SPECIFICATION

METHOD FOR CONSTRUCTING CONTROL SYSTEM FOR CONTROLLING ENERGY-CONSUMING EQUIPMENT AND CONTROL SYSTEM FOR CONTROLLING ENERGY-CONSUMING EQUIPMENT

TECHNICAL FIELD

[0001]

The present invention relates to a method for constructing a control system for controlling energy consuming equipment used in a building and the control system, and in particular, to a method for constructing the control system for controlling energy consuming equipment which acquires data for specifying a setting position of the energy consuming equipment, and the control system.

BACKGROUND ART

[0002]

A control system which controls an operation state of energy consuming equipment such as an electric machine used in a building is already known. In such a control system, there is a system which includes a control apparatus to make communication with the energy consuming equipment for the control of the operation state of the energy consuming equipment from a remote place (for example, see Patent Document 1).

[0003]

The system described in Patent Document 1 is an in-house electric machine remote control system which can access a system using a mobile communication terminal from the outside of the house to remotely control the electric machine in the house from the outside of the house. In Patent Document 1, in order to construct such a system, installation work of the

electric machine in the house is performed during construction work of a home network by providing an in-house information distribution board under construction of the house.

[0004]

Further, in Patent Document 1, before the house is transferred to a client, an operation inspection is performed to confirm whether the electric machine in the house can be remotely controlled. Therefore, it is possible to prevent disadvantages such as a case where an outsider enters the house for inspection after the client moves in the house, and a case where the client requests a repair of the system after the client lives in the house.

[0005]

As a technology relating to checking and operation inspection of the electric machine in the house, technologies other than the content disclosed in Patent Document 1 are also known (for example, see Patent Documents 2 to 4). In a technology disclosed in Patent Document 2, types of the apparatus and inspection contents are stored in a database in association with each other to achieve efficiency in inspection of the apparatus. In a technology disclosed in Patent Document 3, information indicating an operation state of the electric machine is transmitted through the Internet, and abnormality of the electric machine is detected based on the information. In a technology disclosed in Patent Document 4, the electric machine is disposed on a network of a home control system (corresponding to the in-house electric machine remote control system as described above), and a defect state of the electric machine is acquired through the network.

CITATION LIST

Patent Document

[0006]

Patent Document 1: JP 4653448 B1

Patent Document 2: JP 2010-157025 A

Patent Document 3: JP 2007-265049 A

Patent Document 4: JP 2010-287953 A

SUMMARY OF THE INVENTION

Problem to be Solved by the Invention

[0007]

When energy consuming equipment in a building is managed or controlled, there is a need to exactly identify the type and the place of the machine disposed in the building. Herein, in a case where information on the type and the arrangement position of the machine is acquired after the building is transferred to a user of the building, the user of the building oneself is forced to inspect the information and input data and thus it causes trouble to the user of the building in operation.

[0008]

Therefore, the invention has been made in view of the above problem, and an object thereof is to provide a method for constructing a control system which controls energy consuming equipment used in a building, through which the type and the place of the energy consuming equipment in the building can be identified without causing trouble to a user of the building.

Further, another object of the invention is to provide a control system which controls the energy consuming equipment used in the building, through which the type and the place of the energy consuming equipment in the building can be identified without causing trouble to the user of the building.

Means for Solving Problem

[0009]

In order to solve the above problem, according to a method for constructing a control system which controls an energy consuming system of the invention, there is provided a method for constructing a control system which controls energy consuming equipment used in a building. As a construction process of the building, the method includes: a step of disposing the energy consuming equipment at a setting position in the building; a step of acquiring, by using a control apparatus which makes communication with the energy consuming equipment to control an operation state of the energy consuming equipment, machine ID data used to specify the energy consuming equipment which is disposed at the setting position; a step of acquiring, by using the control apparatus, position ID data used to specify the setting position at which the energy consuming equipment specified by the machine ID data is disposed; and a step of storing, by using the control apparatus, the machine ID data and the position ID data while associating the energy consuming equipment specified by the machine ID data with the setting position specified by the position ID data. In the step of disposing the energy consuming equipment at the setting position, the energy consuming equipment is disposed at the setting position according to a floor plan of the building in which the setting position is denoted. In the step of acquiring of the position ID data by using the control apparatus, the control apparatus analyzes drawing data for drawing the floor plan, and specifies a positional relation of the setting position in the floor plan to acquire the position ID data.

[0010]

Further, in order to solve the above problem, according to a method for constructing a control system which controls an energy consuming

system of the invention, there is provided a method for constructing a control system which controls energy consuming equipment used in a building. As a construction process of the building, the method includes: a step of disposing the energy consuming equipment at a setting position in the building; a step of acquiring, by using a control apparatus which makes communication with the energy consuming equipment to control an operation state of the energy consuming equipment, machine ID data used to specify the energy consuming equipment which is disposed at the setting position; a step of acquiring, by using the control apparatus, position ID data used to specify the setting position at which the energy consuming equipment specified by the machine ID data is disposed; and a step of storing, by using the control apparatus, the machine ID data and the position ID data while associating the energy consuming equipment specified by the machine ID data with the setting position specified by the position ID data. In the step of acquiring of the position ID data by using the control apparatus, the control apparatus acquires the position ID data through an input operation of information which indicates the setting position.

[0011]

In a case where any one of the above two methods is used, the position ID data for specifying the setting position at which the energy consuming equipment is disposed is stored in the control apparatus in process of constructing the building (in other words, at a stage before the building is transferred to the user of the building), so that the user of the building oneself saves trouble of acquiring the position ID data.

Furthermore, since the machine ID data and the position ID data are stored in the control apparatus in a state where the energy consuming equipment and the setting position thereof set as the arrangement position

are associated to each other, the user of the building can exactly identify the type and the place of the energy consuming equipment in the building without causing trouble.

[0012]

In addition, in one method of the above two methods, the control apparatus analyzes the drawing data for drawing the floor plan, and specifies the positional relation of the setting position in the floor plan, so that the position ID data is acquired. In the other method, the control apparatus acquires the position ID data through an input operation of information indicating the setting position. In a viewpoint of more easily acquiring the position ID data, the former method is desirable in that the position ID data is automatically acquired by analyzing the drawing data by using the control apparatus.

[0013]

Further, in the method for constructing the control system which controls the energy consuming equipment, the method further includes, in the construction process of the building, a step of inspecting whether the operation state of the energy consuming equipment is normally switched according to a control signal which is output by using the control apparatus toward the energy consuming equipment. In the step of storing the machine ID data and the position ID data by using the control apparatus, it is preferable that the control apparatus store the machine ID data and the position ID data while associating a normal machine of which the operation state is normally switched in the inspecting among the energy consuming equipment specified by the machine ID data with a normal machine position at which the normal machine is disposed among the setting positions specified by the position ID data.

In the method for constructing such a system, the machine ID data

and the position ID data are stored while associating the energy consuming apparatus (a normal machine) determined as normally-switched one in the inspection process with the setting position (a normal machine position) thereof. Therefore, all pieces of the energy consuming equipment in the building are confirmed that the energy consuming equipment in the building is the normal machine at the time when the machine ID data and the position ID data are completely stored, and the arrangement position of the energy consuming equipment is identified. Then, finally, the building in the above state can be ready to be appropriately transferred to the user.

[0014]

Furthermore, in order to solve the above problem, according to a control system which controls energy consuming equipment of the invention, there is provided a control system which controls energy consuming equipment used in a building. The control system includes: the energy consuming equipment that is disposed at a setting position in the building; and a control apparatus that makes communication with the energy consuming equipment to control an operation state of the energy consuming equipment. The energy consuming equipment is disposed at the setting position according to a floor plan of the building in which the setting position is denoted. The control apparatus includes a machine ID data acquiring unit that acquires machine ID data for specifying the energy consuming equipment disposed at the setting position, a position ID data acquiring unit that acquires position ID data for specifying the setting position at which the energy consuming equipment specified by the machine ID data is disposed, and a storage unit that stores the machine ID data and the position ID data. The position ID data acquiring unit analyzes drawing data for drawing the floor plan, and specifies a positional relation of the setting position in the floor plan to acquire the position ID data. In process

of constructing the building, the storage unit stores the machine ID data and the position ID data while associating the energy consuming equipment specified by the machine ID data with the setting position specified by the position ID data.

