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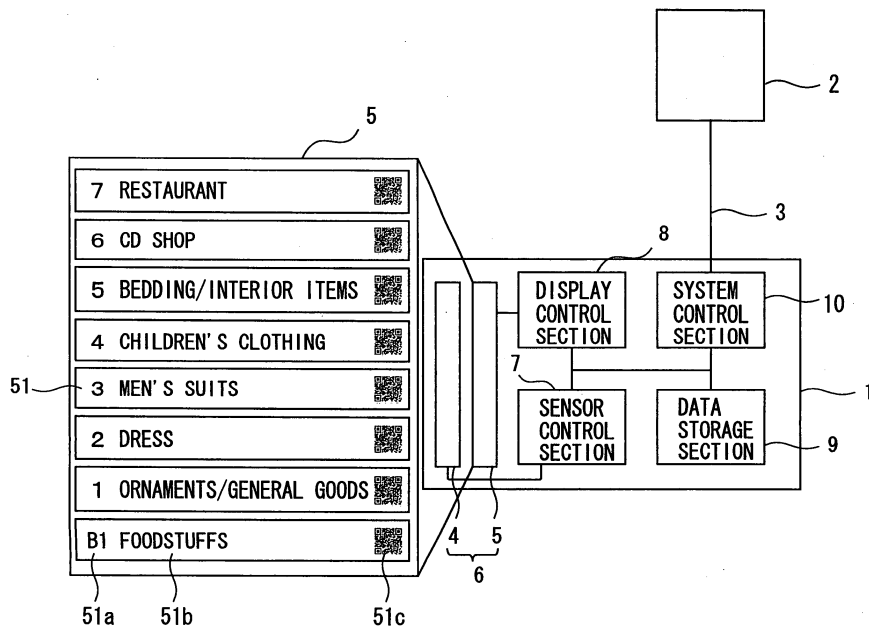
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(54) **DESTINATION FLOOR REGISTRATION DEVICE**

(57) There are provided an operating unit 5 having a button function for registering a destination floor for an elevator, a display unit 5 combined with the operating unit and capable of displaying a two-dimensional code 51c in which information is encoded, a display control section 8 which controls display on the display unit, and a data storage section 9 in which information for display on the display unit is stored. The display unit 5 is constituted by a touch-panel-type display device 6. The touch-

panel-type display device 6 also functions as the operating unit having the button function. The touch-panel-type display device 6 displays destination buttons 51 which are displayed in order of floors, and on each of which an alphanumeric character 51a indicating a name of the corresponding one of the floors, unique character information 51b about the floor and a two-dimensional code 51c in which service information corresponding to the floor is encoded are horizontally arranged in correspondence with the floor.

**FIG. 1**



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## Description

### Technical Field

**[0001]** This invention relates to a destination floor registration apparatus provided in an elevator hall or an elevator car and, more particularly, to destination floor registration apparatus having the function of providing information such as service information including a two-dimensional code.

### Background Art

**[0002]** As a conventional apparatus for displaying information in an elevator hall or an elevator car, an information display system for displaying various sorts of display data such as images, characters and broadcasts is known. Such a system provides an elevator user with various sorts of information by changing various sorts of display data on the basis of schedule data on time/time period settings or the like for display of various sorts of display data. For example, a system is known in which images, characters or the like prepared in advance are displayed to enable an elevator user to kill time or to obtain information on events in the building in which the elevator is installed (see, for example, patent document 1).

Another system is known in which a hall door is used as a screen and elevator operation information, etc., is projected onto the hall door by a projector mounted to a hall ceiling portion to provide information to a passenger waiting in the hall (see, for example, patent document 2).

**[0003]** Patent document 1: Japanese Patent Laid-Open No. 9-34417 (p1, Figure 1)

Patent document 2: Japanese Patent Laid-Open No. 9-263368 (p1, Figure 1)

### Disclosure of the Invention

#### Problems to be Solved by the Invention

**[0004]** Conventional apparatuses for displaying information as described above have problems that (1) because of a restricted display area it is not possible to give sufficient information to elevator users; (2) because displays are changed at certain time intervals, there is a possibility of missing a chance to view information which should be viewed, (3) in the case of scrolling display, there is a possibility of partially displaying information after a halfway point as well as a possibility for a viewer to get off the elevator before viewing the entire information; the completion of a message is not ensured.

**[0005]** This invention has been achieved to solve problems of the conventional art such as those described above, and an object of this invention is to provide an elevator destination floor registration apparatus which provides information on elevator destination floors in the form of a two-dimensional code such as QR code to en-

able an elevator user to obtain guidance information with respect to each floor according to his/her need.

#### Means for Solving the Problems

**[0006]** To solve the above-described problems, this invention provides a destination floor registration apparatus including an operating unit having a button function for registering a destination floor for an elevator, a display unit combined with the operating unit and capable of displaying a two-dimensional code in which information is encoded, a display control section which controls display on the display unit, and a data storage section in which information for display on the display unit is stored.

#### Advantages of the Invention

**[0007]** In this invention, the display unit capable of displaying a two-dimensional code in which information is encoded is combined with the operating unit having the button function for registering a destination floor to enable an elevator user to obtain a large amount of different sorts of information including floor information and tenant information almost instantly according to his/her preference with a two-dimensional reader provided in, for example, a portable telephone in the possession of the user, and to use the obtained information not only during rising/descending operation of the elevator but also after getting off the elevator for example, as well as to register a destination floor, thus achieving an improvement in convenience.

