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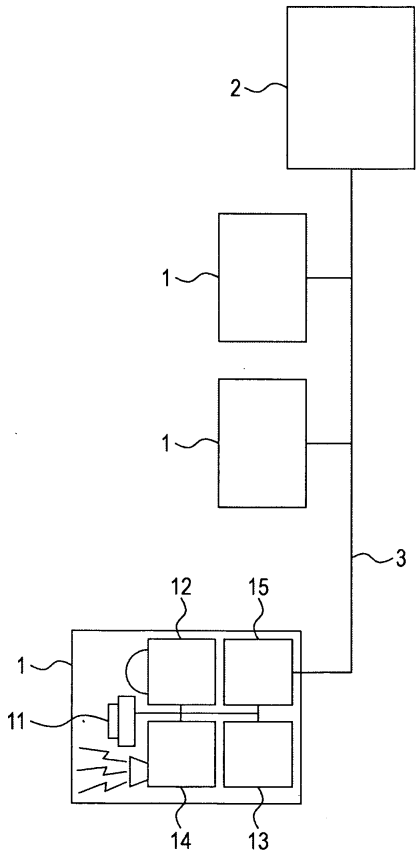
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(54) **ELEVATOR LANDING CALL REGISTER**

(57) An elevator landing call register comprising a landing call registering button (11), a speech input device (12), a speech recognizing device (13) for receiving a speech signal of a user and recognizing a destination floor, and a call control unit (15) for receiving the outputs from the registering button, the speech input device and the speech recognition device and reporting to the elevator control device (2) wherein when the call registering button (11) is operated in predetermined procedures, the call control unit (15) enables the speech recognition function of the speech recognition device, and reports the destination floor recognized by the speech recogniting device to the elevator control device.

FIG. 1



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Description

Technical Field

[0001] The present invention relates to an elevator landing call register that are placed at a landing hall and usable for both physically handicapped persons and able-bodied persons.

Background Art

[0002] A conventional call register is equipped with means for exercising a speech recognition function by detecting existence of a user. For example, according to an elevator landing register disclosed in Patent Document 1, when call registration is made by a microphone set in an elevator hall, human detecting means detects whether a user of an elevator stands in front of the microphone, and speech recognizing means is made operable only when it is detected by the human detecting means that an elevator user stands in front of the microphone. Furthermore, according to an elevator calling register disclosed in Patent Document 2, a call registering speech from a user is input by a microphone only when human detecting means detects that a person stands in front of the microphone. However, in a case where the human detecting means does not detect existence of any person, even if there is a speech input to the microphone, it is judged as a noise and the recognition processing operation is not operated, thereby preventing malfunction.

[0003] [Patent Document 1] Japanese Patent Number 2,557,939
[Patent Document 2] Japanese Patent Number 2,647,207

[Disclosure of the Invention]

[Problem to be solved by the Invention]

[0004] The conventional elevator landing call register has a problem that speech of a user for which speech recognition is not required is also recognized if a person is detected because the speech recognition functions when a person enters a detection range. Furthermore, when the conventional device is designed so that all users use this conventional device, a user who hurries and thus does not need speech recognition is required to execute speech recognition with spending some time every time. Therefore, some users may have sense of discomfort with their unnecessary speech input.
The present invention has been implemented to solve the problem as described above.

[Means of solving the Problem]

[0005] An elevator landing call register according to the present invention comprises a call register button operated at a landing hall by a user, a speech input device for inputting utterance of a destination floor by the user, a speech recognizing device for receiving a speech signal of the user output from the speech input device and recognizing the destination floor, and a call control unit for receiving the respective outputs of the call registering button, the speech input device and the speech recognizing device and reporting to an elevator control device, wherein when the call registering button is operated according to a predetermined procedure, the call control unit enables the speech recognition function of the speech recognizing device and also reports the destination floor recognized by the speech recognizing device to the elevator control device.

