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Aoyama et al.

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(54) **OPERATION SCREEN CONTROLLING METHOD, OPERATION SCREEN CONTROLLING PROGRAM, AND DISPLAY DEVICE**

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(30) **Foreign Application Priority Data**

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H04N 5/50 (2006.01)

(52) **U.S. Cl.** **348/734**

(58) **Field of Classification Search** 348/734,
348/725, 706; 725/139, 140, 141, 10, 11;
340/825.72, 825.69

See application file for complete search history.

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(57) **ABSTRACT**

A controlling method of an operation screen for operations of a remote control device, includes the steps of acquiring an attribute of a remote control device, and determining an operation form corresponding to the remote control device from among a plurality of operation forms previously stored based on the acquired attribute of the remote control device. An additional step includes displaying an operation screen related to the determined operation form displayed.

11 Claims, 10 Drawing Sheets

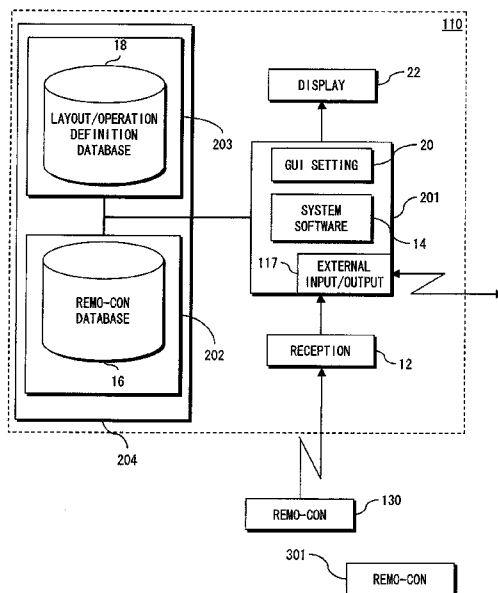


Fig. 1

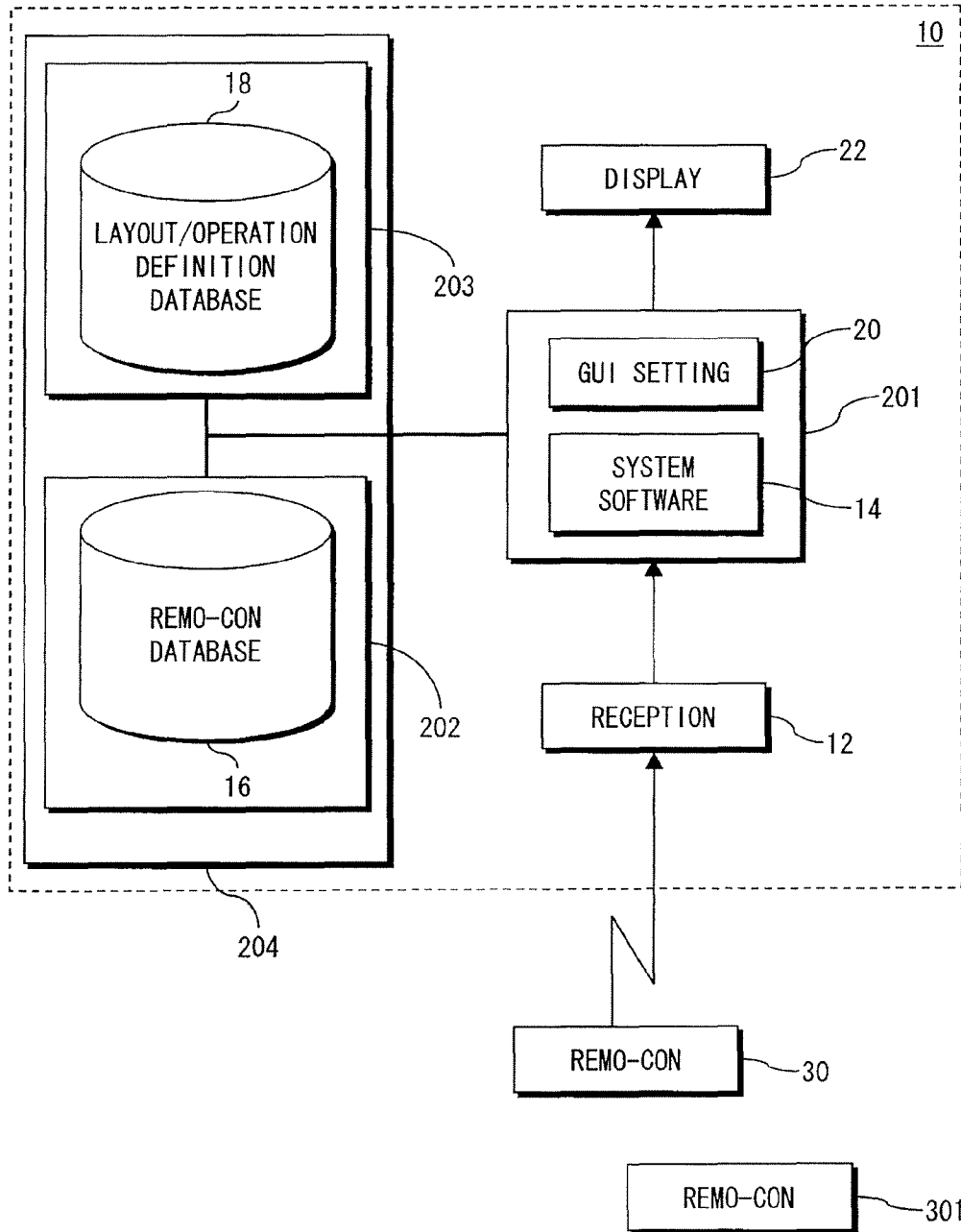


Fig. 2

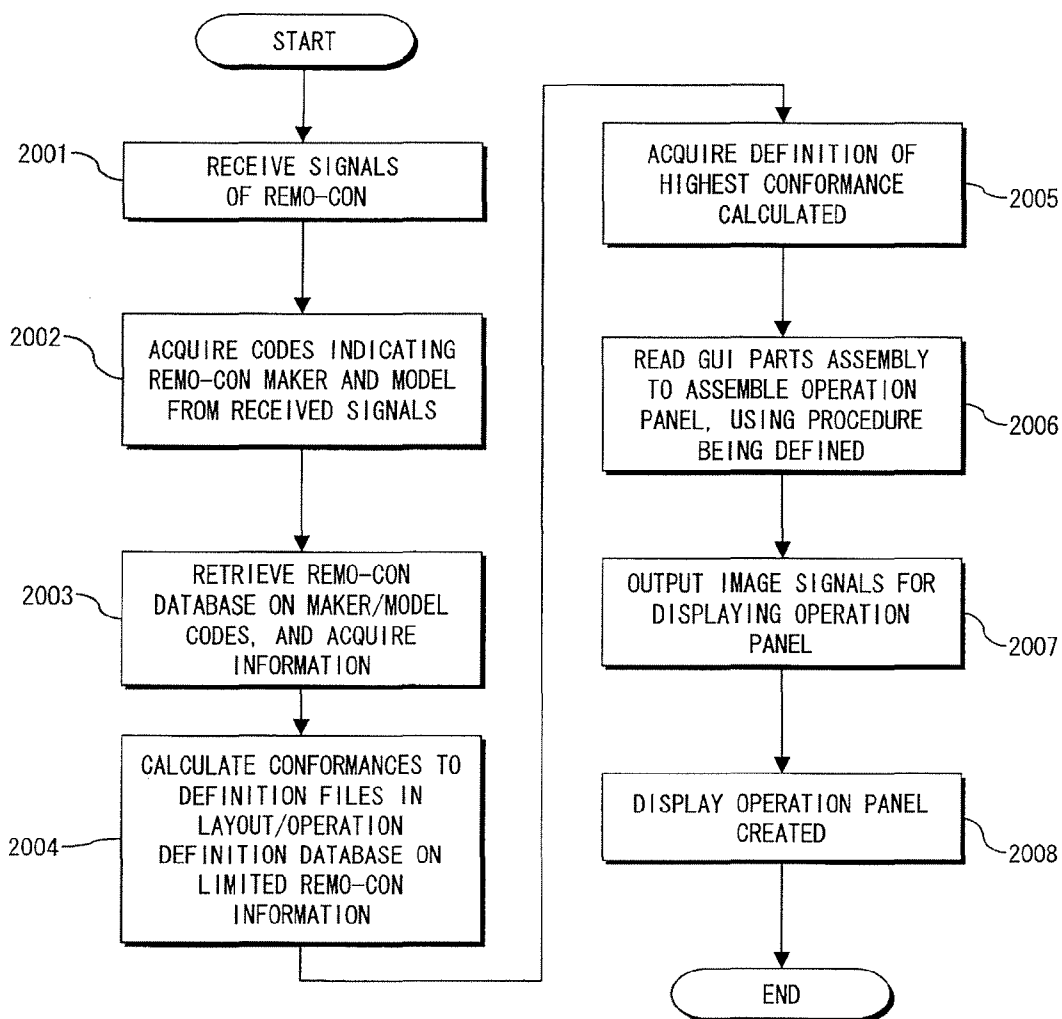


Fig.3

MAKER CODE	MODEL CODE	OPERATION DEVICE INFORMATION			
		POINTING DEVICE	TEN KEY	LIQUID CRYSTAL TOUCH PANEL	DIAL DEVICE
S	01	◎	○	○	○
P	4	×	◎	×	×
N	00	×	×	◎	×
T	13	×	◎	×	×
SP	2	○	◎	×	×
D	5	◎	○	×	×

◎ : MOUNTED ON REMO-CON (MOST ACCESSIBLE ON HAND)

