

DESCRIPTION

CONTROL METHOD AND INFORMATION PROCESSING SYSTEM

5 TECHNICAL FIELD

[0001]

The present invention relates to a method for controlling an information terminal which displays, for example, an image for controlling an electrical device, and to an information processing system.

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BACKGROUND ART

[0002]

Conventionally, a system is known for controlling an electrical device such as a home appliance. For example, Patent Literature (PTL) 1 discloses a communication system which allows a person who lives in a house to know, from outside the house, the result of control performed by a controller on a control target in the house.

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Citation List

20 Patent Literature

[0003]

PTL 1: Japanese Unexamined Patent Application Publication No. 2015-053585

SUMMARY OF THE INVENTION

25 TECHNICAL PROBLEM

[0004]

There is a case where a user controls an electrical device by performing

an operation on the display of an information terminal, such as a smartphone. In such a case, a control image, in which buttons and the like are arranged, is displayed on the display. Such a control image, however, may be displayed incorrectly depending on the model of the information terminal.

5 [0005]

Embodiments of the present invention provide a control method and an information processing system each capable of reducing an incorrect display of an image, such as a control image.

10 SOLUTIONS TO PROBLEM

[0006]

According to a first aspect of the present invention, there is provided a method for controlling an information terminal which communicates with an information processing device the information terminal includes a display and
15 a touch panel disposed on the display, the method including: detecting, by the touch panel, an operation performed by a user; transmitting, to the information processing device, a request for image information of an image in which all image parts forming the image are arranged in advance, the image being displayed according to the operation detected; receiving the image information
20 from the information processing device; and displaying the image on the display based on the image information received, wherein the image is a control image used by the user to control an electrical device.

[0007]

According to a second aspect of the present invention, there is provided
25 a method for controlling an information processing device which communicates with an information terminal, the method including: obtaining, from the information terminal, a request for image information for displaying, on a display of the information terminal, an image in which all image parts forming the image are arranged in advance; generating the image information
30 according to the request obtained; and transmitting, to the information

terminal, the image information generated, wherein the image is a control image used by an user to control an electrical device.

[0008]

Disclosed herein is a method for controlling an information processing
5 device which communicates with a first information terminal and a second
information terminal. The method includes: obtaining, from the first
information terminal, a request for first image information for displaying, on a
first display of the first information terminal, a first image in which all image
parts forming the first image are arranged in advance; generating the first
10 image information according to the request obtained; generating second image
information different from the first image information according to the request
obtained; transmitting, to the first information terminal, the first image
information generated; and transmitting, to the second information terminal,
the second image information generated, wherein the second image information
15 is information for displaying, on a second display of the second information
terminal, a second image in which all image parts forming the second image are
arranged in advance.

[0009]

According to a third aspect of the present invention, there is provided
20 a program for causing a computer to execute any one of the methods described
above.

[0010]

According to a fourth aspect of the present invention, there is provided
an information processing system which communicates with an information
25 terminal, the information processing system including: an obtainment unit
which obtains, from the information terminal, a request for image information
for displaying, on a display of the information terminal, an image in which all
image parts forming the image are arranged in advance; a generator which
generates the image information according to the request obtained; and a
30 transmitter which transmits, to the information terminal, the image

information generated, wherein the image is a control image used by an user to control an electrical device.

ADVANTAGEOUS EFFECT OF INVENTION

5 [0011]

A control method and an information processing system according to embodiments of the present invention each is capable of reducing an incorrect display of an image, such as a control image.

10 BRIEF DESCRIPTION OF DRAWINGS

[0012]

[FIG. 1]

FIG. 1 is a block diagram illustrating a configuration of a device control system according to an embodiment.

15 [FIG. 2]

FIG. 2 is an external view of devices forming the device control system.

[FIG. 3]

FIG. 3 illustrates a control image displayed on a display of an information terminal.

20 [FIG. 4]

FIG. 4 illustrates a control image in which image parts are incorrectly positioned.

[FIG. 5]

FIG. 5 illustrates a control image in which image parts are correctly

25

positioned.

[FIG. 6]

FIG. 6 is a flowchart of operational example 1 of the device control system according to the embodiment.

5 [FIG. 7]

FIG. 7 is a flowchart of operational example 2 of the device control system according to the embodiment.

[FIG. 8]

FIG. 8 is a flowchart of an operation for setting a child lock.

10 [FIG. 9]

FIG. 9 illustrates an example of an image for setting the child lock.

[FIG. 10]

FIG. 10 is a flowchart of operational example 3 of the device control system according to the embodiment.

15 [FIG. 11]

FIG. 11 illustrates an example of an image indicating that the child lock is ON.

[FIG. 12]

FIG. 12 is a flowchart of operational example 4 of the device control system according to the embodiment.

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[FIG. 13]

FIG. 13 is a flowchart of operational example 5 of the device control system according to the embodiment.

[FIG. 14]

25 FIG. 14 illustrates an example of a control image displayed on a control terminal.

[FIG. 15]

FIG. 15 illustrates an example of a display image displayed on a dedicated display terminal.

[FIG. 16]

FIG. 16 is a flowchart of an operation for setting pairing.

5 [FIG. 17]

FIG. 17 is a flowchart of operational example 6 of the device control system according to the embodiment.

[FIG. 18]

FIG. 18 is a flowchart of operational example 7 of the device control
10 system according to the embodiment.

DESCRIPTION OF EXEMPLARY EMBODIMENT

[0013]

Hereinafter, an embodiment will be specifically described with
15 reference to the drawings. The embodiment below shows a general or specific example. The numerical values, shapes, materials, structural elements, the arrangement and connection of the structural elements, steps, and the order of the steps etc. shown in the following embodiment are mere examples, and therefore do not limit the present invention. Moreover, among the structural
20 elements in the following embodiment, structural elements not recited in any one of the independent claims defining the most generic concept are described as arbitrary structural elements.

[0014]

Note that the respective figures are schematic diagrams and are not
25 necessarily precise illustrations. Additionally, like reference signs indicate like elements in the drawings, and overlapping descriptions thereof may be omitted or simplified.

[0015]

(Embodiment)

[Overall Configuration]

The following describes a configuration of a device control system
5 according to an embodiment. FIG. 1 is a block diagram illustrating a
configuration of a device control system according to the embodiment. FIG. 2
is an external view of devices forming the device control system.

[0016]

As illustrated in FIG. 1 and FIG. 2, device control system 100 includes
10 information processing device 10, one or more information terminals, and air
conditioner 30. Although information terminal 20, information terminal 20a
and information terminal 20b are illustrated in FIG. 1 and FIG. 2 as one or
more information terminals, the number of the information terminals is not
particularly limited. It is acceptable that device control system 100 includes
15 at least one information terminal. In device control system 100, information
processing device 10 is a base unit, and each of the one or more information
terminals is a slave unit.

[0017]

Device control system 100 is provided in a building such as a house, and
20 is a system which controls an electrical device in the building. In the present
embodiment, air conditioner 30 is an electrical device which is the control
target. The control target, however, may be any other electrical device such as
a floor heating device or lighting equipment. Moreover, device control system
100 may include a plurality of electrical devices (air conditioners 30).

