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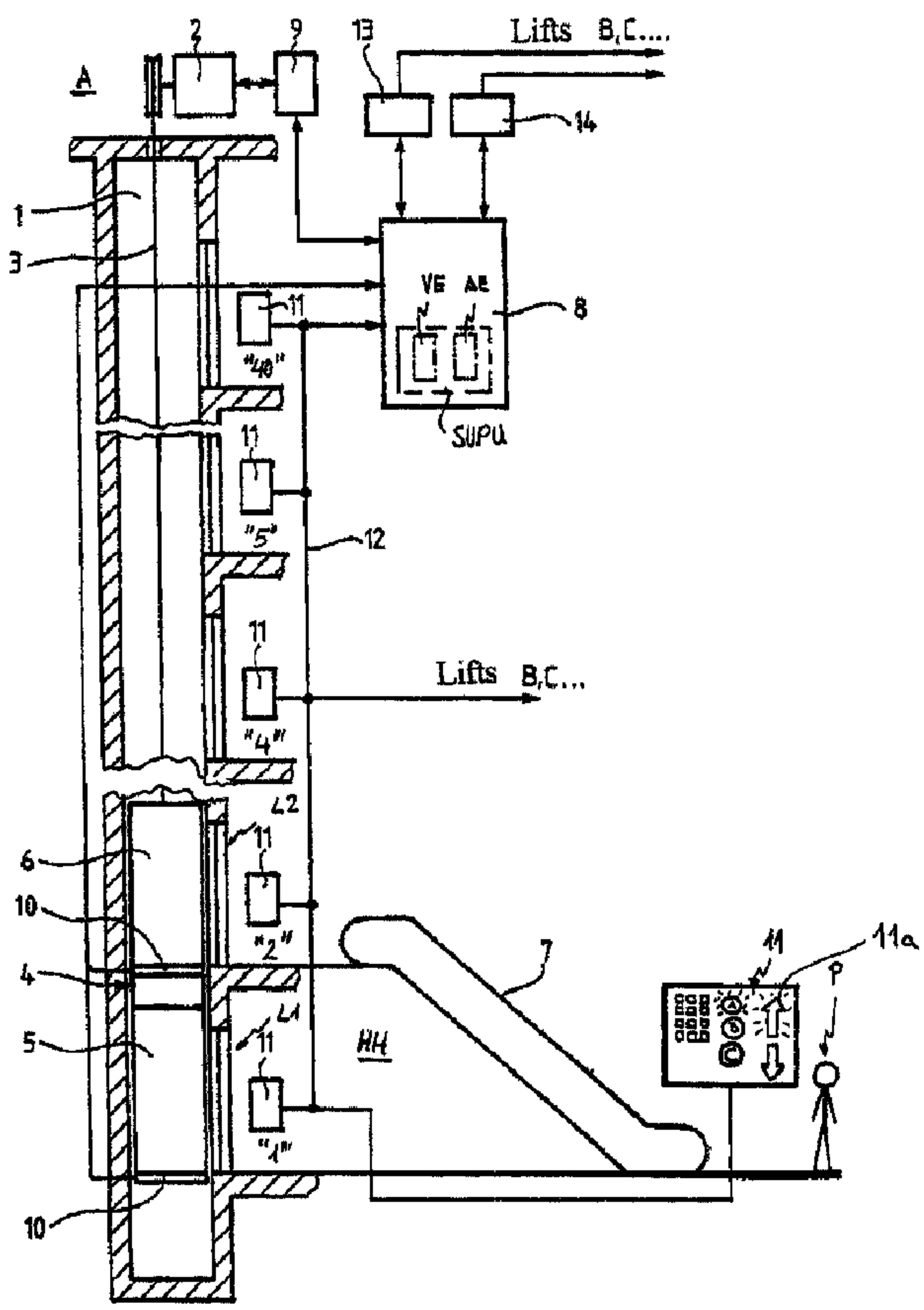
(54) Titre : DISPOSITIF DE COMMANDE ET METHODE DE COMMANDE POUR SYSTEME DE LEVAGE A CABINES MULTIPLES
(54) Title: CONTROL DEVICE AND CONTROL METHOD FOR A LIFT INSTALLATION WITH MULTIPLE CAGE



(57) Abrégé/Abstract:
The invention relates to a control device for controlling a lift installation with a multiple cage (4), by means of which multiple cage (4) several storeys of a building can be simultaneously served by one stop and which multiple cage (4) has a plurality of cage decks (5,

(57) Abrégé(suite)/Abstract(continued):
6), which are simultaneously accessible at a main stopping point (HH) by way of different main stopping planes ("1, "2"), wherein a call registering device (11), by means of which a passenger (P) can input his or her destination storey, is provided at the main stopping point (HH). In order to enable a more rapid filling of the building, it is proposed in accordance with the invention to provide a conversion unit (SUPU) which is constructed for the purpose of ascertaining, on the basis of the destination call of the passenger (P) at the main stopping point (HH) and on the basis of travel orders already allocated to and/or demanded of the multiple cage (4), which cage deck (5, 6) of the multiple cage (4) is to be allocated to the passenger (P) at the main stopping point (HH) in order to minimise the number of stops of the multiple cage (4), and an indicating device (11a) by means of which there can be indicated to the passenger (P) at the main stopping paint (HH) his or her allocated cage deck (6) and/or the main stopping plane ("2") thereof. In addition, the invention relates to a lift installation provided with such a control device as well as to a method for controlling such a lift installation.