○ : MOUNTED ON REMO-CON

× : UNMOUNTED ON REMO-CON

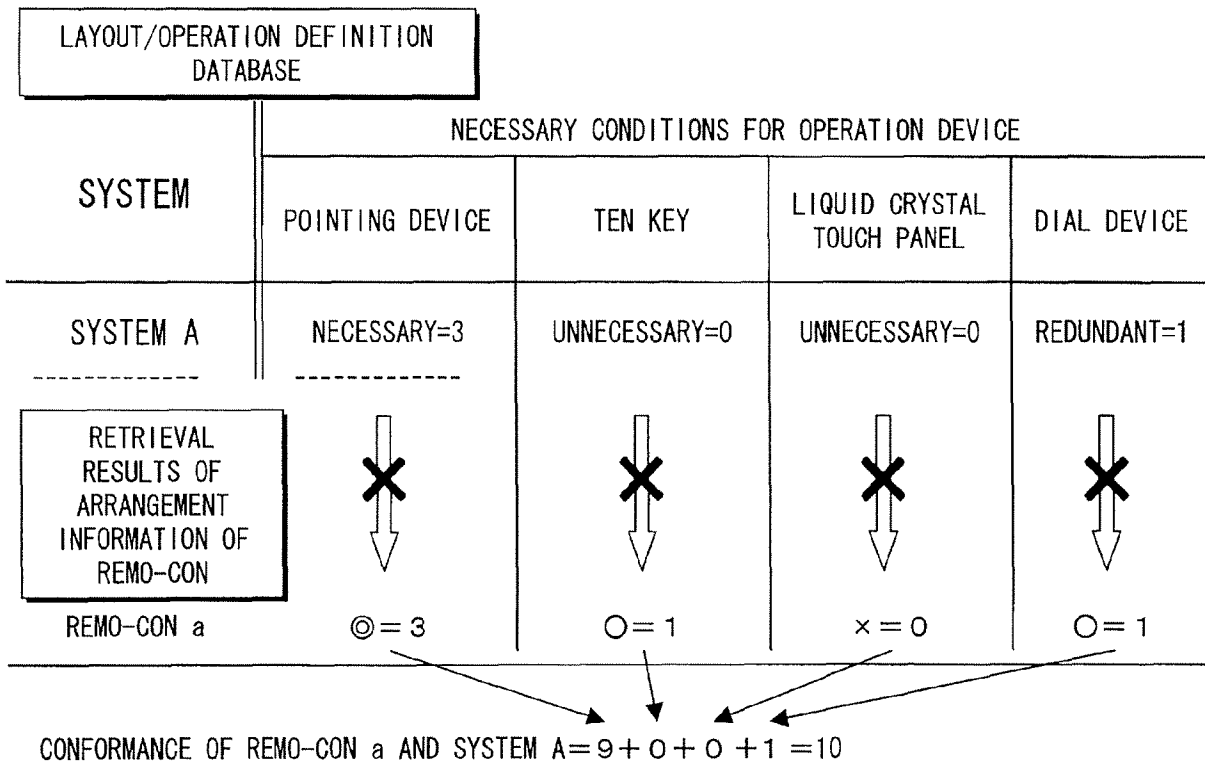


Fig. 4