#### Brief Description of the Drawings

##### **[0008]**

Figure 1 is a configurational diagram schematically showing the overall configuration of a destination floor registration apparatus according to Embodiment 1 of this invention;

Figure 2 is a flowchart showing an example of the operation of the destination floor registration apparatus shown in Figure 1;

Figure 3 is a display screen diagram showing an example of the contents of information displayed on the destination floor registration apparatus shown in Figure 1 and transmitted to a two-dimensional code reader terminal;

Figure 4 is a diagram for explaining an example of display on a display unit which is an essential portion of a destination floor registration apparatus according to Embodiment 2 of the present invention;

Figure 5 is a flowchart showing an example of the operation of the destination floor registration apparatus shown in Figure 4; and

Figure 6 is a configurational diagram schematically showing an essential portion of a destination floor registration apparatus according to Embodiment 3

of this invention.

#### Description of Symbols

##### [0009]

1	Destination floor registration apparatus
2	Elevator controller
3	Communication line
4	Sensor
5	Display unit (also functioning as operating unit)
6	Touch-panel-type display device
7	Sensor control section
8	Display control section
9	Data storage section
10	System control section
11	Reader terminal
11a	Display view
12	Data input device
13	Network
14	Data receiving section
51	Destination button
51a	Alphanumeric character
51b	Character information
51c	Two-dimensional code
52	General service information display section
52A	"Bus schedule"
52B	"Train schedule"
52C	"Bargain information"
52a	Title display section
52b	Two-dimensional code display section

#### Best Mode for Carrying Out the Invention

**[0010]** A destination floor registration apparatus of an elevator is explained by way of example in embodiments of this invention.

#### Embodiment 1

**[0011]** Figures 1 to 3 are diagrams for explaining a destination floor registration apparatus according to Embodiment 1 of this invention. Figure 1 is a configurational diagram schematically showing the overall configuration. Figure 2 is a flowchart showing an example of the operation. Figure 3 is a display screen diagram showing an example of the contents of information transmitted to a two-dimensional code reader terminal. Through the figures, the same reference characters indicate identical or corresponding portions. Referring to the figures, a destination floor registration apparatus 1 has a touch-panel-type display device 6 for inputting a user operation, constituted by a display unit 5 using a sensor 4 and a display such as a dot-matrix LCD, a sensor control section 7 for controlling the sensor 4, a display control section 8 for displaying an image on the display unit 5, a data storage section 9 for storing images to be displayed, and a system control section 10 for controlling these components. At

least one destination floor registration apparatus 1 is provided in a hall or car (only one is illustrated in the figure) and each destination floor registration apparatus 1 is connected to an elevator controller 2 via a communication line 3.

**[0012]** The display unit 5 also functions as an operating unit having a button function for registering an elevator destination floor. Because the display unit 5 uses a dot-matrix-type display, it can display a two-dimensional code such as a QR code in which various sorts of information including service information are encoded. In Embodiment 1, destination buttons 51 are rectangular frames displayed on the display unit 5 in order of floors. In each frame, an alphanumeric character 51a indicating a floor name, unique character information 51b representing the floor, and a two-dimensional code 51c in which service information corresponding to the floor is encoded are horizontally arranged in correspondence with the floor. A button function is provided to detect with the sensor 4 the position of one of the frames touched by an elevator user, and to thereby recognize the corresponding destination floor.

**[0013]** The above-mentioned data storage section 9 can use, without any particular restriction, any of well-known storage elements or devices such as a hard disk drive, a nonvolatile memory, and a memory requiring write and hold operations at all times. The system control section 10 reads an image to be displayed from the data storage section 9 on the basis of data sent from the elevator controller 2, and sends the read image to the display control section 8 to display the image on the display unit 5. The destination floor registration apparatus 1 communicates the state of the destination button 51 to the elevator controller 2 through the communication line 3. When a destination floor is registered, the elevator controller 2 controls the elevator and notifies the destination floor registration apparatus 1 of the registered floor if necessary.

**[0014]** The operation of Embodiment 1 arranged as described above will be described with reference to the flowchart shown in Figure 2. The destination floor registration apparatus 1 starts operating by turning on or resetting a power supply not shown in the figures (step 1, startup). The system control section 10 receives button information from the elevator controller 2 (step S2, reception of button information), reads image data necessary for display from the data storage section 9 (step S3, read of display data), displays an initial view of the destination buttons 51 such as shown in Figure 1 (step S4, display of initial view) and enters a standby state such as to be able to accept an operating input from an elevator user.

**[0015]** An operating input from the user is accepted in step S5 (step S5, operating input). When an operating input is given, the operating coordinates of the touched portion are sent to the system control section 10. Determination is made in the system control section 10 as to which destination button has been selected by the user.

The determination result is transmitted from the system control section 10 to the elevator controller 2 (step S6, transmission of operating information). Determination is made as to whether or not there is a need for display (step S7, Need/non-need for display). If there is a need for a display update, the display on the display unit is updated by the display control section (step S8, display update).

**[0016]** For example, when the destination button 51 for the same floor as the floor on which the car not shown is landing is touched, it is determined that there is no need for display. In other cases, it is determined that there is a need for display, and the display of a portion corresponding to the touched destination button 51 is updated, for example, by a method of displaying in a highlighted state relative to other portions or a method comprising highlighting and simultaneously changing the display color. If the display is updated in the above-described step S8, the process returns to step S2, button information is received from the elevator controller 2 (step S2, reception of button information) and the same operation is subsequently repeated.

**[0017]** In the initial view illustrated in Figure 1 and in the view after a display update, a destination button 51 image including two-dimensional code 51c such as a QR code is displayed. The elevator user can read at all times the two-dimensional code 51c by a two-dimensional code reader function provided in a leader terminal 11 (Figure 3) such as a portable telephone, as shown in a user operation A1 or A2 in Figure 2, and can display the read information at all times as shown in a user operation B. Figure 3 shows an example of display of floor information obtained about a restaurant on the seventh floor in a display view 11a on the reader terminal 11 in the possession of the user. The kind, name and outline of the restaurant placed on the seventh floor, an URL for access to the home page, a telephone number and other information items are displayed. Information to be displayed in two-dimensional code 51c can be contained as desired in the data storage section 9 by widely accepting in advance the provision of information from the building owner and tenants for example.

