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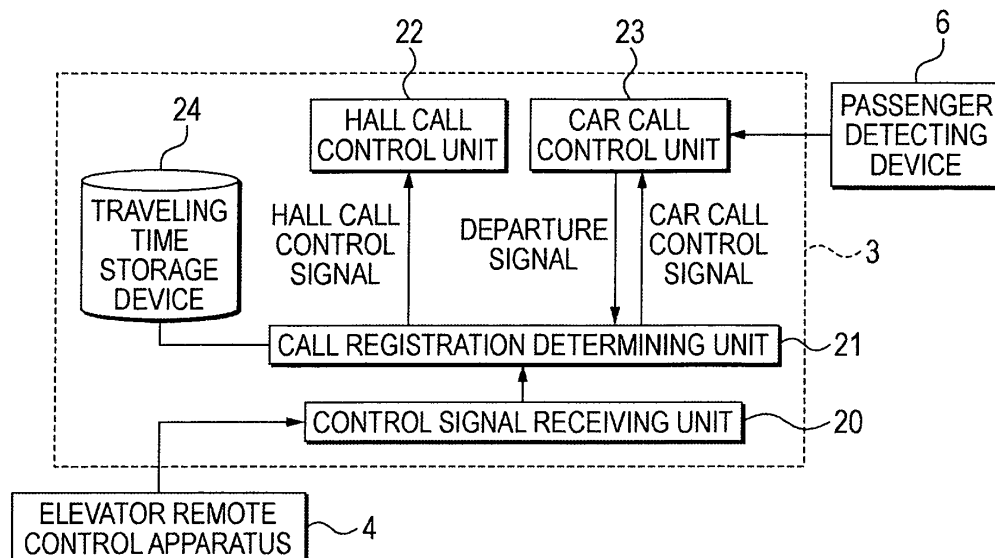
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(54) **ELEVATOR REMOTE CONTROL SYSTEM**

(57) [Problem] To obtain an elevator remote control system that prevents a user who is authenticated later from missing an elevator when multiple users are authenticated in series. [Means for Resolution] A hall call control signal and a car call control signal are transmitted by an elevator remote control apparatus 4 to an elevator control panel 3 in accordance with the result from authentication of a user. The elevator control panel 3 includes a registration determining unit 21 that determines a hall call control signal and a car call control signal, a hall call control

unit 22 that registers a hall call based on a hall call control signal, a car call control unit 23 that registers a car call based on a car call control signal, and a traveling time storage device 24 that stores the traveling time from an authentication place to an elevator of a user. The call registration determining unit 21 transmits a car call control signal to the car call control unit 23 after a lapse of the traveling time stored in the traveling time storage device 24 from the receipt of the last car call control signal when car call control signals are received in series.

FIG. 3



Description

Technical Field

[0001] The present invention relates to an elevator remote control system for an elevator available to personally authenticated users.

Background Art

[0002] In a building having an automatically locked entrance door, a residence thereof can enter to the building by unlocking the automatically-locked entrance door by using the key of his/her room at the entrance of the building. A visitor can enter to the building by having an unlock button, in the room to visit, for the automatically locked entrance door pressed by a residence of the building. In such a building, according to Patent Document 1, a hall call of the entrance floor is automatically registered based on an operation for unlocking an automatically-locked entrance door, and a car call for a living floor is registered in response to the arrival of the elevator to the entrance floor. According to Patent Document 2, a hall call of the entrance floor is automatically registered based on an unlocking operation by a residence to visit with an unlock button for an automatically-locked entrance door in a room to visit, and a car call at a living floor is registered in response to the arrival of the elevator at the entrance floor.

Patent Document 3 discloses one in which the door open time is determined such that the total of the time since a specific person is identified and a hall call for the elevator is registered until an elevator arrives at the entrance floor and the door open time can be equal to the traveling time from the entrance to the elevator hall.