[Effect of the Invention]

[0006] In the conventional landing call register using elevator speech recognition, the speech recognizing means is actuated to perform call registration when an elevator user is detected at a landing hall. However, according to the elevator landing call register of the present invention, the call control unit enables the speech recognition function only when an elevator user needing the speech recognition function operates a call registering button at a landing hall according to a predetermined procedure. Therefore, only the speech of the user needing the speech recognition function is recognized, and the call control unit reports the recognized destination floor to the elevator control device to register the destination floor. Accordingly, a user who does not need the speech recognition function is not required to utter a destination floor by using cumbersome speech recognition function means, and thus there can be provided a landing call register that is highly convenient for any user and has little mis-recognition.

[Brief Description of the Drawings]

[0007]

[Fig. 1] is a diagram showing the overall construction of an elevator landing call register according to embodiments 1 to 3 of the present invention.
[Fig. 2] is a flowchart showing the operation of the elevator landing call register according to the embodiments 1 to 3.

[Description of Reference Numerals and Signs]

[0008]

1	landing call register
2	elevator control device
3	communication path
11	call registering button
12	speech input device
13	speech recognition device

14 sound output device
15 call control unit

[Best Modes for carrying out the Invention]

[0009] The present invention relates to a elevator landing call register set at an elevator landing hall, and relates to a landing call register equipped with a speech recognizing device with which an elevator user needing speech recognition function registers a destination floor by speech.
Each embodiment of the present invention will be described hereunder with reference to the drawings. In the figures, the same reference numerals represent the same or corresponding portions.

Embodiment 1

[0010] Fig. 1 is a diagram showing the overall construction of an elevator landing call register according to a first embodiment of the present invention.
In Fig. 1, one or more elevator landing call registers 1 according to an embodiment 1 of the present invention are set up at each landing hall. Each elevator landing call register 1 comprises a call registering button 11, a speech input device 12, a speech recognizing device 13, a sound output device 14, a call control unit 15, etc., and each of these elements is connected to the elevator control device 2 through the communication path 3.
[0011] Next, the respective functions of the call registering button 11, the speech input device 12, the speech recognizing device 13, the sound output device 14, the call control unit 15 and the elevator control device 2 will be described.
The call registering button 11 comprises call upward and downward buttons on intermediate floors as in the case of the normal call registering button, comprises a call upward button on the lowermost floor, and comprises a downward button on the uppermost floor. The operation procedure to be executed by an elevator user requiring speech recognition is changed from the operation to be normally executed on the upward or downward button of the call registering button 11 (for example, the button is once operated for one second or less), whereby the operation based on the user and the normal operation can be discriminated from each other.
For example, when the user concerned pushes the call registering button 11 for a long time (for example, one second or more), pushes the call registering button 11 at plural times (for twice or more) within a fixed time, or strongly pushes the call registering button 11, a direction call of the call registering button 11 operated on that floor is input, and also the speech input device 12 and the speech recognizing device 13 described below function respectively.
That is, even when an elevator user which does not need speech recognition normally operates the call registering button 11, a direction call of the call registering button operated on that floor is input, however, the speech recognition function is not enabled.
[0012] The speech input device 12 is enabled only when the call control unit 15 detects that an elevator user who needs the speech recognition function carries out a different operation from the normal operation on the call registering button 11, and a speech (a destination floor name) of the user is input through a microphone or the like. That is, only when the operation different from the normal operation (for example, once operation for one second or less) is carried out on the call registering button 11, the input (destination floor name) of the speech of the user is accepted.
[0013] The speech recognition device 13 is enabled only when the call control unit 15 detects the operation of the call registering button 11 which is different from the normal operation as in the case of the speech input device 12, and it recognizes the destination floor based on the speech which is input by the speech input device 12.
That is, the speech recognition device 13 recognizes a speech only when the elevator user needing the speech recognition function carries out a predetermined operation on the call registering button 11, and recognizes the destination floor on the basis of the user' s speech input from the speech input device 12.
[0014] When the normal operation (pushing for one second or less) is carried out on the call control unit 15, the call control unit 15 reports the name of the floor having the call registering button 11 concerned set thereon and the call direction (upward or downward) through the communication path 3 to the elevator control device 2. In addition, when the operation different from the normal operation is carried out on the call registering button 11, the call control unit 15 reports the destination floor recognized on the basis of the speech of the speech recognition device 13 to the elevator control device 2. That is, when the call registering button 11 is operated in a predetermined procedure different from the normal procedure, the functions of the speech input device 12 and the speech recognition device 13 are enabled, and the destination floor recognized by the speech recognition device 13 is reported to the elevator control device 2.
Furthermore, the call control unit 15 records the existence or non-existence of the destination floor, and it has a function of collating the direction of the operated call registering button 11 with the existence or non-existence of the destination floor recognized by the speech recognition device 13 and the destination direction to the destination floor, and then reporting to the elevator control device 2.
[0015] With the above construction, only when the elevator user needing the speech recognition function operates the call registering button 11 in the predetermined procedure, the call control unit 15 enables the speech recognition function, and recognizes only the speech of the requiring user, so that mis-recognition can be suppressed. Furthermore, the elevator user who does not