25 [0018]

In device control system 100, a plurality of information terminals
receive control images from information processing device 10. FIG. 3

illustrates a control image displayed on display 21b of information terminal 20b.

[0019]

There is a method in which information terminal 20b receives a plurality of image parts forming a control image from information processing device 10, and the control image is displayed by the plurality of image parts being arranged on information terminal 20b. In the method, the size of the display (aspect ratio), the display algorithm and the like differ depending on the model (type) of the information terminal. Accordingly, even if the image information of the control image can be properly displayed on display 21b of information terminal 20b as illustrated in FIG. 3, the image parts may be incorrectly positioned on information terminal 20. FIG. 4 illustrates a control image in which the image parts are incorrectly positioned.

[0020]

When the image information of the control image which can be properly displayed on information terminal 20b is used on information terminal 20, as illustrated in FIG. 4, the image parts, such as buttons, may be incorrectly positioned.

[0021]

In order to reduce such a problem, the administrator of information processing device 10 performs a test to see whether or not control images are correctly displayed every time new models of information terminals are available, and performs maintenance such as modifying algorithms as necessary. The burden of such maintenance has increased.

[0022]

In contrast, device control system 100 is capable of reducing the maintenance burden as described above, as well as reducing that a control image

is incorrectly displayed on display 21 of information terminal 20. For example, as illustrated in FIG. 5, device control system 100 is capable of correctly displaying a control image on display 21. FIG. 5 illustrates a control image in which image parts are correctly positioned.

5 [0023]

Hereinafter, respective structural elements of device control system 100 will be described. In the following description, a plurality of information terminals have almost the same structure, and thus, only information terminal 20 will be described in detail.

10 [0024]

[Information Processing Device]

First, information processing device 10 will be described with reference to FIG. 1 and FIG. 2. Information processing device 10 provides control images to information terminals. As illustrated in FIG. 2, in the present
15 embodiment, information processing device 10 is a so-called home energy management system (HEMS) controller. However, the specific aspects of information processing device 10 are not particularly limited. Information processing device 10 may be, for example, a server device which communicates with information terminal 20 via the internet, a personal computer, a
20 smartphone, or a tablet terminal. Information processing device 10 includes first communication unit 11, first controller 12, and first storage 13.

[0025]

First communication unit 11 is a communication circuit (communication module) for communicating with information terminal 20 and
25 air conditioner 30. In the present embodiment, first communication unit 11 wirelessly communicates with second communication unit 24 of information

terminal 20 and a communication unit (not illustrated) included in air conditioner 30.

[0026]

First communication unit 11 is, for example, a communication circuit
5 which conforms with a communication standard such as Bluetooth (registered
trademark) or wireless local area network (WLAN). Note that the specific
aspects of first communication unit 11 are not particularly limited. First
communication unit 11 may be, for example, a universal asynchronous receiver
transmitter (UART) circuit which performs weak wireless communication.
10 Moreover, when the communication method used between first communication
unit 11 and information terminal 20 is different from the communication
method used between first communication unit 11 and air conditioner 30, first
communication unit 11 may include a plurality of types of communication
circuits.

15 [0027]

Moreover, first communication unit 11 is an example of an obtainment
unit. Under the control of first controller 12, first communication unit 11
obtains (receives), from information terminal 20, a request for image
information for displaying a control image on display 21 of information
20 terminal 20. Moreover, first communication unit 11 is an example of a
transmitter. Under the control of first controller 12, first communication unit
11 transmits the image information generated by first controller 12 to
information terminal 20.

[0028]

25 First controller 12 is a control device which performs various types of
control in information processing device 10, such as a communication control of
first communication unit 11. Moreover, first controller 12 is an example of a

generator, and generates image information according to the request for the image information obtained by first communication unit 11. First controller 12 is specifically a microcomputer, but may be realized by a processor or a dedicated circuit.

5 [0029]

The image information generated by first controller 12 is image information for displaying, on display 21 of information terminal 20, a control image in which all image parts forming the control image are arranged in advance. In other words, first controller 12 generates image information of a single (one) control image in which all image parts are arranged in advance. Information terminal 20 which has received such image information is only required to display the single control image on display 21 based on the image information. In order to display the control image, information terminal 20 does not need to perform processing for arranging the image parts forming the control image. With such image information, it is possible to reduce that a control image is incorrectly displayed on display 21 of information terminal 20.

[0030]

Note that the image parts refer to elements forming one control image, and include, for example, a background image and buttons.

20 [0031]

First storage 13 stores, for example, a control program executed by first controller 12, a plurality of types of image information items, a plurality of image parts forming a control image, and IDs (addresses) of a plurality of information terminals and air conditioner 30. First storage 13 also stores, for example, IDs (addresses) of information terminals to which a child lock has been set, and IDs (addresses) of information terminals to which pairing has been set. Setting of the child lock and pairing will be described in detail later.

First storage 13 is specifically realized by, for example, a semiconductor memory.

[0032]

[Information Terminal]

5 Next, information terminal 20 will be described with reference to FIG. 1, FIG. 2, and FIG. 5. FIG. 2 illustrates an external perspective view of information terminal 20.

[0033]

As illustrated in FIG. 2 and FIG. 5, information terminal 20 is a
10 so-called smartphone. Note that information terminal 20 is only required to include display 21 and touch panel 22 provided on display 21, and may be a tablet terminal. Moreover, information terminal 20 may be a dedicated terminal (for example, a dedicated remote control) for controlling air conditioner 30. As illustrated in FIG. 1, information terminal 20 includes
15 display 21, touch panel 22, second controller 23, second communication unit 24, and second storage 25.

[0034]

Display 21 displays a control image, as illustrated in FIG. 5, for controlling air conditioner 30. Display 21 specifically includes, for example, a
20 display panel formed by a liquid crystal display (LCD) or an organic electro luminescent (EL) panel, and a driving circuit thereof.

[0035]

Touch panel 22 is provided on display 21, and is a user interface which detects a user operation. More specifically, touch panel 22 is positioned
25 opposite to the display screen of display 21. Touch panel 22 detects, for example, a tap operation, a swipe operation, and a flick operation performed by the user. Touch panel 22 is specifically a capacitive touch panel. Touch

panel 22 may be any other types of touch panel such as a touch panel of resistive film type (pressure type).

[0036]

Second controller 23 is a control device which controls, for example,
5 display of an image on display 21 and controls communication of second communication unit 24.

[0037]

For example, when touch panel 22 detects a tap operation performed on OFF button 40, update button 41 or the like illustrated in FIG. 5, second
10 controller 23 causes second communication unit 24 to transmit, to information processing device 10, a request for image information of a control image to be displayed according to the detected tap operation. OFF button 40 and update button 41 are examples of image parts which are operation targets of the user. Note that in the present embodiment, the image parts which are the operation
15 targets include texts so that the user can recognize that the image parts are the operation targets. In addition to the texts, the image parts may include figures or symbols.