Fig. 5

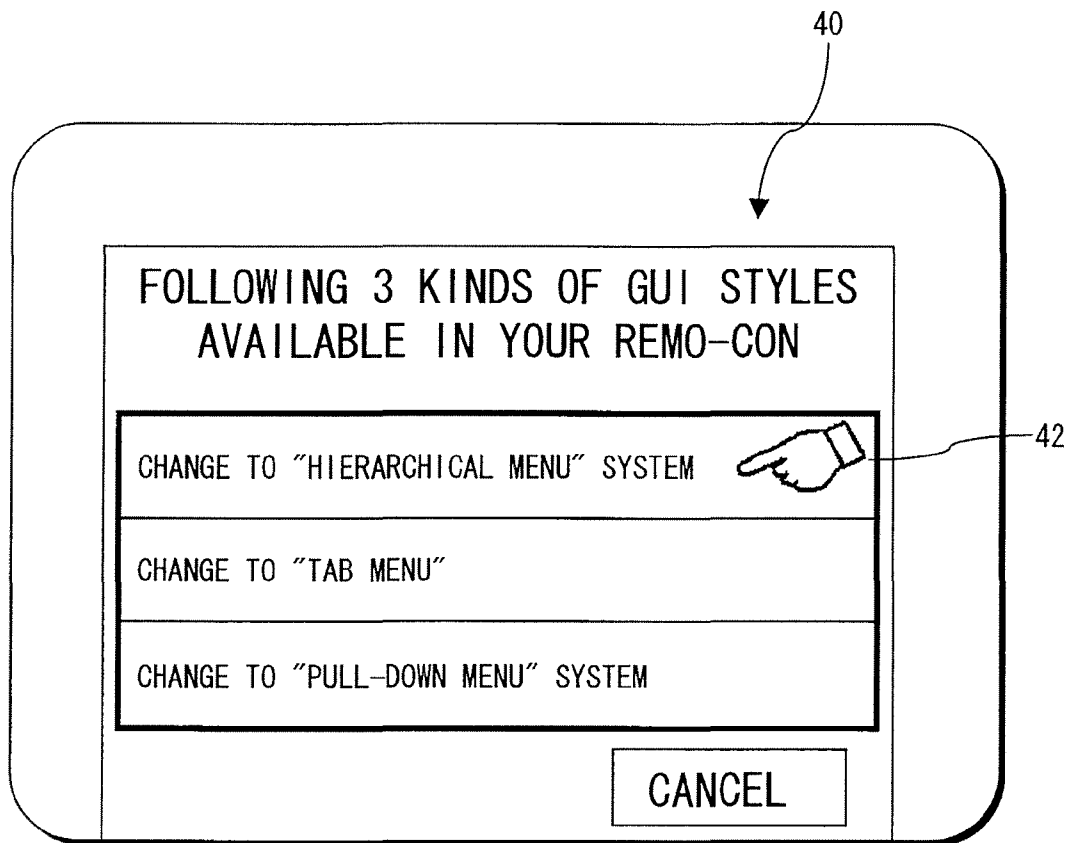


Fig. 6

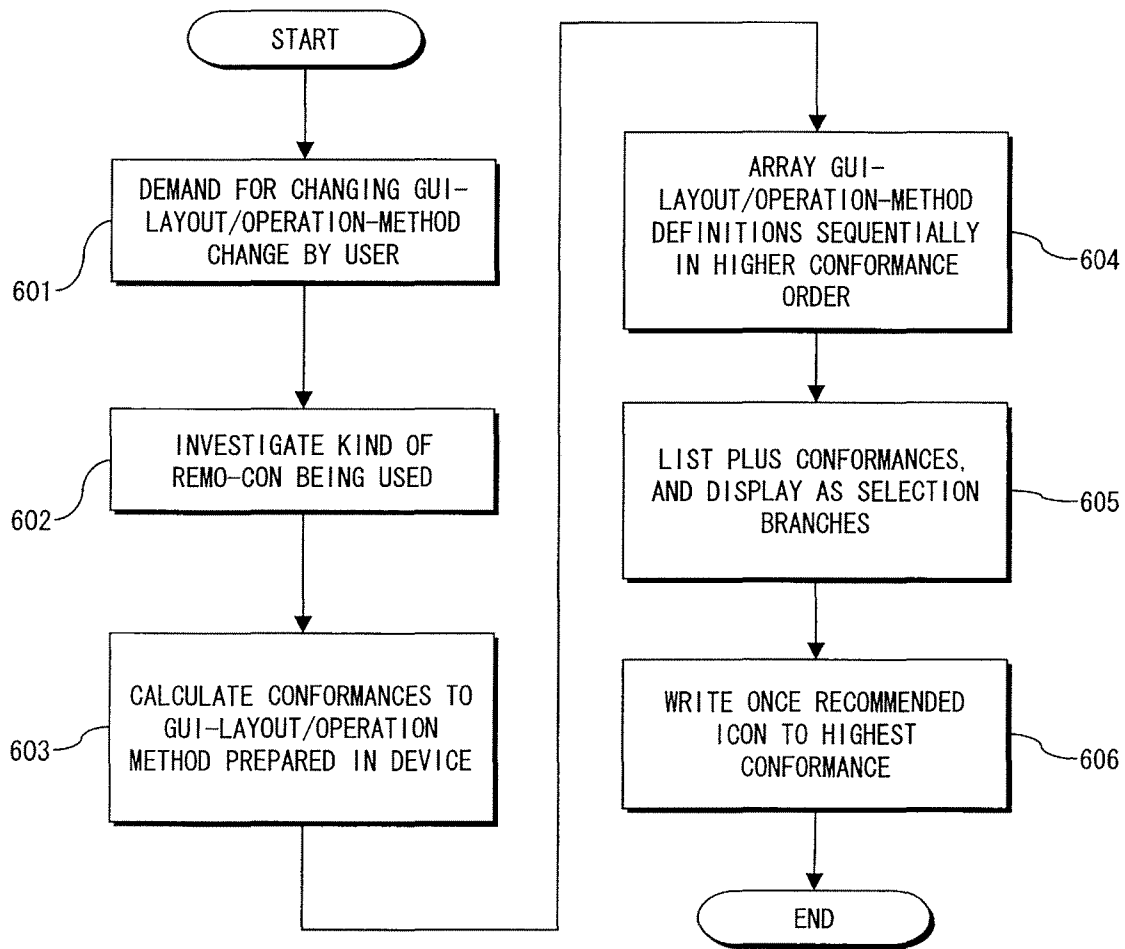


