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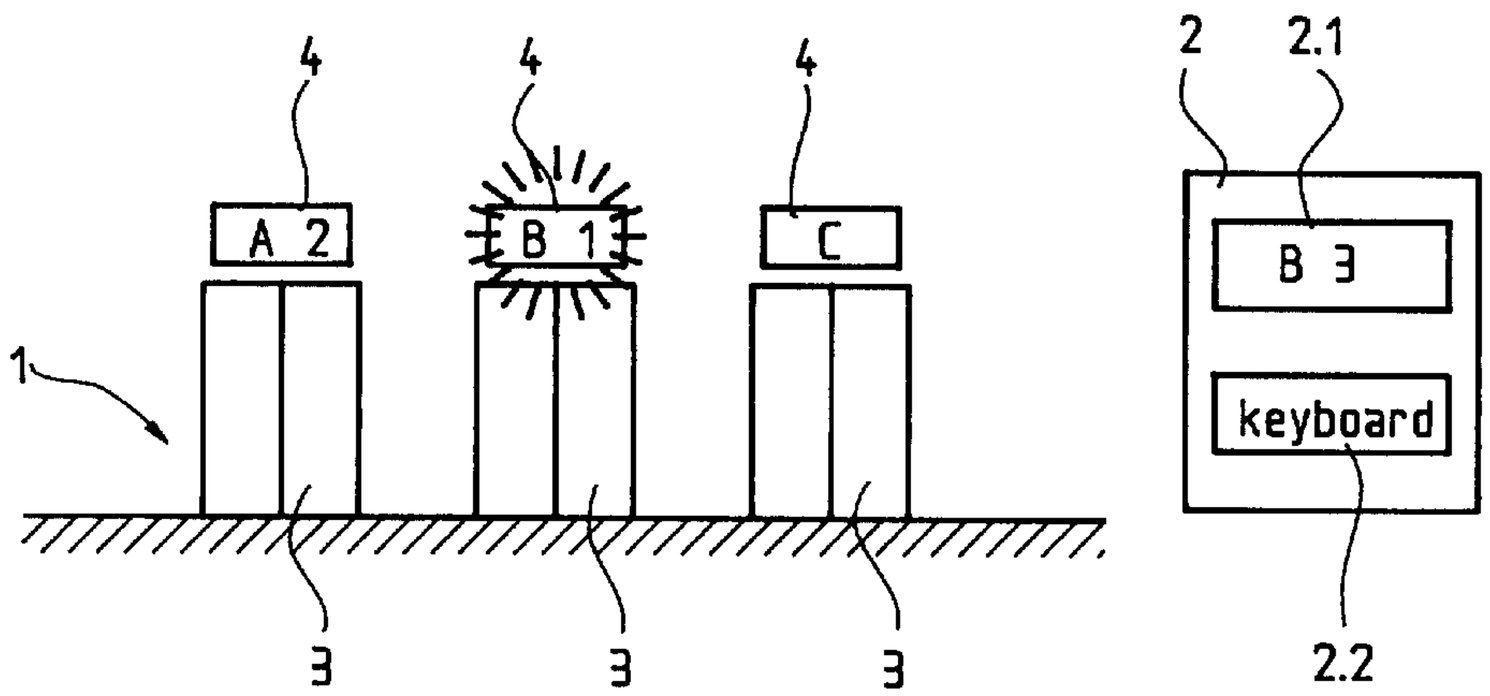
(54) **METHODE DE COMMUNICATION DANS UN SYSTEME DE TRANSPORTS**

(54) **METHOD FOR COMMUNICATION WITH A TRANSPORT SYSTEM**



(57) In this transport system with several autonomous vehicles the user inputs his travel destination at a terminal (2). Subsequently, the boarding location and the allocated vehicle provided for carrying out the travel request is communicated in the form of a symbol (B3) on the terminal display (2.1) to the user. The boarding location is designated by (B) and the vehicle carrying out the travel request is designated by (3). The user now goes to the boarding location (B). In the interim, the first vehicle arrives at the boarding location (B), which is indicated on the display (4) by flashing by the symbol (B1). The user knows that the first vehicle is not his allocated vehicle. He boards only When the symbol (B3) is indicated flashing.