[0038]

Moreover, second controller 23 causes display 21 to display a control
20 image based on the image information received by second communication unit 24 from information processing device 10. Second controller 23 is specifically a microcomputer, but may be realized by a processor or a dedicated circuit.

[0039]

Second communication unit 24 is a communication circuit
25 (communication module) for communicating with information processing device 10. For example, second communication unit 24 transmits, under the control of second controller 23, a request for image information of the control image to

information processing device 10. Moreover, second communication unit 24 receives the image information from information processing device 10.

[0040]

In the present embodiment, second communication unit 24 wirelessly
5 communicates with first communication unit 11. Second communication unit 24 is only required to be a communication circuit (communication module) which conforms with first communication unit 11. The communication method used by second communication unit 24 is not particularly limited as long as second communication unit 24 can communicate with first
10 communication unit 11.

[0041]

Second storage 25 stores, for example, image information, application programs (control programs) for causing second controller 23 to display control images based on the image information, and ID (address) of information
15 processing device 10. Moreover, as described later, in order for second controller 23 to identify the coordinates of the position in the control image at which the user operation has been performed, second storage 25 also stores, for example, information indicating a correspondence relationship between the position on touch panel 22 and the position in the control image (within display
20 screen). Second storage 25 is specifically realized by, for example, a semiconductor memory.

[0042]

[Air Conditioner]

Air conditioner 30 is an example of an electrical device, and is a control
25 target in device control system 100. Air conditioner 30 performs at least one of cooling or heating. Although not illustrated, air conditioner 30 includes a communication module (communication circuit) for wirelessly communicating

with information processing device 10, and is capable of wirelessly communicating with information processing device 10.

[0043]

Upon receipt of a control signal from information processing device 10,
5 air conditioner 30 operates according to the received control signal. Air
conditioner 30 changes, for example, an operating mode, set temperature, fan
speed, and fan direction according to the control signal. In the present
embodiment, the control signal is transmitted from information processing
device 10 when the control image of information terminal 20 is operated, and
10 may also be transmitted directly from information terminal 20 to air
conditioner 30. In other words, in device control system 100, air conditioner
30 and information terminal 20 may be capable of directly communicating with
each other.

[0044]

15 [Operational Example 1]

Hereinafter, operational example 1 of device control system 100 will be
described. FIG. 6 is a flowchart of operational example 1 of device control
system 100.

[0045]

20 Display 21 of information terminal 20 displays a control image (S21).
Step S21 is performed, for example, when an application program is executed
or when information terminal 20 is returned from a sleep state (a state where
part of functions is stopped). The control image displayed in step S21 is, for
example, the control image illustrated in FIG. 5, and is displayed on the entire
25 display screen of display unit 21. The control image is specifically displayed
based on the image information transmitted from information processing

device 10. In FIG. 6, the details of reception of the image information and the like is omitted.

[0046]

Next, touch panel 22 detects a user operation performed on the control
5 image displayed on display 21 (touch panel 22) (S22). For example, when the user performs a tap operation on OFF button 40 in the control image, touch panel 22 detects that the position on the touch panel corresponding to OFF button 40 has been tapped (Yes in S22). The processing in step S22 is continuously performed till the operation is detected (No in S22).

10 [0047]

Next, second communication unit 24 transmits, under the control of second controller 23, a request for image information to first communication unit 11 of information processing device 10 (S23). Here, in order for information processing device 10 to recognize which position in the control
15 image has been tapped, the image information request includes coordinate information indicating the position (coordinates) in the control image at which the tap operation has been performed.

[0048]

The coordinate information is identified by second controller 23 using
20 information indicating the correspondence relationship between the position on the touch panel and the position in the control image. Second controller 23 specifically converts, using such information, the position on touch panel 22 at which the operation has been performed into coordinates in the control image. Note that the information indicating the correspondence relationship between
25 the position on the touch panel and the position in the control image is stored in second storage 25.

[0049]

Here, the control image may be enlarged or reduced according to the aspect ratio of display 21 (display screen). It is preferable that the coordinate information allows information processing device 10 to uniquely identify the position in the control image even if the control image is enlarged or reduced by information terminal 20. Specifically, the coordinate information may be information indicating coordinates which indicate the position in the control image relative to the entire control image, such as coordinates indicating the position in the control image relative to the length and the width of the overall control image.

10 [0050]

The image information request including the above described coordinate information is received by first communication unit 11 of information processing device 10. In other words, first communication unit 11 of information processing device 10 obtains (receives) the request transmitted by second communication unit 24 (S11).

15

[0051]

Next, first controller 12 generates image information according to the request obtained by first communication unit 11 (S12). Specifically, first controller 12 identifies that OFF button 40 has been tapped, according to the coordinate information included in the obtained request.

20

[0052]

Accordingly, first controller 12 generates image information of a control image in which OFF button 40 has been changed into an inactive state, ON button 42 has been changed into an active state, and operating status 43 has been changed from “in operation” to “OFF” in the control image illustrated in FIG. 5. In other words, first controller 12 generates image information of a control image in which only a portion of the control image displayed in step S21

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has been changed. Note that the active state refers to a display mode which allows the user to recognize that the button can be pressed, and the inactive state refers to a display mode which allows the user to recognize that the button cannot be pressed. In order to generate such image information, an
5 image part stored in first storage 13 (for example, an image part of OFF button 40 which is in an inactive state) is used.

[0053]

As described above, the image information generated by first controller 12 is image information for displaying, on display 21 of information terminal 20,
10 a control image in which all image parts forming the control image are arranged in advance. In other words, the image information is image information in which the arrangement of the image parts of the control image cannot be changed by information terminal 20.

[0054]

15 Next, first communication unit 11 transmits, under the control of first controller 12, the generated image information to second communication unit 24 of information terminal 20 (S13).

[0055]

Second communication unit 24 of information terminal 20 receives the
20 image information from first communication unit 11 of information processing device 10 (S24), and display 21 displays, under the control of second controller 23, a control image based on the received image information (S25). In other words, the control image displayed in step S21 is updated according to the operation detected in step S22.

25 [0056]

The image information received in step S24 does not require second controller 23 to separately obtain the image parts forming a control image and

arrange the obtained parts. Second controller 23 is only required to enlarge or reduce the control image identified by the image information, according to the aspect ratio of display 21. Accordingly, the image parts are not incorrectly positioned. In other words, an incorrect display of the control image is
5 reduced.
[0057]

Although not illustrated in FIG. 6, at a time after step S11, first communication unit 11 of information processing device 10 transmits, under the control of first controller 12, a control signal for turning off air conditioner
10 30 to air conditioner 30. Accordingly, air conditioner 30 is controlled by an operation performed on the control image displayed on display 21 of information terminal 20. Note that since the only purpose of update button 41 is to update the control image displayed on display 21. Hence, when a tap operation performed on update button 41 is detected in step S22, transmission
15 of the control signal as described above is not performed.
[0058]

[Operational Example 2]

Hereinafter, operational example 2 of device control system 100 will be described. FIG. 7 is a flowchart of operational example 2 of device control
20 system 100.
[0059]

Operational Example 2 is different from operational example 1 in that the update of the control image displayed on display 21 of information terminal 20 is triggered by an internal control performed in information processing
25 device 10. Hereinafter, descriptions will be given mainly on the differences from operational example 1, and descriptions of the details substantially the same as operational example 1 may be omitted.