need the speech recognition function is not required to utter the destination floor by using the cumbersome speech recognition device 13, and thus there can be provided the landing call register 1 which has high convenience and reliability to any user.

[0016] The speech recognition device 13 and the call control unit 15 may be constructed by a microcomputer, a memory, etc. Furthermore, a memory may be contained in a microcomputer. Furthermore, the functions of parts of the speech input device 12 and a sound output device 14 described later may be contained in a microcomputer. Accordingly, the landing call register can be constructed by using more general parts, and thus the cost can be reduced.

Embodiment 2

[0017] In the embodiment 1, only when it is detected that the call registering button 11 is operated by the elevator user needing the speech recognition, the speech recognition function of the speech recognition device 13 is enabled, and the destination floor which is recognized on the basis of the speech of the user by the speech recognition device 13 is reported to the elevator control device 2 through the communication path 3 to register the recognized destination floor.

On the other hand, in the second embodiment 2, in addition to the above operation, necessary sound information is taken out from the sound information stored in the call control unit 15 of Fig. 1, and the sound output device 14 reports the completion of the call registration of the destination floor to the user with a voice (for example, "OO floor accepted") or a response sound (for example, "piche") from a speaker. Accordingly, the elevator user needing the speech recognition, for example, a vision-impaired person can check with sounds that the speech uttered by the person concerned is correctly recognized, and thus he/she feels reassured.

[0018] The call control unit 15 collates the recognized destination floor with the stored floor destination floors so as to judge whether the recognized destination floor exists. If the recognized destination floor does not exist, it is reported to the user from the sound output device 14 that the destination floor concerned does not exist. At this time, the call control unit 15 takes out stored sound information, for example, "the recognized floor is not registrable, and please utter once again", a response sound "piche piche" or the like, and outputs it from the sound output device 14. Accordingly, the vision-impaired person recognizes it with the sound that the uttered floor name cannot be registered and thus can retry to utter or the like, and thus the convenience can be enhanced.

Embodiment 3

[0019] In the embodiment 1, only when it is detected that the call registering button 11 is operated by the elevator user who needs the speech recognition, the speech recognition function of the speech recognition device 13 is enabled, and the destination floor recognized on the basis of the utterance of the user by the speech recognition device 13 is reported through the communication path 3 to the elevator control device 2.

On the other hand, the call control unit 15 of this embodiment 3 checks whether the direction of the operated call registering button 11 is coincident with the destination direction to the destination floor recognized by the speech recognition device 13, and further checks whether the recognized destination floor exists or not. If the destination floor exists and both the directions are coincident with each other, the destination floor is reported to the elevator control device 2. However, if both the directions are not coincident with each other, the recognized floor destination is judged as being invalid, and nothing is reported to the elevator control device 2. Accordingly, only the matched destination floor is reported, and thus there can be provided the landing call register 1 having a high recognition rate. Therefore, the convenience for the users can be enhanced.