[0015]

Further, in order to solve the above problem, according to a control system which controls energy consuming equipment of the invention, there is provided a control system which controls energy consuming equipment used in a building. The control system includes: the energy consuming equipment that is disposed at a setting position in the building; and a control apparatus that makes communication with the energy consuming equipment to control an operation state of the energy consuming equipment. The control apparatus includes a machine ID data acquiring unit that acquires machine ID data for specifying the energy consuming equipment disposed at the setting position, a position ID data acquiring unit that acquires position ID data for specifying the setting position at which the energy consuming equipment specified by the machine ID data is disposed, and a storage unit that stores the machine ID data and the position ID data. The position ID data acquiring unit acquires the position ID data through an input operation of information indicating the setting position. In process of constructing the building, the storage unit stores the machine ID data and the position ID data while associating the energy consuming equipment specified by the machine ID data with the setting position specified by the position ID data.

[0016]

The above two control systems both are control systems which control the energy consuming equipment used in the building, and identify the type and the place of the energy consuming equipment in the building, and thus

the building can be provided to the user of the building without causing trouble. In other words, in each of the above two control systems, the position ID data for specifying the setting position of the energy consuming equipment is stored in the storage unit of the control apparatus in process of constructing the building (in other words, at a stage before the building is transferred to the user of the building), so that the user of the building oneself saves trouble of acquiring the position ID data. Further, since the machine ID data and the position ID data are stored in the storage unit of the control apparatus in a state where the energy consuming equipment and the position (the setting position) set as the arrangement position thereof are associated to each other, the user of the building can exactly identify the type and the place of the energy consuming equipment in the building without causing trouble.

[0017]

In addition, in one control system of the above two control systems, the position ID data acquiring unit of the control apparatus analyzes the drawing data for drawing the floor plan, and specifies the positional relation of the setting position in the floor plan, so that the position ID data is acquired. In the other control system, the position ID data acquiring unit acquires the position ID data through an input operation of information indicating the setting position. In a viewpoint of more easily acquiring the position ID data, the former control system is desirable in that the position ID data is automatically acquired by analyzing the drawing data by the position ID data acquiring unit.

[0018]

Further, the control system which controls the energy consuming equipment further includes: a sensor that measures an energy consumption of the energy consuming equipment; and a display device that displays

information indicating data from the control apparatus. The control apparatus includes a data generating unit that generates display data for displaying the energy consumption of the energy consuming equipment measured by the sensor in the display device in association with the setting position at which the energy consuming equipment is disposed. The data generating unit reads the machine ID data and the position ID data out of the storage unit, and generates the display data based on a correspondence relation between the energy consuming equipment specified by the read-out machine ID data and the setting position specified by the read-out position ID data. The configuration makes the invention become significant.

Specifically, when an energy consumption of the energy consuming equipment is displayed in association with the setting position at which the energy consuming equipment is disposed, it is necessary to exactly identify the place and the type of the energy consuming equipment in the building. Under such a circumstance, at a stage before the building is transferred to the user of the building, the position ID data is acquired, and the machine ID data and the position ID data are stored while associating the energy consuming equipment with the position set as the arrangement position. The configuration becomes significant in appropriately displaying the data.

Effect of the Invention

[0019]

According to a method for constructing a control system which controls energy consuming equipment of the invention, the position ID data for specifying the setting position at which the energy consuming equipment is disposed is stored in the control apparatus in process of constructing the building (in other words, at a stage before the building is transferred to the user of the building), so that the user of the building oneself saves trouble of

acquiring the position ID data. Furthermore, since the machine ID data and the position ID data are stored in the control apparatus in a state where the energy consuming equipment and the setting position set as the arrangement position thereof are associated to each other, the user of the building can exactly identify the type and the place of the energy consuming equipment in the building without causing trouble.

Further, according to a control system which controls energy consuming equipment of the invention, the control system controls the energy consuming equipment used in the building, and identifies the type and the place of the energy consuming equipment in the building, and thus the building can be provided without causing trouble to the user of the building.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020]

Fig. 1 is a diagram illustrating a configuration of a control system according to an embodiment.

Fig. 2 is a diagram illustrating an example of an energy consumption confirming screen which is drawn in a display device according to the embodiment.

Fig. 3 is a diagram illustrating a configuration of a home server.

Fig. 4 is a diagram illustrating a first example of a sequence of constructing the control system.

Fig. 5 is a diagram illustrating a flow of an inspection process in the first example.

Fig. 6 is an operation screen for operation confirmation in the first example.

Fig. 7 is another operation screen for operation confirmation in the first example.

Fig. 8 is a diagram illustrating a second example of a sequence of constructing the control system.

Fig. 9 is an explanatory diagram of a drawing data analyzing process in the second example.

Fig. 10 is a diagram illustrating a flow of an inspection process in the second example.

Fig. 11 is a diagram illustrating an operation screen for operation confirmation in the second example.

Fig. 12 is another diagram illustrating an operation screen for operation confirmation in the second example.

DESCRIPTION OF EMBODIMENT

[0021]

Hereinafter, a method for constructing a control system that controls energy consuming equipment according to an embodiment (hereinafter, referred to as the embodiment) of the invention, and the control system will be described with reference to Figs. 1 to 12. Fig. 1 is a diagram illustrating a configuration of the control system according to the embodiment. Fig. 2 illustrates an example of an energy consumption confirming screen which is drawn in a display device according to the embodiment. Fig. 3 is a diagram illustrating a configuration of a home server. Fig. 4 is a diagram illustrating a first example of a sequence of constructing the control system. Fig. 5 is a diagram illustrating a flow of an inspection process in the first example. Figs. 6 and 7 illustrate operation screens for operation confirmation in the first example. Fig. 8 is a diagram illustrating a second example of a sequence of constructing the control system. Fig. 9 is an explanation diagram of a drawing data analyzing process in the second example. Fig. 10 is a diagram illustrating a flow of an inspection process in

the second example. Figs. 11 and 12 illustrate operation screens for operation confirmation in the second example.

[0022]

<<Outline of control system according to the embodiment>>

First, the outline of a control system according to the embodiment will be described.

In addition, the following description will be made about a control system which is built in a house H as an example of a building. However, the house H is a mere example of a building, and the invention is also applicable to other buildings, for example, commercial buildings, accessory buildings in a factory, and shops.

[0023]

A control system (hereinafter, simply referred to as the system) S according to the embodiment is to control electric machines that are used in the house H. Specifically, the system S is a so-called home energy management system (HEMS), which manages electric energy consumption in the house H as energy consumption in the house H, visualizes (makes it shown) the electric energy consumption of a plurality of electric machines used in the house H, and reports the visualized information to a user of the house H (hereinafter, also referred to as the user).

[0024]

The electric machine corresponds to the energy consuming equipment, and specifically to a household electric appliance such as an air conditioner and a light, a water heater, and the like. Further, in the embodiment, the electric machines include contact devices such as a door lock, a security buzzer, and the contact device to be used for monitoring or controlling window sensors in the house H, and a multi-functional toilet having functions of sensing a body temperature of the user, a urine sugar

level, a blood pressure, a weight, and the like on defecation or urination and displaying the measured results (see Fig. 1).

[0025]

Further, the system S makes communication with the electric machines through a network (hereinafter, referred to as a home network) constructed in the house H to enable remote control on the respective electric machines. Herein, the home network, for example, is configured by an IP network in a wired manner using an Ethernet (registered trademark) cable, or in a wireless manner using IEEE 802.1x or Bluetooth (registered trademark).