[0060]

Display 21 of information terminal 20 displays a control image (S21). Here, first controller 12 of information processing device 10 performs an internal control (S31). In this case, the internal control is, for example, a control which is performed on air conditioner 30 regardless of a user operation. More specifically, examples of the internal control include a control performed by information processing device 10 for turning off air conditioner 30 according to a demand response signal received externally, and a control performed by information processing device 10 for changing the set temperature of air conditioner 30 according to a demand response signal externally received. The internal control further includes, for example, a control performed by information processing device 10 for turning off air conditioner 30 by detecting abnormality in air conditioner 30.

[0061]

When such an internal control is performed, the control image displayed in step S21 needs to be updated. Accordingly, first controller 12 generates image information for displaying updated image information on display 21 (S12), and first communication unit 11 transmits, under the control of first controller 12, the generated image information to second communication unit 24 of information terminal 20 (S13).

[0062]

Second communication unit 24 of information terminal 20 receives the image information from first communication unit 11 of information processing device 10 (S24), and display 21 displays, under the control of second controller 23, a control image based on the received image information (S25). In other words, the control image displayed in step S21 is updated according to the internal control performed in step S31.

[0063]

As described above, the update of the control image displayed on display 21 may be triggered by the internal control performed in information processing device 10.

5 [0064]

Moreover, when the control image includes information on room temperature or outside temperature, update of the control image may be triggered when the room temperature or the outside temperature changes by a predetermined value or more. The operation performed in such a case is
10 substantially the same as the operation in the flowchart in FIG. 7. The information on room temperature or outside temperature is, for example, obtained by first communication unit 11 from a temperature measuring device (not illustrated) provided in outside information terminal 20.

[0065]

15 [Operational Example 3]

Hereinafter, operational example 3 of device control system 100 will be described. In operational example 3, the operation of device control system 100 performed when a child lock is set will be described.

[0066]

20 A child lock is a setting made to prevent air conditioner 30 from being controlled even when an operation is performed on a control image, so that a child does not operate information terminal 20 against a user's (an adult's) will.

[0067]

First, an operation for setting a child lock will be described. FIG. 8 is a
25 flowchart of the operation for setting a child lock.

[0068]

First, touch panel 22 of information terminal 20 receives a child lock instruction (S121). The child lock instruction is made by, for example, a user through the image as illustrated in FIG. 9. FIG. 9 illustrates an example of an image for setting a child lock. In a similar manner to the control image, the
5 image for setting the child lock may be displayed based on the image information obtained from information processing device 10, or the image information of the image for setting the child lock may be stored in second storage 25.

[0069]

10 Next, second communication unit 24 transmits, under the control of second controller 23, a child lock request to first communication unit 11 of information processing device 10 (S122).

[0070]

When first communication unit 11 obtains (receives) the child lock
15 request (S111), first controller 12 stores in first storage 13 that information terminal 20, which has transmitted the request, is the information terminal with the child lock ON (S112). Specifically, the ID of information terminal 20 included in the request is recorded in first storage 13 as the ID of the information terminal with the child lock ON.

20 [0071]

Next, first communication unit 11 transmits, under the control of first controller 12, a setting completion notice to second communication unit 24 (S113). Second communication unit 24 then receives the setting completion notice (S123). Note that in step S113, image information for displaying an
25 image indicating the completion of the setting may be transmitted. Accordingly, display 21 is capable of displaying an image (not illustrated) indicating the completion of the setting, after step S123.

[0072]

Next, an operational example where different images are displayed depending on whether or not the child lock has been set will be described as operational example 3 of device control system 100. FIG. 10 is a flowchart of operational example 3 of device control system 100. Hereinafter, descriptions will be given mainly on the differences from operational example 1, and descriptions of the details substantially the same as operational example 1 may be omitted.

[0073]

Display 21 of information terminal 20 displays a control image (S21), and touch panel 22 detects a user operation performed on the control image displayed on display 21 (touch panel 22) (S22). When the user operation is detected (Yes in S22), second communication unit 24 transmits a request for image information (S23).

[0074]

First communication unit 11 obtains (receives) the request transmitted by second communication unit 24 (S11), and first controller 12 determines whether or not the information terminal, which has transmitted the request, is the information terminal with the child lock ON (S41). Specifically, first controller 12 performs the above determination by referring to first storage 13.

[0075]

When first controller 12 determines that the child lock is not ON (No in S41), the subsequent operation is substantially the same as operational example 1. In contrast, when first controller 12 determines that the child lock is ON (Yes in S41), first controller 12 generates image information indicating that the child lock is ON (S42). The image information indicating that the child lock is ON is generated using the image parts stored in first storage 13.

In a similar manner to the image information of the control image, the image information indicating that the child lock is ON may be image information for displaying, on display 21 of information terminal 20, an image in which all image parts forming the image are arranged in advance.

5 [0076]

Next, first communication unit 11 transmits, under the control of first controller 12, the generated image information indicating that the child lock is ON to second communication unit 24 of information terminal 20 (S43).

[0077]

10 Second communication unit 24 receives the image information (the image information of the control image or the image information indicating that the child lock is ON) from first communication unit 11 of information processing device 10 (S24), and display 21 displays, under the control of second controller 23, the image based on the received image information (S26).

15 [0078]

Here, when first controller 12 determines in step S41 that the child lock is not ON, a new control image is displayed in step S26. In other words, the control image displayed in step S21 is updated according to the operation detected in step S22.

20 [0079]

In contrast, when first controller 12 determines in step S41 that the child lock is ON, an image indicating that the child lock is ON is displayed in step S26. FIG. 11 illustrates an example of an image indicating that the child lock is ON. As illustrated in FIG. 11, the image indicating that the child lock is ON, for example, indicates that the user operation is invalid.

[0080]

As described above, when the child lock is ON, the control image is not updated according to an operation performed on the control image, and air conditioner 30 is not controlled either. In other words, an improper operation is reduced.

5 [0081]

[Operational Example 4]

Hereinafter, operational example 4 of device control system 100 will be described. FIG. 12 is a flowchart of operational example 4 of device control system 100.

10 [0082]

In operational example 4, the child lock is set in a similar manner to operational example 3. Operational Example 4 is, however, different from operational example 3 in that a request for image information of a control image is not transmitted when the child lock is ON. Hereinafter, descriptions will be given mainly on the differences from operational examples 1 and 3, and descriptions of the details substantially the same as operational examples 1 and 3 may be omitted.

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[0083]

Display 21 of information terminal 20 displays a control image (S21), and touch panel 22 detects a user operation performed on the control image displayed on display 21 (touch panel 22) (S22). When the user operation is detected (Yes in S22), second controller 23 determines whether or not the child lock is ON (S27).

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[0084]

The operation for setting the child lock is substantially the same as the operation illustrated in FIG. 8. In operational example 4, however, the child lock request does not need to be transmitted to information processing device

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10. In other words, it is only required that information terminal 20 manages ON and OFF of the child lock. An operation for turning ON the child lock performed on the image for setting the child lock as illustrated in FIG. 9 is, in other words, an operation for prohibiting transmission of the image
5 information.

