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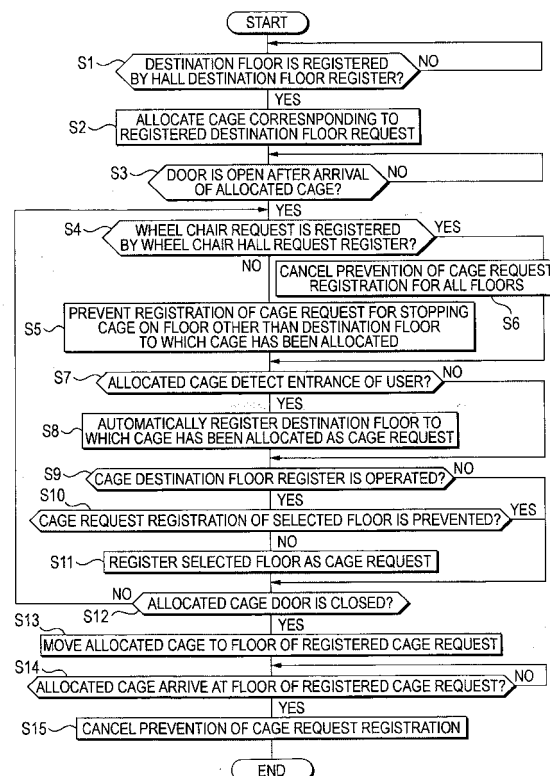
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(54) **ELEVATOR FOR BOTH ORDINARY AND DISABLED PERSONS AND ITS OPERATING METHOD**

(57) An elevator used by both handicapped and non-handicapped persons is **characterized by** including cage request registration prevention canceling means for canceling prevention of cage request registration executed by cage request registration preventing means for

all of operation service floors, or prevention of cage request registration of only the handicapped persons by the cage request registration preventing means for all of the operation service floors, by operating a hall request register for the handicapped.

FIG. 4



Description

Technical Field

[0001] The present invention relates to an elevator used by both handicapped persons such as those using wheel chairs and non-handicapped persons and an operation method of the elevator. Particularly, the invention relates to an elevator used by both handicapped and non-handicapped persons and provided with a hall destination floor register and a hall request register for the handicapped at an elevator hall, and an operation method of the elevator.

Background Art

[0002] Currently, there is an elevator which has a hall destination register located at an elevator hall for specifying a destination floor on which a user desires to get out of the elevator. A certain type of this elevator has cage destination floor request registration preventing means which allocates a cage to each of destination floors inputted and registered through the hall destination floor register and prevents registration of cage request for stopping the cage on a floor other than the floors having been registered through the hall destination floor register by operating a cage destination floor register provided inside the cage.

[0003] This type of elevator prevents deterioration of operation efficiency caused by cage request registered by a user who desires to get out of the elevator on a floor other than the allocated destination floors using the cage destination floor register provided inside the cage after the user get into the cage during its stop. However, when the user on the cage desires to get out of the cage on a floor different from the floors inputted and registered through the hall designation floor register, i.e., the user accidentally gets into a wrong cage, for example, the user needs to change the cage or take other actions for arriving at the desired floor since no means for cage request registration is equipped inside the cage.

[0004] For overcoming this drawback, an elevator improved in this aspect has been proposed. When a user desires to get out of a cage on a floor different from floors registered through a hall designation floor register, the user on this elevator can register request for stopping the cage on the desired floor using a cage destination floor register provided inside the cage under given conditions such as when the cage destination floor register is operated for cancellation while the cage door is open. Accordingly, operation efficiency of the elevator is improved and also its services for users are enhanced (for example, see Patent Reference No. 1).

[0005] There is a group management elevator which has an elevator used by both handicapped persons such as those using wheel chairs and non-handicapped persons, and an elevator for the non-handicapped. According to a currently proposed group management elevator,

the elevator of the group management elevator used by both handicapped persons and non-handicapped persons and provided with destination buttons for the handicapped has means for limiting allocations to new stop requests in the range from the next floor in the cage moving direction to the floor one floor before the registered designation floor after registration of the designated floor (for example, see Patent Reference No. 2).

[0006]

Patent Reference No. 1: JP-A-2003-292256 (paragraphs 0002-0005, Fig. 1)

Patent Reference No. 2: JP-A-2000-109276 (paragraph 0005, Fig. 1)

Disclosure of the Invention

Problems that the Invention is to Solve

[0007] When the elevator disclosed in Patent Reference No. 1 is used by handicapped persons as an elevator used by both handicapped and non-handicapped persons, a hall request register for the handicapped needs to be equipped separately from the hall designation floor register for the non-handicapped persons. The hall request register for the handicapped is typically of UP-DOWN button type and cannot register a designation floor at the elevator hall. Thus, the elevator cannot be used by the handicapped persons as the elevator used by both the handicapped and non-handicapped persons, resulting in prohibition of use of the elevator by the handicapped.

[0008] According to the group management elevator which has the elevator used by both handicapped persons such as those using wheel chairs and non-handicapped persons and an elevator for the non-handicapped under group management control disclosed in Patent Reference No. 2, the elevator used by both the handicapped and non-handicapped persons of the group management elevator has means for separating the elevator used by both the handicapped and non-handicapped persons from group management control by operation of a destination button for the handicapped equipped inside the cage to limit allocations to new stop requests in the range from the present floor to the floor one floor before the registered designation floor in the cage moving direction after registration of the designated floor. In this case, cage request for stopping the cage on all of the service floors cannot be registered, and thus services for the users are limited.

[0009] The invention has been developed to solve the problems arising from the elevators disclosed in the above references. It is an object of the invention to provide an improved type of elevator used by both handicapped and non-handicapped persons and its operation method. This elevator, which is used by both handicapped persons such as those using wheel chairs and non-handicapped persons and prevents registration of

cage request for stopping a cage on floors other than destination floors registered by a hall destination floor register, cancels the prevention of registration of cage request by operation of a hall request register for the handicapped to allow registration of cage request.