Abstract

The invention relates to a control device for controlling a lift installation with a multiple cage (4), by means of which multiple cage (4) several storeys of a building can be simultaneously served by one stop and which multiple cage (4) has a plurality of cage decks (5, 6), which are simultaneously accessible at a main stopping point (HH) by way of different main stopping planes ("1, "2"), wherein a call registering device (11), by means of which a passenger (P) can input his or her destination storey, is provided at the main stopping point (HH). In order to enable a more rapid filling of the building, it is proposed in accordance with the invention to provide a conversion unit (SUPU) which is constructed for the purpose of ascertaining, on the basis of the destination call of the passenger (P) at the main stopping point (HH) and on the basis of travel orders already allocated to and/or demanded of the multiple cage (4), which cage deck (5, 6) of the multiple cage (4) is to be allocated to the passenger (P) at the main stopping point (HH) in order to minimise the number of stops of the multiple cage (4), and an indicating device (11a) by means of which there can be indicated to the passenger (P) at the main stopping point (HH) his or her allocated cage deck (6) and/or the main stopping plane ("2") thereof. In addition, the invention relates to a lift installation provided with such a control device as well as to a method for controlling such a lift installation.

(Fig. 3)

Control device and control method for a lift installation with multiple cage

The invention relates to a control device and method for controlling an elevator lift installation with multiple deck cars.

Such a control device, such a lift installation, such a building and such a control method are known from US-A-5 086 883, to which express reference is made for further details.

All modern controls for lift installations with multiple cages, for example double cages (double-deckers), strive for minimisation of the number of stops and thus also the cycle time. In the case of double-decker controls the embarking and disembarking persons in two adjacent storeys shall be served, as far as possible, simultaneously. In order to fulfil this task, in the case of buildings equipped with multiple cage lifts, for example double-decker lifts, two zones have to be separately considered:

a) The main stopping point, i.e. usually the building entrance (lobby). The main stopping point comprises in correspondence with the cage deck number of the multiple cages at least two, usually the two lowermost, stopping points or stopping point planes. The main stops of the main stopping point (lobby) are usually connected by escalators. There thousands of passengers flow into and out of the building on a daily basis. For the lift control the most important feature here is the constantly same lift position at the stop: the lowermost deck stops at the lowermost main stop plane of the main stopping point, thus as a rule the lobby.

b) The other storeys, thus, for example, the upper storeys above the main stopping point. There the multiple cage lifts, for example double-decker lifts, are so controlled in the case of between-floor traffic with advantage that they simultaneously serve those two adjacent storeys where passengers embark or disembark. The passenger waiting on such a storey accordingly cannot select the deck by which he or she is conveyed.

Known control algorithms - see, for example, the algorithm known from EP 1 193 207 A1 - offer solutions for the zone b) optimised to a greater or lesser extent.

The proposed invention fully optimises the control for journeys from the zone a).

For "filling" of the building in good time it is important that the lifts starting from the main stopping point avoid "overlapping" stops (for example, 13/14 and then 14/15). This was previously solved (see, for example, EP 0 301 178 A1) in such a manner that on the lower main stopping plane only the passengers with destination in uneven storeys embark and in the upper plane those with destinations in even storeys. This regulation applied not only for classical two-button controls, but also for new destination call controls.

Other solution possibilities were also proposed. Thus, in EP 0 624 540 A1 a feasible lift allocation by "preliminary information" by the passenger is proposed. On entry into the lifts the passenger selects one of the channels, wherein each channel is associated with a storey zone. The individual zones here consist of several storeys.

US-A 5 086 883 mentioned in the introduction describes another solution, which forms the introductory part of the independent claims, for a destination call control. According to that a lift installation comprising a double-deck lift group shall selectably be so subdivided that approximately half the lifts belong to the subgroup even/uneven and the second subgroup to uneven/even. The multiple cages are thus controlled in dependence on the divisibility of the number of the destination storey by the number of cage decks per multiple cage. Thus, every passenger in the two lobby storeys should be spared use of the escalator, because a lift can always be allocated to him or her independently of the evenness or unevenness of the destination storey. The individual multiple cages are, however, in that case always controlled with the so-called "restricted service", i.e. one of the cage decks always stops at an even-numbered storey and the other at an uneven-numbered storey. The allocation of the passenger by his determined travel call, indicated by his or her destination call, to a cage deck actually serving the even storeys or to a cage deck actually serving the uneven storeys is also carried out in corresponding manner.

The known solutions have a few disadvantages - the passenger has to at least know what even and uneven mean or then in which zone his or her destination storey is located. In the case of the zone channels a regular building user cannot develop a behavioural stereotype with the same lift group, because possibly different channels have to be used for different destinations. In addition, the apparently elegant solution of subdivision of the lift group into even/uneven and uneven/even subgroups conceals the disadvantage that the waiting times for some passengers are significantly increased.

The greatest problem arises when the storey designations in the building do not correspond with the numbering of the possible stops of the lifts. In such a case the decision of the passenger with regard to the evenness/unevenness of his or her destination storey (generally divisibility of the destination storey number by the cage deck number) does not correspond with that which the control considers on the basis of the number of possible stopping point pairs (stopping point triples in the case of triple cages, etc.). This problem can also arise as soon as the lift group has blind zones or express zones (i.e. storeys which are not served). Sometimes even several blind zones of different length are present and thus the selection of the most favourable stopping point pairs with respect to even/uneven or uneven/even can change several times.

The object of the invention is to improve a control device, a lift installation, a building as well as a lift control of the kind stated in the introductory part of the independent claims in such a manner that the building filling takes place more quickly with lift passengers starting from the main stopping point.

This object is fulfilled by a control device, a lift installation and a control method in accordance with the present invention.

Advantageous refinements of the invention are the subject of the subclaims.

For control of the operation with respect to the above-mentioned zone a) a significant improvement is achieved for the destination call control at the main stopping point with the solution according to the invention. In accordance with the invention the control uses a dynamic conversion unit. Advantageously the conversion unit is adapted to the building layout.

The conversion unit or the control steps which it can perform assist the deck allocation and preferably also the lift allocation in the case of a lift group in such a manner that each lift in the case of distribution travel starting out from the main stopping point, for example the lobby, selects only the non-overlapping stops and correspondingly allocates the passengers to the most suitable deck (and lift). Thus the cycle times are reduced, transport capacity increased and waiting times shortened. The passenger selects his or her destination storey, and the allocated deck (in that case also the lower or upper lobby) - and optionally also the allocated lift - is immediately indicated to him or her on the indicating device, for example a display, at the destination call registration device.

