multicar elevator.

12. Elevator system for serving user groups, which elevator system comprises at least one elevator group and a group control (1300) that controls the

elevator group, call-giving appliances (1301) on the floor landings for receiving call information and transmitting it to the group control (1301), and in which elevator system the floors to be served are divided into one or more zones, **characterized in that** the elevator system is arranged:

to classify passengers into user groups on the basis of the call information received and the classification rules recorded in the elevator system;

to allocate an elevator car to each passenger that has given an elevator call;

to serve the passengers allocated to each elevator car according to the user group.

13. Elevator system according to claim 12, **characterized in that** the elevator system is arranged to take into account the user group of the passenger when allocating the elevator car (A, B, C, D) to serve the passenger.

14. Elevator system according to claim 12 or 13, **characterized in that** one or more call-giving appliances (1301) is a destination call panel.

15. Elevator system according to claim 12, 13 or 14, **characterized in that** one or more call-giving appliances (1301) is a landing call appliance.

16. Elevator system according to any of claims 12-15 above, **characterized in that** the elevator system comprises means (1311, 1300) for receiving information determining the user group of a passenger from a terminal device (1312) in the possession of the passenger or from the access control system (1400) of the building.

17. Elevator system according to any of claims 12-17 above, **characterized in that** the elevator system comprises means (1311, 1300) for receiving the identification data of a passenger, and in that the elevator system is arranged to determine

the user group of the passenger on the basis of the aforementioned identification data.

18. Elevator system according to any of claims 12-17 above, **characterized in that** the permitted destination floors or zones to which travel is possible from each zone are determined in the classification rules.

19. Elevator system according to any of claims 12-18 above, **characterized in that** the classification rules change dynamically on the basis of the time of day and/or the day of the week.

20. Elevator system according to any of claims 12-19 above, **characterized in that** the classification criteria and/or the zone limits change on the basis of the traffic situation and/or an exceptional situation prevailing in the elevator system.

21. Elevator system according to any of claims 12-20 above, **characterized in that** the elevator system comprises means (1304, 1310) for presenting information specific to the user group in the waiting lobby and/or in the elevator car and/or in connection with receiving an elevator call.

22. Elevator system according to any of claims 12-21 above, **characterized in that** the run profiles that are specific to the user group are recorded in the elevator system for controlling the elevators.

23. Elevator system according to any of claims 12-22 above, **characterized in that** the elevator system comprises at least one multicar elevator, which is arranged to serve two or more user groups simultaneously.

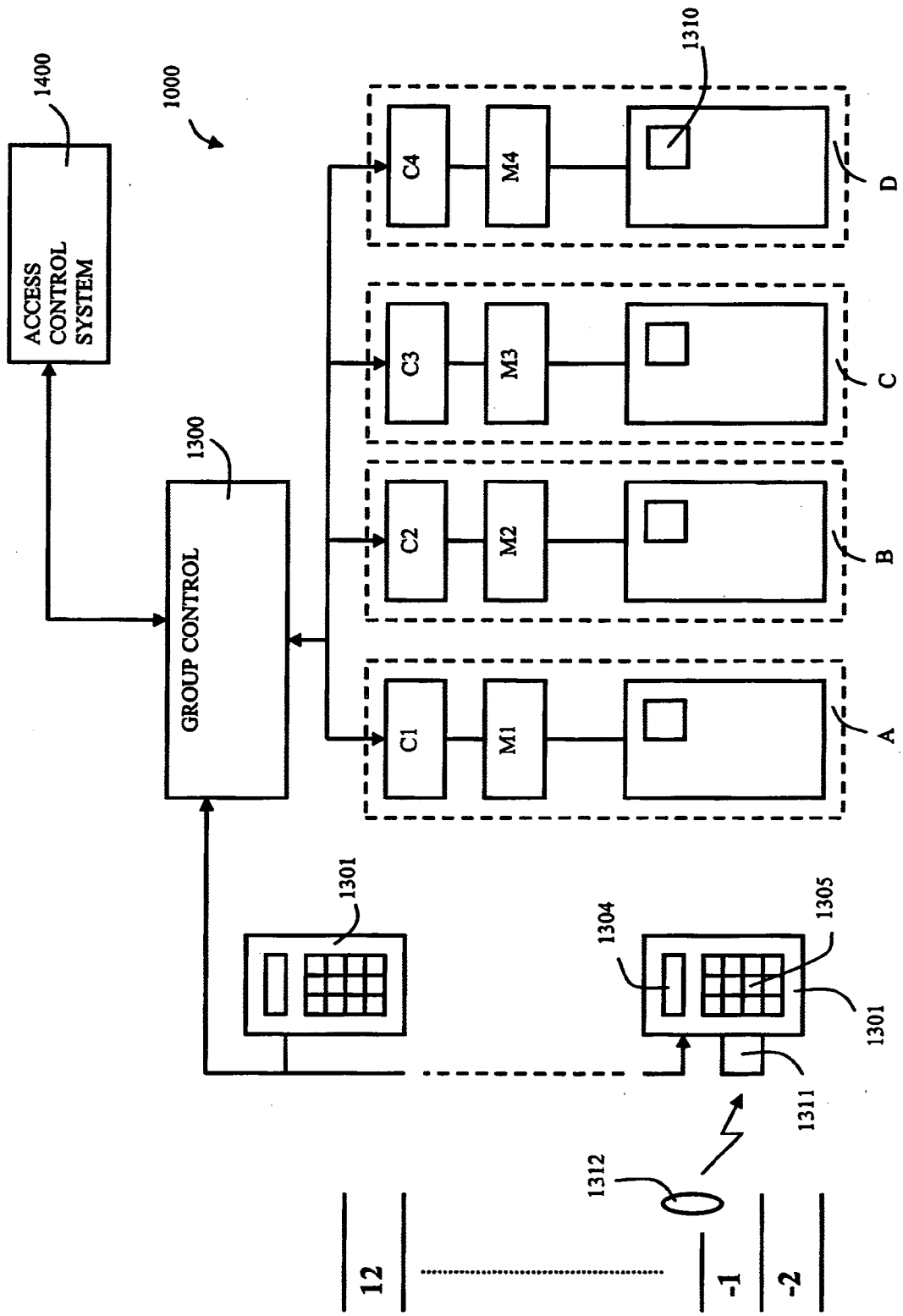
1400
ACCESS CONTROL SYSTEM
1000
1310
C4
M4
D
C3
M3
C
1300
GROUP CONTROL
C2
M2
B
C1
M1
A
1301
1304
1305
1301
1311
1312
12
-1
-2