Means for Solving the Problems

[0010] An elevator used by both handicapped and non-handicapped persons according to an aspect of the invention includes: a hall destination floor register provided at a hall of the elevator for registering destination floors; a hall request register for the handicapped provided at the hall of the elevator; cage allocating means for allocating a cage to each of the destination floors registered by the hall destination floor register; and cage request registration preventing means for preventing registration of cage request for stopping the cage on a floor other than the floors to which the cage has been allocated by the cage allocating means. The elevator further includes cage request registration prevention canceling means for canceling prevention of cage request registration executed by the cage request registration preventing means for all of operation service floors by operating the hall request register for the handicapped.

[0011] An elevator used by both handicapped and non-handicapped persons according to another aspect of the invention includes: a hall destination floor register provided at a hall of the elevator for registering destination floors; a hall request register for the handicapped provided at the hall of the elevator; cage allocating means for allocating a cage to each of the destination floors registered by the hall destination floor register; and cage request registration preventing means for preventing registration of cage request for stopping the cage on a floor other than the floors to which the cage has been allocated by the cage allocating means. The elevator further includes cage request registration prevention canceling means for canceling prevention of cage request registration of only the handicapped executed by the cage request registration preventing means for all of operation service floors by operating the hall request register for the handicapped.

[0012] An operation method of an elevator used by both handicapped and non-handicapped persons according to still another aspect of the invention prevents registration of cage request for stopping a cage on a floor other than floors registered by a hall destination floor register provided at a hall of the elevator. In the operation method, cage request registration prevention canceling means cancels prevention of registration of the cage request and operates the elevator in response to operation of a hall request register for the handicapped provided at the hall.

Advantage of the Invention

[0013] Operation efficiency of an elevator having cage-

es for offering separate operation services provided according to the invention can be improved by preventing registration of cage request for stopping the cage on a floor other than floors registered by a hall destination floor register. In addition, the elevator can be used by handicapped persons through operation of a hall request register for the handicapped. Thus, operation services offered by the elevator can be enhanced.

Brief Description of the Drawings

[0014]

[Fig. 1] Fig. 1 is a block diagram showing a structure for controlling an elevator for persons using wheel chairs in a first embodiment according to the invention.

[Fig. 2] Fig. 2 is a front view showing a part of a hall of the elevator for persons using wheel chairs in the first embodiment according to the invention.

[Fig. 3] Fig. 3 is a front view showing a part of the interior of a cage of the elevator for persons using wheel chairs in the first embodiment according to the invention.

[Fig. 4] Fig. 4 is a flowchart showing operation of the elevator for persons using wheel chairs in the first embodiment according to the invention.

[Fig. 5] Fig. 4 is a flowchart showing operation of an elevator for persons using wheel chairs in a second embodiment according to the invention.

[Fig. 6] Fig. 6 is a flowchart showing operation of the elevator for persons using wheel chairs in the second embodiment according to the invention.

Best Mode for Carrying Out the Invention

First Embodiment

[0015] An elevator used by both handicapped and non-handicapped persons and its operation method in preferred embodiments according to the invention are hereinafter described with reference to the accompanying drawings. For simplifying explanation, handicapped persons refer to those using wheel chairs in the following description as an example.

Fig. 1 is a block diagram showing a structure for controlling the elevator used by both handicapped and non-handicapped persons in the first embodiment according to the invention. As shown in Fig. 1, the elevator has a hall destination floor register 1 for specifying a destination floor for a user and a wheel chair hall request register 2 used by handicapped persons using wheel chairs equipped at an elevator hall. The elevator also has a cage destination floor register 3 located inside its cage. Signals produced by operation of the hall destination floor register 1, the wheel chair hall request register 2, and the cage destination floor register 3 are inputted to an elevator controller 4 to move the cage in a manner as de-

scribed below.

[0016] The elevator controller 4 has respective means for providing the following functions: cage allocating means 4A for allocating the cage in response to destination request registered by the hall designation floor register 1; cage request registration preventing means 4B for preventing registration of cage request for stopping the cage on a floor other than the designation floors to which the cage has been allocated by the cage allocating means 4A; cage request registration prevention canceling means 4C for canceling prevention of cage request registration in response to wheel chair request given through the wheel chair hall request register 2; cage request automatic registering means 4D for registering the destination floors to which the cage has been allocated as cage request at the arrival of the cage; cage request registering means 4E for registering cage request for stopping the cage on the destination floors registered by operation of the cage destination floor register 3 other than the floors for which registration of cage request is prevented by the cage request registration preventing means 4B; and elevator control means 4F for controlling the cage.

[0017] Fig. 2 is a front view illustrating a part of the hall of the elevator used by both the handicapped persons using wheel chairs and the non-handicapped persons in the first embodiment. As illustrated in Fig. 2, both the hall destination floor register 1 for registering the destination floors and the wheel chair hall request register 2 used by the handicapped persons using wheel chairs are provided at the elevator hall. The hall destination floor register 1 has buttons 1A corresponding to respective destination floors and cage indicators 1B for indicating the cages allocated to the registered destination floors. The wheel chair hall request register 2 has known request registration units 2A such as UP/DOWN buttons which can be used by the handicapped persons using wheel chairs, for example. Fig. 2 shows an example in which both No. A elevator 20 and No. B elevator 21 are equipped. The No. A elevator 20 and No. B elevator 21 have hall lanterns 22 and 23, respectively, for notifying the users waiting for the elevator at the elevator hall about arrival of the cage.