[0003]

Patent Document 1: JP-B-7-115804 (pgs. 2 and 3, Fig. 1)

Patent Document 2: JP-A-10-95575 (pgs. 2 and 3, Fig. 2)

Patent Document 3: JP-A-2002-220177 (pgs. 3 and 4, Fig. 1)

Disclosure of the Invention

Problems that the Invention is to Solve

[0004] Since the car call at a living floor is registered in response to the arrival of an elevator at the entrance floor in the conventional systems in Patent Document 1 and Patent Document 2, the automatically-locked entrance door must be unlocked with a key or the automatically-locked entrance door must be unlocked by the residence to visit at the entrance when residences and/or visitors serially come to the entrance of the building and the later residence or visitor misses the elevator, which is a problem.

The system in Patent Document 3 does not consider the use by serial users since the door open time is determined based on the traveling time from the entrance of a specific person to the elevator hall.

[0005] The invention was made in order to solve these problems, and it is an object of the invention to provide an elevator remote control system which prevents a later authenticated user of serially authenticated multiple users from missing an elevator.

Means for Solving the Problems

[0006] An elevator remote control system according to the invention includes an authenticating apparatus that authenticates a user of an elevator at an authentication place, an elevator remote control apparatus that transmits control signals including a hall call control signal and a car call control signal in accordance with the result from the authentication of the user by the authenticating apparatus, and an elevator control panel that performs control over the elevator based on the control signals from the elevator remote control apparatus. In this case, the elevator control panel holds a traveling time from the authentication place to the elevator, registers a hall call in response to the receipt of the hall call control signal, registers a car call after a lapse of the traveling time from the receipt of the car call control signal, and, when the next car call control signal is received before a lapse of the traveling time, registers the car call after a lapse of the traveling time from the receipt of the next car call control signal.

Advantage of the Invention

[0007] As described above, the invention includes an authenticating apparatus that authenticates a user of an elevator at an authentication place, an elevator remote control apparatus that transmits control signals including a hall call control signal and a car call control signal in accordance with the result from the authentication of the user by the authenticating apparatus, and an elevator control panel that performs control over the elevator based on the control signals from the elevator remote control apparatus. In this case, the elevator control panel holds a traveling time from the authentication place to the elevator, registers a hall call in response to the receipt of the hall call control signal, registers a car call after a lapse of the traveling time from the receipt of the car call control signal, and, when the next car call control signal is received before a lapse of the traveling time, registers the car call after a lapse of the traveling time from the receipt of the next car call control signal. Therefore, a user authenticated later can be prevented from missing an elevator when multiple users are authenticated in series.

Best Mode for Carrying Out the Invention

Embodiment 1

[0008] First of all, a construction of the invention will be described with reference to Fig. 1.

Fig. 1 is a block diagram showing a construction of an elevator remote control system according to Embodiment 1 of the invention.

In Fig. 1, a user inputs personal identification data for personal authentication by using an input device 1. A personal authenticating apparatus 2 receives the personal identification data transmitted from the input device 1, authenticates whether the user is a person permitted for the use of the elevator or not, transmits the authentication result as an identification code and unlocks the automatically locked entrance door 5.

An elevator remote control apparatus 4 receives the identification code transmitted from the personal authenticating apparatus 2 and transmits a control signal to an elevator control panel 3 of a group available to the user. A passenger detecting device 6 detects that a user has ridden on the elevator and outputs a signal for determining whether a user has ridden on the elevator or not to the elevator control panel 3. An unlock permitting device 7 is provided at each residence and gives a visitor an instruction for permitting to unlock an automatically locked entrance door.

[0009] Fig. 2 is a block diagram showing a construction of the elevator remote control apparatus of the elevator remote control system according to Embodiment 1 of the invention.

In Fig. 2, the reference numerals 2 to 4 are identical to those in Fig. 1. The elevator remote control apparatus 4 has an identification code decoding unit 10 and decodes the identification code transmitted from the personal authenticating apparatus 2 and transmits the decoding result to a control mode determining unit 11.

The control mode determining unit 11 determines, based on the identification code received from the identification code decoding unit 10, the control mode over an elevator among the automatic registration of a hall call and a car call if the user is an able-bodied residence, the automatic registration of a call for wheelchair driving of a hall call and car call if the user is a residence on a wheel chair, and the automatic registration of a hall call only if the user is a non-residence such as a janitor, for example. Then, the control mode determining unit 11 transmits the control signal on the determined control mode to a transmitting unit 12.