[0026]

In addition, in the embodiment, the electric machines are controlled from a remote place or operated by the user using a predetermined terminal (specifically, a home PC 30 or the like to be described below) in the house H. In other words, the control system (the system S) to be described below is a system of which the allowable remote control on the electric machines used in the house H is restricted to a range in the house H. However, the invention is not limited to the above configuration, but applicable even to a control system which make the remote control on the electric machines in the house H from the outside of the house H by accessing the system using a mobile communication terminal from the outside of the house H.

[0027]

As described above, in the system S, the respective electric machines can be monitored and controlled by the communication through the home network.

Then, the system S, which has the functions described hitherto, is realized by a home server 10 (a home gateway) provided in the house H, the electric machines, sensors 21 to 27, and a user terminal which functions as

an interface when the operation states of the electric machines are controlled and monitored.

Hereinafter, each of components of the above-described system S will be described.

[0028]

(1) Home server

The home server 10 plays a central role of the system S, and transfers data and control signals with respect to communication target machines (for example, the electric machines, the sensors 21 to 27, and the user terminal) in the house H through the home network. In other words, the home server 10 corresponds to a control apparatus of the invention, makes communication with the electric machine used in the house H through the home network to enable control on the operation state of the electric machine. Herein, the operation state has a concept showing controllable items relating to the operations of the electric machine, for example, maneuvering (turning on/off) of the electric machine, an operation mode such as cooling or warming, an operational management value such as a setting temperature, and the like.

[0029]

Further, the home server 10 has a function of generating data (hereinafter, referred to as display data) of electric energy consumption used by each electric machine in the house H, which is displayed by the user terminal, and transferring the display data to the user terminal. Specifically, in the embodiment, the display data to display power consumption (in other words, an amount of power consumption per unit time) of each electric machine is generated and the data is transmitted to the user terminal.

The detailed structure of the home server 10 having the functions as

described above will be described below.

[0030]

(2) Electric machine

According to the embodiment, there are provided a plurality of electric machines in the house H. In Fig. 1, only an air conditioner 1, an air conditioner 2, a light 3, a light 4, a water heater 5, a contact device 6, and a multi-functional toilet 7 among the electric machines used in the house H are illustrated in order to help with understanding of the explanation. However, the example illustrated in Fig. 1 is merely an example of the electric machines used in the house H. It is a matter of course that more units of the electric machines than those illustrated in Fig. 1 may be used in the house H, or other types of electric machines (not illustrated in Fig. 1) may be used in the house H.

[0031]

Each of the electric machines is disposed at an arrangement position (hereinafter, referred to as a setting position) which is set in the house H, makes communication with the home server 10 at the setting position, and receives a control signal output from the home server 10. Herein, the setting position is determined in advance at a stage before the house H begins to be constructed (in detail, a stage of layout examination to be described below).

Then, in the embodiment, each of the electric machines is disposed at the corresponding setting position at the constructing stage of the house H. In other words, in the embodiment, at a stage before the house H is transferred to its user, each of the electric machines is disposed at the setting position which has been set as its arrangement position.

[0032]

Further, when being communicably connected to the home server 10,

each of the electric machines according to the embodiment is automatically recognized by the home server 10. Specifically, the household electric appliances (for example, the air conditioners 1 and 2, and the lights 3 and 4) among the electric machines according to the embodiment are machines which employ the ECHONET standard proposed by the ECHONET consortium, or a standard in conformity with the same standard. In accordance with the ECHONET standard, such an electric machine is automatically recognized by the home server 10 when it is communicably connected to the home server 10, and then is registered in the home server 10 as a machine to be used in the house H. Herein, as a technology of automatically recognizing and registering the electric machine, a known technology (for example, Plug and Play (registered trademark) technology) is applicable.

[0033]

Further, among the electric machines according to the embodiment, machines other than the household electric appliances (for example, the water heater 5, the contact device 6, and the multi-functional toilet 7) are previously registered in the home server 10 as machines supplied by a house company. Similarly to the household electric appliance described above, these machines are automatically recognized by the home server 10 through being communicably connected to the home server 10.

[0034]

(3) Sensors

The sensors 21 to 27 measure power consumption of the electric machine, and transmit data (hereinafter, referred to as measurement data) indicating the measurement results to the home server 10. The home server 10 receives the measurement data from the sensors 21 to 27 through the home network, and creates the above-mentioned display data based on

the received measurement data.

[0035]

In addition, in the embodiment, as illustrated in Fig. 1, the sensors 21 to 27 are separately provided for the respective electric machines, and thus it is possible to measure power consumption for every electric machine. However, the invention is not limited to the above configuration, and any type other than the above configuration may be used as long as the power consumption can be measured for every electric machine. For example, the sensor may be provided in every branch circuit provided in a distribution board (not illustrated).

[0036]

(4) User terminal

The user terminal is an information processing terminal which is used by the user in the house H, has a browsing function, and is communicably connected to the home server 10 through the home network. Further, the user terminal displays information indicated by the data from the home server 10 in a display. In other words, the user terminal corresponds to the display device of the invention; for example, when the above-mentioned display data is received from the home server 10 through the home network, the power consumption of each electric machine can be displayed in the display based on the display data.

[0037]

Making an explanation on the displaying of the power consumption of the electric machine in detail, when the user terminal receives the display data from the home server 10 through the home network, a power consumption confirming screen (an example of the energy consumption confirming screen) illustrated in Fig. 2 is drawn in the display of the user terminal as a result of developing the display data by the browsing function

of the user terminal. As illustrated in Fig. 2, the power consumptions of the electric machines used in the house H are displayed for every machine in the screen.

[0038]

Specifically, as illustrated in Fig. 2, in the power consumption confirming screen according to the embodiment, the power consumption of each electric machine is displayed in association with the setting position which is set as the arrangement position of the electric machine. For example, in a display field of the air conditioner 1 in the power consumption confirming screen illustrated in Fig. 2, there are simultaneously displayed both the power consumption of the air conditioner 1 and character information (in particular, character information denoted with "1st Fl. Living") indicating the setting position which is set as the arrangement position of the air conditioner 1.

As described above, the display data transmitted from the home server 10 can be regarded as data for displaying the power consumptions of the electric machines, which are measured by the sensors 21 to 27, in the user terminal in association with the setting positions at which the electric machines are disposed.

[0039]

In addition, hereinafter, the description will be made about a case where a personal computer (hereinafter, referred to as the home PC) 30 installed in the house H is used as an example of the user terminal, but a mobile phone such as a smart phone, a PDA, or an information processing terminal such as a digital photo frame having a browsing function may be configured as the user terminal.

[0040]

<<Detailed structure of home server>>

Next, the structure of the above-described home server 10 will be described in detail.

As illustrated in Fig. 1, the home server 10 includes a CPU 10a, a ROM 10b, a RAM 10c, a communication interface (denoted with communication I/F in Fig. 1) 10d as main components of hardware, and various kinds of programs are stored in the ROM 10b. Then, the programs are executed by the CPU 10a to exert the above-described functions of the home server 10.

[0041]

Examples of the programs stored in the ROM 10b include a communication program, a machine control program, a machine confirming program, an operation confirming program, and a display data generating program.

The communication program is a program which makes communication with a machine which is communicably connected to the home server 10 through the home network and transfers data with respect to the machine. In addition, as illustrated in Fig. 1, the home server 10 according to the embodiment is connected to the Internet 12, through a router 11, and also can transfer data with respect to an external server (not illustrated) outside the house H by the communication program.

[0042]

The machine control program is a program which is used to make remote control on the electric machines in the house H through the home network. Specifically, the program is to output a control signal for switching an operation state of the electric machine which is designated as a control target by a user, according to a condition designated by the user.

The machine confirming program is a program which is used to automatically recognize the electric machine communicably connected to the

home server 10.