Fig. 7

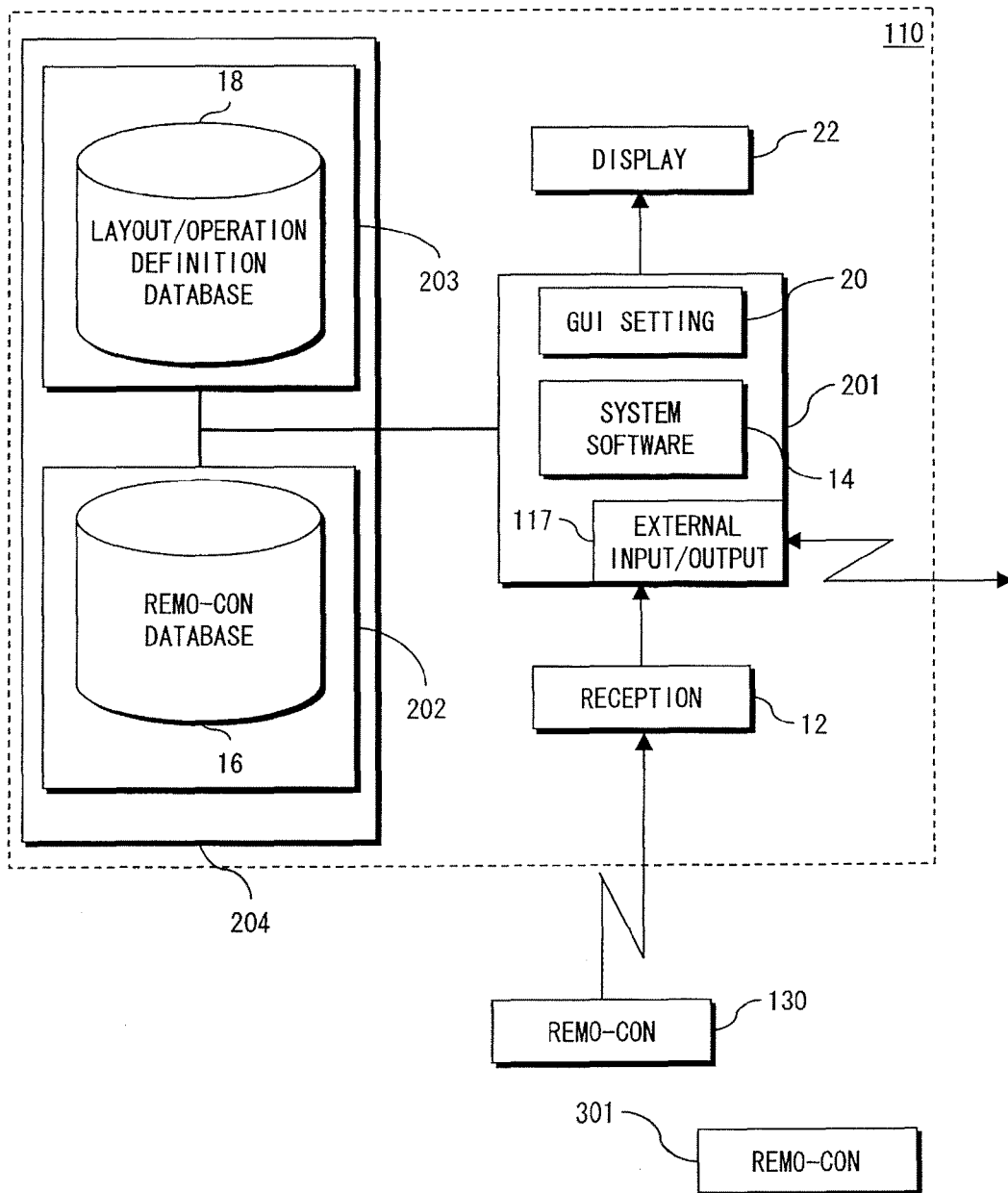


Fig. 8

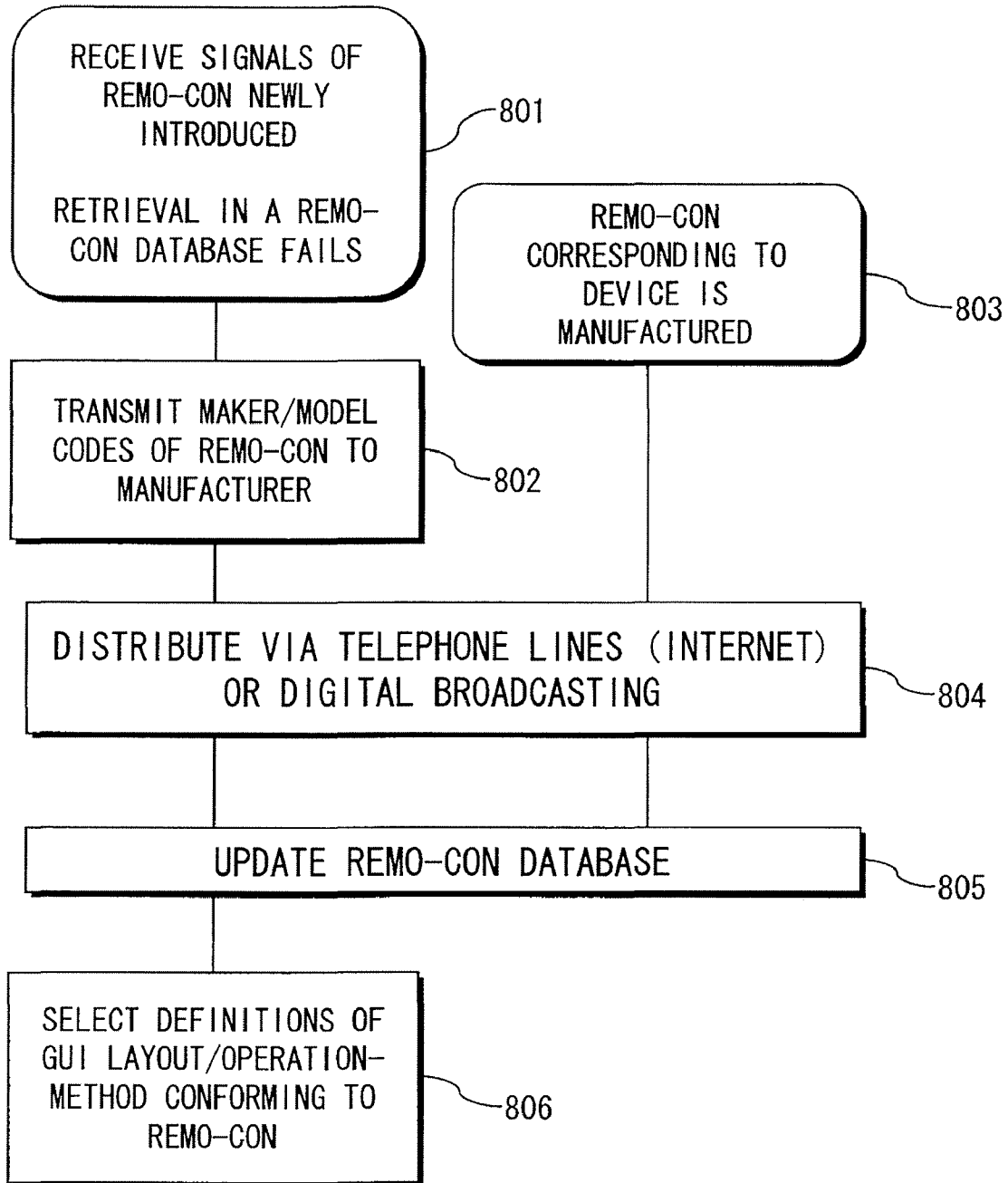


