

DESCRIPTION

TITLE: SIMULATION DEVICE

FIELD

[0001]

The invention relates to a simulation device.

BACKGROUND

[0002]

PTL 1 describes a simulation device for an elevator. The simulation device described in PTL 1 makes it possible to display selected car specifications and selected hall specifications on a PC display.

Citation List

Patent Literature

[0003]

[PTL 1] JP 2006-232480 A

SUMMARY

Technical Problem

[0004]

The simulation device described in PTL 1 can only display the selected car specifications on a small PC display. Consequently, a user cannot recognize an actual size or the like of equipment disposed in a car.

[0005]

The invention is made in order to solve the above-described problem. An object of the invention is to provide a simulation device capable of properly simulating a size or the like of equipment disposed in a car of an elevator.

Solution to Problem

[0006]

A simulation device of the present invention comprises a first display device forming a right

wall surface of the space, the first display device displaying an image toward the space, a second display device forming a left wall surface of the space, the second display device displaying an image toward the space, a third display device forming a far-side wall surface of the space, the third display device displaying an image toward the space, a fourth display device forming a ceiling surface of the space, the fourth display device displaying an image toward the space, a storage device configured to store a plurality of pieces of image data, an input device for inputting information, extraction means configured to extract one piece of image data from the plurality of pieces of image data on the basis of the information inputted from the input device, and display control means configured to display the piece of image data extracted by the extraction means on the first display device, the second display device, the third display device, and the fourth display device. Each of the plurality of pieces of image data represents an interior design of a car of an elevator.

Advantageous Effects of Invention

[0007]

According to the invention, it is possible to properly simulate a size or the like of equipment disposed in a car of an elevator.

BRIEF DESCRIPTION of DRAWINGS

[0008]

Figure 1 is a view showing an appearance of a simulation device in Embodiment 1.

Figure 2 is a front view of the simulation device shown in Fig. 1.

Figure 3 is a view showing a configuration example of the simulation device.

Figure 4 is a flowchart showing an operation example of the simulation device in Embodiment 1.

Figure 5 is a view showing an example in which an interior design of a car is displayed.

Figure 6 is a view showing another example in which an interior design of the car is displayed.

Figure 7 is a view showing another example in which an interior design of the car is displayed.

Figure 8 is a view showing another example in which an interior design of the car is displayed.

Figure 9 is a view showing an example of a hardware resource of a controller.

Figure 10 is a view showing another example of the hardware resource of the controller.

DESCRIPTION of EMBODIMENTS

[0009]

The present invention will be described with reference to the accompanying drawings. Redundant descriptions will be appropriately simplified or omitted. In each of the drawings, the same reference numerals indicate the same or corresponding portions.

[0010]

Embodiment 1

Fig. 1 is a view showing an appearance of a simulation device in Embodiment 1. Fig. 2 is a front view of the simulation device shown in Fig. 1. Fig. 3 is a view showing a configuration example of the simulation device. The simulation device is a device which simulates the inside of a car of an elevator.

[0011]

In the simulation device, space 2 corresponding to an inside space of the car is formed. A user can enter the space 2 from an entrance 1. In the following description, as shown in Fig. 2, the left and the right are determined on the basis of a person facing the space 2 from the entrance 1. In addition, a side far from the entrance 1 is described as a far side on the basis of the person facing the space 2 from the entrance 1. The space 2 is defined in vertical, lateral, and depth directions.

[0012]

The simulation device includes, for example, a display device 3, a display device 4, a display device 5, a display device 6, a storage device 7, an input device 8, and a controller 9.

[0013]

The display device 3 forms a right wall surface of the space 2. The display device 3 displays an image toward the space 2. The present embodiment shows an example in which the display device 3 forms the right wall surface with one display. The display device 3 may form the right wall surface with a plurality of displays.

[0014]

The display device 4 forms a left wall surface of the space 2. The display device 4 faces the display device 3. The display device 4 displays an image toward the space 2. The present embodiment shows an example in which the display device 4 forms the left wall surface with one display. The display device 4 may form the left wall surface with a plurality of displays.