[0085]

When second controller 23 determines that the child lock is not ON (No in S27), the subsequent operation is substantially the same as operational example 1. When second controller 23 determines that the child lock is ON
10 (Yes in S27), the operation ends without transmission of the request for image information. Here, display 21 may display the image indicating that the child lock is ON, as illustrated in FIG. 11. In this case, the image information of the image indicating that the child lock is ON is stored in second storage 25 in advance.

15 [0086]

In this manner, after an operation for turning ON the child lock (an operation for prohibiting transmission of the request for image information) is received, the request for image information is not transmitted. Accordingly, an improper operation is reduced.

20 [0087]

In operational example 4, even when the child lock is ON, the detection by touch panel 22 is performed. However, when the child lock is ON, the detection itself does not need to be performed by touch panel 22.

[0088]

25 [Operational Example 5]

Hereinafter, operational example 5 of device control system 100 will be described. FIG. 13 is a flowchart of operational example 5 of device control system 100.

[0089]

5 For example, both information terminal 20 and information terminal 20b may be used for controlling air conditioner 30 in the same house. Specifically, a plurality of information terminals may be recorded as terminals for controlling air conditioner 30 in first storage 13 of information processing device 10. In this case, as illustrated in FIG. 3 and FIG. 5, information
10 terminal 20 and information terminal 20b may display the same image.

[0090]

Here, for example, when the user changes the set temperature of air conditioner 30 through an operation performed on information terminal 20, the change in set temperature is preferably reflected on the control image
15 displayed on display 21b of information terminal 20b. Hereinafter, descriptions of operational example 5 will be given mainly on the differences from operational example 1, and descriptions of the details substantially the same as operational example 1 may be omitted.

[0091]

20 Display 21 of information terminal 20 displays a control image (S21). In a similar manner, display 21b of information terminal 20b displays a control image (S61).

[0092]

Touch panel 22 of information terminal 20 detects a user operation
25 (S22). When the user operation is detected (Yes in S22), second communication unit 24 of information terminal 20 transmits a request for

image information to first communication unit 11 (S23). The request for image information includes coordinate information.

[0093]

First communication unit 11 obtains (receives) the request transmitted
5 by second communication unit 24 of information terminal 20 (S11). First controller 12 generates image information according to the request obtained by first communication unit 11 (S12). For example, first controller 12 identifies that the temperature set button has been tapped, according to the coordinate information included in the obtained request. First controller 12 then
10 generates image information of a control image in which the set temperature has been changed. Such image information is generated using the image parts stored in first storage 13.

[0094]

As described above, the image information generated by first controller
15 12 is image information for displaying, on display 21 of information terminal 20, a control image in which all image parts forming the control image are arranged in advance.

[0095]

Next, first communication unit 11 transmits the generated image
20 information to second communication unit 24 of information terminal 20 (S13). Second communication unit 24 of information terminal 20 receives the image information from first communication unit 11 (S24), and display 21 of information terminal 20 displays a control image based on the received image information (S25). In other words, in information terminal 20, the control
25 image displayed in step S21 is updated according to the operation detected in step S22.

[0096]

In contrast, after step S13, first controller 12 of information processing device 10 refers to first storage 13 to determine whether or not another information terminal recorded as a control terminal for air conditioner 30 exists (S51). When first controller 12 determines that no other information terminal
5 has been recorded as a control terminal for air conditioner 30 (No in S51), the operation ends.

[0097]

When first controller 12 determines that another information terminal has been recorded as a control terminal for air conditioner 30 (Yes in S51), first
10 communication unit 11 transmits the image information generated in step S13 to second communication unit 24 of the another information terminal (information terminal 20b) (S52).

[0098]

Second communication unit 24 of information terminal 20b receives the
15 image information from first communication unit 11 (S62), and display 21b of information terminal 20b displays a control image based on the received image information (S63). In other words, the control image displayed on display 21b of information terminal 20b is updated according to the operation detected in information terminal 20 which is different from information terminal 20b.

20 [0099]

Note that although not illustrated in FIG. 13, at a time after step S11, first communication unit 11 of information processing device 10 transmits a control signal for changing the set temperature of air conditioner 30 to air conditioner 30. Accordingly, air conditioner 30 is controlled by the operation
25 performed on the control image displayed on display 21 of information terminal 20.

[0100]

As described above, it may be that information processing device 10 communicates with a plurality of information terminals, and that first communication unit 11 obtains a request for image information from one information terminal 20 among the plurality of information terminals, and
5 transmit the generated image information to the plurality of information terminals.

[0101]

Accordingly, information processing device 10 is capable of collectively updating the control images of the plurality of information terminals.

10 [0102]

Moreover, as described above, in device control system 100, second controller 23 of each of the plurality of information terminals does not need to separately obtain the image parts forming a control image and arrange the obtained image parts. Each second controller 23 is only required to enlarge or
15 reduce the control image identified by the image information, according to the aspect ratio of the display. In other words, the image information for displaying an image in which image parts are arranged in advance is useful when the control images of the plurality of information terminals are collectively updated.

20 [0103]

[Operational Example 6]

Hereinafter, operational example 6 of device control system 100 will be described. In operational example 6, descriptions will be given of the operation of device control system 100 performed when a plurality of
25 information terminals include a control terminal and a dedicated display terminal.

[0104]

The control terminal is the information terminal which allows a user to control air conditioner 30 through a control image as described in the above embodiment. FIG. 14 illustrates an example of a control image displayed on a control terminal.

5 [0105]

FIG. 14 illustrates information terminal 20 as an example of a control terminal. Display 21 of information terminal 20 displays a control image. In the control image, a plurality of buttons (image parts) which are operation targets are arranged.

10 [0106]

In contrast, the dedicated display terminal is an information terminal which cannot control air conditioner 30, but can display the operating status of air conditioner 30. The dedicated display terminal is, for example, used through pairing with the control terminal. Here, the term “pairing” refers to, for example, that the control image displayed on a control terminal and the display image displayed on a dedicated display terminal are updated in conjunction with each other (as a pair). FIG. 15 illustrates an example of the display image displayed on a dedicated display terminal.

[0107]

20 FIG. 15 illustrates information terminal 20a as an example of the dedicated display terminal. Display 21a of information terminal 20a displays a display image. In the display image, only update button 44 for updating an image is the button (image part) which is the operation target, and no button for controlling air conditioner 30 is arranged.

25 [0108]

Hereinafter, descriptions will be given of the operation of device control system 100 performed when information terminal 20 and information terminal

20a are used through pairing. First, an operation for setting pairing will be described. FIG. 16 is a flowchart of the operation for setting pairing.

[0109]

First, touch panel 22 of information terminal 20 receives a pairing
5 instruction (S221). Specifically, a user directly or indirectly designates the ID
of an information terminal to be paired, through a pairing setting image (not
illustrated) displayed on display 21. Then, second communication unit 24
transmits, under the control of second controller 23, a pairing request to first
communication unit 11 of information processing device 10 (S222). The
10 pairing request includes the IDs of a plurality of information terminals to be
paired.