[0043]

The operation confirming program is a program which is used to inspect whether the operation state of the electric machine is normally switched when the electric machine is remotely controlled. Specifically, when the operation confirming program is executed, a designation operation for designating an electric machine as an inspection target becomes acceptable. When accepting the designation operation, the operation confirming program activates the above-mentioned machine control program, and the machine control program is caused to output the control signal to the electric machine which is designated as the inspection target. Thereafter, an inspector (for example, a builder) locally confirms whether the operation state of the electric machine is normally switched according to the control signal, and the operation confirming program accepts the confirmation results.

[0044]

Through a series of processes described above, the operation confirmation (that is, an inspection process to be described) is completed.

In addition, in the embodiment, the designation operation is performed using an inspection terminal (not illustrated). Then, when the designation operation is detected by the home server 10, the detection causes the operation confirming program to be executed. Further, while performing the operation confirmation, the operation confirming program lists the electric machines which are automatically recognized by the machine confirming program, and thus generates data (in other words, data for displaying the list of the electric machines as the target candidates of the operation confirmation) which is used to display the list in the inspection terminal.

[0045]

The display data generating program is a program which creates display data for displaying the power consumption of each electric machine in the house H in a display of the home PC 30 based on the measurement data received from the sensors 21 to 27.

[0046]

Making an explanation on the configuration of such a home server 10 again from a viewpoint of functions, as illustrated in Fig. 3, the home server 10 includes a machine ID data acquiring unit 101, a position ID data acquiring unit 102, an operation-confirmed data acquiring unit 103, a machine control unit 104, a storage unit 105, a measurement data acquiring unit 106, a data generating unit 107, and a data transmitting unit 108 as components.

[0047]

The machine ID data acquiring unit 101 acquires machine ID data for specifying an electric machine which is used in the house H, and is configured to include the CPU 10a, the ROM 10b, the RAM 10c, the communication interface 10d, and the above-mentioned machine confirming program. The machine ID data acquiring unit 101 makes communication with the electric machine which is disposed at a setting position (a position set as an arrangement position) in the house H, and thus acquires the machine ID data for specifying the electric machine.

[0048]

More specifically, when the electric machine is communicably connected to the home server 10, the electric machine is automatically recognized by the machine confirming program. In other words, when the electric machine is connected to the home server 10, the machine confirming program is executed, and the machine confirming program automatically

generates data (for example, data indicating a machine name, a model number, or the like) for specifying the electric machine connected to the home server 10. As a result, the machine ID data acquiring unit 101 acquires the machine ID data for the electric machine connected to the home server 10.

[0049]

The position ID data acquiring unit 102 acquires position ID data for specifying a setting position at which the electric machine specified by the machine ID data is disposed. The operation-confirmed data acquiring unit 103 acquires data indicating that the operation confirmation is completed, and more specifically data indicating an operation-confirmed date for the electric machine of which the operation confirmation is completed (in other words, the electric machine of which the operation state is normally switched according to the control signal in the case of the remote control).

The above two units (that is, the position ID data acquiring unit 102 and the operation-confirmed data acquiring unit 103) are both configured to include the CPU 10a, the ROM 10b, the RAM 10c, the communication interface 10d, and the above-mentioned operation confirming program.

[0050]

More specifically, when the operation confirmation is performed on each of the electric machines in the house H, the above-mentioned inspection terminal is connected to the home server 10 and a predetermined operation is performed by the inspection terminal, thereby activating the operation confirming program. When the operation confirming program is activated, first, data for displaying the list of the electric machines as the target candidates of the operation confirmation is generated by the data generating unit 107 to be described below. The data is developed by the inspection terminal so that an operation confirming screen illustrated in

Fig. 6 is drawn. In the operation confirming screen, as described above, the electric machine as the target candidate of the operation confirmation (in other words, the electric machine which is automatically recognized by the home server 10) is listed and displayed.

[0051]

Thereafter, in the inspection terminal with the operation confirming screen drawn, when one button B1 among a plurality of operation confirmation executing buttons B1 which are displayed in the operation confirming screen is pressed in order to designate the electric machine as the inspection target, the screen illustrated in Fig. 7 (hereinafter, the operation confirming screen for individual machine) is drawn as the operation confirming screen of the electric machine corresponding to the button B1 (more specifically, the electric machine which is displayed on the near left of the pressed operation confirmation executing button B1).

[0052]

In the operation confirming screen for individual machine, character information indicating the machine name of the electric machine designated as the inspection target, character information indicating the current operation state of the electric machine, and a control signal output button B2 for outputting the control signal to perform the operation confirmation are displayed. When the control signal output button B2 is pressed, a request for control execution such as switching the operation state displayed on the near left of the button B2 is made for the home server 10 (in detail, the machine control unit 104). The home server 10 outputs the control signal according to the request to the electric machine designated as the inspection target, and the electric machine receives the control signal through the home network.

[0053]

Herein, when the electric machine is a normal machine, the operation state is normally switched according to the control signal. In the embodiment, after pressing the control signal output button B2, the inspector oneself makes a confirmation on whether the operation state of the electric machine is normally switched according to the control signal at a place (that is, the setting position) where the electric machine is disposed.

[0054]

Then, in a case where it is confirmed that the operation state is normally switched according to the control signal, the inspector (for example, a builder of the house H) performs an input operation of the setting position which is set as the arrangement position of the electric machine, in the arrangement place input field T1 displayed in the operation confirming screen for individual machine. The input operation to the arrangement place input field T1 corresponds to an input operation of information indicating the setting position.

In addition, in the embodiment, the setting position is input in a manner of directly inputting the position in the arrangement place input field T1 using a keyboard or the like, but the invention is not limited thereto. The candidates of the setting position are displayed in a pull-down format, and the setting position may be input by selecting one from such candidates.

[0055]

At the time when the setting position is completely input, the inspector performs an operation of pressing a completion button B3 which is displayed in the operation confirming screen for individual machine. When such an operation is performed, data indicating the content input in the arrangement place input field T1 and data indicating a date and time (that is, the current time point) when the completion button B3 is pressed are

generated at the inspection terminal, and the data is transmitted to the home server 10.

[0056]

By the sequence described above, the position ID data acquiring unit 102 acquires data as the position ID data indicating the content input to the arrangement place input field T1, through the input operation to the arrangement place input field T1 by the inspector. Further, the operation-confirmed data acquiring unit 103 acquires data as operation-confirmed data indicating a date and time when the completion button B3 is pressed, through the pressing operation on the completion button B3 by the inspector.

[0057]

The machine control unit 104 controls the operation state of the electric machine used in the house H from a remote place, and outputs the control signal to the electric machine (the control target) through the home network. The machine control unit 104 is configured to include the CPU 10a, the ROM 10b, the RAM 10c, the communication interface 10d, and the above-mentioned machine control program.

[0058]

The storage unit 105 is mainly configured to include the ROM 10b and the RAM 10c, and is used to store the machine ID data acquired by the machine ID data acquiring unit 101, the position ID data acquired by the position ID data acquiring unit 102, and the operation-confirmed data acquired by the operation-confirmed data acquiring unit 103.

[0059]

Then, in the embodiment, the storage unit 105 stores the machine ID data, the position ID data, and the operation-confirmed data while associating the electric machine specified by the machine ID data, the

setting position specified by the position ID data, and the operation-confirmed date specified by the operation-confirmed data with each other.

In other words, in the embodiment, a correspondence relation of the machine name, the setting position which is set as the arrangement position, and the operation-confirmed date of each electric machine (strictly speaking, each electric machine which is connected to the home server 10 and automatically recognized) in the house H is stored in the storage unit 105.

[0060]

Furthermore, in the embodiment, the storing of such data described above is performed under construction of the house H. That is, the storage unit 105 of the home server 10 according to the embodiment stores the machine ID data, the position ID data, and the operation-confirmed data in process of constructing the house H while associating the electric machine specified by the machine ID data, the setting position specified by the position ID data, and the operation-confirmed date specified by the operation-confirmed data with each other.