Summary:

In this transport system with several autonomous vehicles the user inputs his travel destination at a terminal (2). Subsequently, the boarding location and the allocated vehicle provided for carrying out the travel request is communicated in the form of a symbol (B3) on the terminal display (2.1) to the user. The boarding location is designated by (B) and the vehicle carrying out the travel request is designated by (3). The user now goes to the boarding location (B). In the interim, the first vehicle arrives at the boarding location (B), which is indicated on the display (4) by flashing by the symbol (B1). The user knows that the first vehicle is not his allocated vehicle. He boards only when the symbol (B3) is indicated flashing.

(Fig. 1)

Description:

Method for Communication with a Transport System

The invention relates to a method for communication with a transport system which comprises vehicles of high autonomy and in which at least one man/machine interface is provided for the input of travel destinations and for information of the user.

A transport system in which several lift cages run autonomously in a lift shaft has become known from the patent specification US 3 658 155. Each lift cage has an own drive and can move horizontally as well as vertically. On one side of the lift shaft the lift cages, guided by rails, travel up and on the other side of the lift shaft the lift cages travel back to the starting point. For serving the storeys, the lift cages branch from the vertical main direction into a horizontal blind alley. The branches are controlled by points. Due to the lack of details about the communication of the passengers with the transport system the assumption is that the autonomous lift cages work in taxi operation. If a storey call is present, a lift cage travels to the storey calling and thereafter carries out the transport request of the user.

A disadvantage of the known equipment is that the transport capacity of the transport system cannot be fully utilised. Moreover, a dividing up of the flow of people is not possible.

Here, the invention will create a remedy. The invention, as it is characterised in claim 1, meets the object of avoiding the disadvantages of the known equipment and of proposing a method which improves the communication of the user with a transport system with autonomous vehicles and improves the vehicle utilisation.

The advantages achieved by the invention are essentially to be seen in that a dividing up of the flow of people amongst the autonomous vehicles can take place unhindered. The time for boarding the appropriate vehicle can be minimised, which in turn facilitates route planning and improves the transport performance of the entire transport system. Moreover, it is ensured that the user actually uses the vehicle provided for him even when the boarding location is not only associated with the provided vehicle.

The invention is more closely explained in the following by reference to drawings illustrating an embodiment. There:

Fig. 1 shows a man/machine interface at a stopping point of a transport system with boarding locations,

Fig. 2 shows a communication sequence of the man/machine interface and of the transport system and

Fig. 3 shows details of the communication sequence.

As shown in Fig. 1, in terms of hardware a man/machine interface of a stopping point 1 of a transport system consists of at least one terminal 2, of displays 4 associated with the boarding locations 3 and optionally of at least one audio unit. The terminal 2 consists of a keyboard 2.1, for example a decade keyboard, and of a display 2.2. The terminal 2 can also be a touch screen in which the form of keyboard is controllable and in which keyboard and display can be represented on a screen. The stopping point 1 is shown with, for example, three boarding locations 3 formed as shaft doors. The transport system can be, for example, a lift system with at least one lift shaft in which at least one vehicle or at least one lift cage runs with, in the matters of control and drive, high autonomy, wherein the direction of movement can be vertical and/or horizontal.

Fig. 1 shows an example of a destination call input of a user and the display of the allocation of the corresponding vehicle, wherein alpha-numeric symbols are used. The user inputs his travel destination at the terminal 2. Subsequently, the vehicle and the boarding location, for example B3, are communicated on the terminal display 2.1 to the user. B designates the boarding location and 3 designates the allocated vehicle, which is provided for the realisation of the travel request and which carries out the travel request. the user now goes to the boarding location B. In the interim the vehicle 1 arrives at the boarding location B, which is displayed on the display 4 by flashing with the symbol B1. The user knows that the vehicle 1 is not his allocated vehicle. He boards only when the symbol B3 is displayed flashing.

Other easily remembered symbols standing in relation to the travel destination, such as for example names, telephone numbers, pet names for kindergartens, acoustic signals,

pictures, signs, colours, etc., are also possible. Symbols can also be used which permit a subordination of further symbols, for example "animals" for the boarding location and, for example "hare" for vehicle 1, "horse" for vehicle 2, "bird" for vehicle 3, etc. In cases in which the vehicle symbol used is a subordination of the boarding location symbol, the communication of the boarding location can be dispensed with. It is sufficient, for example, to display "horse" because the user can, if the ordering is clear, remember the superordination of the boarding location symbol and present himself at the stopping point of the "animals".