The advantage relative to the previous solutions consists in that the passenger does not have to make any decision about the evenness/unevenness (or other divisibility by the number of the cage decks) of his or her destination storey. Such a decision could possibly be counter-productive. A further advantage is to be seen in the fact that particularly in the case of "traffic peaks during the upward peak traffic" the passengers are optimally distributed to all decks and, in a given case, lifts.

The designation "dynamic" signifies according to the preferred form of embodiment that there is no statistical allocation of cage decks of individual lifts to a specific storey group (for example even/uneven) during a lift journey. The conversion unit can thus not only solve the problem of an inconsistency between the storey designation in the building and a stop number numeration within the control, but according to a respective situation also permits grouping of passengers with even and uneven destinations in one deck. In correspondence with the function of the conversion unit to optimally process traffic peaks in the case of (upward) journeys starting from the lobby or like main stopping point these could also be differently denoted, for example SUPU (Super Up Peak Unit).

In one aspect, the present invention provides a control device for controlling an elevator installation with a multiple deck car that simultaneously serves several floors of a building with one stop, the car having at least two car decks that are accessible at the same time at a main stopping point by way of different associated main stopping floors, the elevator installation further including a call registering device at the main stopping point by which a passenger can input a destination call representing his or her travel order for a desired destination floor, comprising: a conversion unit adapted to be connected to the call registering device, said conversion unit responding to a destination call input by a passenger at the main stopping point and to destination floor travel orders already allocated to and/or demanded of the multiple deck car to ascertain which car deck of the multiple deck car is to be allocated to the passenger at the main stopping point in order to minimize the number of stops to be made by the multiple deck car; and an indicating device connected to said conversion unit and being responsive to the ascertained car deck to indicate to the passenger at the main stopping point the main stopping floor associated with the allocated car deck.

In another aspect, the present invention provides a method of controlling an elevator installation with a multiple deck car for simultaneously serving more than one floor by one stop, wherein a main stopping point with different main stopping floors is driven to in normal operation in such a manner that each car deck of the multiple deck car stops at a main stopping floor, wherein destination calls of passengers are registered at the main stopping point, comprising the steps of: a) registering a destination call at the main stopping point; b) allocating the destination call to one of the car decks in dependence on all the destination calls registered at the main stopping point and/or in dependence on destination calls registered at other floors and/or in dependence on the structure of the building; and c) indicating to the passenger at the main stopping point the allocated car deck and/or an associated allocated main stopping floor wherein when the elevator installation includes several multiple deck elevators, said indicating step is performed by displaying to the passenger both the allocated car deck and the associated allocated main stopping floor.

In yet another aspect, the present invention provides a method of controlling an elevator installation with at least two multiple deck cars for simultaneously serving more than one floor by one stop, wherein a main stopping point with different main stopping floors is driven to in normal operation in such a manner that each car deck of the multiple deck cars stops at one of the main stopping floors, wherein destination calls of passengers are registered at the main stopping point, comprising the steps of: a) registering a destination call at the main stopping point entered by a passenger; b) allocating the destination call to one of the car decks in dependence on all the destination calls registered at the main stopping point and/or in dependence on destination calls registered at other floors and/or in dependence on the structure of the building; and c) displaying to the passenger at the main stopping point the main stopping floor associated with the allocated car deck.

An embodiment of the invention is explained in more detail in the following by reference to the accompanying drawing, in which:

Fig. 1 shows a schematic illustration of a lift shaft of a lift installation in a building, wherein the lift installation serves storeys of different height and express or blind zones, as well as a multiple cage in the form of a double-deck cage with two cage decks disposed one above the other, wherein the numeration of the floors, a numeration carried out within the control and a numeration of the possible stops of the double-deck cage are compared in different columns alongside one another;

Fig. 2A shows, in schematic illustration, the possible stopping positions of a double-deck cage in the case of a journey, which starts from a main stopping point, with a lift control according to the state of the art;

Fig. 2B shows a schematic illustration of a lift shaft of a lift installation with a double-deck cage and the stopping positions for execution of the same travel orders as in Fig. 2A, but in the case of the control according to the invention; and

Fig. 3 shows a schematic illustration of an embodiment of a lift control according to the invention for a lift of a lift group with double(-deck) cages.

In the description which follows here as well as in the drawings the numberings of storeys or stops are placed in quotes on each occasion in order to distinguish them from reference numerals.

Fig. 1 shows on the left a lift shaft 1 in which the respective storeys to be served by a lift with a double-deck cage 4 are indicated. The respective building storey number GSNR is indicated alongside at the right in a first column. A possible storey numeration SINR internal to the control is indicated alongside further to the right. Respective stopping positions HPA of the double-deck cage 4 (see Fig. 3) are illustrated in a further column and provided with a possible stop numbering HNR. It may be assumed that the corresponding lift does not serve the storeys "3" to "9" and "21" to "39". These storeys thus form the blind zones BZ or express zones which the lift can pass in rapid travel.

The problem of different numbering of the storeys of "building side" and "control internal" on the other hand is illustrated in Fig. 1. With consideration of the illustration in Fig. 1 it is apparent that virtually every physical level in the building can be denoted by several numbers. For example, the building storey "40" (this is also known as such to the passenger) is only the "14"th stopping point which is served as seen from the control, but then able to be served by the "15"th or, however, also "16"th possible stop of the double-deck cage 4. This has to be taken into consideration by the control. It is apparent from the drawing that the association of the lower cage deck 5 with an uneven storey and the upper cage deck with an even storey is not always practicable. Thus, for example, in the case of a destination call to the building storey "10" the double cage 4 stops by the lower cage deck 5 in the blind zone BZ of the storey "9" which is not served.

Schematic illustrations of a lift shaft are shown in Figures 2A and 2B. It is illustrated where the positions of the double cage 4 during a distribution travel in the case of upward peak traffic could happen. For a better overview in both cases only four passengers with, in both cases, the same travel desires are considered.