[0015]

The display device 5 forms a far-side wall surface of the space 2. The display device 5 displays an image toward the space 2. The present embodiment shows an example in which the

display device 5 forms the far-side wall surface with one display. The display device 5 may form the far-side wall surface with a plurality of displays.

[0016]

The display device 6 forms a ceiling surface of the space 2. The display device 6 displays an image toward the space 2. The present embodiment shows an example in which the display device 6 forms the ceiling surface with one display. The display device 6 may form the ceiling surface with a plurality of displays.

[0017]

A floor surface of the space 2 is formed of, for example, a floor material 10 which is actually used in the car of the elevator. The floor surface of the space 2 may be formed of a transparent plate, and a display device may be installed under the transparent plate. In such a case, the display device displays an image toward the space 2.

[0018]

An upper edge 3a of the display device 3 is adjacent to a right edge 6a of the display device 6. Consequently, on the right wall surface of the space 2, the display device 3 forms an area from an upper end of a baseboard 11 to a portion adjacent to the ceiling surface in the vertical direction. In addition, an upper edge 4a of the display device 4 is adjacent to a left edge 6b of the display device 6. Consequently, on the left wall surface of the space 2, the display device 4 forms an area from an upper end of a baseboard 12 to a portion adjacent to the ceiling surface in the vertical direction. An upper edge 5a of the display device 5 is adjacent to a far-side edge 6c of the display device 6. Consequently, on the far-side wall surface of the space 2, the display device 5 forms an area from an upper end of a baseboard 13 to a portion adjacent to the ceiling surface in the vertical direction.

[0019]

A far-side edge 3b of the display device 3 is adjacent to a right edge 5b of the display device 5. Consequently, on the right wall surface of the space 2, the display device 3 forms an area from a portion adjacent to the far-side wall surface of the space 2 to an edge of a pillar 14 in the depth direction. In addition, a far-side edge 4b of the display device 4 is adjacent to a left edge 5c of the display device 5. Consequently, on the left wall surface of the space 2, the display device 4 forms an area from a portion adjacent to the far-side wall surface of the space 2 to an edge of a pillar 15 in the depth direction. As described above, the far-side edge 6c of the display device 6 is adjacent to the upper edge 5a of the display device 5. Consequently, on the ceiling surface of the space 2, the display device 6 forms an area from a portion adjacent to the far-side wall surface of the space 2 to an

edge of an upper frame 16 in the depth direction. In addition, on the ceiling surface of the space 2, the display device 6 forms an area from a portion adjacent to the right wall surface of the space 2 to a portion adjacent to the left wall surface of the space 2 in the lateral direction. Note that the pillar 14, the pillar 15, and the upper frame 16 form the entrance 1.

[0020]

The storage device 7 stores a large number of pieces of first image data and a large number of pieces of second image data. Each piece of first image data represents a wall surface design of the inside of the car of the elevator. Specifically, each piece of first image data represents the wall surface design of three surfaces which are adjacent to each other. Each piece of second image data represents a ceiling surface design of the car of the elevator.

[0021]

The input device 8 is used by a user to select images displayed on the display devices 3 to 6. Each of Fig. 1 and Fig. 2 shows an example in which the transportable input device 8 is installed on an installation base 17. The user may detach the input device 8 from the installation base 17 to operate the input device 8. Means for inputting information from the input device 8 may be any means. For example, the user inputs information from the input device 8 by operating a touch panel. In an example shown in the present embodiment, the user inputs first information and second information from the input device 8. The first information is information for determining the wall surface design of the inside of the car. The second information is information for determining the ceiling surface design of the car. The first information and the second information inputted from the input device 8 are transmitted to the controller 9.

[0022]

The controller 9 includes, for example, an extraction unit 20 and a display control unit 21. Hereinbelow, functions of the simulation device will be described also with reference to Figs. 4 to 6. Fig. 4 is a flowchart showing an operation example of the simulation device in Embodiment 1.

[0023]

In the controller 9, it is determined whether or not the controller 9 has received information from the input device 8 (S101). When a user performs a specific operation on the input device 8, the first information and the second information are transmitted from the input device 8. The first information and the second information transmitted from the input device 8 are received by the controller 9.