[0110]

When first communication unit 11 obtains (receives) a pairing request
(S211), first controller 12 sets pairing (S212). Specifically, first controller 12
15 stores (records) in first storage 13 that the ID of the information terminal
included in the pairing request is the ID of a paired information terminal.

[0111]

Next, under the control of first controller 12, first communication unit
11 transmits a setting completion notice to second communication unit 24
20 (S213). Second communication unit 24 then receives the setting completion
notice (S223). Note that in step S213, the image information for displaying an
image indicating the completion of the setting may be transmitted.
Accordingly, display 21 is capable of displaying an image (not illustrated)
indicating the completion of the setting, after step S223. Note that the pairing
25 may be set by information terminal 20a (dedicated display terminal) instead of
information terminal (control terminal) 20.

[0112]

Next, an example of updating the image on the paired information terminal will be described as operational example 6 of device control system 100. FIG. 17 is a flowchart of operational example 6 of device control system 100. Hereinafter, descriptions will be given mainly on the differences from operational example 1, and descriptions of the details substantially the same as operational example 1 may be omitted.

[0113]

Display 21 of information terminal 20 displays a control image (S21), and display 21a of information terminal 20a displays a display image (S81). Here, touch panel 22 of information terminal 20 detects a user operation performed on the control image displayed on display 21 of information terminal 20 (touch panel 22) (S22). When the user operation is detected (Yes in S22), second communication unit 24 of information terminal 20 transmits a request for image information (S23).

[0114]

First communication unit 11 obtains (receives) the transmitted request (S11), and first controller 12 generates image information according to the request obtained by first communication unit 11 (S12). For example, first controller 12 identifies that the temperature set button has been tapped, according to the coordinate information included in the obtained request. First controller 12 then generates image information of a control image in which the set temperature has been changed. Such image information is generated using the image parts stored in first storage 13.

[0115]

As described above, the image information generated by first controller 12 is image information for displaying, on display 21 of information terminal 20,

a control image in which all image parts forming the control image are arranged in advance.

[0116]

Next, first communication unit 11 transmits the generated image
5 information to second communication unit 24 of information terminal 20 (S13).
Second communication unit 24 of information terminal 20 receives the image
information from first communication unit 11 (S24), and display 21 of
information terminal 20 displays a control image based on the received image
information (S25). In other words, in information terminal 20, the control
10 image displayed in step S21 is updated according to the operation detected in
step S22.

[0117]

In contrast, after step S13, first controller 12 of information processing
device 10 refers to first storage 13 to determine whether or not a dedicated
15 display terminal paired with information terminal 20 exists (S71). When first
controller 12 determines that no dedicated display terminal has been paired
with information terminal 20 (No in S71), the operation ends.

[0118]

When first controller 12 determines that a dedicated display terminal
20 paired with information terminal 20 exists (Yes in S71), first controller 12
generates display image information of a display image in which the set
temperature has been changed (S72). Such image information is generated
using the image parts stored in first storage 13. The display image
information is information for displaying, on display 21a of information
25 terminal 20a, an image which indicates at least the operating status of air
conditioner 30 and in which all image parts forming the image are arranged in
advance.

[0119]

First communication unit 11 then transmits the generated display image information to second communication unit 24 of information terminal 20a (S73).

5 [0120]

Second communication unit 24 of information terminal 20a receives display image information from first communication unit 11 (S82), and display 21a of information terminal 20a displays a display image based on the received image information (S83). In other words, the display image displayed on
10 display 21a of information terminal 20a is updated according the operation detected in information terminal 20 which is different from information terminal 20a.

[0121]

The display image information received in step S82 does not require
15 second controller 23 of information terminal 20a to separately obtain the image parts forming the display image and arrange the obtained parts. Second controller 23 of information terminal 20a is only required to enlarge or reduce the display image identified by the display image information, according to the aspect ratio of display 21a. Accordingly, the image parts are correctly
20 positioned. In other words, an incorrect display of the display image is reduced.

[0122]

Note that although not illustrated in FIG. 17, at a time after step S11, first communication unit 11 of information processing device 10 transmits a
25 control signal for changing the set temperature of air conditioner 30 to air conditioner 30. Accordingly, air conditioner 30 is controlled according to the

operation performed on the control image displayed on display 21 of information terminal 20.

[0123]

[Operational Example 7]

5 Hereinafter, operational example 7 of device control system 100 will be described. In a similar manner to operational example 6, the operation performed when a plurality of information terminals include a control terminal and a dedicated display terminal which have been paired will be described in operational example 7. Specifically, descriptions will be given of an operation
10 for updating, according to the operation performed on information terminal 20a which is the dedicated display terminal, the control image displayed on display 21 of information terminal 20 which is the control terminal and the display image displayed on display 21a of information terminal 20a in conjunction with each other.

15 [0124]

FIG. 18 is a flowchart of operational example 7 of device control system 100. Hereinafter, descriptions will be given mainly on the differences from operational example 6, and descriptions of the details substantially the same as operational example 6 may be omitted. Note that descriptions of the operation
20 for setting pairing will be omitted as it is substantially the same as the operation illustrated in FIG. 16.

[0125]

Display 21 of information terminal 20 displays a control image (S21), and display 21a of information terminal 20a displays a display image (S81).
25 Here, as illustrated in FIG. 15, the display image does not include buttons for controlling air conditioner 30, but includes update button 44 for updating an image. Touch panel 22 of information terminal 20a detects a user operation

performed on update button 44 displayed on display 21a of information terminal 20a (S91). When the user operation is detected (Yes in S91), second communication unit 24 of information terminal 20a transmits a request for image information (S92). The processing in step S91 is continuously
5 performed till a user operation on update button 44 is detected (No in S91).
[0126]

First communication unit 11 obtains (receives) the transmitted request (S11), and first controller 12 generates display image information according to the request obtained by first communication unit 11 (S72). Specifically, first
10 controller 12 identifies that update button 44 has been tapped, according to the coordinate information included in the obtained request. First controller 12 then generates display image information in which a portion of an image, such as the set temperature, has been changed. Such display image information is generated using the image parts stored in first storage 13.
15 [0127]

The display image information is information for displaying, on display 21a of information terminal 20a, an image which indicates at least the operating status of air conditioner 30 and in which all image parts forming the image are arranged in advance.
20 [0128]

First communication unit 11 then transmits the generated display image information to second communication unit 24 of information terminal 20a (S73). Second communication unit 24 of information terminal 20a receives image information from first communication unit 11 (S82), and display
25 21a of information terminal 20a displays a control image based on the received image information (S83). In other words, in information terminal 20a, the

display image displayed in step S81 is updated according to the operation detected in step S91.

[0129]

The display image information received in step S82 does not require
5 second controller 23 of information terminal 20a to separately obtain the image parts forming a display image and arrange the obtained parts. Second controller 23 of information terminal 20a is only required to enlarge or reduce the display image identified by the display image information, according to the aspect ratio of display 21a. Accordingly, the image parts are not incorrectly
10 positioned. In other words, an incorrect display of the display image is reduced.