Fig. 2A shows the previous solution with a so-called "restricted service" (even/uneven decision). It is assumed that the passengers would like to travel from the double-deck lobby forming the main stopping points HH (storeys "1" and "2" form the main stopping planes) to the storeys "11", "12", "18" and "19". Different stopping positions of the double cage of a lift according to the state of the art during processing of travel orders are shown in Fig. 2A. It may thus be assumed that passengers with the destination storeys "11", "12", "18" and "19" are to be allocated at a main stopping point HH which comprises the storey "1" as a first main stopping plane and the storey "2" as a second main stopping plane. The main stopping point HH is approached by the double-deck lift in such a manner that the lower cage deck stops at the storey "1" and the upper cage deck at the upper storey "2". The two main stopping planes "1" and "2" are connected by an escalator or the like, as is explained in more detail hereinafter.

In the case of the solution according to the state of the art (Fig. 2A) the passengers with the destination storeys "11" and "19" get into the lower cage deck and those with the destination storeys "12" and "18" into the upper cage deck. The lift then stops at "11/12", wherein the two passengers with the destination storeys "11" and "12" can disembark simultaneously. Thereafter the lift travels to the position "17/18" in order to let the passenger with the destination storey "18" in the upper cage deck disembark. A further short travel, which is conducted to the position "18/19", is necessary in order to transport the passenger in the lower cage deck to his or her destination storey "19".

In Fig. 2B there are shown the possible stops of a lift installation with a double cage which corresponds with the lift cage of Fig. 2A and is to execute the same travel orders, but the control of which is provided with a conversion unit SUPU. This conversion unit dynamically allocates the passengers, who register their destination storey at the main stopping point HH by way of a destination call registration device 11, in correspondence with the travel orders already assigned to the double cage 4, wherein the possible allocations are compared with respect to which allocation in the succeeding journey gives the minimum stopping halts.

The conversion unit SUPU optimises the allocation of the passengers to the individual cage decks on the basis of the call situation supplied by the control module of the selected lift. In this case the passengers with the destination storeys "11" and "18" are conveyed in the lower cage deck and the passengers with the destination storeys "12" and "19" are conveyed in the upper cage deck. Thus, only two stops at the positions "11/12" and "18/19" are necessary in order to transport all passengers to their destinations.

The advantages of the solution with the conversion unit SUPU (Fig. 2B) are apparent by a comparison with the previous double-deck controls with the so-termed "restricted service" (illustrated in Fig. 2A), as are known from, for example, EP 0 301 178 A1 or also US-A 5 086 883. Express reference is made to both specifications for more specific details of equipping, by way of example, in terms of hardware, of the lift installation coming into question here.

By comparison of the two illustrations according to Figs. 2A and 2B it is clear that the use of the conversion unit SUPU can reduce the number of stops per round journey.

A concrete example of embodiment of a lift installation, which serves the building according to Fig. 1, with a control is illustrated in Fig. 3.

A lift shaft 1 of a lift A or a lift group consisting of several lifts is illustrated in Fig. 3. A hoisting engine 2 drives, by way of a conveying cable 3, a double cage 4 which is guided in the lift shaft 1 and formed from two cage decks 5, 6 arranged in a common cage frame. It may be assumed that the illustrated lift installation is disposed in the building, which is indicated entirely at the left in Fig. 1, with forty-one storeys and serves, with interposition of blind zones BZ (not illustrated in Fig. 3), only a part of these storeys of the building.

The spacing of the two cage decks 5, 6 from one another is so selected that it corresponds with the spacing of two adjacent storeys if the storey "3" formed higher is left out of consideration. A main stopping point HH present at the ground floor has in the storey "1" a lower access L1 to the lower cage deck 5 and in the storey "2" an upper access L2 to the upper cage deck 6 of the double cage 4. The two accesses L1, L2 are connected together by an escalator 7.

The hoisting engine 2 is controlled by, for example, a drive control known in principle from EP-0 026 406, wherein the target value generation, regulating function and stop initiation are carried out by means of a control device 8 which is constructed as a microcomputer system. The control device 8 is connected with measuring and setting elements 9 of the drive control. The control device 8 can also take over still further tasks, as is described in detail and illustrated in US-A 5 086 883. For example, also load measuring devices 10 are connected with the control device 8.

Call registration devices 11, which are, for example, known from EP-A-0 320 583 and which comprise decade keyboards, by means of which calls for journeys to desired destination storeys can be input, are provided at the storeys. As described in US-A 5 086 883 these are connected by a data conductor 12 with the control device 8. The control devices 8 of the individual lifts of the group are connected together by way of a first comparison device 13 known from EP-B-0 050 304 and a party-line transmission system 14 known from EP-B-0 050 305.

A conversion unit SUPU, which in the case of the control of the lift installation leads to a minimisation of the stops for a journey starting from the main stopping point HH, is formed in the control unit 8 by software modules. The conversion unit SUPU comprises a second comparison device VE and a selecting device AE.

The corresponding call registration device 11 is disposed at the main stopping point HH at, for example, a region in front of the escalator 7 where the paths to the two accesses L1 and L2 branch off from one another. Here a passenger P can input his or her desired destination storey by way of the decade keyboard. In the case of the lift A there are then possible allocations of the passenger P to the upper cage deck 6 or the lower cage deck 5. These two allocations are compared, on the basis of travel orders already allocated to the individual cage decks, with one another with respect to the then-necessary stops in the succeeding upward number. That allocation which gives the smallest number of stops is then selected by the selecting device AE and indicated to the passenger by way of the indicating device 11a of the call registration device 11. In the illustrated example an arrow "upper" for the upper cage deck 6 illuminates.