[0024]

The extraction unit 20 extracts image data for display from a plurality of pieces of image data stored in the storage device 7 on the basis of the information inputted from the input device 8 (S102). In the example shown in the present embodiment, the extraction unit 20 extracts one piece of first image data from a plurality of pieces of first image data stored in the storage device 7 on the basis of the first information inputted from the input device 8. The extraction unit 20 extracts one piece of second image data from a plurality of pieces of second image data stored in the storage device 7 on the basis of the second information inputted from the input device 8.

[0025]

The display control unit 21 displays the image data extracted by the extraction unit 20 on the display device 3, the display device 4, the display device 5, and the display device 6 (S103). In the example shown in the present embodiment, the display control unit 21 displays the piece of first image data extracted by the extraction unit 20 on the display device 3, the display device 4, and the display device 5. With this, images of the wall surface design selected by the user are displayed on the display device 3, the display device 4, and the display device 5. In addition, the display control unit 21 displays the piece of second image data extracted by the extraction unit 20 on the display device 6. With this, an image of the ceiling surface design selected by the user is displayed on the display device 6.

[0026]

Fig. 5 is a view showing an example in which the interior design of the car is displayed. Fig. 5 shows the example in which a door 22 and an operation panel 23 of the elevator are displayed on the display device 5. In the example shown in Fig. 5, the wall surface design on the entrance side of the car is displayed on the display device 5. Fig. 6 is a view showing another example in which the interior design of the car is displayed. Fig. 6 shows the example in which the displayed wall surface is switched by operating the input device 8 after the display shown in Fig. 5 is performed. In the example shown in Fig. 6, the wall surface design on the far side of the car is displayed on the display device 5. Thus, by switching the displayed wall surface, the user can recognize the wall surface design on the entrance side of the car and the wall surface design on the far side of the car at the entrance 1.

[0027]

As shown in Fig. 5 and Fig. 6, according to the example shown in the present embodiment, it is possible to properly simulate the size or the like of equipment (for example, the operation panel 23) disposed in the car of the elevator. The user can enter the space 2 to check the display, and hence the

user can easily recognize the size, height, and position of the equipment. In addition, when the color of the wall surface, the color of the door 22, and the brightness of illumination are properly simulated, the user can also recognize the atmosphere or the like in the car.

[0028]

In the example shown in the present embodiment, the right edge 5b and the left edge 5c of the display device 5 are adjacent to the display device 3 and the display device 4, respectively. Consequently, it is possible to minimize a gap between the display device 5 and the display device 3, and a gap between the display device 5 and the display device 4, and it is possible to represent boundaries between the wall surfaces naturally. In addition, in the example shown in the present embodiment, the right edge 6a, the left edge 6b, and the far-side edge 6c of the display device 6 are adjacent to the display device 3, the display device 4, and the display device 5, respectively. Consequently, it is possible to minimize a gap between the display device 6 and the display device 3, a gap between the display device 6 and the display device 4, and a gap between the display device 6 and the display device 5, and it is possible to represent boundaries between the ceiling surface and the wall surfaces naturally.

[0029]

In the example shown in the present embodiment, the example in which the user inputs both of the first information and the second information from the input device 8 has been described. The user may change only the second information without changing the first information after inputting the first information and the second information from the input device 8. With this, it is possible to change, for example, only the display of the ceiling surface design and simulate various combinations of the wall surface design and the ceiling surface design. Similarly, the user may change only the first information without changing the second information after inputting the first information and the second information from the input device 8.

[0030]

In addition, with regard to equipment which can be mounted in the car of the actual elevator as an option, the selection of display or non-display of the equipment may be allowed in the simulation device. For example, a large number of pieces of option image data are stored in the storage device 7. Each piece of option image data represents the design of optional equipment which can be mounted to the wall surface in the car of the elevator.

[0031]

For example, the user inputs option information from the input device 8 by operating a touch

panel. The option information is information for determining the optional equipment to be displayed. The option information inputted from the input device 8 is transmitted to the controller 9.