[0020] Furthermore, the call control unit 15 may instruct the sound output device 14 to emit a sound such as an utterance of "please utter once again" or the like, a warning sound "piche piche" or the like, and report from the sound output device 14 to the user. Accordingly, the user can know whether the destination floor uttered by himself/herself is correctly registered, and if he/she can known that it is not registrable, he/she can retry the utterance and repeat the utterance until the speech recognition device 13 correctly recognizes the utterance. Accordingly, there can be provided the landing call register 1 that puts the user at his/her ease and has high recognition rate. Therefore, the convenience can be enhanced.

[0021] Fig. 2 is a flowchart showing the operation of an elevator landing call register according to the embodiments 1 to 3.

The operation of the elevator landing call register according to the embodiments 1 to 3 will be described hereunder with reference to Fig. 2.

First, the normal operation by an elevator user who does not need the speech recognition device, for example, an able-bodied person will be described.

First, the landing call register 1 is set to a standby state for the operation of the call registering button 11 (S1). When the call registering button 11 pushes for a normal short time (for one second or less), the call control unit 15 judges that the operation of the call registering button 11 is normally operated (S2), and it reports the floor of the operated calling registering button 11 and the pushed call direction (upward, downward) through the communication path 3 to the elevator control device 2 and registers the call (S3).

The elevator control device 2 allocates an elevator in accordance with the reported floor and call direction (upward, downward) (S3). When the elevator allocation is completed and the call registration is released, the landing call register 1 is set to a standby state for the call

registration button 11 again (S1).

[0022] Next, the operation by an elevator user who needs the speech recognition device, for example, a physically handicapped person will be described.

When a physically handicapped person operates the button according to the predetermined procedure, that is, when the operation of the call registering button 11 is a special operation different from the normal operation (for example, long-time pushing for one second or more, pushing at plural times within a fixed time, strongly pushing, or the like), the speech recognition device 13 takes out necessary sound information (in this case, "please utter destination floor" or a response sound "pi") or the like, and outputs the sound to the sound output device 14, whereby the physically handicapped person is informed of a using manner or that the device has responded (S4).

The speech recognition device 13 is set to a standby state for an input from the speech input device 12 (S5). When utterance of a destination floor is input (S6), the speech recognition device 13 recognizes the input concerned (S7). For example, when "fourth floor" is input, the speech recognition device 13 recognizes "fourth floor", and the call control unit 15 judges whether the direction (upward, downward) of the call registering button 11 operated in S2 is coincident with the destination direction of the recognized floor (S8).

If no speech input can be detected during a fixed time or more, the function of the speech recognition function is disabled, and a standby state for the normal operation of the call registering button is set (S6).

If the destination direction of the recognized floor and the direction of the operated call registering button 11 are not coincident with each other, the sound information stored in the call control unit 15, for example, "please utter once again" or a response sound "piche piche" is taken out and output from the sound output device 14 (S9) and then the standby state is set again (S5).

If the recognized floor destination direction and the direction of the call registering button 11 are coincident with each other, the call control unit 15 reports the destination floor (fourth floor in this case) to the elevator control device 2 through the communication path 3 (S10).

When no recognized destination floor exists (S11), the call control unit 15 reports to the landing call register 1 that the destination floor is a non-existing floor. At this time, the call control unit 15 takes out the stored sound information, for example, "please utter once again" or a response sound "piche piche", outputs it from the sound output device 14 (S9), and is set to the standby state again (S5).

When the destination floor recognized by the call control unit 15 exists (S11), the elevator controller 2 registers the destination floor, allocates an elevator on the basis of the reported destination floor (S12), and reports the registration concerned to the landing call register 1. The call control unit 15 takes the stored sound information, for example, "fourth floor registered", "fourth floor accepted" or a response sound "piche", and outputs it from the sound output device 14 (S13).

[0023] With respect to the stored sound information, plural segments such as "four" and "floor accepted" are connected to each other and then output, whereby the same phrases can be repetitively used. Therefore, the memory capacity for storing the sound information can be reduced, and thus the cost can be reduced.