[0010] Fig. 3 is a block diagram showing a construction of the elevator control panel of the elevator remote control system according to Embodiment 1 of the invention.

In Fig. 3, the reference numerals 3, 4 and 6 are identical to those in Fig. 1. A control signal receiving unit 20 receives a control signal from the elevator remote control apparatus 4. A call registration determining unit 21 transmits the control signal transmitted from the control signal

receiving unit 20 to a hall call control unit 22 and a car call control unit 23 based on a determination criterion. The car call control unit 23 receives the input of a signal for determining whether a user has ridden thereon or not from the passenger detecting device 6. A traveling time storage device 24 stores a least required traveling time for a user to travel from an authentication place (the entrance of a building) to an elevator hall.

[0011] Fig. 4 is a flowchart describing an operation of the call registration determining unit of the elevator remote control system according to Embodiment 1 of the invention.

Next, referring to the flowchart in Fig. 4, an operation of the call registration determining unit 21 will be described. First of all, in step S1, a control signal is received from the control signal receiving unit 20. Next, in step S2, a hall call, control signal is transmitted to the hall call control unit 22. Next, in step S3, whether any car call control signal is included in the control signals transmitted from the control signal receiving unit 20 or not is determined. In step S4, if a car call control signal is included therein, a timer is reset (that is, the timer variable TM is returned to zero), and the timer is started. The term, timer variable TM, here refers to a numeral value automatically incrementing by one for each lapse of one second.

Next, in step S5, the timer variable TM and the value of the traveling time T0, which is stored in the traveling time storage device 24, from the authentication place of a user to the elevator are compared to determine which is higher. If the timer variable TM is higher than T0, a car call control signal is transmitted to the car call control unit 23 in step S6.

[0012] In the flowchart, the timer variable TM has a new variable value every time a car call control signal is received from the control signal receiving unit 20. In other words, when multiple car call control signals are received in series, the timer variable TM is sequentially reset, and the timer variable TM for the car call control signal received most lately is used.

Immediately after the receipt of a hall call control signal from the call registration determining unit 21, the hall call control unit 22 performs processing for registering the hall call. The car call control unit 23 temporarily stores the car call control signal received from the call registration determining unit 21 and performs processing for registering the car call control signal temporarily stored until then if it is determined that a user has ridden thereon by using the signal from the passenger detecting device 6. When the elevator that the user has ridden on departs, the car call control unit 23 transmits a departure signal that indicates that the elevator has departed to the call registration determining unit 21. If the car call control signal to be transmitted to the car call control unit 23 has been stored before the departure signal is received, the call registration determining unit 21 transmits the hall call control signal to the hall call control unit 22 again.

[0013] Thus, when users use the elevator in series and even when a user having registered first rides on the

elevator before the second authenticated user arrives at the elevator hall, the car call for the target floor of the second authenticated user is not automatically registered.

Furthermore, if the second user arrives at the hall after the elevator departs, the hall call has been registered again. Thus, the second user can automatically move to a target floor by riding on the elevator arriving in response to the hall call.

The operation for a visitor is only different therefrom in that the personal identification data is transmitted from the unlock permitting device 7 to the personal authenticating apparatus 2 instead of the input through the input device 1, and the subsequent operation of the entire system is the same as the one to be performed when a residence comes home.

[0014] According to Embodiment 1, when multiple users are authenticated in series, a user authenticated later can be prevented from missing an elevator, and the user authenticated after an elevator departs can use the elevator without requiring the authentication again.

Brief Description of the Drawings

[0015]

[Fig. 1] It is a block diagram showing a construction of an elevator remote control system according to Embodiment 1 of the invention.

[Fig. 2] It is a block diagram showing a construction of an elevator remote control apparatus of the elevator remote control system according to Embodiment 1 of the invention.

[Fig. 3] It is a block diagram showing a construction of an elevator control panel of the elevator remote control system according to Embodiment 1 of the invention.