[0061]

As described above, in the embodiment, at a stage before the house H is transferred to a user of the house H, since the position ID data is stored in the storage unit 105 of the home server 10 in advance, the user of the house H oneself saves trouble of acquiring the position ID data. Further, since the machine ID data and the position ID data are stored in the storage unit 105 in a state of associating the electric machine and a position (the setting position) which is set as the arrangement position, the user of the house H can exactly identify the place and the type of the electric machine which is disposed in the house H without trouble.

[0062]

In addition, the machine name, the arrangement place, and the operation-confirmed date of the operation-confirmed electric machine (in other words, a machine of which the machine ID data, the position ID data, and the operation-confirmed data are completely stored) are displayed in fields (in the case illustrated in Fig. 6, the display field of the air conditioner 1 and the display field of the light 3) corresponding to the electric machine in the operation confirming screen illustrated in Fig. 6.

[0063]

Further, in the embodiment, the inspector confirms whether the operation state of the electric machine is normally switched according to the control signal. Then, after confirming that the operation state of each electric machine is normally switched, the inspector inputs the setting position in the arrangement place input field T1 of the operation confirming screen for individual machine, and presses the completion button B3 again.

[0064]

By the sequence described above, the storage unit 105 stores the machine ID data and the position ID data while associating the normal machine of which the operation state is normally switched in the operation confirmation (in other words, the inspection process) among the electric machines specified by the machine ID data and a normal machine position where the normal machine is disposed among the setting positions specified by the position ID data.

[0065]

Therefore, at the time when the storage unit 105 completely stores the machine ID data and the position ID data of all the electric machines in the house H, it is confirmed whether the electric machines in the house H are the normal machines, and the arrangement positions of the respective electric machines are exactly identified. Then, finally, the house H in this

state can be appropriately transferred to the user.

[0066]

The measurement data acquiring unit 106 acquires the measurement data from each of the sensors 21 to 27. In addition, the measurement of the power consumptions by the sensors 21 to 27 are constantly measured at a predetermined time interval, and the measurement data is transmitted to the home server 10 whenever the measurement data is newly acquired. However, the measurement of the power consumption is not limited to a case where the measurement is normally performed, and the measurement may be performed only in a period of time when the power consumption of the entire house H is equal to or higher than a given value. Further, the transmission of the measurement data to the home server 10 is not limited to a case where the transmission is performed whenever the data is acquired. For example, once the measurement data is temporarily stored in the respective sensors 21 to 27, the transmission may be performed at the time when the home server 10 makes a request for the data transmission from the respective sensors 21 to 27.

[0067]

The data generating unit 107 generates data to be delivered from the home server 10, and is configured to include the CPU 10a, the ROM 10b, the RAM 10c, and various types of data generating programs.

Herein, the above-mentioned display data generating program is included in the programs of the data generating unit 107, and the data generating unit 107 generates display data for displaying the power consumption of each electric machine in the house H in the display of the home PC 30 based on the measurement data acquired by the measurement data acquiring unit 106.

Further, the above-mentioned operation confirming program is

included in the programs of the data generating unit 107, and when the operation confirming program is activated, the data generating unit 107 generates data (in other words, data for drawing the operation confirming screen illustrated in Fig. 6) for displaying a list of the electric machines as the target candidates of the operation confirmation.

[0068]

The data transmitting unit 108 transmits the data generated by the data generating unit 107 through the home network or the Internet 12, and is configured to include the CPU 10a, the ROM 10b, the RAM 10c, the communication interface 10d, and the above-mentioned communication program.

[0069]

In the embodiment, the power consumption of each electric machine in the house H can be displayed in the display of the home PC 30 by providing the measurement data acquiring unit 106, the data generating unit 107, and the data transmitting unit 108 in the home server 10.

In addition, in the embodiment, when generating the display data, the data generating unit 107 reads the machine ID data and the position ID data out of the storage unit 105, and calculates the display data based on the correspondence relation between the energy consuming equipment specified by the read-out machine ID data and the setting position specified by the read-out position ID data. That is, the display data generated by the data generating unit 107 is used to display the power consumptions of the electric machines measured by the sensors 21 to 27 in the user terminal in association with the positions where the electric machines are disposed.

[0070]

In such a configuration of generating the display data, the unique configuration of the system S such that the machine ID data and the

position ID data are stored while associating the machine name and the setting position of each electric machine becomes more significant.

Specifically, when the power consumption of the electric machine is displayed at a position in association with the position of the electric machine, it is necessary to exactly identify the place and the type of the electric machine which is disposed in the house H. Under such a circumstance, at a stage before the house H is transferred to the user of the house H, the acquiring of the position ID data and the storing of the machine ID data and the position ID data while associating the electric machine with the setting position become significant specifically for appropriately performing the displaying.

[0071]

<<First example of method for constructing system>>

Next, a first example of the method for constructing the system S will be described.

The construction of the system S proceeds along a flow illustrated in Fig. 4, and, first, begins with a layout examination (S001) such as a machine layout in the house H. In the process S001, the arrangement position (the setting position) of each of the electric machines used in the house H is determined.

[0072]

Next, according to the layout determined in the previous process S001, installation work of the electric machines and electric work such as wire connecting are performed (S002). In the process S002, the electric machine corresponding to the setting position determined in the previous process S001 is disposed, and a power line to the electric machine is laid. In addition, in the process S002, the home server 10 and the sensors 21 to 27 are further installed at predetermined positions in the house H.

[0073]

Next, a machine recognizing process in which the respective electric machines are automatically recognized by the home server 10 is performed by communicably connecting the respective electric machines disposed at the setting positions in the previous process S002 to the home server 10 (S003). As a result of the process S003, the home server 10 (in detail, the machine ID data acquiring unit 101) acquires the machine ID data of the respective electric machines.

[0074]

More specifically, in the process S003, wiring work for constructing the home network is performed. Therefore, the respective electric machines disposed at the setting positions in the house H are communicably connected to the home server 10. In this way, when the respective electric machines are connected to the home server 10, as described above, the home server 10 automatically recognizes the respective electric machines, and as a result, the machine ID data acquiring unit 101 acquires the machine ID data of the respective electric machines.

[0075]

Next, an inspection process in which the operation of the electric machine in the house H is confirmed is performed (S004). In the process S004, the home server 10 inspects whether the operation state of the electric machine is normally switched according to the control signals output to the electric machines which are disposed at the respective setting positions in the house H.

[0076]

Herein, a flow of the inspection process S004 will be described in detail.

First, when the inspection process S004 starts, the above-mentioned

inspection terminal is connected to the home server 10 and a predetermined operation is performed by the inspection terminal, thereby activating the operation confirming program. When the operation confirming program is activated, data for displaying the list of the electric machines as the target candidates of the operation confirmation is generated by the data generating unit 107. The data is developed by the inspection terminal so that an operation confirming screen illustrated in Fig. 6 is drawn. In the operation confirming screen, as described above, the electric machine which is automatically recognized by the home server 10 and becomes the target candidate of the operation confirmation is listed and displayed.

[0077]

Thereafter, in the inspection terminal with the operation confirming screen drawn, when the inspector selectively presses one button B1 among a plurality of operation confirmation executing buttons B1 which are displayed in the operation confirming screen in order to designate the electric machine as the inspection target, the operation confirming screen for individual machine illustrated in Fig. 7 is drawn as the operation confirming screen of the electric machine corresponding to the button B1.

[0078]

Then, when the inspector presses the control signal output button B2 in the operation confirming screen for individual machine, the inspection terminal requests the home server 10 for control execution, the home server 10 (in detail, the machine control unit 104) which receives the request outputs the control signal for switching the operation state displayed on the near left of the button B2 toward the electric machine designated as the inspection target (S011 in Fig. 5).