**[0018]** According to Embodiment 1, as described above, the display unit 5 capable of displaying two-dimensional code 51c in which various sorts of information are encoded is combined with the operating unit having the button function to enable an elevator user to obtain a large amount of different sorts of information including floor information and tenant information almost instantly according to his/her preference by reading when necessary an image including two-dimensional code 51c displayed on the display unit 5 with a reader such as a portable telephone in the possession of the user, and to use the obtained information not only during rising/descending operation of the elevator but also after getting off the elevator for example, as well as to register a destination floor by operating the sensor 4 on the basis of the destination button 51 image displayed on the display unit 5,

thus achieving an improvement in convenience. Also, the user can read the obtained information and view information on a shop by accessing a designated URL during a waiting time before arrival of the elevator car or during elevator use to dissolve irritation during the waiting time and eliminate the time during which the user spends his/her time having nothing to do in the car.

#### Embodiment 2

**[0019]** Figures 4 and 5 are diagrams for explaining an essential portion of a destination floor registration apparatus according to Embodiment 2 of this invention. Figure 4 is a diagram for explaining an example of display on the display unit. Figure 5 is a flowchart showing an example of the operation. In Embodiment 2, image files with a two-dimensional code for providing other sorts of general service information are displayed by being changed at certain time intervals on the display unit 5 in the above-described Embodiment 1 in addition to the destination buttons 51. Referring to the figure, the display unit 5 constituting the destination floor registration apparatus 1 depicts a general service information display section 52 separately from eight destination buttons 51. In the general service information display section 52, three images to be changed, formed of "bus schedule" 52A, "train schedule" 52B and "bargain information" 52C are prepared. The designated images (52A, 52B, 52C) are cyclically displayed one after another, one being replaced with another after a lapse of a designated time (e.g., five seconds).

**[0020]** The general service information display section 52 is constituted by a title display section 52a for displaying a title of information and a two-dimensional code display section 52b for displaying information on contents corresponding to the title by encoding the information into a two-dimensional code. The two-dimensional code display section 52b is placed in the same position in the horizontal direction as that displayed position of the two-dimensional codes 51c in the destination floor registration buttons 51 so that the two-dimensional code display section 52b and the two-dimensional codes 51c are arranged in a line in the vertical direction. In other respects, the configuration of Embodiment 2 is the same as that of Embodiment 1. The description of other details will not be repeated. A description will be made below by referring also to the configurational diagram of Figure 1.

**[0021]** The display operation of the general service information display section 52 in Embodiment 2 arranged as described above will be described with reference to the flowchart of Figure 5. When the destination floor registration apparatus 1 starts operating by turning on or resetting the power supply (step 11, startup), the destination floor registration button 51 image is displayed by the same procedure as that described above with reference to Figure 2. The system control section 10 reads a user setting file from the data storage section 9 to obtain the number of images to be selectively displayed, names

of the files to be displayed and a display time (step S13). The system control section 10 reads data necessary for initial display from the data storage section 9 (step S 14, read of image to be displayed) and displays the information view on the general service information display section 52 on the display unit 5 (step S15, display of information view).

**[0022]** Subsequently, determination is made as to the designated time (step S15, lapse of designated time). After a lapse of the designated time, the image to be displayed, designated next, is read (step S16, read of next image to be displayed) and a display update is made (step S17, display update). The destination registration operation is entirely the same as that in Embodiment 1 and the description of it will not be repeated.

**[0023]** In Embodiment 2 arranged as described above, a passenger who is on the elevator and who wishes to refer to a bus schedule for example reads the two-dimensional code displayed in "bus schedule" 52 with a reader terminal such as a portable telephone in his/her possession when "bus schedule" 52 is displayed in the general service information display section 52. The two-dimensional code is then decoded and the passenger can easily obtain the necessary information. As information displayed in the two-dimensional code, various sorts of information, e.g., building closing information, event information, bargain sale information, hot news in various fields such as politics, economy, society and sports can be provided as well as the above-mentioned information.

#### Embodiment 3

**[0024]** Figure 6 is a configurational diagram schematically showing an essential portion of a destination floor registration apparatus according to Embodiment 3 of this invention. Referring to the figure, the destination floor registration apparatus 1 has, in addition to the configuration of Embodiment 1 shown in Figure 1, a data receiving section 14 which is connected via a network 13 to a data input device 12 for inputting data such as an image file used for display externally supplied, and which receives data from the data input device 12. In other respects, the configuration of Embodiment 3 is the same as that of Embodiment 1. The description of other details will not be repeated.

**[0025]** In Embodiment 3 arranged as described above, the destination floor registration apparatus 1 communicates an image file used for display from the data input device 12 via the network 13. The data receiving section 14 stores the received image file in the data storage section 9. After reception of the image file, a read command is again received. The data receiving section 14 sends a command to the system control section 10 to redo reading images necessary for display from the data storage section 9 from the beginning. The system control section 10 reads the new image file and again displays the destination buttons 51.

**[0026]** Thus, the apparatus is arranged to enable im-

age files with two-dimensional codes to be updated via the network 13 and to thereby enable updating of information provided in a two-dimensional code without stopping the elevator, so that a person who maintains and manages the elevator can easily maintain the display contents. The data input device 12 may be arranged to use, for example, a personal computer or the like and to produce an image file to be displayed on the display unit 5 by inputting character information by means of the personal computer used as an input device and by encoding the necessary character information into a two-dimensional code.