Fig.9

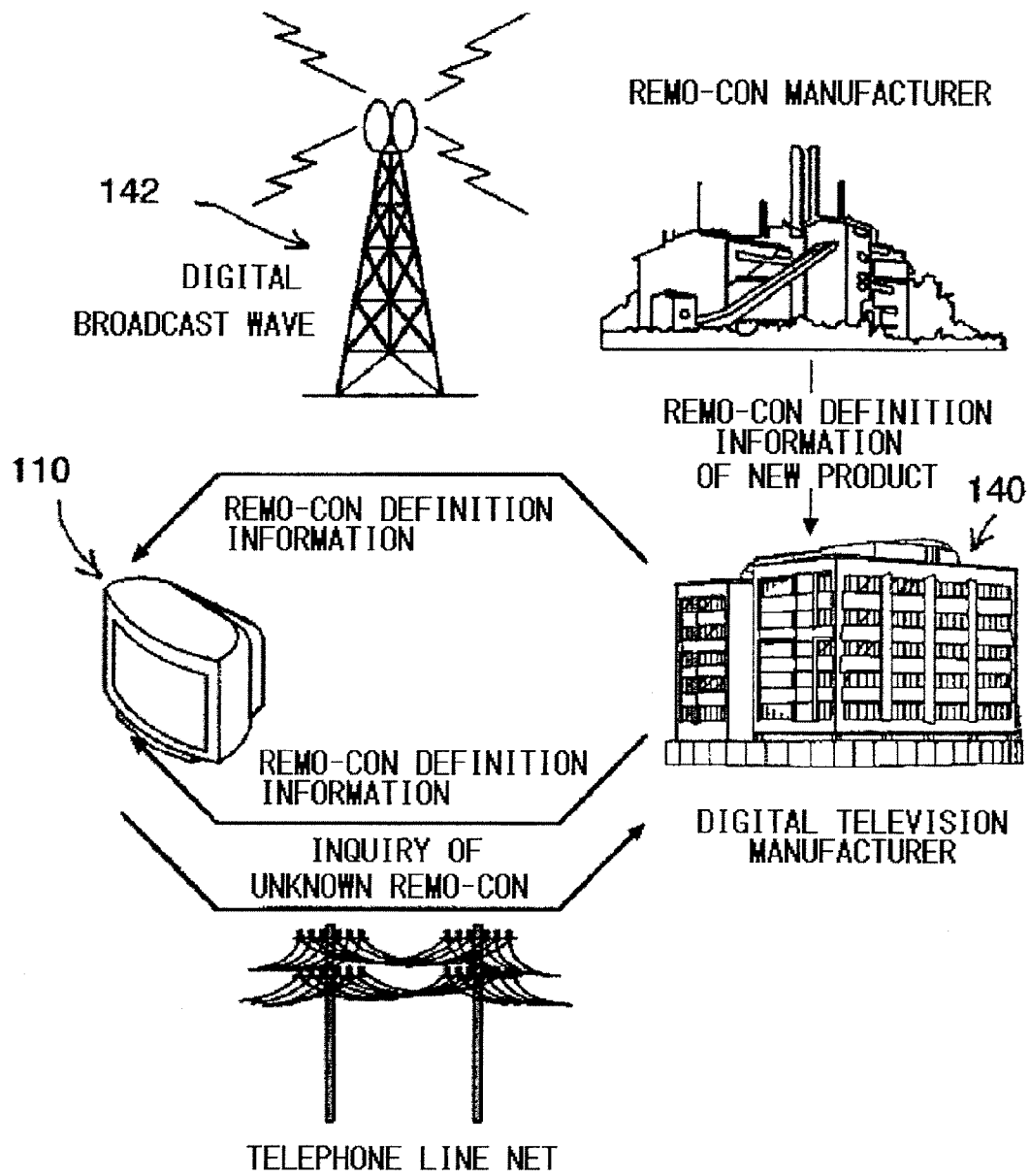
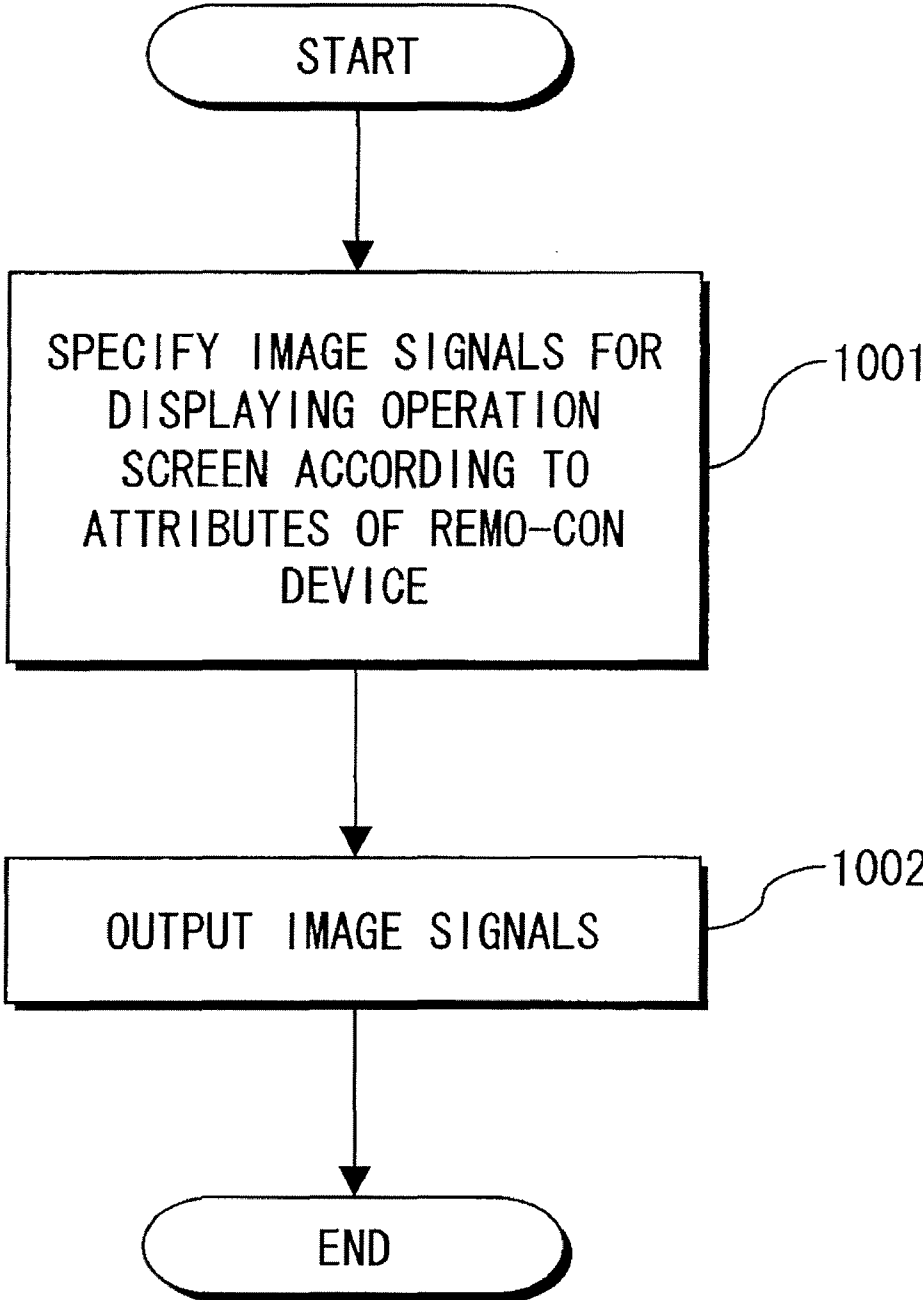