[0079]

After pressing the control signal output button B2, the inspector goes

to a place where the electric machine designated as the inspection target is disposed and confirms whether the operation state of the electric machine is normally switched. Herein, when the electric machine designated as the inspection target is a normal machine, the electric machine receives the control signal through the home network. Since the operation state is normally switched according to the control signal (in Fig. 5, Yes in S012), the inspector determines that the operation confirmation on the electric machine is completed. On the contrary, in the case where the operation state of the electric machine is not normally switched due to some reasons such as failure in the apparatus itself (in Fig. 5, No in S012), the apparatus is reinstalled (S013 in Fig. 5) and then the inspection is performed again.

[0080]

Thereafter, the inspector performs, for the electric machine determined as an operation-confirmed machine, an input operation of the setting position of the electric machine in the arrangement place input field T1 which is displayed in the operation confirming screen for individual machine (S014 in Fig. 5).

[0081]

Then, at the time when the setting position is completely input, the inspector presses the completion button B3 displayed in the operation confirming screen for individual machine (S015 in Fig. 5). When such a pressing operation is performed, data indicating the content input in the arrangement place input field T1 and data indicating a date and time (that is, the current time point) when the completion button B3 is pressed are generated at the inspection terminal, and the data is transmitted to the home server 10. As a result, the position ID data acquiring unit 102 acquires the data indicating the content input in the arrangement place input field T1 as the position ID data, and the operation-confirmed data

acquiring unit 103 acquires the data indicating a date and time when the completion button B3 is pressed as the operation-confirmed data.

[0082]

In the example (the first example) as described above, in the process in which the home server 10 acquires the position ID data, the home server 10 acquires the position ID data through the input operation to the arrangement place input field T1 by the inspector.

[0083]

After the position ID data and the operation-confirmed data are acquired, the storage unit 105 in the home server 10 stores the machine ID data, the position ID data, and the operation-confirmed data (S016 in Fig. 5). At this time, the storage unit 105 stores the machine ID data, the position ID data, and the operation-confirmed data for the electric machine of which the operation confirmation is completed, such that the machine name, the arrangement position, and the operation-confirmed date are associated with each other.

[0084]

As described above, in the embodiment, the process S016 in which the storage unit 105 stores the machine ID data and the position ID data is performed on the electric machine of which the operation confirmation is completed. That is, in the embodiment, in the process S016 in which the storage unit 105 of the home server 10 stores the machine ID data and the position ID data, the storage unit 105 stores the machine ID data and the position ID data while associating the normal machine of which the operation state is normally switched in the inspection process among the electric machines specified by the machine ID data, and the normal machine position at which the normal machine is disposed among the setting positions specified by the position ID data.

[0085]

When the above processes are completed, the screen drawn in the inspection terminal is switched from the operation confirming screen for individual machine to the operation confirming screen again. Then, in the operation confirming screen after the switching, the machine name, the setting position which is set as the arrangement position, and the operation-confirmed date of the operation-confirmed electric machine (in other words, the electric machine of which the machine ID data, the position ID data, and the operation-confirmed data are completely stored) are displayed in the display field corresponding to the electric machine (see Fig. 6).

[0086]

When a series of processes described above is performed on all the electric machines disposed in the house H, and the operation confirmation is completed for all the electric machines (S017 in Fig. 5), the inspection process is completed. Along with the completion of the inspection process, the system construction is ended.

Then, after all the acceptance inspection processes of the house H are ended including with the inspection process, as illustrated in Fig. 4, the house H is transferred to a user (S005).

[0087]

In the embodiment as described above, as illustrated in Fig. 4, a series of processes (specifically, the above-described processes S001 to S004) of constructing the system S is performed as a construction process of the house H. Specifically, a process of disposing the electric machines at the setting positions in the house H, a process of acquiring the machine ID data by the home server 10 (in detail, the machine ID data acquiring unit 101), a process of acquiring the position ID data by the home server 10 (in detail, the position ID data acquiring unit 102), and a process of storing the

machine ID data and the position ID data by the home server 10 (in detail, the storage unit 105) are performed as the construction process of the house H.

[0088]

As in the example, the acquisition of the machine ID data, the position ID data, and the operation-confirmed data and the storing of these pieces of data are performed in advance at a stage before the house H is transferred to the user of the house H, the user of the house H saves trouble of acquiring the position ID data. Further, since the machine ID data and the position ID data are stored in the storage unit 105 in a state where the electric machine is associated with the setting position set as the arrangement position, it is possible for the user of the house H to exactly identify the type of the electric machine and the position in the house H without necessitating any trouble.

[0089]

Furthermore, in the embodiment, the inspection process in which the operation state of the electric machine is inspected whether it is normally switched according to the control signal output from the home server 10 (specifically, the machine control unit 104) toward the electric machine is also performed as the construction process of the house H (in other words, it is performed at a stage before the house H is transferred to the user of the house H).

[0090]

Then, in the process of storing the machine ID data and the position ID data by the home server 10, the storage unit 105 stores the machine ID data and the position ID data while associating the normal machine of which the operation state is normally switched in the inspection process among the electric machines specified by the machine ID data, and the

normal machine position at which the normal machine is disposed among the setting positions specified by the position ID data.

As a result, at the time when the storage unit 105 ends the storing of the machine ID data and the position ID data in association with the machine name and the setting position (the arrangement position) for all the electric machines in the house H, the electric machine in the house H is confirmed whether it is the normal machine, and the arrangement position of each electric machine comes to be identified. Then, finally, the house H in this state can be appropriately transferred to the user.

[0091]

<<Second example of method for constructing system>>

Next, a second example of the method for constructing the system S will be described. In addition, in the following description, the same content as that of the above-mentioned first example may not be described.

In the above-mentioned first example, at the time of the operation confirmation of the electric machine, the inspector manually inputs the character information indicating the setting position at which the electric machine is disposed so as to acquire the position ID data through the inspection terminal (specifically, the arrangement place input field T1 in the operation confirming screen for individual machine).

[0092]

In this regard, in the second example, drawing data is created to draw a floor plan of the house H in which the setting position set as the arrangement position of the electric machine is denoted, and the position ID data is acquired by analyzing the drawing data to specify a positional relation of the setting position in the floor plan.

[0093]

Making an explanation in detail, in the second example, the position

ID data acquiring unit 102 of the home server 10 includes the CPU 10a, the ROM 10b, the RAM 10c, the communication interface 10d, and a drawing analysis program.

[0094]

The drawing analysis program is a program which analyzes the above-described drawing data and specifies the positional relation of the setting position which is set as the arrangement position of the electric machine in the floor plan.

Hereinafter, a drawing analysis process performed by the drawing analysis program will be described with reference to Fig. 9. The floor plan illustrated in Fig. 9 schematically illustrates the first floor of the house H. In addition, in order to help with understanding, only the setting position of the air conditioner 1 among the electric machines used in the house H is denoted in the floor plan illustrated in Fig. 9. In the following, a case in which the positional relation is specified on the setting position of the air conditioner 1 will be described as a specific example.

[0095]

In the embodiment, the drawing data is for drawing the floor plan on an X-Y plane as illustrated in Fig. 9. Therefore, the occupancy space of each room in the house H (strictly speaking, the first floor of the house H) and the setting position at which the electric machine is disposed can be specified using coordinates. For example, in the floor plan illustrated in Fig. 9, the occupancy space of a living room is specified in a range from the coordinates (X1, Y1) to the coordinates (X2, Y2), and the setting position of the air conditioner 1 is specified in a range from the coordinates (X3, Y1) to the coordinates (X4, Y3).

[0096]

Then, the drawing data is analyzed to specify the coordinates

indicating the occupancy range of each room and the coordinates indicating the setting position of the air conditioner 1, and thus the occupancy space in the room to which the setting position of the air conditioner 1 belongs is specified. In other words, the positional relation of the setting position which is set as the arrangement position of the air conditioner 1 is specified in the floor plan. In this way, as a result of specifying the positional relation in the floor plan, the position ID data for specifying the setting position of the air conditioner 1 is generated by the home server 10, and the position ID data is acquired.