**[0027]** In the above-described Embodiments 1 to 3, the destination buttons 51 for designating a destination floor are formed by using the touch-panel-type display device 6 and one unit is arranged to function both as an operating unit having a button function and as a unit for display of information in the form of two-dimensional code 51c. However, this invention is not limited to this arrangement. For example, an operating unit having a button function may be separately provided, while the destination buttons themselves are arranged as an operating unit constituted by a well-known push-type button array. This operating unit (not shown) may be provided by such a method that an ordinary dot-matrix LCD or the like is integrally provided by the side of the operating unit constituted by the destination buttons to display the character information 51b using characters and graphical symbols respectively related to floors and detailed service information using the two-dimensional code 51c.

**[0028]** Needless to say, while the contents of a display on the display unit 5 have been described as contents to be provided in a car, even a destination floor registration apparatus which is provided in a hall and which registers only an upper floor or a lower floor as a destination floor may be arranged in the same way and such an apparatus can have the same advantage. Also, while an example of an arrangement in which at least one destination floor registration apparatus 1 described above is provided in each hall or in each car, an arrangement may alternatively be adopted in which only the touch-panel-type display device 6 also functioning as an operating unit is provided in each hall or in each car while sections including the sensor control section 7, the display control section 8, the data storage section 9 and the system control sections 10 are controlled in a centralized manner in one unit. Needless to say, other various modifications and changes may be made within the scope of the spirit of this invention, for example, with respect to the display design of the display unit 5 and the number of two-dimensional codes 51c to be displayed.

#### Industrial Applicability

**[0029]** As described above, the destination floor registration apparatus in accordance with this invention is usable in a controller for a mechanical apparatus on which an ordinary user makes various settings and reg-

istrations.

## Claims

1. A destination floor registration apparatus **characterized by** comprising an operating unit having a button function for registering a destination floor for an elevator, a display unit combined with the operating unit and capable of displaying a two-dimensional code in which information is encoded, a display control section which controls display on the display unit, and a data storage section in which information for display on the display unit is stored. 5  
10  
15
2. The destination floor registration apparatus according to claim 1, **characterized in that** the display unit is constituted by a touch-panel-type display device and the touch-panel-type display device also functions as the operating unit having the button function. 20
3. The destination floor registration apparatus according to claim 2, **characterized in that** the display unit displays destination buttons which are displayed in order of floors, and on each of which an alphanumeric character indicating a name of the corresponding one of the floors, unique character information about the floor and a two-dimensional code in which service information corresponding to the floor is encoded are horizontally arranged in correspondence with the floor. 25  
30
4. The destination floor registration apparatus according to any of claims 1 to 3, **characterized in that** the display unit has a general service information display section for displaying general service information about general services in and outside a building in which the elevator is installed and a two-dimensional code for detailed contents of the general service information. 35  
40
5. The destination floor registration apparatus according to claim 4, **characterized in that** in the general service information display section a plurality of groups of service information are selectively displayed one after another at predetermined time intervals. 45
6. The destination floor registration apparatus according to any of claims 1 to 5, **characterized in that** the information in the two-dimensional code includes at least one of a URL and a telephone number. 50
7. The destination floor registration apparatus according to any of claims 1 to 6, **characterized in that** the data storage section can be updated via a network. 55