In the case of the comparison of the lift stops to be undertaken by a specific allocation, those already allocated to the individual cage decks of the lifts A, B, C ... and the building structure, as it is apparent from Fig. 1, are taken into consideration. For this purpose in the comparison device it is calculated for a specific allocation at which of the stopping positions HPA "1" to "16" the lift cage 4 has to stop for this allocation. The corresponding stops are counted and compared with the correspondingly ascertained stops for the remaining allocations. Then that allocation which gives the smallest number of overall stops is selected by the selecting device AE and indicated to the passenger P by the indicating device 11. According to that the lamp "A" for the lift A illuminates in the example illustrated here.

The journey following the allocation and boarding of the passenger P is then carried out in correspondence with the effected allocation with the minimised number of stops.

What is claimed is:

1. A control device for controlling an elevator installation with a multiple deck car that simultaneously serves several floors of a building with one stop, the car having at least two car decks that are accessible at the same time at a main stopping point by way of different associated main stopping floors, the elevator installation further including a call registering device at the main stopping point by which a passenger can input a destination call representing his or her travel order for a desired destination floor, comprising:

a conversion unit adapted to be connected to the call registering device, said conversion unit responding to a destination call input by a passenger at the main stopping point and to destination floor travel orders already allocated to and/or demanded of the multiple deck car to ascertain which car deck of the multiple deck car is to be allocated to the passenger at the main stopping point in order to minimize the number of stops to be made by the multiple deck car; and

an indicating device connected to said conversion unit and being responsive to the ascertained car deck to indicate to the passenger at the main stopping point the main stopping floor associated with the allocated car deck.

2. The control device according to claim 1 wherein said conversion unit further responds to a structure of the building, including different spacings between floors to be served by the multiple deck car, to ascertain which car deck is to be allocated.

3. The control device according to claim 2 wherein said conversion unit ascertains the car deck which is to be allocated in dependence on distances between the destination floors to be served.

4. The control device according to claim 1 wherein said conversion unit considers at which stop of the multiple car one of the car decks did not come to a stop at a floor previously directly served by the elevator installation and carries out the allocation in such a manner that the number of such stops is minimized.

5. The control device according to claim 2 wherein said conversion unit ascertains the car deck which is to be allocated to a destination call at the main stopping point dynamically on the basis of all destination calls registered or demanded at the main stopping point for this elevator and/or on the basis of destination calls registered or

demanded at the entire elevator installation without consideration of whether a floor, the number of which is divisible by the number of car decks of the multiple car, was driven to by a car deck at each stop.

6. The control device according to claim 1 wherein the multiple deck car has two car decks and said conversion unit allocates to each of the car decks passengers with even and uneven numbered destination floors in order to minimize the number of stops.

7. The control device according to claim 1 including a call registration device adapted to be located at a main stopping point of the elevator installation, said call registration device including said indicating device.

8. The control device according to claim 1 wherein the elevator installation has a plurality of elevators and said conversion unit ascertains a one of the elevators and an associated deck to be allocated in dependence on the divisibility of a number of the destination floor by the deck number such that the number of overall stops is minimized and said indicating device indicates the allocated elevator and the allocated car deck and/or the main stopping floor from which the allocated car deck is accessible.

9. The control device according to claim 1 wherein said conversion unit includes a comparison device that compares possible allocations of the destination call to the car decks as to whether a specific allocation with consideration of travel orders already allocated to the multiple car gives by comparison to another allocation a lesser number of stops in the case of travel, which starts subsequently from the main stopping point, for execution of the travel orders allocated to the multiple car.

10. The control device according to claim 9 wherein said conversion unit includes a selecting device which responds to a comparison of two possible allocations by said comparison device to select that allocation which gives the lesser number of stops.

11. A method of controlling an elevator installation with a multiple deck car for simultaneously serving more than one floor by one stop, wherein a main stopping point with different main stopping floors is driven to in normal operation in such a manner that each car deck of the multiple deck car stops at a main stopping floor, wherein destination calls of passengers are registered at the main stopping point, comprising the steps of:

a) registering a destination call at the main stopping point;

b) allocating the destination call to one of the car decks in dependence on all the destination calls registered at the main stopping point and/or in dependence on destination calls registered at other floors and/or in dependence on the structure of the building; and

c) indicating to the passenger at the main stopping point the allocated car deck and/or an associated allocated main stopping floor wherein when the elevator installation includes several multiple deck elevators, said indicating step is performed by displaying to the passenger both the allocated car deck and the associated allocated main stopping floor.

12. The method according to claim 11 wherein said step b) is performed dynamically without consideration of the divisibility of the number of the destination floor by the number of the car deck of the multiple deck car.

13. The method according to claim 11 wherein immediately after performing said step b), performing a step of indicating to the passenger at the main stopping point the allocated elevator and the car deck thereof or the corresponding main stopping floor.

14. The method according to claim 11 said step b) is performed in accordance with whether a specific allocation with consideration of travel orders already allocated to the multiple deck car results in a smaller number of stops relative to another allocation in the case of travel which starts subsequently from the main stopping point.

15. A method of controlling an elevator installation with at least two multiple deck cars for simultaneously serving more than one floor by one stop, wherein a main stopping point with different main stopping floors is driven to in normal operation in such a manner that each car deck of the multiple deck cars stops at one of the main stopping floors, wherein destination calls of passengers are registered at the main stopping point, comprising the steps of:

a) registering a destination call at the main stopping point entered by a passenger;