[Fig. 4] It is a flowchart describing an operation by a call registration determining unit of the elevator remote control system according to Embodiment 1 of the invention. Description of Reference Numerals and Signs

[0016]

- 1 Input Device
- 2 Personal Authenticating Apparatus
- 3 Elevator Control Panel
- 4 Elevator Remote Control Apparatus
- 5 Automatically Locked Entrance Door
- 6 Passenger Detecting Device
- 7 Unlock Permitting Device
- 10 Identification Code Decoding Unit
- 11 Control Mode Determining Unit
- 12 Transmitting Unit
- 20 Control Signal Receiving Unit
- 21 Call Registration Determining Unit
- 22 Hall Call Control Unit

- 23 Car Call Control Unit
- 24 Traveling Time Storage Device

5 Claims

1. An elevator remote control system **characterized by** comprising an authenticating apparatus that authenticates a user of an elevator at an authentication place, an elevator remote control apparatus that transmits control signals including a hall call control signal and a car call control signal in accordance with the result from the authentication of the user by the authenticating apparatus, and an elevator control panel that performs control over the elevator based on the control signals from the elevator remote control apparatus, wherein the elevator control panel holds a traveling time from the authentication place to the elevator, registers a hall call in response to the receipt of the hall call control signal, registers a car call after a lapse of the traveling time from the receipt of the car call control signal, and, when the next car call control signal is received before a lapse of the traveling time, registers the car call after a lapse of the traveling time from the receipt of the next car call control signal.
2. The elevator remote control system according to Claim 1, **characterized by** further comprising a passenger detecting device that detects that a user has ridden on the elevator, wherein the elevator control panel has call registration determining means for determining a hall call control signal and a car call control signal from the control signals and transmitting the determined hall call control signal and car call control signal, hall call control means for receiving the hall call control signal transmitted from the call registration determining means and registering the hall call by the received hall call control signal, car call control means for receiving a car call control signal transmitted from the call registration determining means, and a traveling time storage device that stores a traveling time from the authentication place to the elevator of the user;
- the call registration determining means transmits the car call control signal to the car call control means after a lapse of the traveling time stored in the traveling time storage device from the receipt of the car call control signal and transmits the car call control signal to the car call control means after a lapse of the traveling time from the receipt of the next car call control signal when the next car call control signal is received before a lapse of the traveling time from the receipt of the car call control signal; and the car call control means registers a car call based on the car call control signal after the fact that a user has ridden thereon is detected by the passenger detecting device.

3. The elevator remote control system according to Claim 2, **characterized in that** the car call control means transmits a departure signal to the call registration determining means when the elevator departs, and the call registration determining means transmits a hall call control signal to the hall call control means if the car call control means has an unsent car call control signal when the departure signal is received.