FIG. 1

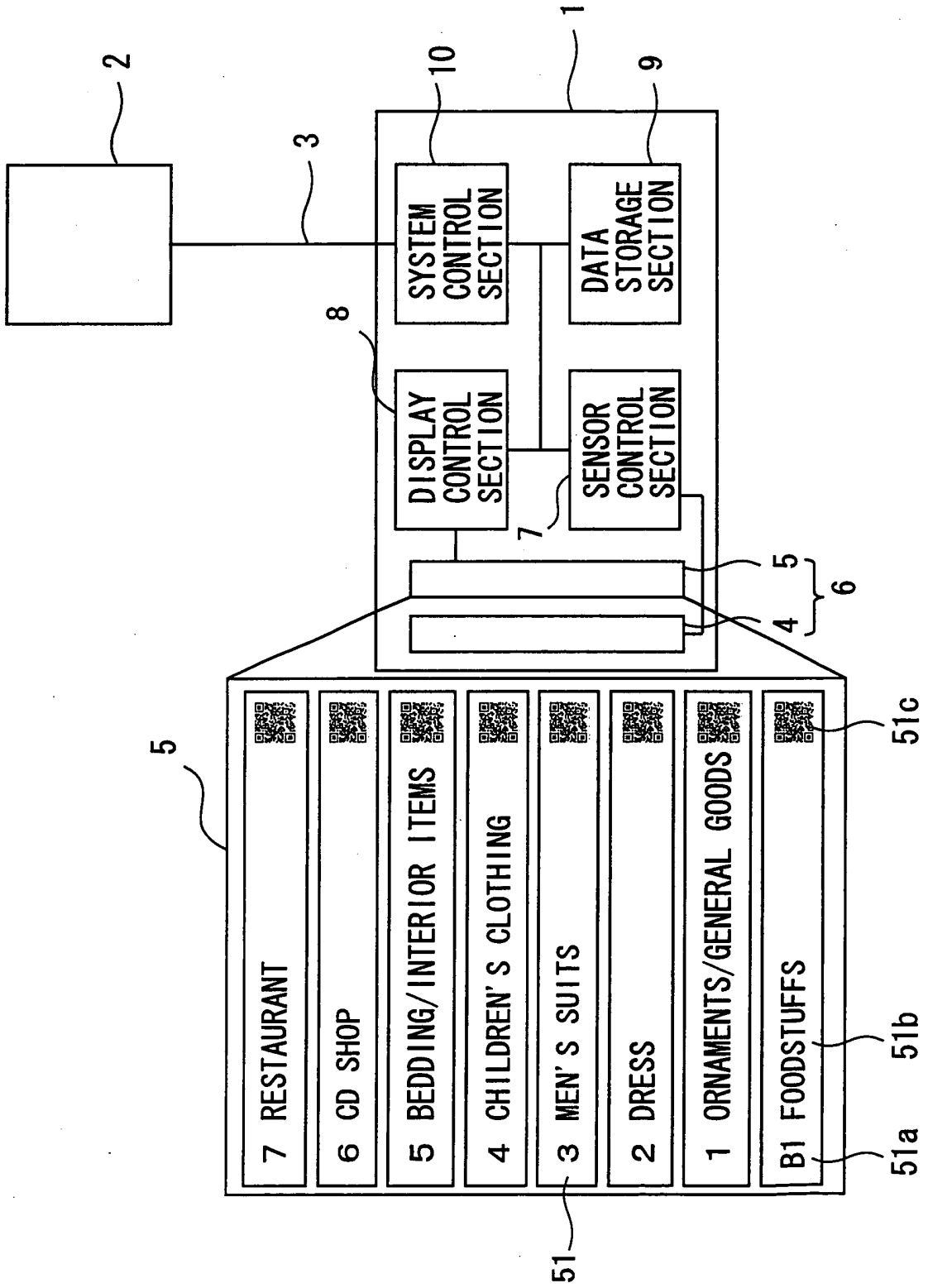
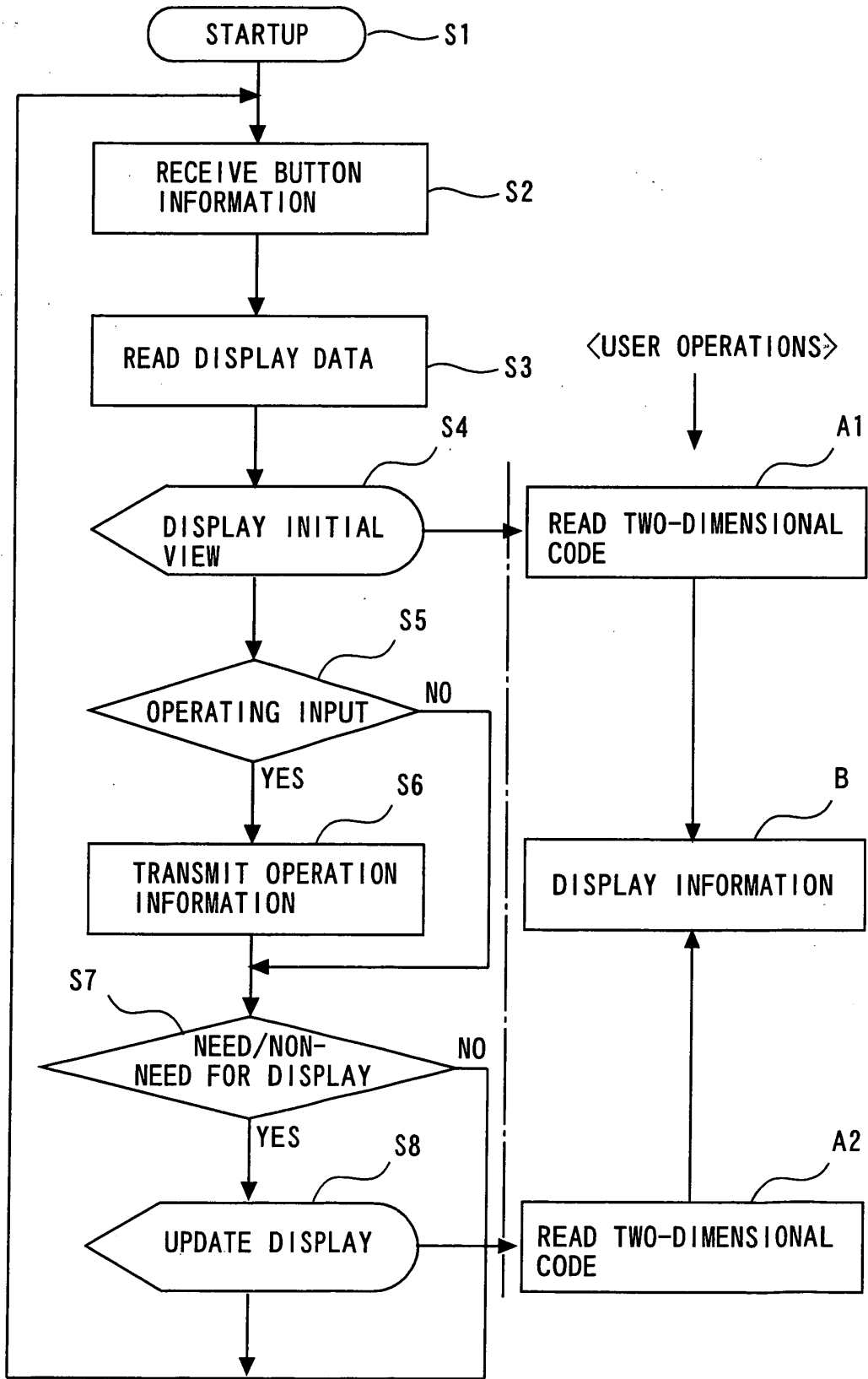