[0032]

The extraction unit 20 extracts one piece of option image data from a plurality of pieces of option image data stored in the storage device 7 on the basis of the option information inputted from the input device 8. The display control unit 21 displays the piece of option image data extracted by the extraction unit 20 on the display device 3, the display device 4, or the display device 5.

[0033]

Fig. 7 is a view showing another example in which the interior design of the car is displayed. For example, in a state shown in Fig. 5, when option information for displaying a handrail 24 is inputted from the input device 8, the display control unit 21 displays a piece of option image data of the handrail 24 extracted by the extraction unit 20 on the display device 3. Similarly, when option information for displaying a sub-operation panel 25 is inputted from the input device 8, the display control unit 21 displays a piece of option image data of the sub-operation panel 25 extracted by the extraction unit 20 on the display device 4.

[0034]

Fig. 8 is a view showing another example in which the interior design of the car is displayed. Fig. 8 shows the example in which the displayed wall surface is switched by operating the input device 8 after the display shown in Fig. 7 is performed. For example, when option information for displaying a mirror 26 is inputted from the input device 8 after the displayed wall surface is switched, the display control unit 21 displays a piece of option image data of the mirror 26 extracted by the extraction unit 20 on the display device 5. Similarly, when option information for displaying a security camera 27 is inputted from the input device 8, the display control unit 21 displays a piece of option image data of the security camera 27 extracted by the extraction unit 20 on the display device 5.

[0035]

Note that, with regard to the option image data, switching between display and non-display can be preferably allowed by an operation from the input device 8. In addition, change of the position where the option image data is displayed may be allowed by an operation from the input device 8. With this, it is possible to simulate various combinations of pieces of equipment which can be mounted as options.

[0036]

The simulation device is suitably installed in, for example, an exhibition place or the like. In

such a case, for example, it is preferable to store, in the storage device 7, a piece of first image data which represents the wall surface design of an old car before renovation work and a piece of first image data which represents the wall surface design of a new car after the renovation work. Similarly, it is preferable to store, in the storage device 7, a piece of second image data which represents the ceiling surface design of the old car before the renovation work and a piece of second image data which represents the ceiling surface design of the new car after the renovation work. With this, it is possible to show states before and after the renovation work to the user. The user can easily understand an advantage obtained by performing the renovation work.

[0037]

In the example shown in the present embodiment, the example in which the first image data and the second image data are stored in the storage device 7 has been described. This is only exemplary. For example, the storage device 7 may also store a large number of pieces of image data which represent the interior design of the car. In such a case, the extraction unit 20 extracts one piece of image data from a plurality of pieces of image data stored in the storage device 7 on the basis of information inputted from the input device 8. The display control unit 21 displays the piece of image data extracted by the extraction unit 20 on the display device 3, the display device 4, the display device 5, and the display device 6. The storage device 7 may also store a piece of image data which represents the interior design of the old car before the renovation work and a piece of image data which represents the interior design of the new car after the renovation work.

[0038]

In addition, in the case where the simulation device is installed in an exhibition place or the like, the display device 3, the display device 4, the display device 5, and the display device 6 may display videos. For example, the simulation device may be used for explanation of the procedure and effect of the renovation work. In such a case, the simulation device preferably includes a speaker.

[0039]

In the embodiment, each of the units indicated by the reference numerals 20 and 21 denotes a function of the controller 9. Fig. 9 is a view showing an example of a hardware resource of the controller 9. As the hardware resource, the controller 9 includes processing circuitry 60 which includes, for example, a processor 61 and a memory 62. The controller 9 executes a program stored in the memory 62 with the processor 61 to implement the function of each of the units indicated by the reference numerals 20 and 21.

[0040]

Fig. 10 is a view showing another example of the hardware resource of the controller 9. In the example shown in Fig. 10, the controller 9 includes the processing circuitry 60 which includes, for example, the processor 61, the memory 62, and dedicated hardware 63. Fig. 10 shows the example in which part of the functions of the controller 9 is implemented by the dedicated hardware 63. All of the functions of the controller 9 may also be implemented by the dedicated hardware 63.

Industrial Applicability

[0041]

The simulation device according to the invention makes is possible to easily understand the size or the like of the equipment disposed in the car.