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FIG. 1

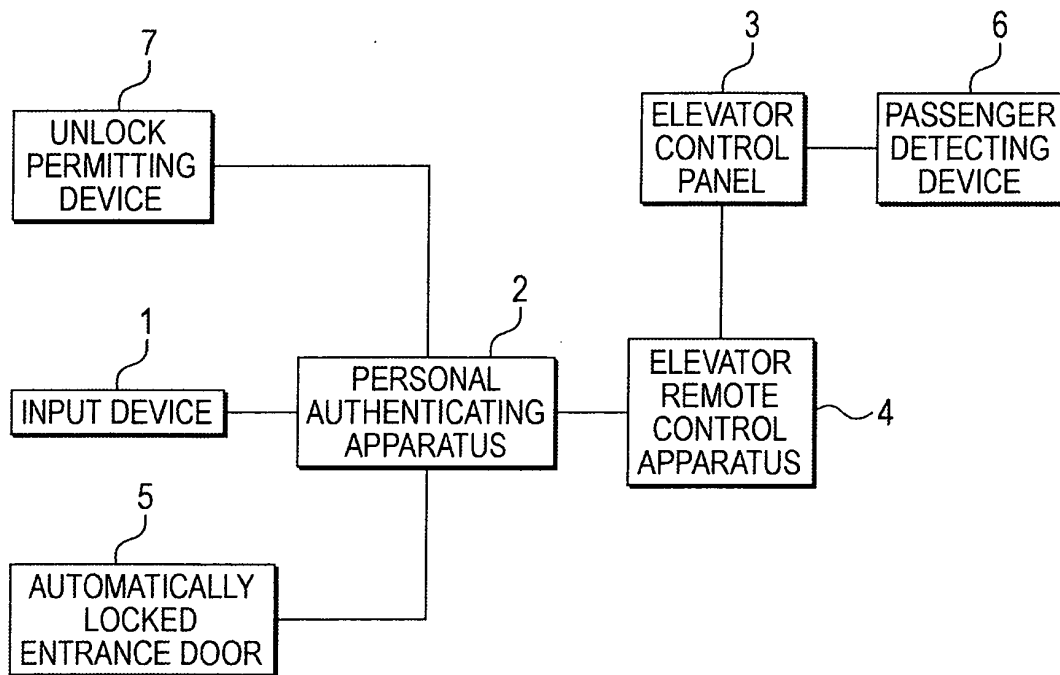


FIG. 2

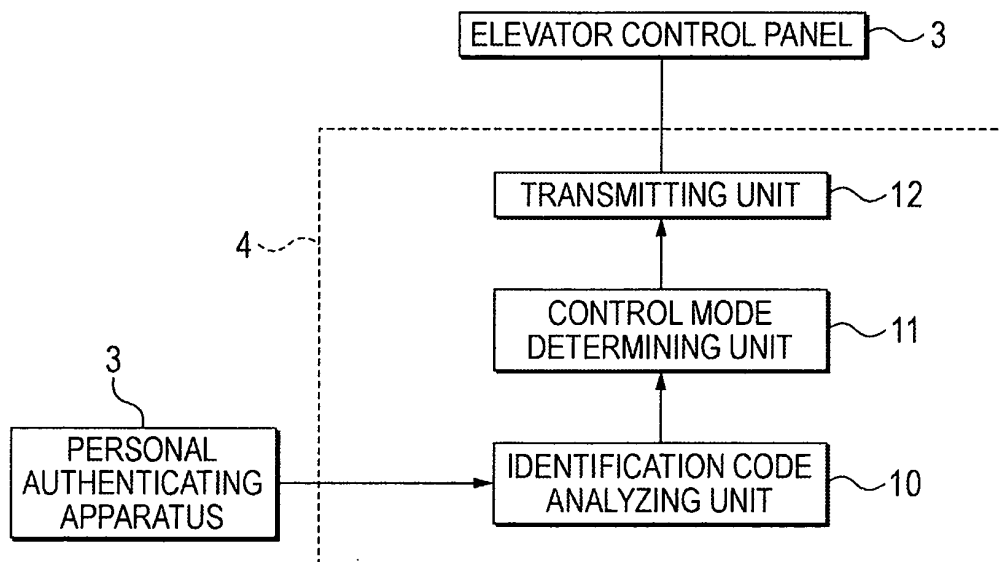


FIG. 3

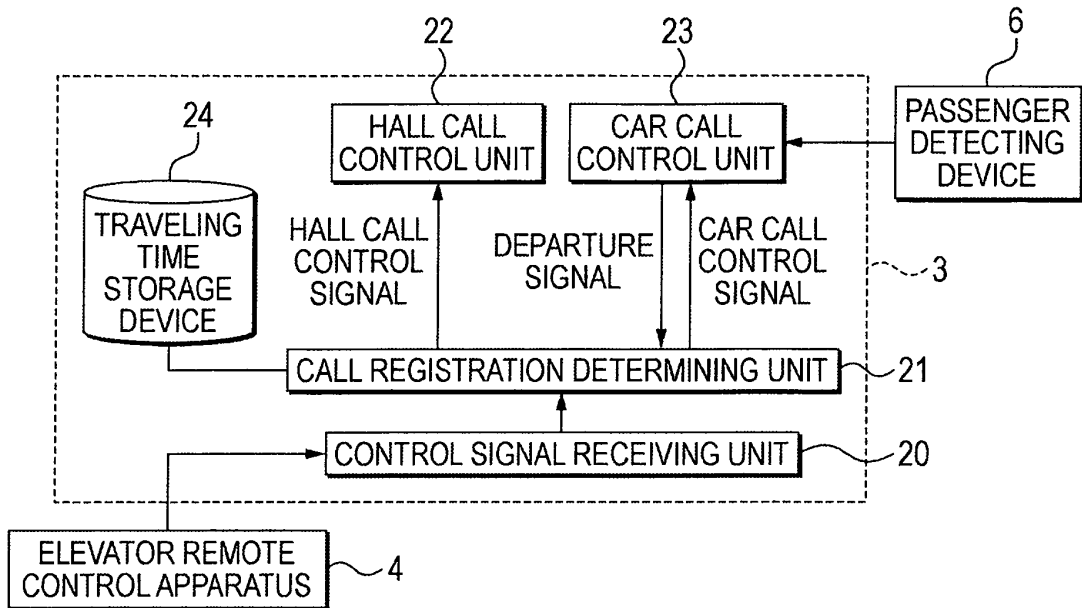
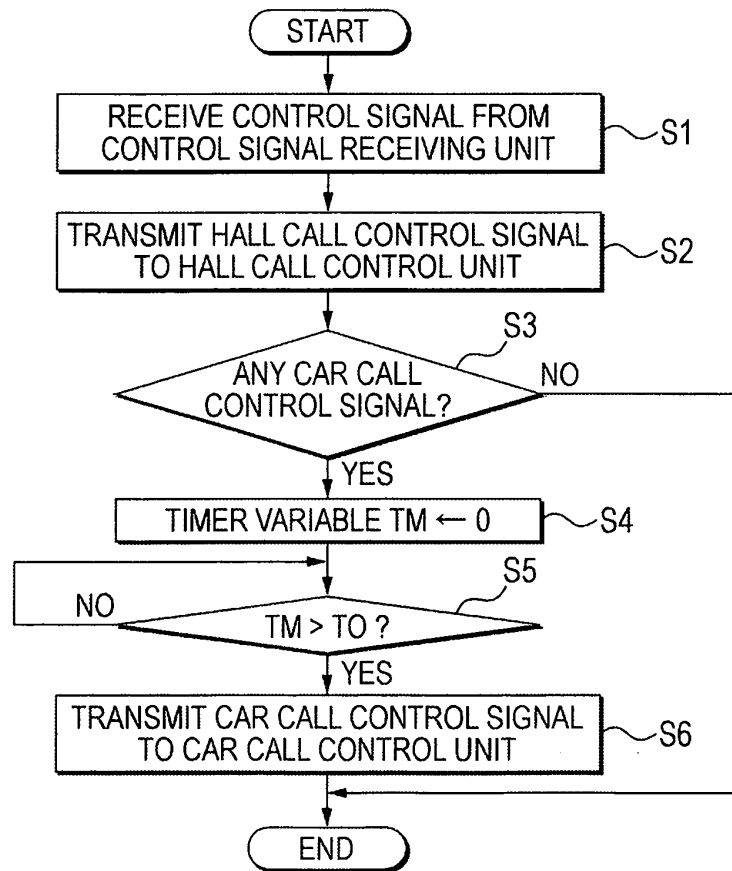


FIG. 4



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2006/306882

A. CLASSIFICATION OF SUBJECT MATTER

B66B1/14 (2006.01)

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)

B66B1/00 (2006.01) - **B66B1/52** (2006.01)

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.
A	JP 2002-326770 A (Mitsubishi Electric Corp.), 12 November, 2002 (12.11.02), Claims 1 to 5 (Family: none)	1-3
A	JP 2005-022821 A (Mitsubishi Electric Corp.), 27 January, 2005 (27.01.05), Claims 1 to 4 (Family: none)	1-3
A	JP 2003-276960 A (Mitsubishi Electric Corp.), 02 October, 2003 (02.10.03), Claims 1 to 2 (Family: none)	1-3

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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Date of the actual completion of the international search
10 July, 2006 (10.07.06)Date of mailing of the international search report
18 July, 2006 (18.07.06)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2006/306882

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2002-220163 A (Mitsubishi Electric Corp.), 06 August, 2002 (06.08.02), Claim 1 (Family: none)	1-3

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

REFERENCES CITED IN THE DESCRIPTION

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- JP 7115804 B [0003]
- JP 10095575 A [0003]
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