Furthermore, when no speech input is detected during a fixed time or more after the call registering button 11 is once operated according to the predetermined procedure (the operation of the call registering button by a physically handicapped person) different from the normal procedure, the function of the speech recognition is disabled again, and the standby state for the normal call registering button is set. Accordingly, the convenience can be enhanced without disturbing the convenience for able-bodied persons.

[0024] In the above embodiment, the landing call register 1 itself records the existence or non-existence of the destination floor, and collates the existence or non-existence of the recognized destination floor and the destination direction with the direction of the operated call registering button. However, even when the elevator control device 2 receiving a report of the recognized destination floor from the landing call register 1 collates the existence or non-existence of the recognized destination floor and reports to the landing call register 1, the same effect can be achieved.

[Industrial Applicability]

[0025] The present invention is suitably used as a landing call register for an elevator, particularly, an elevator usable for both physically handicapped persons and able-bodied persons.

Claims

1. An elevator call register **characterized by** comprising: a call registering button operated at a landing hall by a user; a speech input device for inputting an utterance of a destination floor by the user; a speech recognition device for receiving a speech signal of the user output from the speech input device and recognizing the destination floor; and a call control unit for receiving the respective outputs of the call registering button, the speech input device and the speech recognition device and reporting to the elevator control device, wherein when the call registering button is operated according to a predetermined procedure, the call control unit enables a speech recognition function of the speech recognition device, and reports the destination floor recognized by the speech recognition device to the elevator control device.

2. The elevator call register according to claim 1, further comprising a sound output device for making a sound guidance indicating that the destination floor recognized by the speech recognition device is call-registered.

3. The elevator call register according to claim 2, wherein the direction of the operated call registering button and the destination direction to the destination floor recognized by the speech recognition device are collated with each other, and when the call control unit judges that both the direction and the destination direction are not coincident with each other, the call control unit invalidates the call registration, and the sound output device makes a sound guidance so as to promote a speech to be input again.

4. The elevator call register according to any one of claims 1 to 3, wherein the operation in the predetermined procedure is to push the call registering button for a predetermined time or more.

5. The elevator call register according to any one of claims 1 to 3, wherein the operation in the predetermined procedure is to push the call registering button at plural times within a fixed time.

6. The elevator call register according to any one of claims 1 to 3, wherein the operation in the predetermined procedure is to push the call registering button more strongly than a normal operation.

