Solution to Problem

According to ~~an~~a first aspect of the present disclosure, there is provided a device management system that includes a device information transmitting apparatus and a management apparatus. The device information transmitting apparatus collects information about a device. The management apparatus communicates with the device information transmitting apparatus via a communication network. The management apparatus and/or the device information transmitting apparatus includes an anomaly state input unit and a designating unit. The anomaly state input unit receives an anomaly state of the device. The designating unit designates first information in accordance with the received anomaly state. The first information is information to be used to identify a cause of the anomaly state. The device information transmitting apparatus includes a first information transmitting unit. The first information transmitting unit transmits the first information, the management apparatus includes a first information requesting unit that transmits, to the device information transmitting apparatus, a first information request signal of requesting transmission of the first information designated by the designating unit, and the first information transmitting unit transmits the first information in response to the first information request signal, the device information transmitting apparatus includes an operation information transmitting unit that transmits operation information specifying an operation state of the device to the management

apparatus at a predetermined timing, the management apparatus includes a management apparatus storage unit that stores the operation information that has been acquired, and the first information requesting unit transmits the first information request signal in a case where an anomaly cause is not identifiable based on the operation information stored in the management apparatus storage unit.

Accordingly, the first information to be used to identify the cause of the anomaly state in the management apparatus is designated by the designating unit in accordance with the received anomaly state. The first information is transmitted from the device information transmitting apparatus to the management apparatus. As a result, even in a case where an anomaly cause of the device is not identifiable only using the information held by the management apparatus, identification of the anomaly cause is promoted.

The "first information" herein may include not only a single piece of information but also a plurality of pieces of information.

The "management apparatus" herein is a computer that manages the device. The management apparatus is, for example, a super computer, a work station, a personal computer, a tablet device, a smartphone, or the like. For example, the management apparatus may be constituted by a plurality of computers and devices connected by a network.

In an embodiment of the above device management system, the device information transmitting apparatus includes a first information storage unit that accumulates the first

information. Accordingly, the first information is accumulated in the device information transmitting apparatus. As a result, when an anomaly of the device is estimated, it is possible to transmit a plurality of pieces of first information from the device information transmitting apparatus to the management apparatus, and identification of an anomaly cause is promoted.

In an embodiment of the above device management system, the management apparatus includes a first information requesting unit. The first information requesting unit transmits a first information request signal to the device information transmitting apparatus. The first information request signal is a signal of requesting transmission of the first information designated by the designating unit. The first information transmitting unit transmits the first information in response to the first information request signal. Accordingly, the first information based on the request from the management apparatus is transmitted from the device information transmitting apparatus to the management apparatus.

In an embodiment of the above device management system, the device information transmitting apparatus includes an operation information transmitting unit. The operation information transmitting unit transmits operation information to the management apparatus at a predetermined timing. The operation information is information specifying an operation state of the device. The management apparatus includes a management apparatus storage unit. The management apparatus storage unit stores the operation information that has been

~~acquired. The first information requesting unit transmits the first information request signal in a case where an anomaly cause is not identifiable based on the operation information stored in the management apparatus storage unit.~~

Accordingly, in a case where an anomaly of the device is estimated and in a case where an anomaly cause is not identifiable based on the operation information held by the management apparatus, it is possible to transmit operation information from the device information transmitting apparatus to the management apparatus. Accordingly, the management apparatus is appropriately able to request first information that is not held only when it is necessary, and the load of communication is reduced.

In an embodiment of the above device management system, the first information requesting unit requests, in the first information request signal, the first information which is the operation information collected at a shorter interval than the operation information stored in the management apparatus storage unit and/or information that is not held by the management apparatus but is held by the device information transmitting apparatus. Accordingly, identification of an anomaly cause is further promoted.

In an embodiment of the above device management system, the first information request signal includes information designating an ID and data item of the device related to the first information that is requested.

~~In an embodiment of the above device management system~~According to a second aspect of the present invention,

there is provided a device management system including: a device information transmitting apparatus that collects information about a device; and a management apparatus that communicates with the device information transmitting apparatus via a communication network, the management apparatus and/or the device information transmitting apparatus including an anomaly state input unit that receives an anomaly state of the device, and a designating unit that designates, in accordance with the received anomaly state, first information which is information to be used to identify a cause of the anomaly state of the device, the device information transmitting apparatus including a first information transmitting unit that transmits the first information to the management apparatus, the device information transmitting apparatus includes an operation information collecting unit and an operation information transmitting unit. The operation information collecting unit collects operation information under a predetermined first condition. The operation information is information specifying an operation state of the device. The operation information transmitting unit transmits the collected operation information to the management apparatus. Accordingly, in the device information transmitting apparatus, operation information is collected under the first condition.

~~In an embodiment of the above device management system, the management apparatus includes a changing unit that changes the first condition. Accordingly, the management apparatus is capable of flexibly determining, in accordance with a~~

~~situation, the manner of collecting operation information in the device information transmitting apparatus.~~

~~In an embodiment of the above device management system, the management apparatus includes a management apparatus storage unit. The management apparatus storage unit stores the operation information that has been acquired. The changing unit changes the first condition in a case where an anomaly cause is not identifiable based on the operation information stored in the management apparatus storage unit. Accordingly, in a case where an anomaly cause is not identifiable based on the operation information held by the management apparatus, it is possible to change the manner of collecting operation information in the device information transmitting apparatus.~~

In an embodiment of the above device management system, the device includes at least any one of an air conditioning device, a ventilation device, a humidity adjusting device, and a refrigeration device. Accordingly, when an anomaly of any one of the air conditioning device, the ventilation device, the humidity adjusting device, and the refrigeration device is estimated, identification of an anomaly cause is promoted.