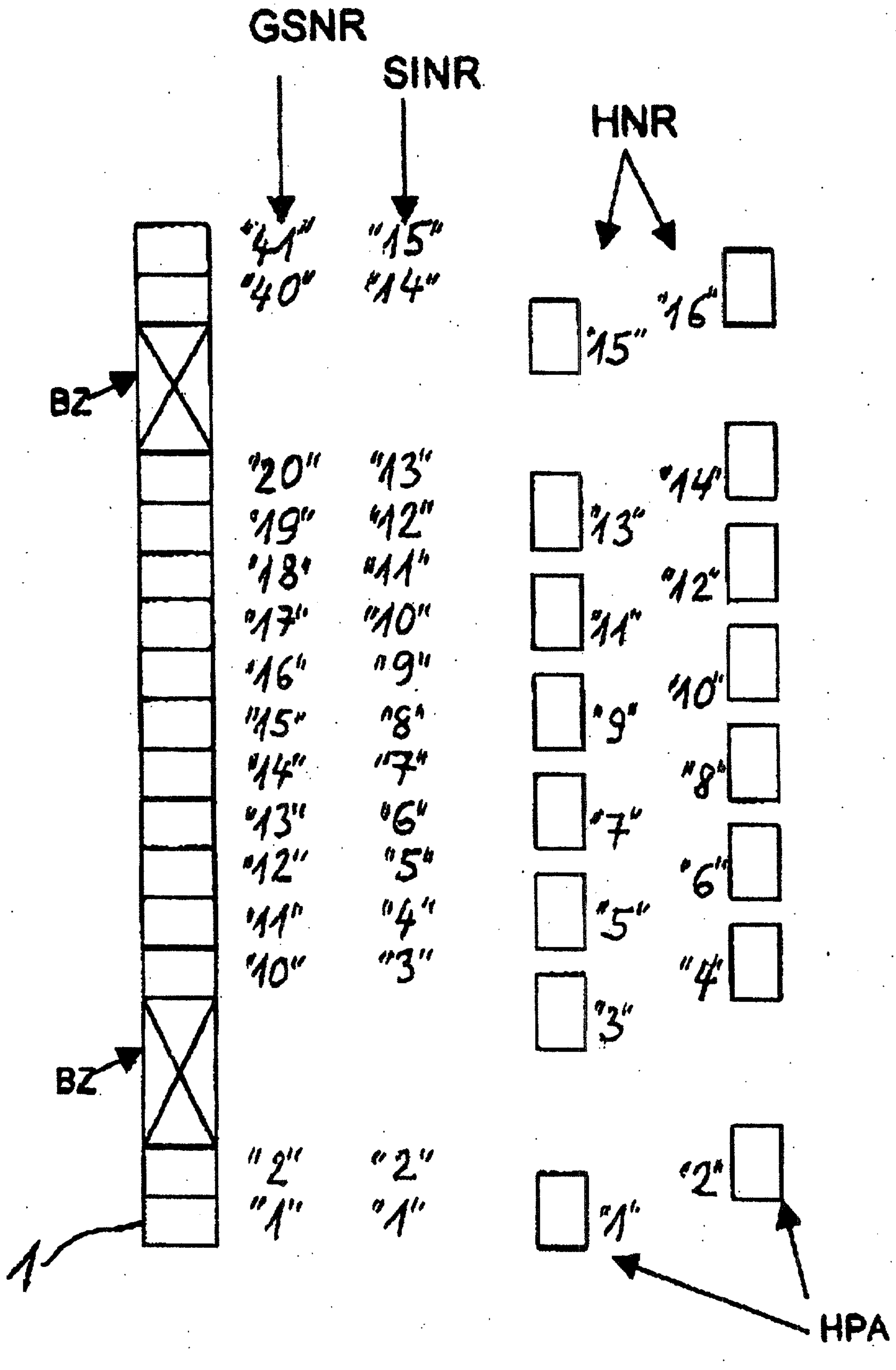
b) allocating the destination call to one of the car decks in dependence on all the destination calls registered at the main stopping point and/or in dependence on destination calls registered at other floors and/or in dependence on the structure of the building; and

c) displaying to the passenger at the main stopping point the main stopping floor associated with the allocated car deck.

16. The method according to claim 15 wherein said step b) is performed dynamically without consideration of the divisibility of the number of the destination floor by the number of the car deck of the multiple deck car.

17. The method according to claim 15 wherein immediately after performing said step b), performing a step of indicating to the passenger at the main stopping point the allocated elevator and the car deck thereof or the corresponding main stopping floor.

18. The method according to claim 15 said step b) is performed in accordance with whether a specific allocation with consideration of travel orders already allocated to the multiple deck car results in a smaller number of stops relative to another allocation in the case of travel which starts subsequently from the main stopping point.


GSNR
SINR
HNR
BZ
BZ
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"11"
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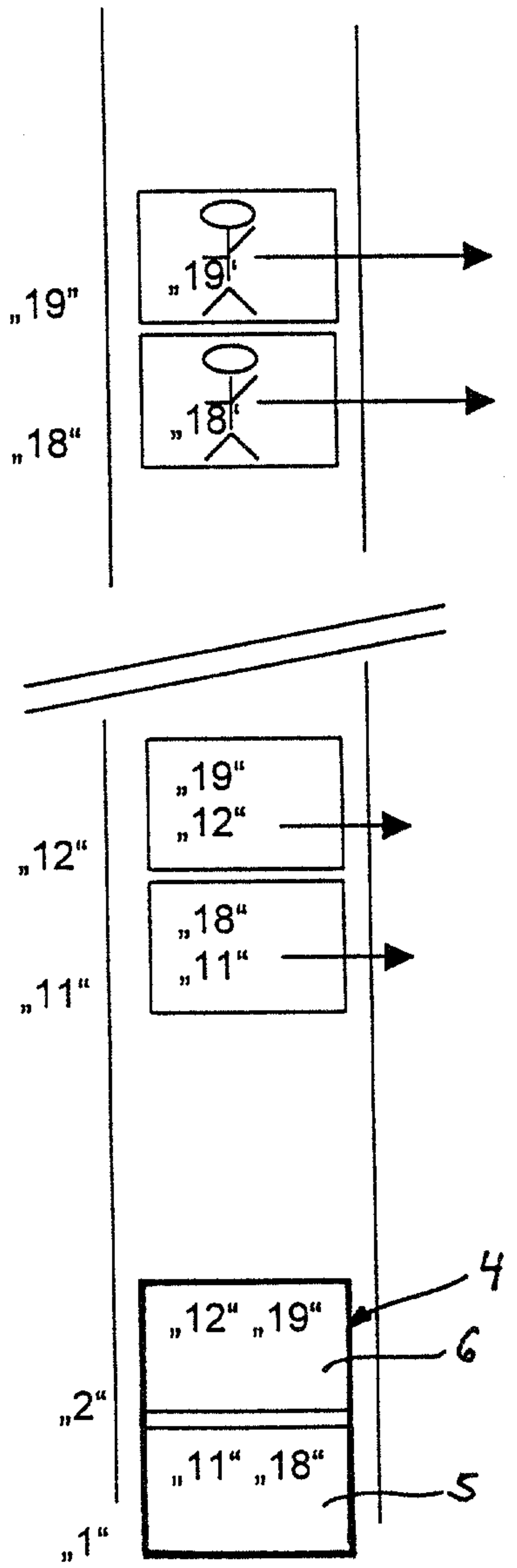
"2"
"1"
1
HPA