Reference Signs List

[0042]

1 entrance, 2 space, 3 display device, 3a-3b edge, 4 display device, 4a-4b edge, 5 display device, 5a-5c edge, 6 display device, 6a-6c edge, 7 storage device, 8 input device, 9 controller, 10 floor material, 11-13 baseboard, 14-15 pillar, 16 upper frame, 17 installation base, 20 extraction unit, 21 display control unit, 22 door, 23 operation panel, 24 handrail, 25 sub-operation panel, 26 mirror, 27 security camera, 60 processing circuitry, 61 processor, 62 memory, 63 dedicated hardware

CLAIMS

[Claim 1]

A simulation device which forms space defined in vertical, lateral, and depth directions and allows a person to enter the space from an entrance, the simulation device comprising:

a first display device forming a right wall surface of the space, the first display device displaying an image toward the space;

a second display device forming a left wall surface of the space, the second display device displaying an image toward the space;

a third display device forming a far-side wall surface of the space, the third display device displaying an image toward the space;

a fourth display device forming a ceiling surface of the space, the fourth display device displaying an image toward the space;

a storage device configured to store a plurality of pieces of image data;

an input device for inputting information;

extraction means configured to extract one piece of image data from the plurality of pieces of image data on the basis of the information inputted from the input device; and

display control means configured to display the piece of image data extracted by the extraction means on the first display device, the second display device, the third display device, and the fourth display device, wherein

each of the plurality of pieces of image data represents an interior design of a car of an elevator.

[Claim 2]

The simulation device according to claim 1, wherein

the plurality of pieces of image data include a piece of image data which represents the interior design of the car before renovation work, and a piece of image data which represents the interior design of the car after the renovation work.

[Claim 3]

A simulation device which forms space defined in vertical, lateral, and depth directions and allows a person to enter the space from an entrance, the simulation device comprising:

a first display device forming a right wall surface of the space, the first display device displaying an image toward the space;

a second display device forming a left wall surface of the space, the second display device

displaying an image toward the space;

a third display device forming a far-side wall surface of the space, the third display device displaying an image toward the space;

a fourth display device forming a ceiling surface of the space, the fourth display device displaying an image toward the space;

a storage device configured to store a plurality of pieces of first image data and a plurality of pieces of second image data;

an input device for inputting first information and second information;

extraction means configured to extract one piece of first image data from the plurality of pieces of first image data on the basis of the first information inputted from the input device, and extract one piece of second image data from the plurality of pieces of second image data on the basis of the second information inputted from the input device; and

display control means configured to display the piece of first image data extracted by the extraction means on the first display device, the second display device, and the third display device, and display the piece of second image data extracted by the extraction means on the fourth display device, wherein

each of the plurality of pieces of first image data represents a wall surface design of a car of an elevator, and

each of the plurality of pieces of second image data represents a ceiling surface design of the car of the elevator.

[Claim 4]

The simulation device according to claim 3, wherein

the plurality of pieces of first image data include a piece of image data which represents the wall surface design of the car before renovation work, and a piece of image data which represents the wall surface design of the car after the renovation work.

[Claim 5]

The simulation device according to any one of claims 1 to 4, wherein

a plurality of pieces of option image data are stored in the storage device,

each of the plurality of pieces of option image data represents a design of optional equipment which is attachable to a wall surface of the car of the elevator,

option information is able to be inputted from the input device,

the extraction means extracts one piece of option image data from the plurality of pieces of

option image data on the basis of the option information inputted from the input device, and
the display control means displays the piece of option image data extracted by the extraction means on the first display device, the second display device, or the third display device.

[Claim 6]

The simulation device according to any one of claims 1 to 5, wherein
an upper edge of the first display device is adjacent to a right edge of the fourth display device,
an upper edge of the second display device is adjacent to a left edge of the fourth display device, and
an upper edge of the third display device is adjacent to a far-side edge of the fourth display device.

[Claim 7]

The simulation device according to any one of claims 1 to 6, wherein
a far-side edge of the first display device is adjacent to a right edge of the third display device,
and
a far-side edge of the second display device is adjacent to a left edge of the third display device.