Fig. 10



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**OPERATION SCREEN CONTROLLING
METHOD, OPERATION SCREEN
CONTROLLING PROGRAM, AND DISPLAY
DEVICE**

This is a continuation of Application Ser. No. 10/854,231, filed on May 27, 2004.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an operation screen controlling method, an operation screen controlling program and a display device and, more particularly, to a control method of an operation screen having relations to the operations of a remote control device.

2. Description of the Related Art

In case a plurality of remote control devices for controlling a television receiver are used, as disclosed in JP-A-2001-61110, there has been proposed a television receiver, which is enabled to use a plurality of remote control devices (as abbreviated into the "remo-con") by giving priority to the individual remote control devices to improve the operability of the television receiver.

SUMMARY OF THE INVENTION

Depending on the operation screen of a graphical user interface, however, the operability may be degraded by the remote control device used.

Therefore, an object of the invention is to provide an operation screen controlling method, an operation screen controlling program and a display device, which can eliminate those disadvantages.

In order to achieve the object, in a remote control system according to the invention, there is provided an operation screen controlling method which comprises: the step of specifying image signals for displaying an operation screen, according to the attributes of a remote control device; and the step of outputting the image signals.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention, together with further advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a block diagram schematically showing a construction of a display device according to a first embodiment of the invention;

FIG. 2 is a flow chart showing a flow of changing the GUI layout and operation methods according to the first embodiment of the invention;

FIG. 3 is a diagram showing one example of data in a remote control database;

FIG. 4 is a chart showing a flow of calculating the conformances of the GUI layout and the operation methods;

FIG. 5 is a diagram showing an example of an operation screen for changing the GUI layout and the operation methods;

FIG. 6 is a flow chart showing a flow of works for selecting the available change definitions of the GUI layout and the operation methods;

FIG. 7 is a block diagram schematically showing a construction of a display device according to a second embodiment of the invention;

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FIG. 8 is a chart showing a flow of works to add information to the remote control database;

FIG. 9 is a diagram showing a flow of definition information of a remote control device in the outside; and

FIG. 10 is a flow chart showing a flow of an operation screen controlling method according to an embodiment of the invention.

DESCRIPTION OF THE PREFERRED
EMBODIMENTS

Embodiments of the invention will be described with reference to the accompanying drawings. FIG. 10 shows a flow of an operation screen controlling method according to an embodiment of the invention.

In the embodiment of the invention, as shown in FIG. 10, image signals for displaying an operation screen are specified at first in Step 1001 in accordance with the attributes of a remote control device. After this, the routine transfers to Step 1002, at which the specified image signals are outputted. Here, the attributes of the remote control device in the invention are characteristics intrinsic to the remote control device. Moreover, these intrinsic characteristics of the remote control device are the identification information itself for identifying a plurality of remote control devices from one another, and whether or not the remote control device is provided with a pointing device such as a cross key for moving a pointer or focus position on the screen or a specific operation device such as a numeral key.

On the other hand, the operation screen is constructed of either a display element corresponding to the operation device owned by the remote control device or a display element corresponding to such a specific operation of the remote control device as can be performed by the user. As the operation screen, a screen containing an image indicating that numeral key can be adopted as a display element corresponding to a predetermined numeral key provided in the remote control device. Moreover, a screen containing the image indicating the cross key can be adopted as the display element corresponding to the cross key of the remote control device.