Fig. 1

Zone	Floors	Permitted destination floors	User group	Classification basis
8. Restaurant floor		-2, 5-2, 1	Company 2	Destination floor
		-1, 6-9	Company 1	
		11-10	Resident	
		0	Visitor	
7. Residential floors	11-10	12,11,10,0, -1	Resident	Departure floor
6. Company 1	9-6	-1,0,9-6,12	Company 1	Departure floor
5. Company 2	5-2	-2,1,5-2,12	Company 2	Departure floor
4. Arrival lobby 1	1	-2, 5-2, 12	Company 2	Departure floor
3. Arrival lobby 0	0	-1,9-6	Company 1	Destination floor
		11-10	Resident	
		12	Visitor	
2. Parking floor -1	-1	9-6	Company 1	Destination floor
		11-20	Resident	
1. Parking floor -2	-2	5-2	Company 2	Departure floor

Table 1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2009/000039

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)

EPODOC, WPI, TXTE, COMPDX, EMBASE, INSPEC, XPAIP, XPIEE, XPIOP, XPI3E, NPL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	US 5192836 A (SCHRODER J.) 09 March 1993 (09.03.1993)	
X	Abstract, column 1 line 56 - column 2 line 51, claims, and figures	1, 2, 12 - 15
Y		4, 5, 10, 16, 17, 21
	US 2007017753 A1 (YLINEN J. et al.) 25 January 2007 (25.01.2007)	
X	Abstract, paragraph 0015, claims, and figures	1, 2, 7, 8, 10, 12 - 15, 19 - 21
Y		4, 5, 16, 17
	US 2002129994 A1 (KOSTKA M. et al.) 19 September 2002 (19.09.2002)	
X	Abstract, paragraphs 0007 - 0009, 0046 - 0055, and figures	1, 2, 12 - 15
Y		4, 5, 10, 16, 17, 21
	US 2004144599 A1 (WYSS P. et al.) 29 July 2004 (29.07.2004)	
X	Abstract, paragraphs 0005 - 0012, 0033 - 0074, and figures	1, 2, 5 - 8, 12, 13, 17 - 19, 20
Y		4, 10, 16, 21

☒ 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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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"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

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

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CLASSIFICATION OF SUBJECT MATTER

Int.Cl.
B66B 1/20 (2006.01)
B66B 1/24 (2006.01)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI2009/000039

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5932853 A (FRIEDLI P. et al.) 03 August 1999 (03.08.1999), Abstract, column 1 line 55 - column 2 line 55, and figures	4, 5, 16, 17
Y	GB 2315567 A (GODWIN A.) 04 February 1998 (04.02.1998), Abstract, pages 1 - 3, and figures	10, 21
A	EP 1418148 A1 (INVENTIO AG) 12 May 2004 (12.05.2004), Abstract and figures	1 - 23
E, A	WO 2009047382 A1 (KONE CORP et al.) 16 April 2009 (16.04.2009), Entire document	1 - 23
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