Brief Description of Drawings

[Fig. 1] Fig. 1 is a schematic diagram illustrating the configuration of a device management system.

[Fig. 2] Fig. 2 is a schematic diagram illustrating the configuration of an air conditioner.

[Fig. 3] Fig. 3 is a schematic diagram illustrating functional blocks of individual apparatuses constituting a

CLAIMS

~~[Claim 1]~~

1. A device management system ~~(1, 1A)~~ comprising:

a device information transmitting apparatus ~~(20, 20')~~ that collects information about a device ~~(10)~~; and

a management apparatus ~~(30)~~ that communicates with the device information transmitting apparatus via a communication network ~~(NW1)~~,

the management apparatus and/or the device information transmitting apparatus including

an anomaly state input unit ~~(33, 24)~~ that receives an anomaly state of the device, and

a designating unit ~~(342, 233)~~ that designates, in accordance with the received anomaly state, first information which is information to be used to identify a cause of the anomaly state of the device,

the device information transmitting apparatus including a first information transmitting unit ~~(232)~~ that transmits the first information to the management apparatus,

the management apparatus includes a first information requesting unit that transmits, to the device information transmitting apparatus, a first information request signal of requesting transmission of the first information designated by the designating unit, and

the first information transmitting unit transmits the

first information in response to the first information request signal,

the device information transmitting apparatus includes an operation information transmitting unit that transmits operation information specifying an operation state of the device to the management apparatus at a predetermined timing,

the management apparatus includes a management apparatus storage unit that stores the operation information that has been acquired, and

the first information requesting unit transmits the first information request signal in a case where an anomaly cause is not identifiable based on the operation information stored in the management apparatus storage unit.

~~[Claim 2]~~

2. The device management system ~~(1, 1A)~~ according to Claim 1, wherein

the device information transmitting apparatus includes a first information storage unit ~~(21)~~ that accumulates the first information.

~~[Claim 3]~~

~~The device management system (1, 1A) according to Claim 1 or 2, wherein~~

~~the management apparatus includes a first information requesting unit (343) that transmits, to the device~~

~~information transmitting apparatus, a first information request signal of requesting transmission of the first information designated by the designating unit, and~~

~~the first information transmitting unit transmits the first information in response to the first information request signal.~~

~~[Claim 4]~~

~~The device management system (1, 1A) according to Claim 3, wherein~~

~~the device information transmitting apparatus includes an operation information transmitting unit (232) that transmits operation information specifying an operation state of the device to the management apparatus at a predetermined timing,~~

~~the management apparatus includes a management apparatus storage unit (31) that stores the operation information that has been acquired, and~~

~~the first information requesting unit transmits the first information request signal in a case where an anomaly cause is not identifiable based on the operation information stored in the management apparatus storage unit.~~

~~[Claim 5]~~

3. The device management system ~~(1, 1A)~~ according to Claim ~~4~~1 or 2, wherein

the first information requesting unit requests, in the

first information request signal, the first information which is the operation information collected at a shorter interval than the operation information stored in the management apparatus storage unit and/or information that is not held by the management apparatus but is held by the device information transmitting apparatus.

~~[Claim 6]~~

4. The device management system ~~(1, 1A)~~ according to any one of Claims ~~3~~1 to ~~5~~3, wherein

the first information request signal includes information designating an ID and data item of the device related to the first information that is requested.

~~[Claim 7]~~

5. ~~The device management system (1, 1A) according to any one of Claims 1 to 3, wherein~~A device management system comprising:

a device information transmitting apparatus that collects information about a device; and

a management apparatus that communicates with the device information transmitting apparatus via a communication network,

the management apparatus and/or the device information transmitting apparatus including

an anomaly state input unit that receives an anomaly state of the device, and

a designating unit that designates, in accordance with the received anomaly state, first information which is information to be used to identify a cause of the anomaly state of the device,

the device information transmitting apparatus including a first information transmitting unit that transmits the first information to the management apparatus,

the device information transmitting apparatus includes

an operation information collecting unit ~~(231)~~ that collects, under a predetermined first condition, operation information specifying an operation state of the device, and

an operation information transmitting unit ~~(232)~~ that transmits the collected operation information to the management apparatus,

the management apparatus includes a changing unit that changes the first condition,

the management apparatus includes a management apparatus storage unit that stores the operation information that has been acquired, and

the changing unit changes the first condition in a case where an anomaly cause is not identifiable based on the operation information stored in the management apparatus storage unit.

~~[Claim 8]~~

~~The device management system (1, 1A) according to Claim~~

~~7, wherein~~

~~the management apparatus includes a changing unit (342) that changes the first condition.~~

~~[Claim 9]~~

~~The device management system (1, 1A) according to Claim 8, wherein~~

~~the management apparatus includes a management apparatus storage unit (31) that stores the operation information that has been acquired, and~~

~~the changing unit changes the first condition in a case where an anomaly cause is not identifiable based on the operation information stored in the management apparatus storage unit.~~

~~[Claim 10]~~

6. The device management system ~~(1, 1A)~~ according to any one of Claims 1 to ~~9~~5, wherein

the device comprises at least any one of an air conditioning device, a ventilation device, a humidity adjusting device, and a refrigeration device.