FIG. 1

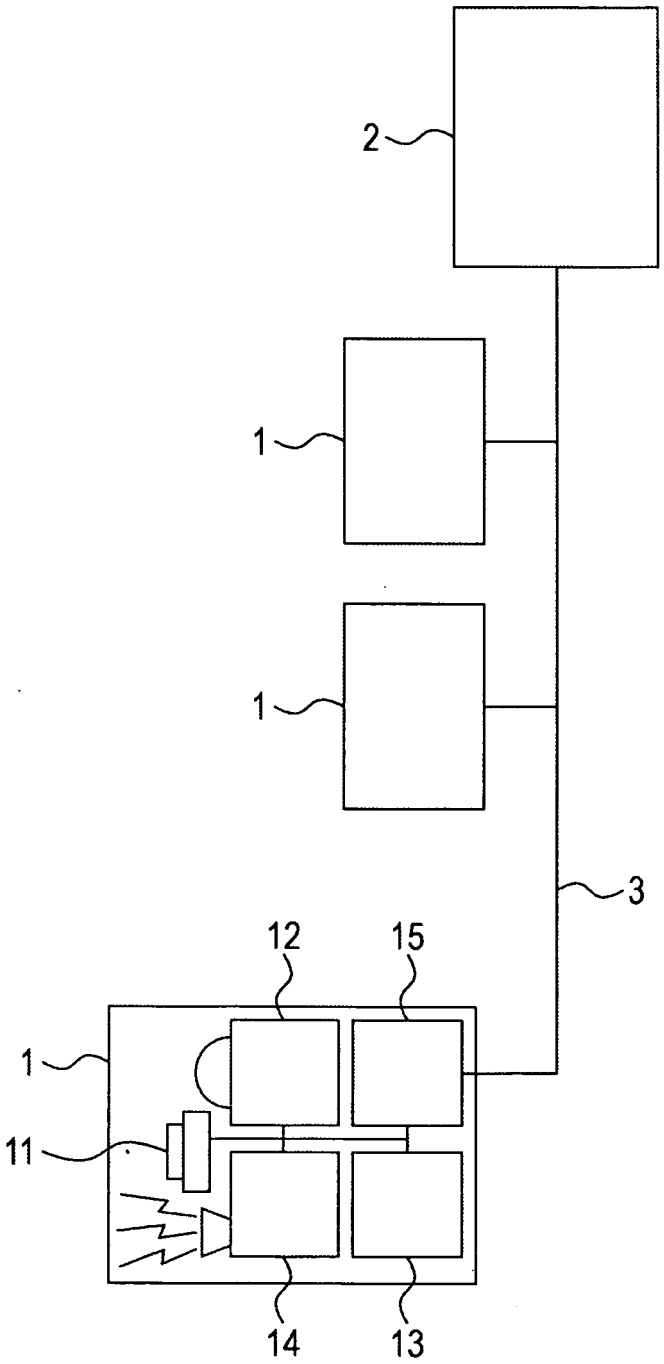
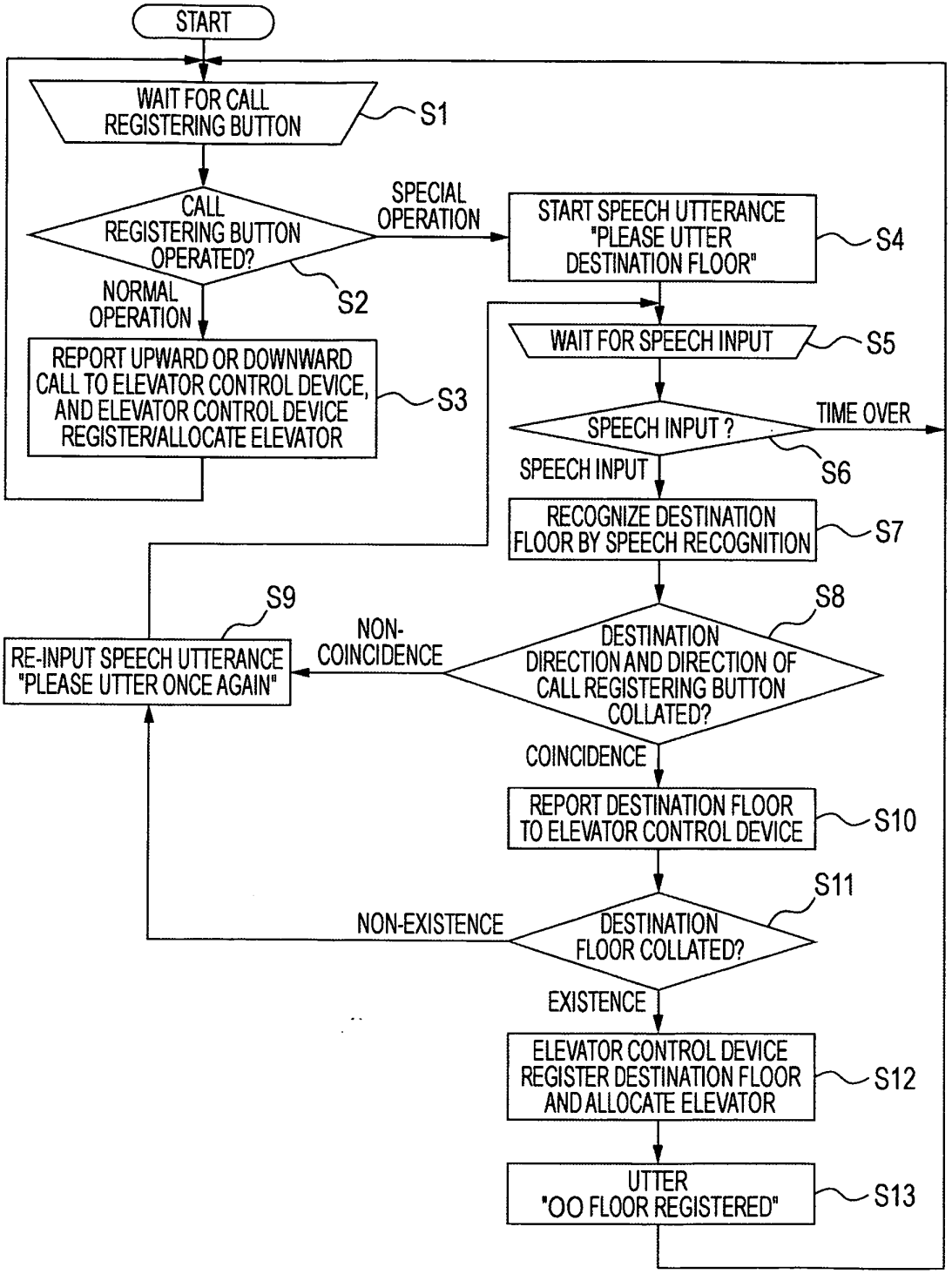