Different symbols for each vehicle are also possible insofar as the symbol concerned has not already been used for an allocation in the process of being carried out. Also, several symbols can be pledged for different users for a vehicle at the same stopping point.

Fig. 2 shows the individual communication steps of the destination call input up to completion of the transport request at a stopping point. In a first step 1), the user inputs his desired travel destination at the terminal 2. Altogether, an information packet is generated which comprises the starting position, the destination position of the user and, if need be, also data of the user. In a second step 2), the terminal 2 triggers by the information packet 2 a query to the vehicles, which examine the feasibility on the basis of an individual travel costs computation. The vehicles communicate the examination result together with the remaining starting positions / destination positions in the form of an offer to the terminal 2. In the case of several feasible variants, the optimum route is determined and a schedule is drawn up in accordance with which the users are served. In a third step 3) the terminal 2 selects the most favourable travel variant for the users and obtains an unambiguous symbol from a symbol manager of the corresponding boarding location. In a fourth step 4) the symbol is made available by the manager, which bears a list of the symbols which are pledged. New symbols may not be entered in the list already as pledged symbols. In a fifth step 5), the pledged symbol is communicated by means of the terminal display 2.1 to the user and to the vehicle selected for the transport together with the booking. In a sixth step 6) the pledged symbol is, on arrival of the vehicle at the boarding location, displayed on the display 4 and removed from the list of pledged symbols. The user then boards the vehicle and is transported to his destination. Several boarding locations can also be associated with one terminal 2. The management then takes place through a common authority. It is then incumbent on the respective user to locate the allocated symbol. The steps 1) to 6) apply even when the transport system

consists of only one vehicle, which simulates, in sequential succession, several vehicles. As a variant, the boarding location can be established and allocated to the terminal 2. Moreover, a portable terminal, for example in the form of a wristwatch, which communicates with the stationary terminal 2, can be provided for the user.

Fig. 3 shows details of the communication steps 1) to 6) in the form of a flow chart, wherein steps concerning terminal, vehicle and boarding location and the linkings thereof are illustrated.

In the step 1.1) concerning terminal, the destination position is read in from the keyboard and subsequently, in step 1.2, the starting position, destination position and if need be further information concerning the user or the transport, such as for example the departure time of the vehicle, is passed on as a query for the setting of an offer.

In the step 2.1) concerning vehicle, the query of the step 1.2) is received and it is examined in the iteration step 2.2) whether the request is feasible. The examination takes place on the basis of attainable stopping points, the instantaneous operational state and, if need be, further parameters such as maximum load, door width, etc. In the step 2.3 the scheduling of the requested journey takes place based on a) the requests already booked, b) the route particulars and c) the traffic situation on the routes. Subsequently, the schedule is stored. In the iteration step 2.4) it is investigated whether the parameters are variable. If specific parameters are not clearly established, further schedules can be drawn up by variation of the still free parameters. In the step 2.5) the best schedule is selected on the basis of specific criteria and stored together with the request and the relevant details for the scheduled transport, such as for example boarding location and disembarking location, as offers. In the step 2.6) the issue of the precise boarding location, the disembarking location as well as further details relative to the transport takes place in response to the requesting point of the step 1.2).

In the step 3.1) concerning terminal, the offers of the step 2.6) are received and stored. It is checked in the iteration step 3.2) whether the waiting time has elapsed or whether sufficient offers are put in. The selection of the best offers and the storage of the relevant date takes place in the step 3.3) according to specific criteria. With the step 3.4), a request concerning a symbol comprising boarding location and selected vehicle is triggered.

In the step 4.1) concerning boarding location, the request of the step 3.4) is received. In the step 4.2) a vehicle symbol is selected from the list a) of available symbols and in the subsequent iteration step 4.3) it is checked whether the selected symbol is reserved. In the step 4.4) the selected, free symbol is marked as reserved. In the following step 4.5) the vehicle symbol and the boarding location symbol are issued in response to the requesting point of the step 3.4).

In the step 5.1) concerning terminal, the symbol describing boarding location and vehicle is received and displayed for the user in the step 5.2). In the step 5.3) the reservation of the vehicle takes place by booking the offer at the selected vehicle of step 3.3) together with the symbol that has been pledged.