[0097]

In the second example as described above, the home server 10 (in detail, the position ID data acquiring unit 102) analyzes the drawing data, and the positional relation of the setting position at which the electric machine is disposed in the floor plan is specified, so that the position ID data is acquired to specify the setting position. Therefore, since the position ID data can be automatically acquired through the analysis on the drawing data by the home server 10, the position ID data in the second example can be acquired more easily compared to that in the first example.

[0098]

In addition, the sequence for analyzing the above drawing data is an example of the sequence for specifying the positional relation of the setting position of the electric machine in the floor plan. Of course, sequences other than the above sequence may be employed to specify the positional relation.

[0099]

Next, a flow in the method for constructing a system according to the second example will be described. Even in the second example, as illustrated in Fig. 8, the construction begins with a layout examination

(S021) such as a machine layout in the house H. In the process S021, the builder determines the setting position of each electric machine in the house H. Thereafter, the floor plan of the house H is created according to the layout examined in the previous process S021 (S022). In the floor plan, the setting position of each electric machine used in the house H is denoted.

[0100]

Next, the installation work for disposing the electric machines at the setting positions in the house H according to the floor plan and the electric work such as wire connecting are performed (S023), and the home server 10 and the sensors 21 to 27 are further installed in the house H. Thereafter, the respective electric machines disposed at the setting positions in the previous process S023 are communicably connected to the home server 10, and the home server 10 performs a machine recognizing process to automatically recognize the respective electric machines (S024). Through the process S024, the home server 10 (in detail, the machine ID data acquiring unit 101) acquires the machine ID data of the respective electric machines.

[0101]

Next, the drawing data for drawing the above-described floor plan is acquired, and the drawing data is analyzed according to the above-described sequence, so that the positional relation of the setting position at which the electric machine is disposed in the floor plan is specified (S025). By the process S025, the home server 10 (in detail, the position ID data acquiring unit 102) obtains the position ID data for specifying the setting positions of the respective electric machines.

[0102]

In addition, in the embodiment, the drawing data is stored in a server owned by the builder, and when the drawing data is analyzed, the home

server 10 downloads the drawing data from the server through the Internet 12 to acquire the drawing data. However, the drawing data may be acquired by another acquisition method; for example, the drawing data may be acquired by reading the floor plan using an image reading apparatus such as a scanner at a construction site (that is, a building site of the house H).

[0103]

Next, an inspection process is performed to confirm the operation of the electric machine in the house H (S026). In the process S026, it is inspected whether the operation state of the electric machine is normally switched according to the control signal which is output from the home server 10 to the electric machine disposed at each setting position. The sequence is substantially the same as that in the first example.

[0104]

In other words, even in the inspection process S026 of the second example, when the process starts, the inspection terminal is connected to the home server 10, and the operation confirming program which is stored in the home server 10 is activated from the inspection terminal. When the operation confirming program is activated, data for displaying the list of the electric machines as the target candidates of the operation confirmation is generated by the data generating unit 107. The data is developed by the inspection terminal so that an operation confirming screen illustrated in Fig. 11 is drawn. In the operation confirming screen, as in the case with the first example, the electric machine which is automatically recognized by the home server 10 and becomes the target candidate of the operation confirmation is listed and displayed.

[0105]

In addition, in the second example unlike the first example, the

machine name and the arrangement place are already displayed in the display field of each electric machine in the operation confirming screen from the beginning of the inspection process S026 (see Fig. 11).

[0106]

Thereafter, when the inspector selectively presses one button B1 among a plurality of operation confirmation executing buttons B1 which are displayed in the operation confirming screen in order to designate the electric machine as the inspection target, the operation confirming screen for individual machine illustrated in Fig. 12 is drawn as the operation confirming screen of the electric machine corresponding to the button B1.

[0107]

When the inspector presses the control signal output button B2 in the operation confirming screen for individual machine, the inspection terminal makes a request for control execution of the home server 10, the home server 10 (more specifically, the machine control unit 104) which receives the request outputs the control signal for switching the operation state displayed on the near left of the button B2 toward the electric machine designated as the inspection target (S031 in Fig. 10). After pressing the control signal output button B2, the inspector goes to a place where the electric machine designated as the inspection target is disposed and confirms whether the operation state of the electric machine is normally switched.

[0108]

Herein, when the electric machine designated as the inspection target is a normal machine, the electric machine receives the control signal through the home network. The operation state is normally switched according to the control signal. In such a case (in Fig. 10, Yes in S032), the inspector determines that the operation confirmation on the electric

machine is completed, and presses the completion button B3 which is displayed in the operation confirming screen for individual machine (S034 in Fig. 10). When such operations are performed, data indicating a date and time (that is, the current time point) when the completion button B3 is pressed is generated in the inspection terminal, and the data is transmitted to the home server 10. As a result, the operation-confirmed data acquiring unit 103 acquires the data indicating a date and time when the completion button B3 is pressed as the operation-confirmed data.

[0109]

After the operation-confirmed data is acquired, the storage unit 105 of the home server 10 stores the machine ID data, the position ID data, and the operation-confirmed data in association with the machine name, the arrangement position, and the operation-confirmed date of the electric machine of which the operation confirmation is completed (S035 in Fig. 10).

[0110]

On the other hand, in the case where the operation state of the electric machine is not normally switched even when the control signal is output toward the electric machine designated as the inspection target (in Fig. 10, No in S032), the apparatus is reinstalled (S033 in Fig. 10) and then the inspection is performed again.

[0111]

When the above processes are completed, the screen drawn in the inspection terminal is switched from the operation confirming screen for individual machine to the operation confirming screen. Then, in the operation confirming screen after the switching, the operation-confirmed date of the operation-confirmed electric machine is displayed newly in the display field corresponding to the electric machine.

[0112]

When a series of processes described above is performed on all the electric machines disposed in the house H, and the operation confirmation is completed for all the electric machines (S036 in Fig. 10), the inspection process is completed. Along with the completion of the inspection process, the system construction is ended.

Then, after all the acceptance inspection processes of the house H are ended including with the inspection process, the house H is transferred to a user (S027).

[0113]

Even in the example (the second example) as described above, a series of processes (specifically, the above-described processes S021 to S026) of constructing the system S is performed as a construction process of the house H as illustrated in Fig. 8. That is, even in the example, the acquisition of the machine ID data, the position ID data, and the operation-confirmed data and the storing of these pieces of data are performed in advance at a stage before the house H is transferred to the user of the house H. As a result, the user of the house H saves trouble of acquiring the position ID data. Further, since the machine ID data and the position ID data is stored in the storage unit 105 in a state where the electric machine is associated with the setting position set as the arrangement position, it is possible for the user of the house H to exactly identify the type of the electric machine and the position in the house H without necessitating any trouble.

[0114]

<<Other embodiments>>

In the above embodiment, the method for constructing the control system and the control system of the invention has been described by giving an example. However, the above embodiment is given in order to help with understanding of the invention, and the invention is not limited thereto.

The invention can be changed and improved without departing from the spirit thereof, and it is a matter of course that the equivalents are included in the invention.

[0115]

Further, in the above embodiment, in process of constructing the system, the inspection process is performed to inspect whether the operation state of the electric machine is normally switched according to the control signal from the home server 10. However, the invention is not limited the above configuration, and the inspection process may not be performed in process of constructing the system.

[0116]

Further, in the above embodiment, the electric machines in the house H are communicably connected to the home server 10. The home server 10 automatically recognizes the electric machines and acquires the machine ID data. However, the sequence of acquiring the machine ID data is not limited to the above sequence. For example, another sequence may be applied such that the inspector inputs the machine name, the model number, and the like of the electric machine through the inspection terminal at the time of the operation confirmation, and transmits the data indicating the input information from the inspection terminal to the home server 10, thereby acquiring the data as the machine ID data.