[0130]

In contrast, after step S73, first controller 12 of information processing device 10 refers to first storage 13 to determine whether or not a dedicated
15 display terminal paired with information terminal 20a exists (S74). When first controller 12 determines that no dedicated display terminal has been paired with information terminal 20a (No in S74), the operation ends.

[0131]

When first controller 12 determines that a dedicated display terminal
20 paired with information terminal 20a exists (Yes in S74), first controller 12 generates image information of a control image in which a portion of an image has been changed according to the display image information generated in step S72 (S12). Such image information is generated using the image parts stored in first storage 13. The image information is image information for displaying,
25 on display 21 of information terminal 20, a control image in which all image parts forming the control image are arranged in advance.

[0132]

First communication unit 11 then transmits the generated display image information to second communication unit 24 of information terminal 20 (S13).

[0133]

5 Second communication unit 24 of information terminal 20 receives the image information from first communication unit 11 (S24), and display 21 of information terminal 20 displays a control image based on the received image information (S25). In other words, the control image displayed on display 21 of information terminal 20 is updated according the operation detected in
10 information terminal 20a which is different from information terminal 20.

[0134]

The image information received in step S24 does not require second controller 23 of information terminal 20 to separately obtain the image parts forming a display image and arrange the obtained parts. Second controller 23
15 of information terminal 20 is only required to enlarge or reduce the control image identified by the image information, according to the aspect ratio of display 21. Accordingly, the image parts are not incorrectly positioned. In other words, an incorrect display of the control image is reduced.

[0135]

20 [Variation]

Note that the present invention may be applied to display of an image other than a control image. For example, display 21 of information terminal 20 may display, instead of a control image, a notice image for proving a notice related to energy in a facility of a consumer such as a house.

25 [0136]

The notice image includes information on energy in a facility of a consumer such as a house. The energy information is, for example,

information on the power consumed by electrical devices provided in the facility of the consumer. Moreover, the energy information may be information on the amount of energy generated by electrical devices provided in the facility of the consumer, such as the amount of generated power of solar panels. Moreover, 5 the energy information may be information on the fee for energy generated or consumed by electrical devices such as power purchase fee or power selling fee per month.

[0137]

Moreover, the energy information may be service information provided 10 to a user. Specific examples include notice information for notifying the user that the energy usage is large or advice information prompting the user to reduce energy consumption such as saving energy.

[0138]

[Advantageous Effects etc.]

15 As described above, the method for controlling information terminal 20 which includes display 21 and touch panel 22 disposed on display 21, and which communicates with information processing device 10 includes detecting a user operation by touch panel 22. The control method includes transmitting, to information processing device 10, a request for image information of an image 20 which is displayed according to the detected operation and in which all image parts forming the image are arranged in advance. The control method includes receiving the image information from information processing device 10, and displaying, on display 21, the image based on the received image information. Air conditioner 30 is an example of an electrical device. The 25 image described above is, for example, a control image used by a user to control air conditioner 30.

[0139]

Accordingly, information terminal 20 may display a single image on display 21 based on the image information. In order to display the image, information terminal 20 does not need to arrange a plurality of image parts forming the image. Information terminal 20 is only required to, for example, 5 enlarge or reduce the image identified by the image information, according to the aspect ratio of display 21. Accordingly, with the control method, it is possible to reduce that the image is incorrectly displayed on display 21 of information terminal 20.

[0140]

10 The control method may further include, before the detecting, displaying another image different from the image on display 21. It may be that, in the detecting, touch panel 22 detects an operation performed on the another image which is currently being displayed. In the displaying, it may be that an image in which a portion of the another image has been changed 15 according to the detected operation is displayed as the above image.

[0141]

In this manner, with the control method, it is possible to update the another image according to the user operation.

[0142]

20 Moreover, it may be that the control method further includes converting the position on the touch panel at which the operation has been performed into coordinates in another image. It may be that in the transmitting, a request including coordinate information indicating the coordinates is transmitted to the information processing device. Moreover, it may be that in the displaying, 25 an image in which a portion of the another image has been changed according to the transmitted coordinate information is displayed as the above image.

[0143]

With this, information processing device 10 is capable of identifying what kind of operation was performed by the user on information terminal 20, based on the coordinate information indicating the coordinates in the control image.

5 [0144]

Moreover, it may be that all image parts include an image part which is an operation target of the user. Examples of the image part which is the operation target include OFF button 40, update button 41, and ON button 42.

[0145]

10 As described above, the image may include image parts which are the operation targets.

[0146]

Moreover, it may be that in the displaying, the image displayed on display 21 includes a text, a figure, or a symbol indicating an image part which
15 is the operation target.

[0147]

Accordingly, the image displayed on display 21 allows the user to recognize the image parts which are the operation targets.

[0148]

20 Moreover, it may be that the control method includes receiving, by touch panel 22, an operation for prohibiting transmission of the request for image information. It may be that after the operation for prohibiting the transmission is received in the receiving, the request for image information does not need to be transmitted. The operation for prohibiting the
25 transmission is, for example, an operation for instructing the child lock.

[0149]

Accordingly, an improper operation of information terminal 20 is reduced.

[0150]

Moreover, it may be that the image described above is a control image
5 used by the user for controlling air conditioner 30. Air conditioner 30 is an example of an electrical device.

[0151]

With the above method, it is possible to reduce that the control image is incorrectly displayed on display 21 of information terminal 20.

10 [0152]

Moreover, the method for controlling information processing device 10 which communicates with information terminal 20 includes obtaining, from information terminal 20, a request for image information for displaying an image on display 21 of information terminal 20. The image is an image in
15 which all image parts forming the image are arranged in advance. Moreover, the control method includes generating image information according to the obtained request, and transmitting the generated image information to information terminal 20.

[0153]

20 With this, in order to display an image, information terminal 20 does not need to arrange a plurality of image parts forming the image. Information terminal 20 is only required to, for example, enlarge or reduce the image identified by the image information, according to the aspect ratio of display 21. Accordingly, with the control method, it is possible to reduce that the image is
25 incorrectly displayed on display 21 of information terminal 20.

[0154]

Moreover, it may be that information processing device 10 communicates with a plurality of information terminals, and in the obtaining, information processing device 10 obtains the request from one of the plurality of information terminals, and in the transmitting, information processing
5 device 10 transmits the generated image information to the plurality of information terminals.

[0155]

Accordingly, with the control method, it is possible to collectively update the images on the plurality of information terminals.

10 [0156]

Moreover, the method for controlling information processing device 10 which communicates with information terminal 20 and information terminal 20a includes obtaining, from information terminal 20, a request for first image information for displaying a first image on display 21 of information terminal
15 20. Moreover, the control method includes generating first image information according to the obtained request, and generating second image information different from the first image information according to the obtained request. Moreover, the control method includes transmitting the generated first image information to information terminal 20, and transmitting the generated second
20 image information to a second information terminal.

[0157]

The first image is an image in which all image parts forming the first image are arranged in advance. Moreover, the second image information is information for displaying, on display 21a of information terminal 20a, a second
25 image in which all image parts forming the second image are arranged in advance.