[0018] Fig. 3 is a front view illustrating a part of the interior of the cage of the elevator used by both handicapped and non-handicapped persons in the first embodiment. As illustrated in the figure, cage destination floor registration units 3A and 3B for registering destination floors are provided inside the cage. The cage destination floor registration unit 3A is used by the non-handicapped persons. The cage destination floor registration unit 3B is used by the handicapped persons using wheel chairs, and located at a lower position than the position of the cage destination floor registration unit 3A. A cage door 30 opens and closes when the cage arrives at the destination floors so that the users can get into and out of the cage.

[0019] The elevator used by both the handicapped and

non-handicapped persons according to the first embodiment has the structure discussed above. Next, the operation method of the elevator is explained with reference to the flowchart shown in Fig. 4.

[0020] As shown in Fig. 4, it is repeatedly judged whether a destination floor is registered by the hall destination floor register 1 (step S1). When it is determined that the hall destination floor register 1 has been operated to register the destination floor, the cage corresponding to the registered destination floor is allocated and moved to the elevator hall on the registered destination floor by the cage allocating means 4A (step S2).

[0021] When the allocated cage arrives at the corresponding elevator hall, it is judged whether the cage door 30 is opened (step S3). When the cage door 30 is open, it is determined whether wheel chair request has been registered by the wheel chair hall request register 2 (step S4). When it is determined that the wheel chair request has not been registered, registration of cage request for stopping the cage on floors other than the destination floor to which the cage has been allocated is prevented by the cage request registration preventing means 4B (step S5). When it is determined that the wheel chair request has been registered, prevention of cage request registration is cancelled for all of the service floors by the cage request registration prevention canceling means 4C (step S6).

[0022] After registration of the cage request for stopping the cage on floors other than the destination floor to which the cage has been allocated is prevented in step S5 or after prevention of cage request registration is cancelled for all of the service floors in step S6, it is detected whether the user has entered the allocated cage (step S7). When the user is in the cage, the destination floor to which the cage has been allocated is automatically registered as cage request by the cage request automatic registering means 4D (step S8). Then, it is judged whether the cage destination floor register 3 located inside the cage has been operated (step S9). When it is determined that the user has not entered the cage in step S7, the flow proceeds to the judgment in step S9 without automatic registration of the destination floor to which the cage has been allocated as cage request.

[0023] When it is determined that the cage destination floor register 3 located inside the cage has been operated in step S9, it is further judged whether registration of the floor selected by the cage destination floor register 3 is prevented (step S10). When registration of the cage request is not prevented, the floor selected by the cage destination floor register 3 is registered as cage request by the cage request registering means 4E (step S11).

[0024] After the floor selected by the cage destination floor register 3 located inside the cage is registered as cage request in step 11 or after it is determined that the cage destination floor register 3 located inside the cage has not been operated in step S9 or that registration of cage request for stopping the cage on the floor selected by the cage destination floor register 3 located inside the

cage is prevented in step S10, it is judged whether the cage door 30 of the allocated cage is closed (step S12). When it is determined that the cage door 30 of the allocated cage is closed, the allocated cage moves to the floor for which cage request has been registered under the control of the elevator control means 4F (step S13). When the cage door 30 of the allocated cage is not closed, the flow returns to the judgment in step S4 and operations in the following steps described above are repeated.

[0025] Then, it is judged whether the allocated cage has arrived at the floor for which the cage request has been registered (step S14). When it is determined that the cage has arrived at the floor, prevention of the cage request registration is cancelled (step S15) and a series of the operations end. When it is determined that the cage has not arrived yet, the judgment in step S14 is repeated.

[0026] The elevator used by both handicapped persons using wheel chairs and non-handicapped persons and the operation method of the elevator provided according to the first embodiment described above prevents registration of cage request for stopping the cage on a floor other than the destination floor for which cage request has been registered by the hall destination floor register so that the operation efficiency of the elevator can be improved by separate operation services of the cages. Also, the elevator according to the first embodiment cancels prevention of cage request registration by operation of the wheel chair hall request register so that cage request for all of the operation service floors can be registered. Thus, the handicapped persons using wheel chairs can use the elevator for reaching any of the floors.

Second Embodiment

[0027] A second embodiment is now described. According to the second embodiment, the elevator cancels prevention of cage request registration having been executed by the cage request registration preventing means for all of the floors by operating the wheel chair hall request register only when the cage request is made by handicapped persons using wheel chairs.

[0028] Similarly to the first embodiment, the case where handicapped persons using wheel chairs use the elevator is discussed in the second embodiment. In the second embodiment, the block diagram showing the structure for controlling the elevator used by both handicapped persons using wheel chairs and non-handicapped persons, the front view showing a part of the elevator hall of the elevator used by both handicapped persons using wheel chairs and non-handicapped persons, and the front view showing a part of the interior of the cage of the elevator are identical to those shown in Figs. 1, 2, and 3. Thus, the detailed explanation of those figures is not repeated.

[0029] Next, the operation method of the elevator used

by both handicapped persons and non-handicapped persons according to the second embodiment is discussed with reference to flowcharts shown in Figs. 5 and 6.

[0030] As shown in Figs. 5 and 6, it is repeatedly judged whether a destination floor is registered by the hall destination floor register 1 (step S51). When it is determined that the hall destination floor register 1 has been operated to register the destination floor, the cage corresponding to the registered destination floor is allocated and moved to the elevator hall on the registered destination floor by the cage allocating means 4A (step S52).

[0031] When the allocated cage arrives at the corresponding elevator hall, it is judged whether the cage door 30 is opened (step S53). When the cage door 30 is open, it is determined whether wheel chair request has been registered by the wheel chair hall request register 2 (step S54). When it is determined that the wheel chair request has not been registered, registration of cage request by both the non-handicapped persons and the handicapped persons using wheel chair for stopping the cage on floors other than the destination floor to which the cage has been allocated is prevented by the cage request registration preventing means 4B (step S55). When it is determined that the wheel chair request has been registered, prevention of cage request registration by only the handicapped persons using wheel chairs is cancelled for all of the service floors by the cage request registration prevention canceling means 4C (step S56).