[0117]

Further, in the above embodiment, the inspector inputs the setting position through the inspection terminal, and the drawing data for drawing the floor plan denoted with the setting position is analyzed by the home server 10 in order to acquire the position ID data for specifying the setting position which is set as the arrangement position of the electric machine. However, the sequence of acquiring the position ID data is not limited to the

above sequence. For example, another sequence may be applied such that the home server 10 communicates wirelessly with the electric machine, and the setting position is obtained based on a reception intensity of the output signal from the electric machine to acquire the position ID data.

[0118]

Further, in the above embodiment, as an example of the control system, a system which remotely controls the electric machine used in a building (the house H in the above embodiment) has been described, but the invention is not limited thereto. The invention can also be applied to a system of which the control target is energy consuming equipment which consumes energy (for example, the quantity of gas or tap water) other than electric energy.

Reference Signs List

[0119]

S system

H house

1, 2 air conditioner

3, 4 light

5 water heater

6 contact device

7 multi-functional toilet

10 home server

10a CPU

10b ROM

10c RAM

10d communication interface

11 router

12 Internet

21, 22, 23, 24, 25, 26, 27 sensor

30 home PC

101 machine ID data acquiring unit

102 position ID data acquiring unit

103 operation-confirmed data acquiring unit

104 machine control unit

105 storage unit

106 measurement data acquiring unit

107 data generating unit

108 data transmitting unit

B1 operation confirmation executing button

B2 control signal output button

B3 completion button

T1 arrangement place input field

CLAIMS

1. A method for constructing a control system that controls energy consuming equipment used in a building, the method performs, in a construction process of the building at a stage before the building is transferred to the user of the building:

a step of disposing the energy consuming equipment at a setting position in the building;

a step of acquiring, by using a control apparatus that makes communication with the energy consuming equipment to control an operation state of the energy consuming equipment, machine ID data for specifying the energy consuming equipment disposed at the setting position;

a step of acquiring, by using the control apparatus, position ID data for specifying the setting position at which the energy consuming equipment specified by the machine ID data is disposed;

a step of storing, by using the control apparatus, the machine ID data and the position ID data while associating the energy consuming equipment specified by the machine ID data with the setting position specified by the position ID data; and

a step of inspecting whether the operation state of the energy consuming equipment is normally switched according to a control signal output by using the control apparatus toward the energy consuming equipment,

wherein in the step of disposing the energy consuming equipment at the setting position, the energy consuming equipment is disposed at the setting position according to a floor plan of the building in which the setting position is denoted, and

wherein in the step of acquiring the position ID data by using the

control apparatus, the control apparatus analyzes drawing data for drawing the floor plan, and specifies a positional relation of the setting position in the floor plan to acquire the position ID data, and

wherein in the step of inspecting, an operation-confirmed data is acquired for the energy consuming equipment of which the operation state is normally switched according to the control signal, and

wherein in the step of storing the machine ID data and the position ID data by using the control apparatus, the control apparatus stores the machine ID data and the position ID data and the operation-confirmed data while associating a normal machine of which the operation state is normally switched in the step of inspecting among the energy consuming equipment specified by the machine ID data with a normal machine position at which the normal machine is disposed among the setting positions specified by the position ID data and an operation-confirmed date.

2. A method for constructing a control system that controls energy consuming equipment used in a building, the method performs, in a construction process of the building at a stage before the building is transferred to the user of the building:

a step of disposing the energy consuming equipment at a setting position in the building;

a step of acquiring, by using a control apparatus that makes communication with the energy consuming equipment to control an operation state of the energy consuming equipment, machine ID data for specifying the energy consuming equipment disposed at the setting position;

a step of acquiring, by using the control apparatus, position ID data for specifying the setting position at which the energy consuming equipment specified by the machine ID data is disposed;

a step of storing, by using the control apparatus, the machine ID data and the position ID data while associating the energy consuming equipment specified by the machine ID data with the setting position specified by the position ID data; and

a step of inspecting whether the operation state of the energy consuming equipment is normally switched according to a control signal output by using the control apparatus toward the energy consuming equipment,

wherein in the step of acquiring the position ID data by using the control apparatus, the control apparatus acquires the position ID data through an input operation of information indicating the setting position, and

wherein in the step of inspecting, an operation-confirmed data is acquired for the energy consuming equipment of which the operation state is normally switched according to the control signal, and

wherein in the step of storing the machine ID data and the position ID data by using the control apparatus, the control apparatus stores the machine ID data and the position ID data and the operation-confirmed data while associating a normal machine of which the operation state is normally switched in the step of inspecting among the energy consuming equipment specified by the machine ID data with a normal machine position at which the normal machine is disposed among the setting positions specified by the position ID data and an operation-confirmed date.

3. A control system that controls energy consuming equipment used in a building, comprising:

the energy consuming equipment that is disposed at a setting position in the building; and

a control apparatus that makes communication with the energy consuming equipment to control an operation state of the energy consuming equipment,

wherein the energy consuming equipment is disposed at the setting position according to a floor plan of the building in which the setting position is denoted,

wherein the control apparatus includes

a machine ID data acquiring unit that acquires machine ID data for specifying the energy consuming equipment disposed at the setting position,

a position ID data acquiring unit that acquires position ID data for specifying the setting position at which the energy consuming equipment specified by the machine ID data is disposed,

a storage unit that stores the machine ID data and the position ID data, and

an operation-confirmed data acquiring unit that acquires operation-confirmed data for the energy consuming equipment of which the operation state is normally switched according to a control signal in a step of inspecting whether the operation state of the energy consuming equipment is normally switched according to the control signal output by using the control apparatus toward the energy consuming equipment,

wherein the position ID data acquiring unit analyzes drawing data for drawing the floor plan, and specifies a positional relation of the setting position in the floor plan to acquire the position ID data, and

wherein in a process of constructing the building at a stage before the building is transferred to the user of the building, the storage unit stores the machine ID data and the position ID data and the operation-confirmed data while associating a normal machine of which the operation state is normally switched in the step of inspecting among the energy consuming

equipment specified by the machine ID data with a normal machine position at which the normal machine is disposed among the setting positions specified by the position ID data and an operation-confirmed date.

4. A control system that controls energy consuming equipment used in a building, comprising:

the energy consuming equipment that is disposed at a setting position in the building; and

a control apparatus that makes communication with the energy consuming equipment to control an operation state of the energy consuming equipment,

wherein the control apparatus includes

a machine ID data acquiring unit that acquires machine ID data for specifying the energy consuming equipment disposed at the setting position,

a position ID data acquiring unit that acquires position ID data for specifying the setting position at which the energy consuming equipment specified by the machine ID data is disposed,

a storage unit that stores the machine ID data and the position ID data, and

an operation-confirmed data acquiring unit that acquires operation-confirmed data for the energy consuming equipment of which the operation state is normally switched according to a control signal in a step of inspecting whether the operation state of the energy consuming equipment is normally switched according to the control signal output by using the control apparatus toward the energy consuming equipment,

wherein the position ID data acquiring unit acquires the position ID data through an input operation of information indicating the setting position, and

wherein in a process of constructing the building at a stage before the building is transferred to the user of the building, the storage unit stores the machine ID data, the position ID data and the operation-confirmed data while associating a normal machine of which the operation state is normally switched in the step of inspecting among the energy consuming equipment specified by the machine ID data with a normal machine position at which the normal machine is disposed among the setting position specified by the position ID data and an operation-confirmed date.

5. The control system that controls the energy consuming equipment according to claim 3 or 4, further comprising:

a sensor that measures an energy consumption of the energy consuming equipment; and

a display device that displays information indicating data from the control apparatus,

wherein the control apparatus includes a data generating unit that generates display data for displaying the energy consumption of the energy consuming equipment measured by the sensor in the display device in association with the setting position at which the energy consuming equipment is disposed, and

wherein the data generating unit reads the machine ID data and the position ID data out of the storage unit, and generates the display data based on a correspondence relation between the energy consuming equipment specified by the read-out machine ID data and the setting position specified by the read-out position ID data.