In these cases, the display element is desirably an element for displaying the numeral key disposed in the remote control device or the mode of an operation device such as a bonding device precisely. However, the display element should not necessarily be limited to the image for displaying the mode of the operation device but may be a state, in which the user can recognize the corresponding relation between the operation device of the remote control device and the image contained by the operation screen. Moreover, the display element is preferred to have the construction, in which the operation screen contains at least one display element corresponding one-by-one to the operation device owned by the remote control device, but should not necessarily be limited to the construction. Specifically, the operation screen can be one containing such a plurality of selection branches for display elements as are to be selected by a specific operation of the pointing device of the remote control device, for example, by a depression of the cross key to be designated four upward, downward, leftward and downward directions, such as the images of a plurality of tabs to be sequentially selected by the specific operation. Preferably, it is possible to adopt the construction, in which the individual images (as will be called the "graphical user interface (GUI) parts") as the display elements are stored individually in storage devices. In case the operation screen containing the display elements is to be displayed, the images or the display elements can be combined to produce the image signals for displaying the opera-

tion screen. It is also preferably possible to adopt the construction, in which the information indicating the arrangement relation of the display elements, that is, the layout information is determined according to the attributes of the remote control device. However, it is unnecessary to store the display elements individually as different images. For example, it is possible to store one image containing a plurality of display elements such as an image displaying the entirety of the remote control device having a plurality of display elements. In this case, the image displaying the entire remote control device may be stored to correspond individually to a plurality of kinds of remote control devices. As a result, the step of reading the image corresponding to a specific remote control device in accordance with the identification information of the remote control device can be easily executed as a step of specifying the image signals for displaying the operation screen.

Moreover, the screen to be actually displayed on the display may not be limited to the display elements of the operation screen. For example, a screen displaying television broadcasting may be displayed simultaneously with the display elements of the operation screen. In this case, the image signal outputting step may output the image signals, which are synthesized from the image signals for displaying the operation screen and other image signals (for example, the image signals for displaying the television broadcasting).

As a preferable mode, there can be adopted the construction, in which the step of specifying the image signals has a step of selecting the display elements constructing the operation screen in accordance with the attributes. As a preferable mode, moreover, there can be adopted the construction, in which the step of specifying the image signals has a step of selecting one of a plurality of image signals for displaying a plurality of operation screens individually. As a preferable mode, there can be adopted the construction, in which the step of specifying the image signals has a step of evaluating a degree of suitability between the remote control device and each of forms of a plurality of operation screens based on the attributes of the remote control device. As preferable mode, each of forms which can be display by the display apparatus can be used as each of forms of a plurality of operation screens which is evaluate.

As a preferable mode, there can be adopted the construction, in which the step of specifying the image signals is performed according to the identification information for identifying the remote control device from another remote control device.

As a preferable mode, moreover, there can be adopted the construction, in which the step of specifying the image signals has a step of reading the attributes of a plurality of remote control device from storage device storing the attributes. The storage device can be exemplified by a semiconductor memory or a hard disk device.

As a preferable mode, moreover, there can be adopted the construction, in which the step of specifying the image signals has a step of reading at least any of display elements constructing the operation screen, an image containing a plurality of display elements and the layout information of the display elements from the storage device. As a preferable mode, moreover, there can be adopted the construction, in which the step of specifying the image signals has: a step of reading a plurality of attributes of the remote control device from storage device storing the attribute; and a step of reading either the display elements to construct the operation screen in accordance with the read attributes or an image containing a plurality of display elements, from the storage device. There can be preferably adopted the construction for preparing a

remote control database, which is stored with the attributes of the remote control device, and a database, which is stored with: a display element; an image containing a plurality of display elements; a layout of display elements; and/or an operation method of the operation device corresponding to the display element.

As a preferable mode, moreover, there can be adopted the construction having a step of updating the database, which is stored with the attributes of the remote control device. As a preferable mode, moreover, there can be adopted the construction, which has a step of receiving signals outputted from the remote control device and a step of updating in case the attributes of the remote control device cannot be specified from the signals outputted from the remote control device. Specifically, the updating step can be performed by a step of inquiring an inquirer, and a step of registering the database with the attribute information sent in response to an inquiry.

As a preferable mode, moreover, there can be adopted the construction, which has a step of receiving signals outputted by the remote control device, and in which the image signal specifying step is a step for specifying the image signals in accordance with the attributes to be specified with the signals outputted from the remote control device.

As a preferable mode of a control program of an operation screen, on the other hand, there can be adopted the construction, which has a step of specifying image signals for displaying an operation screen, in accordance with the attributes of a remote control device, and a step of outputting the image signals.

First Embodiment

The aforementioned mode of embodiment will be described in connection with its more detailed example. FIG. 1 shows a construction of a display device according to a first embodiment of the invention, and FIG. 2 shows a flow chart of a control procedure according to the first embodiment.

As shown in FIG. 1, a digital television receiver **10** acting as the display device is provided with a reception device **12** for discriminating the signals of a plurality of remote control devices **30** and **301**. The first embodiment will be described by assuming the state, in which the user uses the remote control device **30** of the remote control devices **30** and **301**.

The digital television receiver **10** is provided with an execution unit **201** for executing the steps of FIG. 10. The execution unit **201** is provided with: a system software **14** or a storage device such as a flash memory, which is stored with a program for executing the operations of Step **1001** and Step **1002**; and a GUI setting unit **20** or a circuit for executing the program.

At Step **2001** of FIG. 2, moreover, the execution unit **201** extracts (at Step **2002** of FIG. 2) the identification code of the remote control device **30** from the signals outputted from the remote control device **30** and received by the reception device **21**. This identification code contains the maker and the model name or type number of the remote control device **30**. There can be adopted the mode, in which the execution unit **201** reads the signals for displaying the image of the remote control device **30** on the basis of the identification code and outputs the signals read from a storage device **204** constituted by a flash memory or the like as the image signals for forming the operation screen. As a result, the image of the remote control device **30** is displayed in the display unit of a display device **22**.

In the first embodiment, however, the following construction is adopted to display the operation screen more softly.