[0032] After registration of the cage request by both the non-handicapped persons and the handicapped persons using wheel chairs for stopping the cage on floors other than the destination floor to which the cage has been allocated is prevented in step S55 or after prevention of cage request registration by only the handicapped persons using wheel chairs is cancelled in step S56, it is detected whether the user has entered the allocated cage (step S57). When the user is in the cage, the destination floor to which the cage has been allocated is automatically registered as cage request of the non-handicapped persons by the cage request automatic registering means 4D (step S58). Then, it is judged whether the cage destination floor registration unit for the non-handicapped 3A located inside the cage has been operated (step S59). When it is determined that the user has not entered the cage in step S57, the flow proceeds to the judgment in step S59 without automatic registration of the destination floor to which the cage has been allocated as executed in step S58 as cage request by the non-handicapped.

[0033] When it is judged whether the cage destination floor registration unit for the non-handicapped 3A located inside the cage has been operated in step S59 and determined that the cage destination floor registration unit 3A has been operated, it is further judged whether registration of the floor selected by the cage destination floor registration unit 3A as cage request by the non-handicapped is prevented (step S60). When registration of the cage request is not prevented, the floor selected by the

cage destination floor registration unit 3A is registered as cage request of the non-handicapped by the cage request registering means 4E (step S61). Then, it is judged whether the cage destination floor registration unit 3B for the handicapped persons using wheel chairs located inside the cage has been operated (step S62). When it is determined that the cage destination floor registration unit for the non-handicapped 3A located inside the cage has not been operated in step S59 or that registration of the selected floor is prevented in step S60, the flow proceeds to the judgment in step S62 without registration of the selected floor as cage request by the non-handicapped persons as executed in step S61.

[0034] When it is determined that the cage destination floor registration unit for the handicapped 3B located inside the cage has been operated in step S62, it is further judged whether registration of the floor selected by the cage destination floor registration unit for the handicapped 3B as cage request by the handicapped is prevented (step S63). When registration of the cage request is not prevented, the floor selected by the cage destination floor registration unit for the handicapped 3B is registered as cage request by the handicapped (step S64).

[0035] After the floor selected by the cage destination floor registration unit for the handicapped 3B is registered as cage request by the handicapped in step S64 or after it is determined that the cage destination floor registration unit for the handicapped 3B has not been operated in step S62 or that registration of the floor selected by the cage destination floor registration unit for the handicapped 3B as cage request by the handicapped is prevented in step S63, it is judged whether the cage door 30 of the allocated cage is closed (step S65). When it is determined that the cage door 30 of the allocated cage is closed, the allocated cage moves to the floor for which cage request has been registered under the control of the elevator control means 4F (step S66). When the cage door 30 of the allocated cage is not closed, the flow returns to the judgment in step S54 and operations in the following steps described above are repeated.

[0036] Then, it is judged whether the allocated cage has arrived at the floor for which the cage request has been registered (step S67). When it is determined that the cage has arrived at the floor, prevention of the cage request registration is cancelled (step S68) and a series of the operations end. When it is determined that the cage has not arrived yet, the judgment in step S67 is repeated until the cage arrives at the corresponding floor.

[0037] The elevator used by both handicapped persons using wheel chairs and non-handicapped persons and the operation method of the elevator provided according to the second embodiment described above prevents registration of cage request by the non-handicapped persons for stopping the cage on a floor other than the destination floor for which cage request has been registered by the hall destination floor register so that the operation efficiency of the elevator can be improved by separate operation services of the cages, and simulta-

neously the elevator cancels prevention of cage request registration by only the handicapped persons for all of the operation service floors. Thus, the handicapped persons using wheel chairs can use the elevator for reaching any of the floors.

[0038] In the respective embodiments described above, the hall destination floor register and the cage destination floor register may be any types of registration units including buttons and touch panels as long as destination floors can be registered through the units. The wheel chair hall request register may also be any types such as registration units for visually handicapped persons as long as the units can register cage request by persons other than non-handicapped persons at the elevator hall. It is therefore obvious that various changes and modifications in design may be given to the invention without departing from the scope thereof.

Industrial Applicability

[0039] As described above, the elevator used by both handicapped and non-handicapped persons and the operation method of the elevator according to the invention prevents registration of cage request for stopping the cage on floors other than destination floors registered by the hall destination floor register so that the operation efficiency of the elevator offering separate operation services of the cages can be improved. The elevator also cancels prevention of cage request registration by operation of the hall request register for the handicapped so that cage request registration can be allowed. Thus, the elevator can be used by handicapped persons such as those using wheel chairs, and therefore provides a wide range of industrial applicability.

Claims

1. An elevator used by both handicapped and non-handicapped persons, comprising:

a hall destination floor register provided at a hall of the elevator for registering destination floors;
a hall request register for the handicapped provided at the hall of the elevator;
cage allocating means for allocating a cage to each of the destination floors registered by the hall destination floor register; and
cage request registration preventing means for preventing registration of cage request for stopping the cage on a floor other than the floors to which the cage has been allocated by the cage allocating means, **characterized by** further including:

cage request registration prevention cancelling means for canceling prevention of cage request registration executed by the cage

request registration preventing means for all of operation service floors by operating the hall request register for the handicapped.

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2. An elevator used by both handicapped and non-handicapped persons, comprising:

a hall destination floor register provided at a hall of the elevator for registering destination floors; 10
a hall request register for the handicapped provided at the hall of the elevator;
cage allocating means for allocating a cage to each of the destination floors registered by the hall destination floor register; and 15
cage request registration preventing means for preventing registration of cage request for stopping the cage on a floor other than the floors to which the cage has been allocated by the cage allocating means, **characterized by** further including: 20

cage request registration prevention canceling means for canceling prevention of cage request registration of only the handicapped 25
executed by the cage request registration preventing means for all of operation service floors by operating the hall request register for the handicapped.