[0158]

Information terminal 20 is an example of a first information terminal.
Information terminal 20a is an example of the second information terminal.
Display 21 is an example of a first display, and display 21a is an example of a
second display. The first image is, for example, a control image used by the
5 user of information terminal 20 for controlling air conditioner 30. In this case,
information terminal 20 serves as a control terminal. The second image is, for
example, a display image indicating at least the operating status of air
conditioner 30. In this case, information terminal 20a serves as a dedicated
display terminal.

10 [0159]

Accordingly, with the control method, it is possible to update the image
displayed on display 21a of information terminal 20a based on an operation
performed on information terminal 20.

[0160]

15 Moreover, general or specific aspects of the present invention may be
realized as a system, a device, a method, an integrated circuit, a computer
program, or a computer readable recording medium such as a CD-ROM.
Moreover, general or specific aspects of the present invention may be realized
by any given combination of a system, a device, a method, an integrated circuit,
20 a computer program, and a recording medium.

[0161]

For example, the present invention may be realized as a program for
causing a computer to execute any one of the above control methods.

[0162]

25 Such a program also produces substantially the same advantageous
effects as in the above control methods.

[0163]

Moreover, for example, the present invention may be realized as an information processing system. In this case, the information processing system which communicates with information terminal 20 includes first controller 12 which generates image information according to the obtained request, and first communication unit 11 which transmits the generated image information to information terminal 20. First communication unit 11 obtains, from information terminal 20, a request for image information for displaying, on display 21 of information terminal 20, an image in which all image parts forming the image are arranged in advance. First communication unit 11 is an example of an obtainment unit and a transmitter, and first controller 12 is an example of a generator.

[0164]

Such an information processing system also produces substantially the same advantageous effects as in the method for controlling information processing device 10.

[0165]

Note that when the present invention is realized as the information processing system, the information processing system may be formed by a plurality of devices produced as separate devices, or by a single device (information processing device 10).

[0166]

(Other Embodiments)

Although the embodiment has been described above, the present invention is not limited to the embodiment.

[0167]

For example, the display of an information terminal may display an image by overlaying texts on the image, under the control of a second controller.

The display may, for example, overlay texts indicating the current time on the image. The texts indicating the current time changes, for example, every second regardless of a user operation. When an image including such texts is generated by an information processing device, image update is frequently performed. In other words, communication is frequently performed, which is not preferable in view of the reduction in communications traffic. Hence, information (for example, texts) which changes regardless of a user operation may be overlaid on the image by the information terminal.

[0168]

Moreover, the processing performed by a specific processing unit in the above embodiment may be performed by another processing unit. Moreover, the order of the processing may be changed, or may be performed in parallel.

[0169]

Moreover, in the above embodiment, communication performed between the structural elements may be wireless communication or wired communication. The communication protocol used between the structural elements is not limited to a specific protocol.

[0170]

Moreover, each of the structural elements in the above-described embodiment may be configured in the form of an exclusive hardware product, or may be realized by executing a software program suitable for the structural element. Each of the structural elements may be realized by a program executing unit, such as a CPU or a processor, reading and executing the software program recorded on a recording medium such as a hard disk or a semiconductor memory.

[0171]

Moreover, each of the structural elements may be a circuit (or an integrated circuit). These circuits may be configured as a single circuit and, alternatively, may be individual circuits. Moreover, these circuits may be ordinary circuits and, alternatively, may be dedicated circuits.

5 [0172]

Moreover, the processing order in the operation in the information terminals described in the above embodiment is an example. The processing order may be changed, or may be performed in parallel.

[0173]

10 The scope of the present invention may also include embodiments as a result of adding various modifications to the embodiment that may be conceived by those skilled in the art, and embodiments obtained by combining structural elements in the embodiment in any manner as long as the combination does not depart from the spirit of the present invention.

15

REFERENCE MARKS IN THE DRAWINGS

[0174]

- 10 information processing device (information processing system)
- 11 first communication unit (obtainment unit, transmitter)
- 20 12 first controller (generator)
- 20, 20a, 20b information terminal
- 21, 21a, 21b display
- 22 touch panel
- 30 air conditioner (electrical device)
- 25 40 OFF button (image part which is an operation target)
- 41, 44 update button (image part which is an operation target)
- 42 ON button (image part which is an operation target)

CLAIMS

1. A method for controlling an information terminal which communicates with an information processing device, the information terminal
5 including a display and a touch panel disposed on the display, the method comprising:

detecting, by the touch panel, an operation performed by a user;

transmitting, to the information processing device, a request for image
information of an image in which all image parts forming the image are
10 arranged in advance, the image being displayed according to the operation
detected;

receiving the image information from the information processing
device; and

displaying the image on the display based on the image information
15 received,

wherein the image is a control image used by the user to control an
electrical device.

2. The method according to claim 1, further comprising:
20 displaying another image on the display before the detecting, the
another image being different from the image,

wherein, in the detecting, the operation performed on the another
image which is currently displayed is detected by the touch panel, and

in the displaying of the image, an image in which a portion of the
25 another image has been changed according to the operation detected is
displayed as the image.

3. The method according to claim 2, further comprising:

converting a position on the touch panel at which the operation has been performed into coordinates in the another image,

wherein, in the transmitting, the request including coordinate
5 information indicating the coordinates is transmitted to the information processing device, and

in the displaying of the image, an image in which a portion of the another image has been changed according to the coordinate information transmitted is displayed as the image.

10

4. The method according to any one of claims 1 to 3,

wherein the all image parts include an image part which is an operation target of the user.

15

5. The method according to claim 4,

wherein the image displayed on the display in the displaying of the image includes a text, a figure, or a symbol indicating the image part which is the operation target.

20

6. The method according to any one of claims 1 to 5, further comprising:

receiving, by the touch panel, an operation for prohibiting transmission of the request for the image information,

wherein the request for the image information is not transmitted after
25 the operation for prohibiting the transmission is received in the receiving.

7. A method for controlling an information processing device which communicates with an information terminal, the method comprising:

obtaining, from the information terminal, a request for image information for displaying, on a display of the information terminal, an image
5 in which all image parts forming the image are arranged in advance;

generating the image information according to the request obtained;
and

transmitting, to the information terminal, the image information generated,

10 wherein the image is a control image used by an user to control an electrical device.

8. The method according to claim 7,

wherein the information processing device communicates with a
15 plurality of the information terminals,

in the obtaining, the request is obtained from one of the plurality of the information terminals, and

in the transmitting, the image information generated is transmitted to the plurality of the information terminals.

20

9. A program for causing a computer to execute the method according to any one of claims 1 to 8.

10. An information processing system which communicates with an
25 information terminal, the information processing system comprising:

an obtainment unit which obtains, from the information terminal, a request for image information for displaying, on a display of the information terminal, an image in which all image parts forming the image are arranged in advance;

5 a generator which generates the image information according to the request obtained; and

 a transmitter which transmits, to the information terminal, the image information generated,

 wherein the image is a control image used by an user to control an
10 electrical device.