FIG. 2


START
WAIT FOR CALL REGISTERING BUTTON
S1
CALL REGISTERING BUTTON OPERATED?
S2
SPECIAL OPERATION
NORMAL OPERATION
START SPEECH UTTERANCE "PLEASE UTTER DESTINATION FLOOR"
S4
REPORT UPWARD OR DOWNWARD CALL TO ELEVATOR CONTROL DEVICE, AND ELEVATOR CONTROL DEVICE REGISTER/ALLOCATE ELEVATOR
S3
WAIT FOR SPEECH INPUT
S5
SPEECH INPUT ?
S6
TIME OVER
SPEECH INPUT
RECOGNIZE DESTINATION FLOOR BY SPEECH RECOGNITION
S7
DESTINATION DIRECTION AND DIRECTION OF CALL REGISTERING BUTTON COLLATED?
S8
NON-COINCIDENCE
RE-INPUT SPEECH UTTERANCE "PLEASE UTTER ONCE AGAIN"
S9
COINCIDENCE
REPORT DESTINATION FLOOR TO ELEVATOR CONTROL DEVICE
S10
DESTINATION FLOOR COLLATED?
S11
NON-EXISTENCE
EXISTENCE
ELEVATOR CONTROL DEVICE REGISTER DESTINATION FLOOR AND ALLOCATE ELEVATOR
S12
UTTER "OO FLOOR REGISTERED"
S13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2006/309405

A. CLASSIFICATION OF SUBJECT MATTER
B66B3/00(2006.01)i, *B66B1/14*(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)
B66B1/00-B66B3/02

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 04-191259 A (Toshiba Corp.), 09 July, 1992 (09.07.92), Page 2, upper left column, line 11 to page 3, upper right column, line 14; Figs. 1 to 3 (Family: none)	1-6
Y	JP 56-088077 A (Hitachi, Ltd.), 17 July, 1981 (17.07.81), Claim 1 (Family: none)	1-6
Y	JP 57-057173 A (Mitsubishi Electric Corp.), 06 April, 1982 (06.04.82), Page 2, lower left column, line 2 to lower right column, line 13 (Family: none)	2-3

☒ 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	Date of mailing of the international search report
22 August, 2006 (22.08.06)	29 August, 2006 (29.08.06)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2006/309405

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 086316/1987(Laid-open No. 194881/1988) (Fujitec Co., Ltd.), 15 December, 1988 (15.12.88), Claims (Family: none)	6

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2557939 B **[0003]**
- JP 2647207 B **[0003]**