In the step 5.4) concerning vehicle, the booking of the step 5.3) is received. In the step 5.5), the request, which is marked as offered, of the step 2.5) is entered as booked, complemented by the vehicle symbol. In the step 6.1) all vehicle symbols of the boarding users, stored from the step 5.5), are then issued to the next stopping point called at.

The vehicle symbol of the step 6.1) are displayed in the step 6.2) concerning boarding location. Finally, the symbol is marked as free in the list of available symbols.

PATENT CLAIMS:

1. Method for communication with a transport system which comprises vehicles of high autonomy and in which at least one man/machine interface is provided for the input of travel destinations and for information of the user, characterised in that after the input of the travel destination of the user, the boarding location and the vehicle carrying out the transport request is communicated to the user.

2. Method according to claim 1, characterised in that on the basis of the input of travel destination the vehicles examine feasibility on the basis of a travel costs computation and communicate in the form of an offer with the man/machine interface, which selects the travel variant most favourable for the user and the vehicle.

3. Method according to claim 2, characterised in that the boarding location and vehicle are communicated to the user by means of symbols.

4. Method according to claim 3, characterised in that a list of the symbols concerning the boarding location is carried, wherein new symbols are entered in the list and pledged symbols are erased from the list on arrival of the vehicle at the boarding location.

5. Method according to one of the preceding claims, characterised in that the symbols are used instead of actual location particulars, wherein the symbols represent the desired travel destinations in an easily remembered form and stand in relation to the travel destinations.