FIG. 2



*FIG. 3*

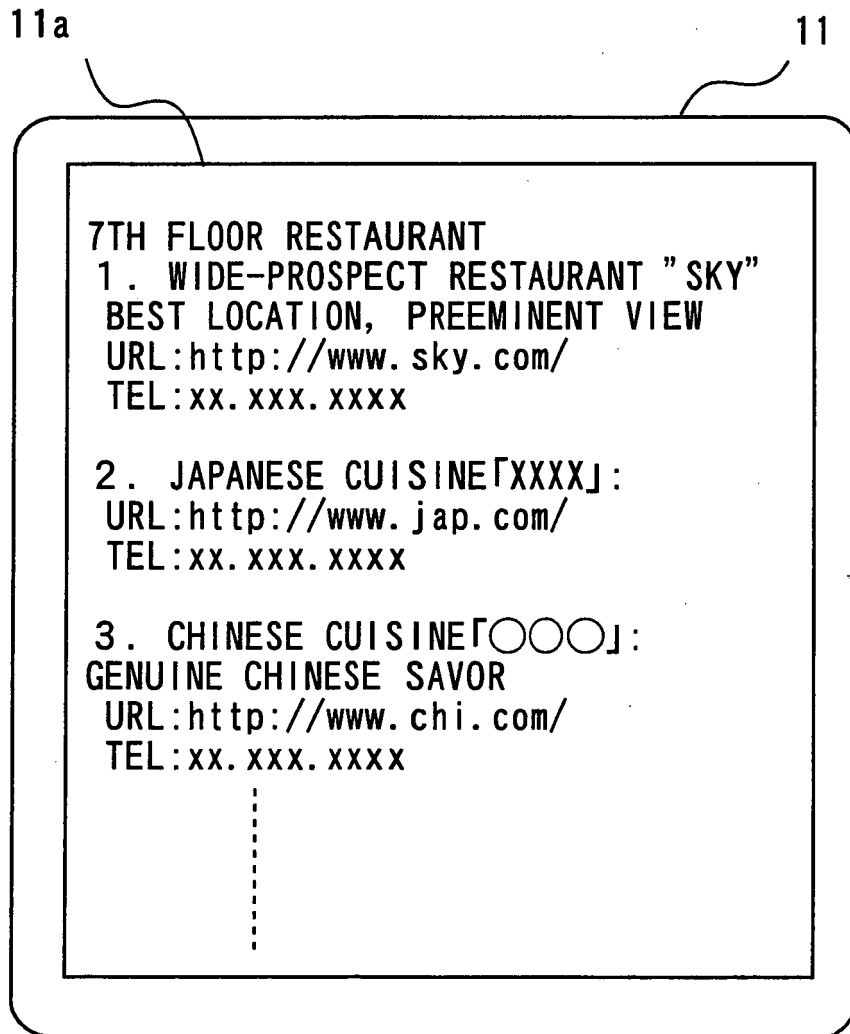


FIG. 4

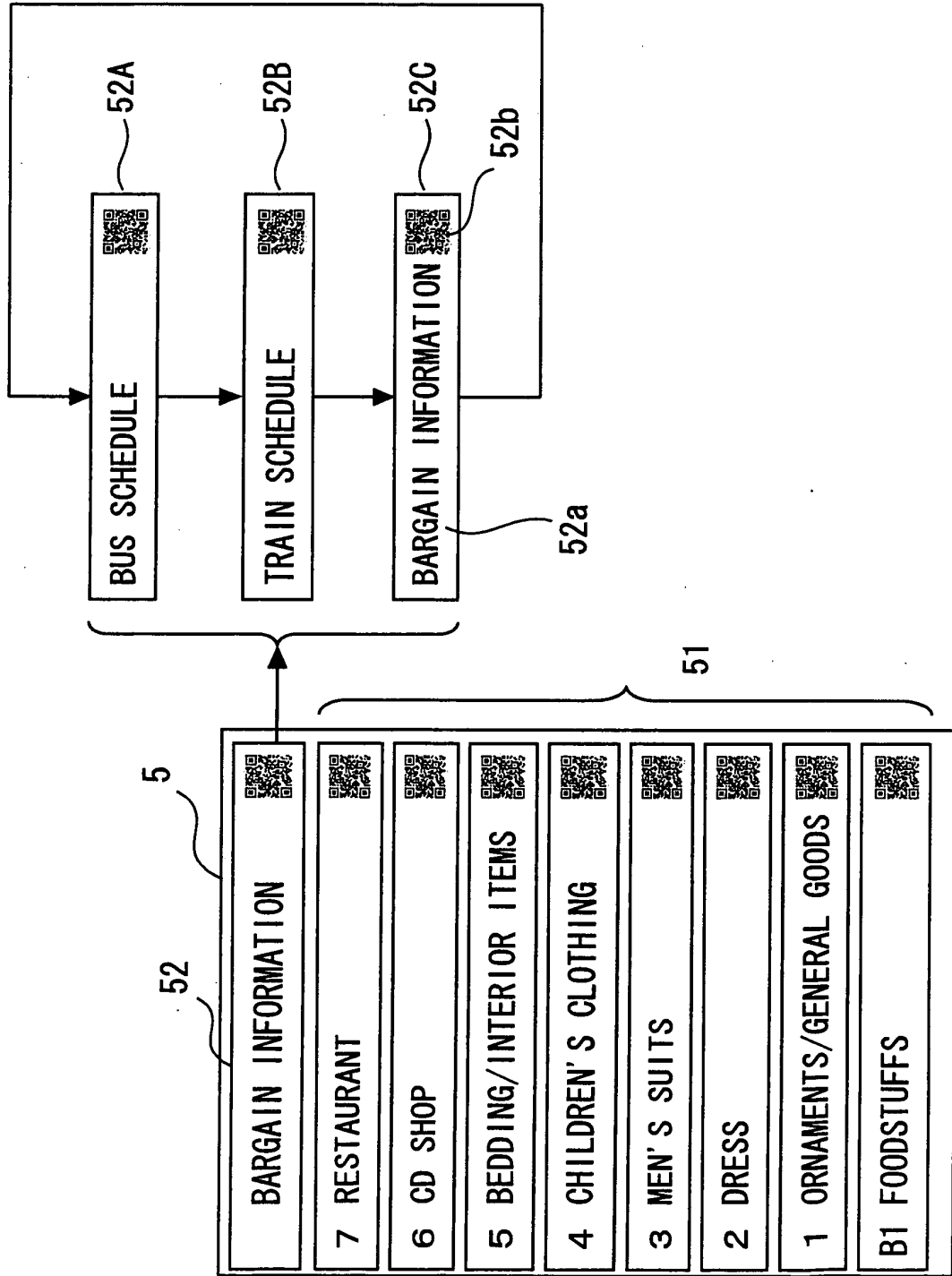