FIG. 1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„18"
„19"
„18"
„12"
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„19"
„12"
„18"
„11"
4
6
5
„2"
„1"
„12" „19"
„11" „18"

FIG. 2B

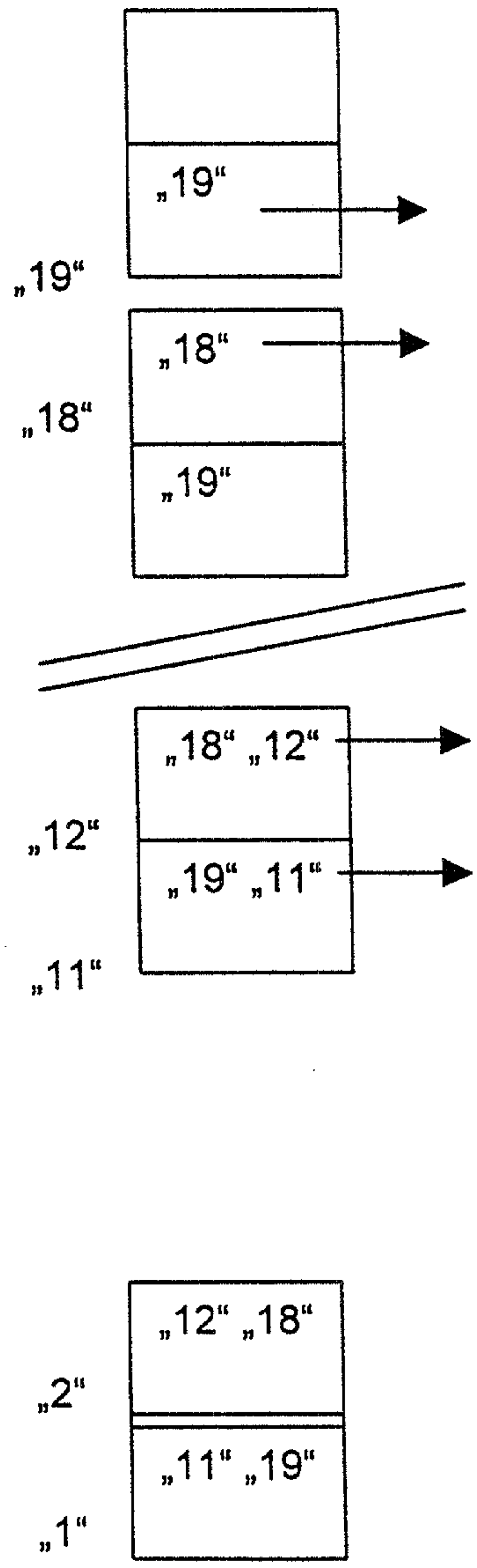
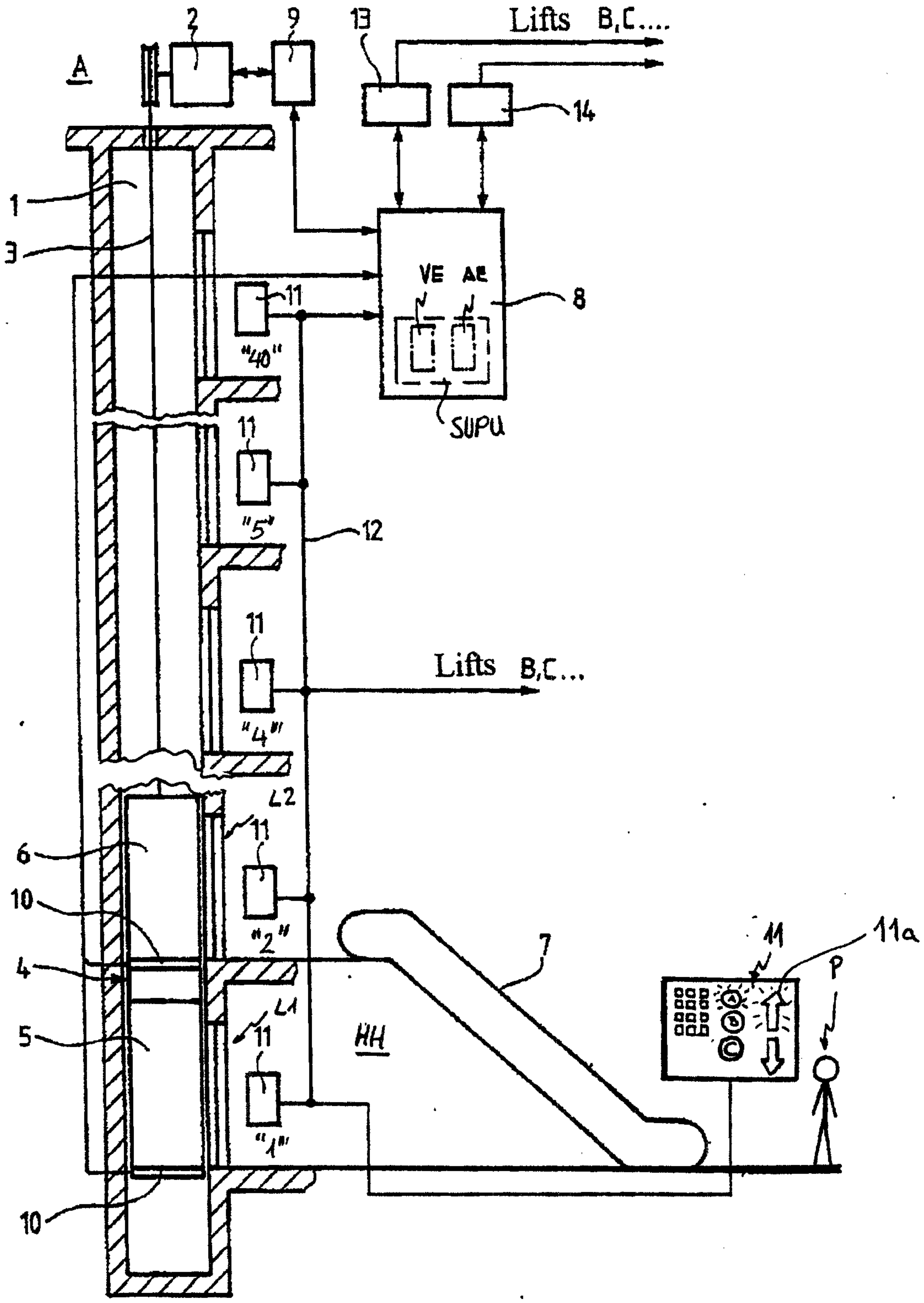
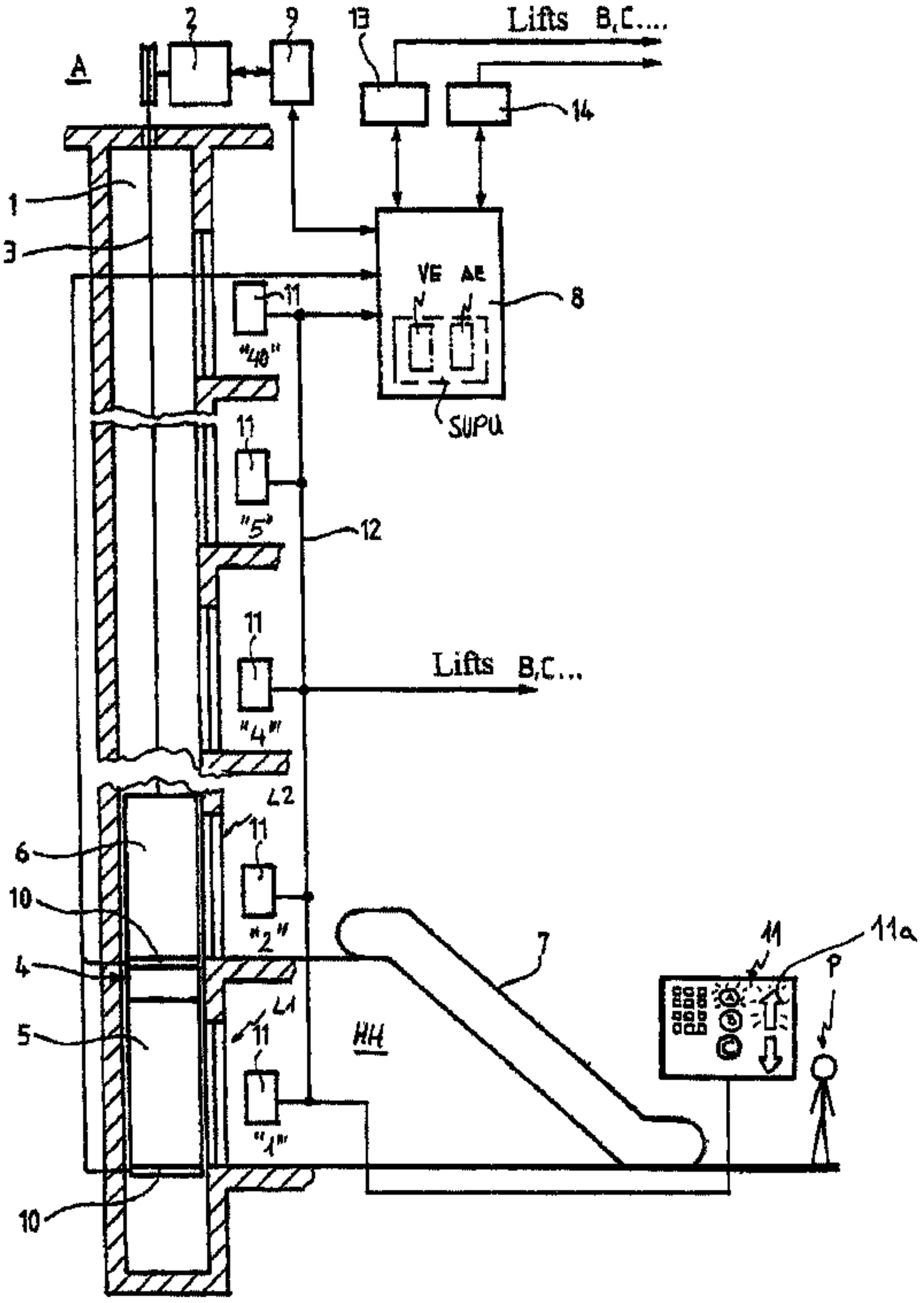

„19"
„18"
„19"
„18"
„19"
„12"
„11"
„18" „12"
„19" „11"
„2"
„1"
„12" „18"
„11" „19"

FIG. 2A

Fig. 3


A
2
9
13
Lifts B,C....
14
1
3
8
VE
AE
11
"40"
SUPU
11
"5"
12
11
Lifts B,C...
"4"
L2
6
11
10
"2"
7
11
11a
4
P
L1
5
11
HH
"1"
10



Lifts B,C....
Lifts B,C...
A
1
2
3
4
5
6
7
8
9
10
11
11a
12
13
14
VE
AE
SUPU
"40"
"5"
"4"
"2"
"1"
L1
L2
HH
P