Fig. 1

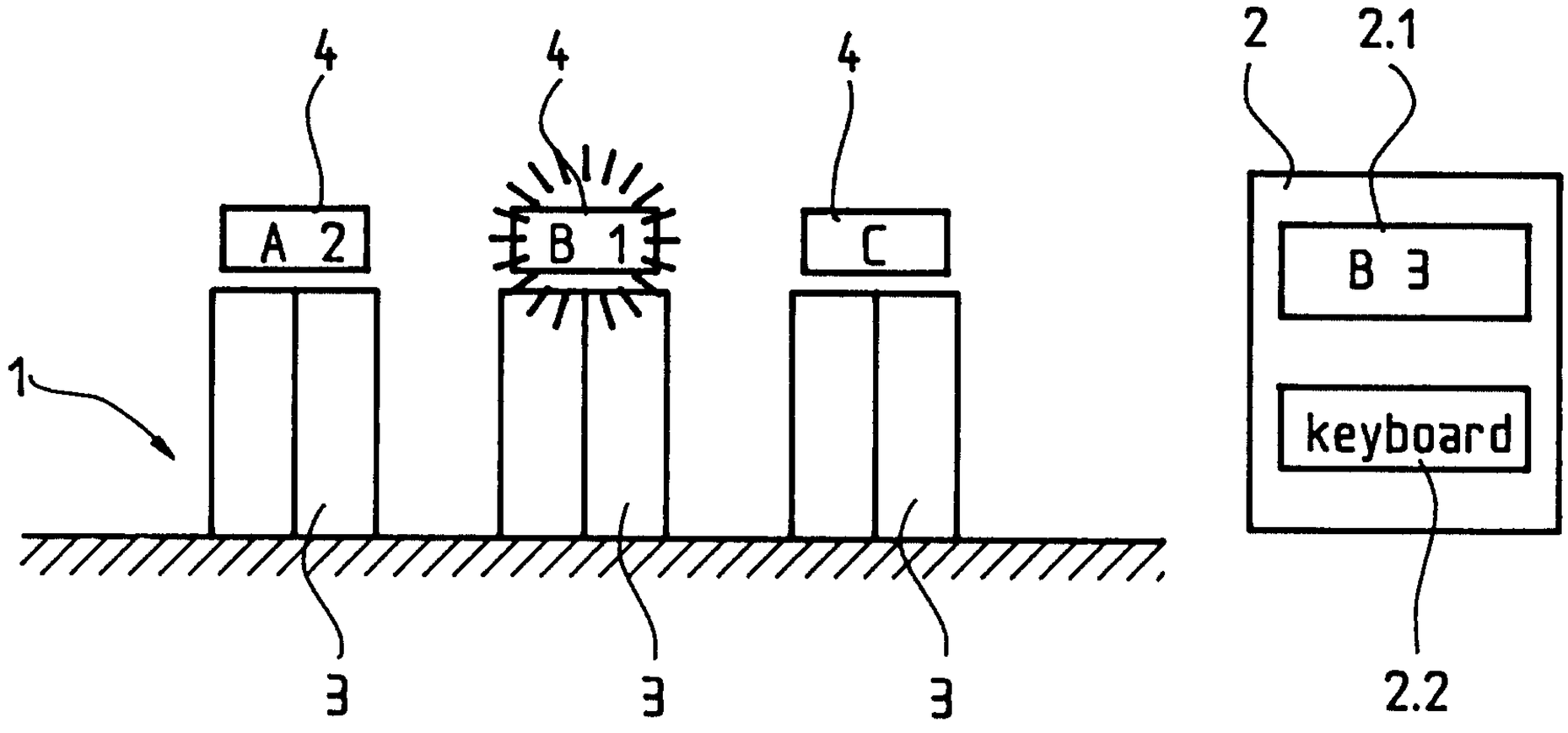

4
4
4
A 2
B 1
C
1
3
3
3
2
2.1
B 3
keyboard
2.2

Fig. 2

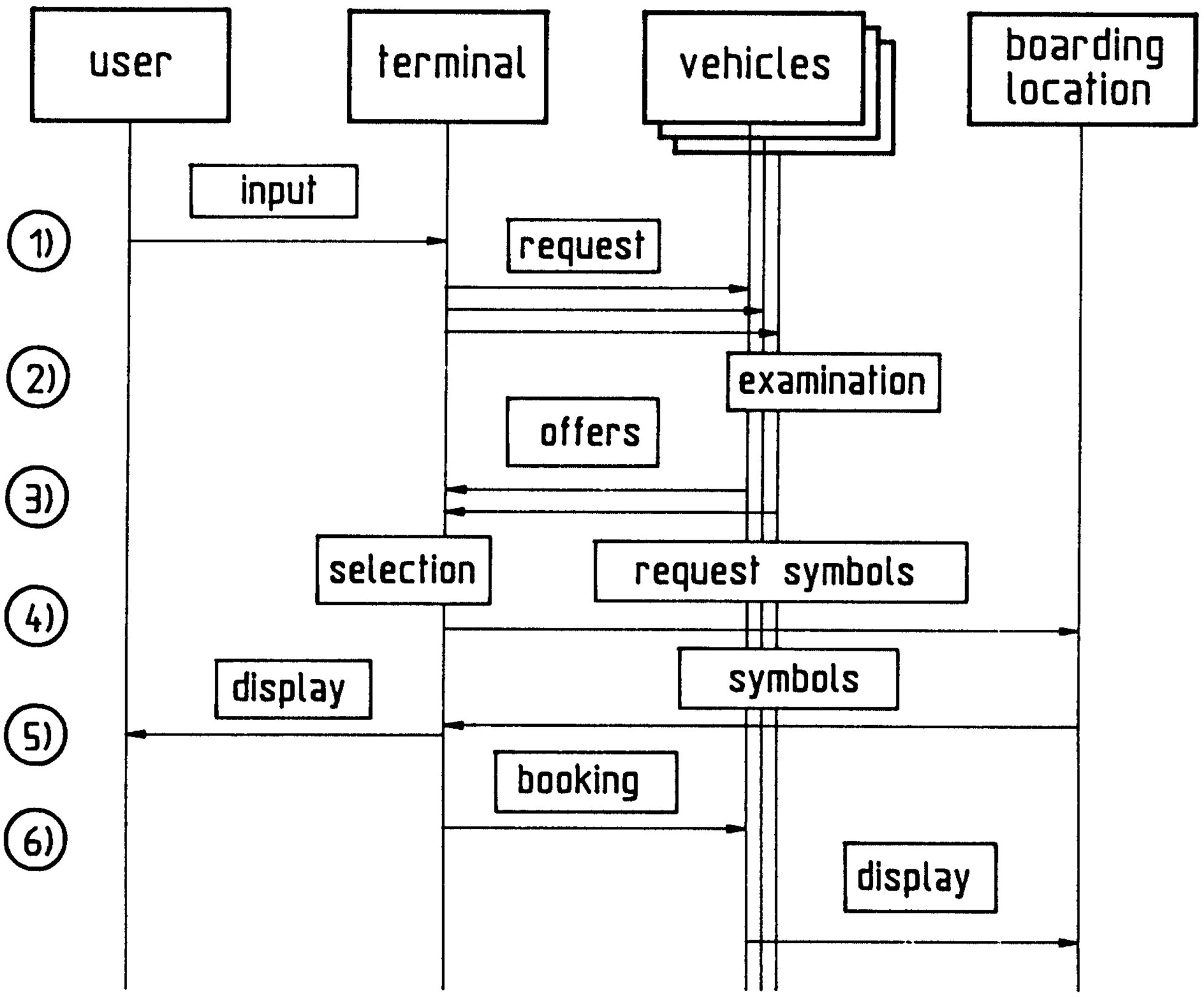
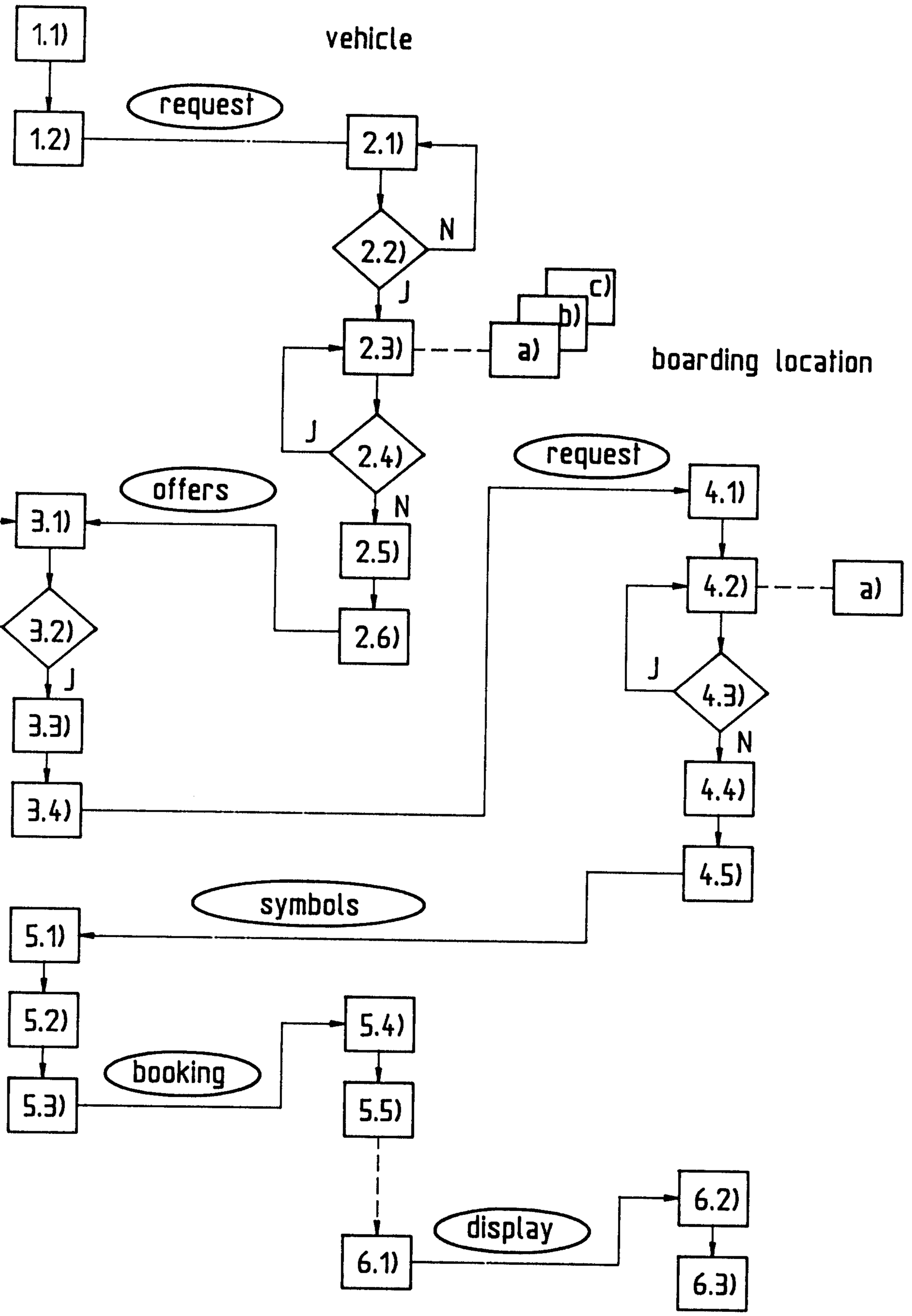

user
terminal
vehicles
boarding location
input
request
examination
offers
selection
request symbols
symbols
display
booking
display
1)
2)
3)
4)
5)
6)