FIG. 5

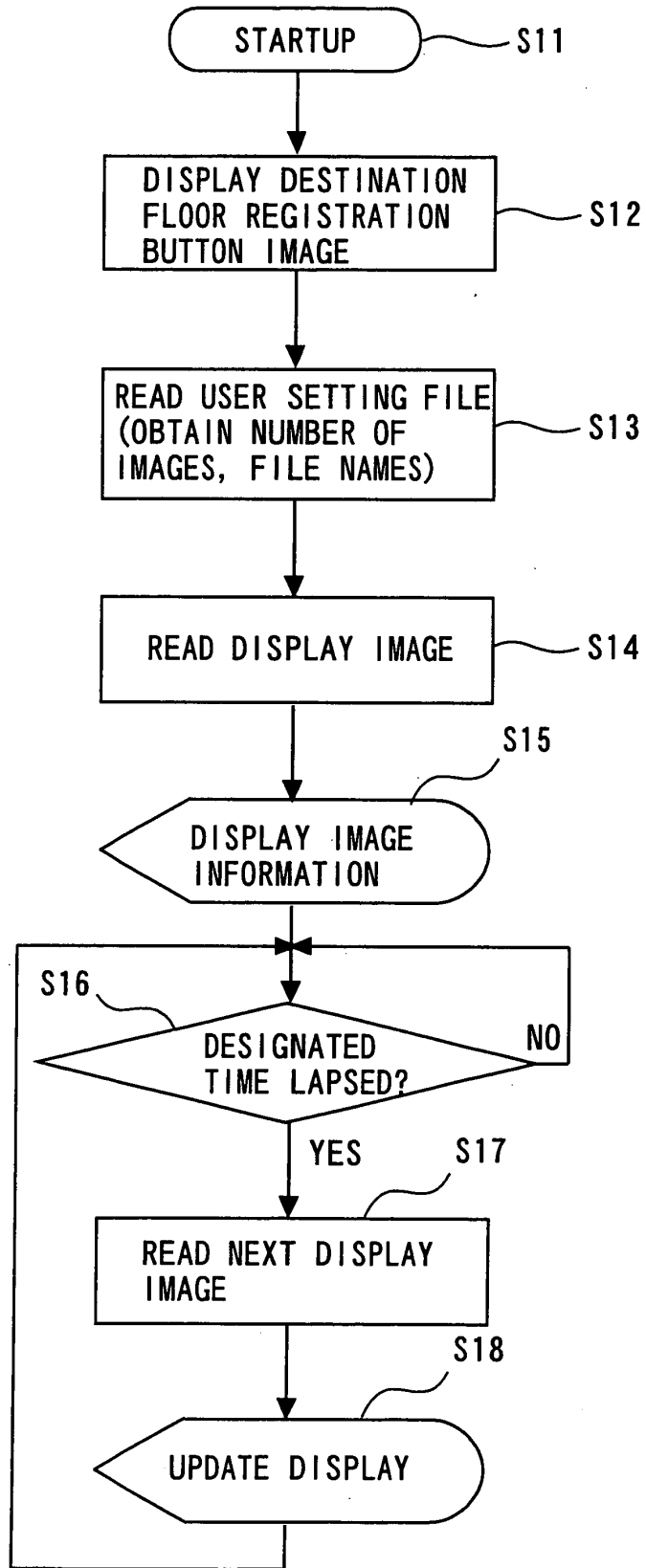
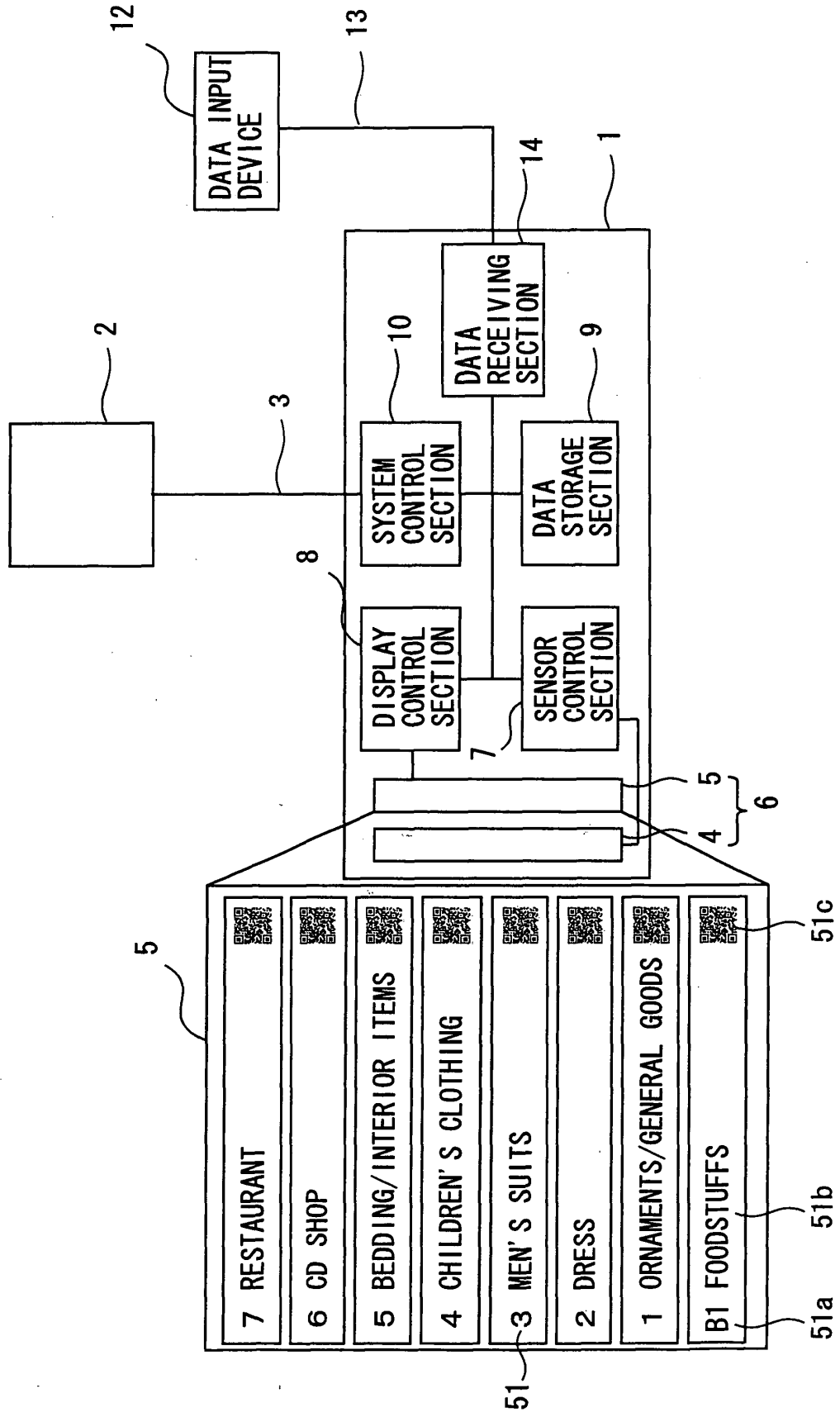