30

3. An operation method of an elevator used by both handicapped and non-handicapped persons for preventing registration of cage request for stopping a cage on a floor other than floors registered by a hall destination floor register provided at a hall of the elevator, **characterized in that:** 35

cage request registration prevention canceling means cancels prevention of registration of the cage request and operates the elevator in response to operation of hall request register for the handicapped provided at the hall. 40

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FIG. 1

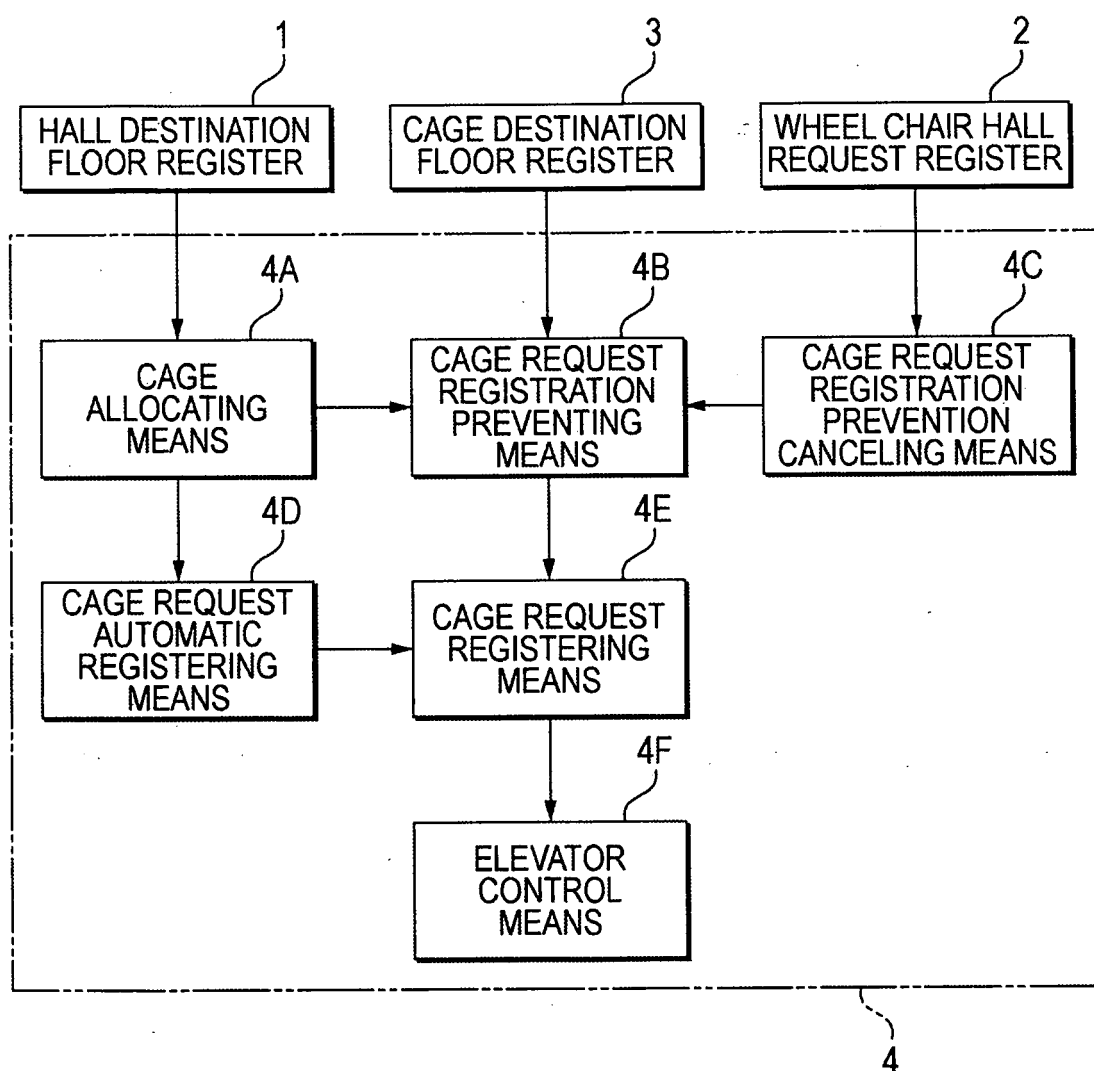


FIG. 2

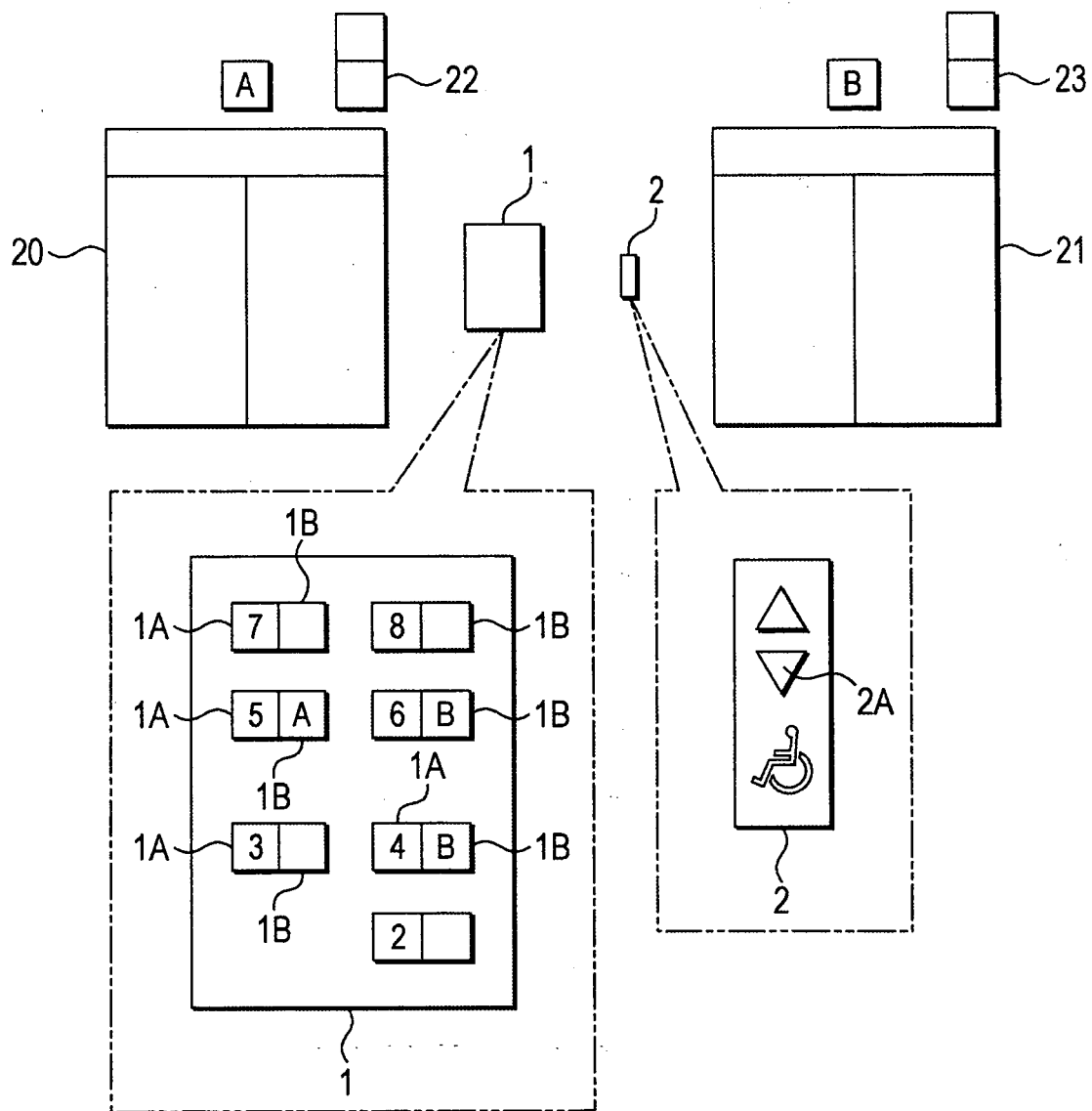


FIG. 3

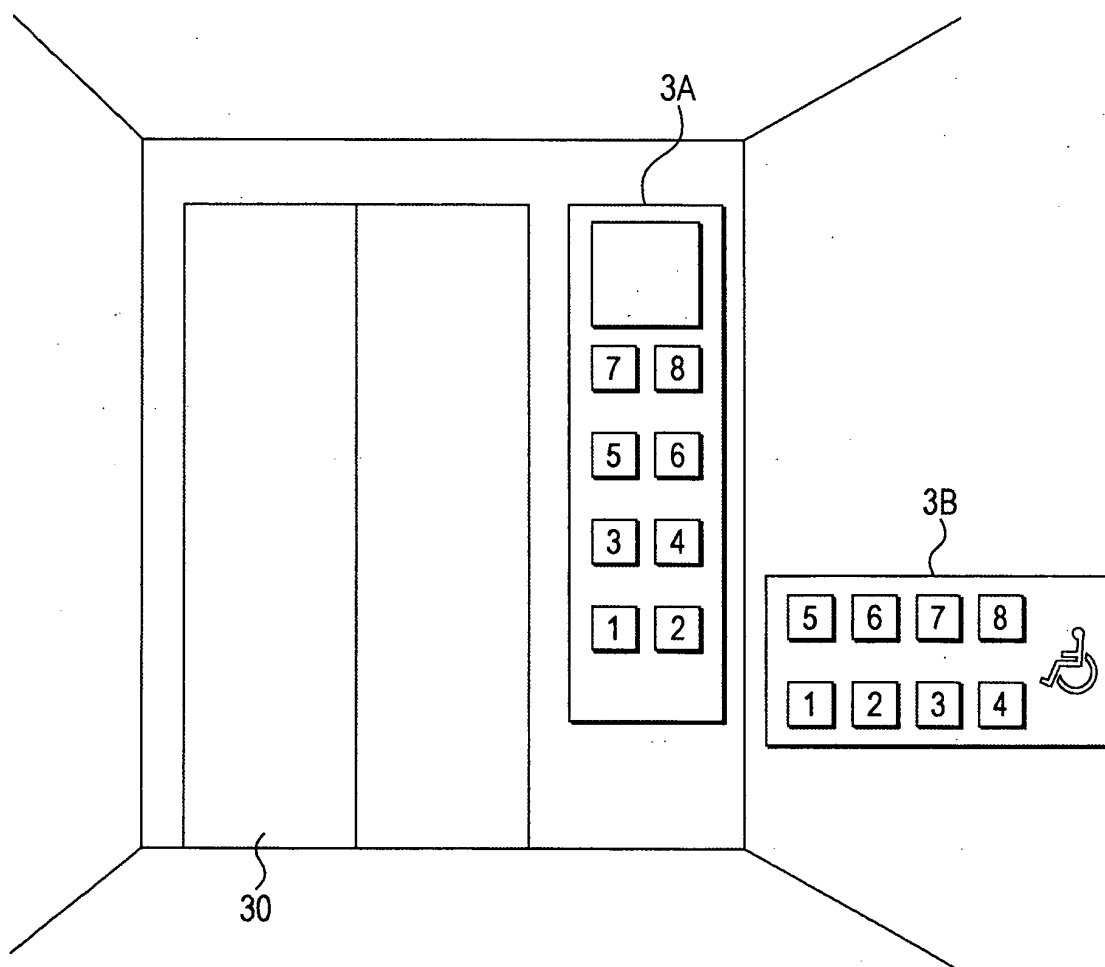


FIG. 4

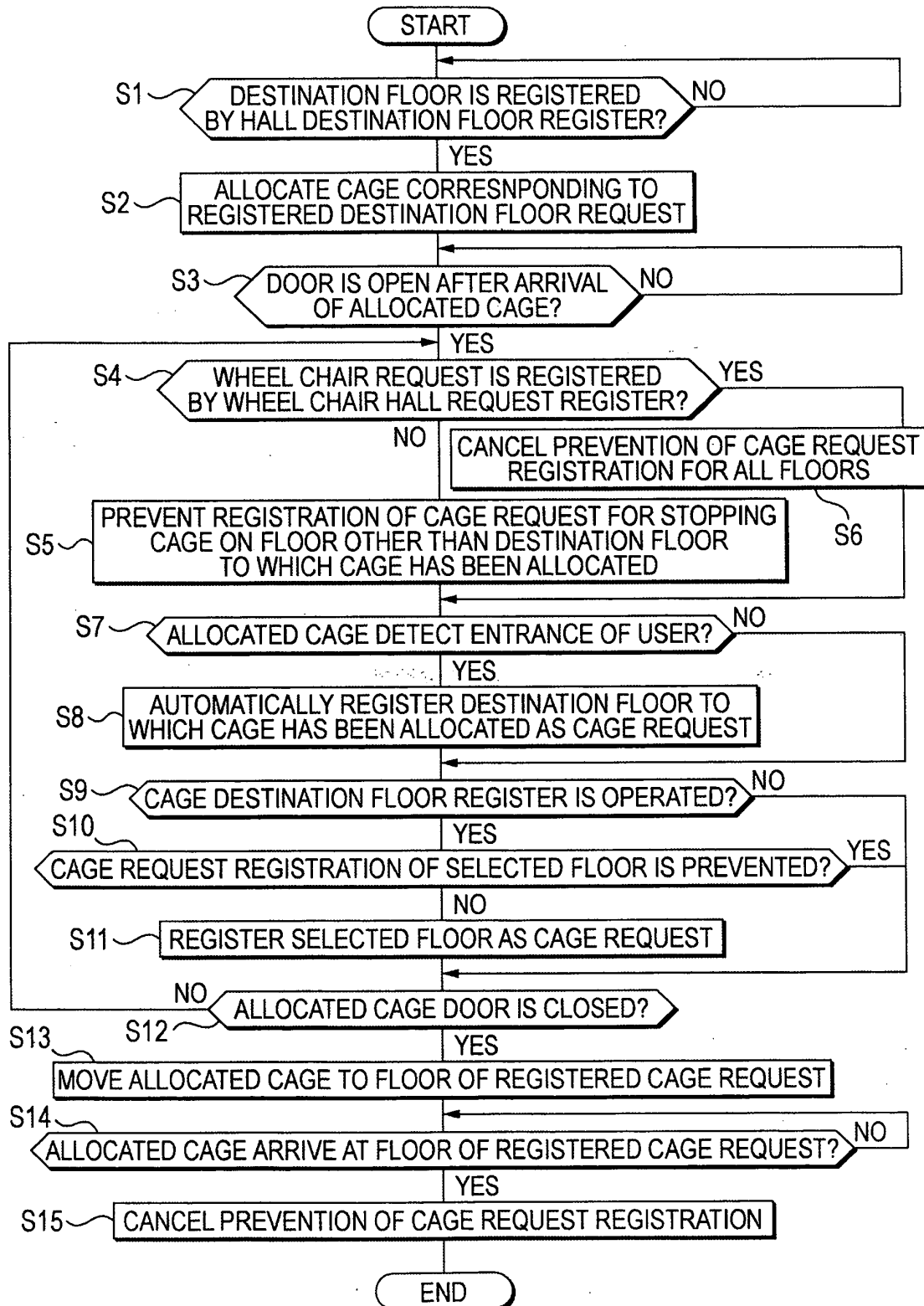


FIG. 5

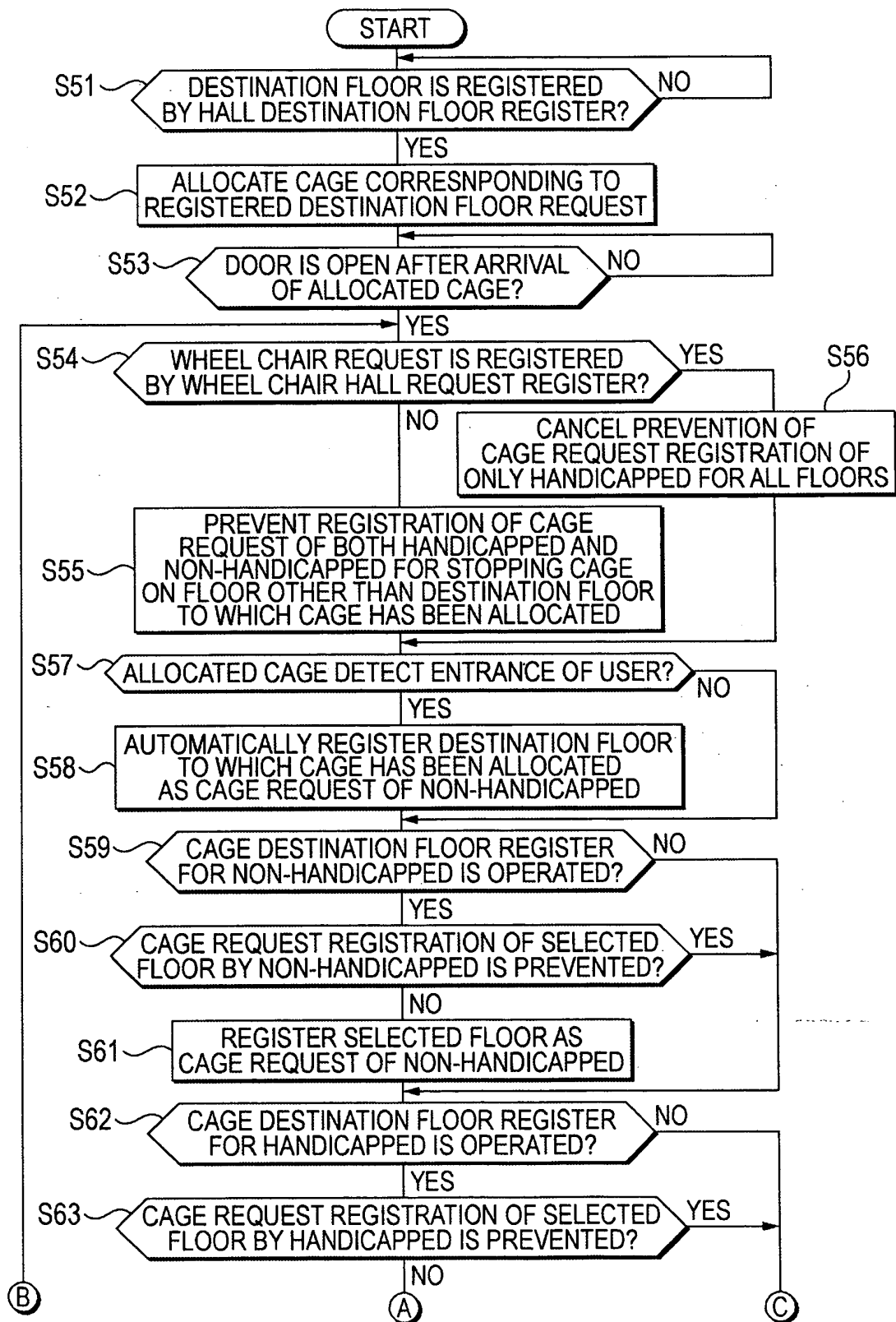
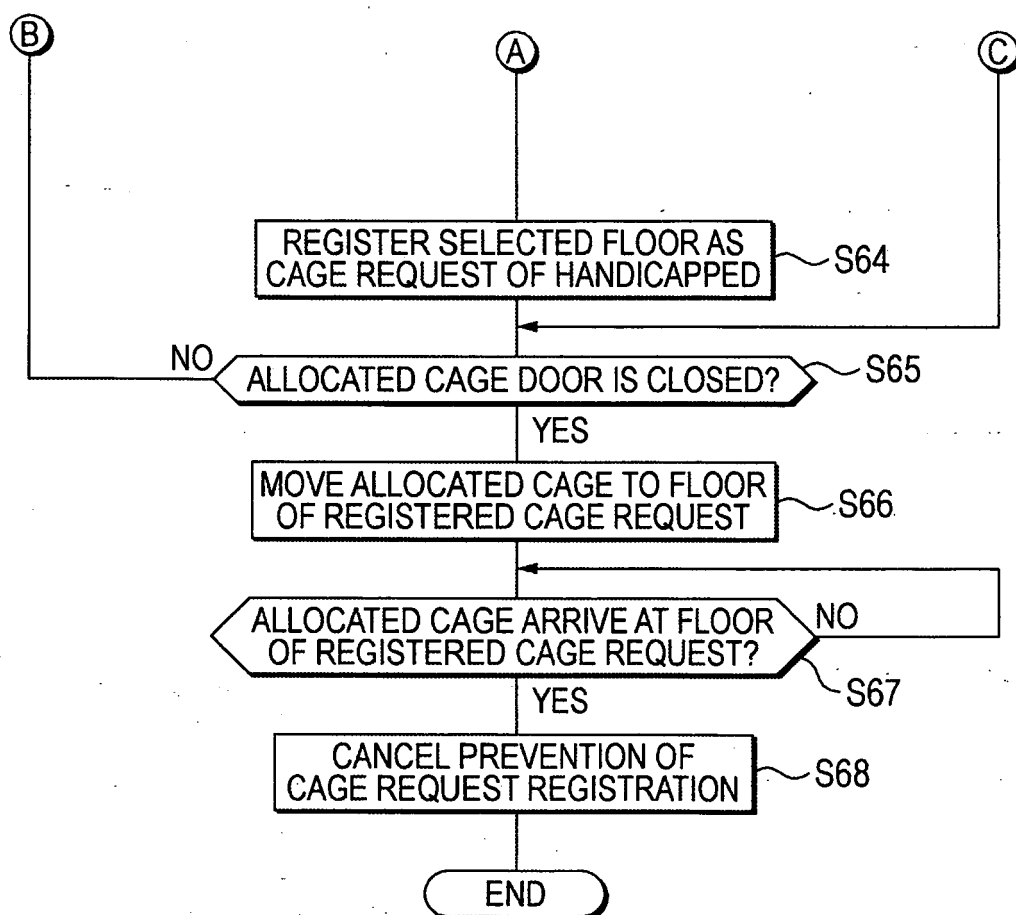


FIG. 6



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2006/308752

A. CLASSIFICATION OF SUBJECT MATTER B66B1/18(2006.01) i		
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) B66B1/18		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2006 Kokai Jitsuyo Shinan Koho 1971-2006 Toroku Jitsuyo Shinan Koho 1994-2006		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 2003-292256 A (Mitsubishi Electric Corp.), 15 October, 2003 (15.10.03), Abstract; Fig. 1 (Family: none)	1-3
Y	JP 07-069544 A (Toshiba Corp.), 14 March, 1995 (14.03.95), Abstract; Fig. 1 (Family: none)	1-3
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Date of the actual completion of the international search 09 August, 2006 (09.08.06)		Date of mailing of the international search report 15 August, 2006 (15.08.06)
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Patent documents cited in the description

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- JP 2000109276 A [0006]