Fig. 3


terminal
vehicle
1.1)
request
1.2)
2.1)
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N
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b)
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boarding location
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2.4)
request
offers
4.1)
3.1)
N
2.5)
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a)
N
3.2)
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J
4.3)
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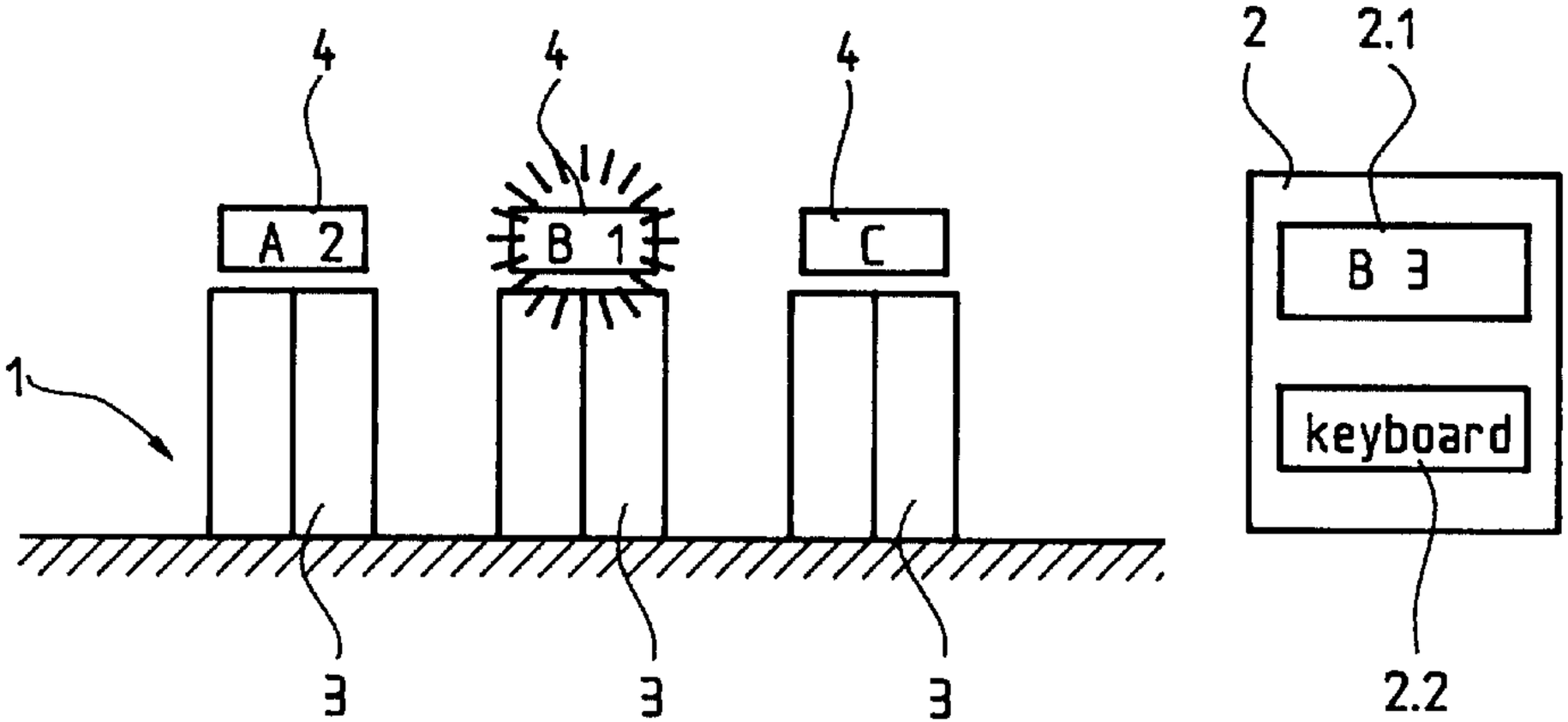
symbols
5.1)
5.2)
5.4)
booking
5.3)
5.5)
display
6.2)
6.1)
6.3)


4
4
4
A 2
B 1
C
1
3
3
3
2
2.1
B 3
keyboard
2.2