FIG. 6



INTERNATIONAL SEARCH REPORT

International application No.  
PCT/JP2006/305040

<p>A. CLASSIFICATION OF SUBJECT MATTER <b>B66B3/00</b> (2006.01), <b>B66B1/14</b> (2006.01)</p> <p>According to International Patent Classification (IPC) or to both national classification and IPC</p>																				
<p>B. FIELDS SEARCHED</p> <p>Minimum documentation searched (classification system followed by classification symbols) <b>B66B1/00</b> (2006.01) - <b>B66B3/02</b> (2006.01)</p> <p>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</p> <p>Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)</p>																				
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p> <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>WO 01/98189 A1 (Mitsubishi Electric Corp.), 27 December, 2001 (27.12.01), &amp; CN 1368935 A &amp; EP 1291311 A1</td> <td>1-7</td> </tr> <tr> <td>Y</td> <td>JP 2001-265800 A (Laurel Intelligent Systems Co., Ltd.), 28 September, 2001 (28.09.01), Par. Nos. [0017] to [0019]; Fig. 1 (Family: none)</td> <td>1-7</td> </tr> <tr> <td>Y</td> <td>JP 2001-226051 A (Hitachi Building Systems Co., Ltd.), 21 August, 2001 (21.08.01), Claim 1 (Family: none)</td> <td>5,7</td> </tr> </tbody> </table> <p><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.</p> <p>* Special categories of cited documents:          "A" document defining the general state of the art which is not considered to be of particular relevance          "E" earlier application or patent but published on or after the international filing date          "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)          "O" document referring to an oral disclosure, use, exhibition or other means          "P" document published prior to the international filing date but later than the priority date claimed          "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention          "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone          "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art          "&amp;" document member of the same patent family</p> <table border="1"> <tr> <td>Date of the actual completion of the international search 27 June, 2006 (27.06.06)</td> <td>Date of mailing of the international search report 11 July, 2006 (11.07.06)</td> </tr> <tr> <td>Name and mailing address of the ISA/ Japanese Patent Office</td> <td>Authorized officer</td> </tr> <tr> <td>Facsimile No.</td> <td>Telephone No.</td> </tr> </table>			Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	WO 01/98189 A1 (Mitsubishi Electric Corp.), 27 December, 2001 (27.12.01), & CN 1368935 A & EP 1291311 A1	1-7	Y	JP 2001-265800 A (Laurel Intelligent Systems Co., Ltd.), 28 September, 2001 (28.09.01), Par. Nos. [0017] to [0019]; Fig. 1 (Family: none)	1-7	Y	JP 2001-226051 A (Hitachi Building Systems Co., Ltd.), 21 August, 2001 (21.08.01), Claim 1 (Family: none)	5,7	Date of the actual completion of the international search 27 June, 2006 (27.06.06)	Date of mailing of the international search report 11 July, 2006 (11.07.06)	Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer	Facsimile No.	Telephone No.
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																		
Y	WO 01/98189 A1 (Mitsubishi Electric Corp.), 27 December, 2001 (27.12.01), & CN 1368935 A & EP 1291311 A1	1-7																		
Y	JP 2001-265800 A (Laurel Intelligent Systems Co., Ltd.), 28 September, 2001 (28.09.01), Par. Nos. [0017] to [0019]; Fig. 1 (Family: none)	1-7																		
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Date of the actual completion of the international search 27 June, 2006 (27.06.06)	Date of mailing of the international search report 11 July, 2006 (11.07.06)																			
Name and mailing address of the ISA/ Japanese Patent Office	Authorized officer																			
Facsimile No.	Telephone No.																			

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/JP2006/305040

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
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Form PCT/ISA/210 (continuation of second sheet) (April 2005)

**REFERENCES CITED IN THE DESCRIPTION**

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