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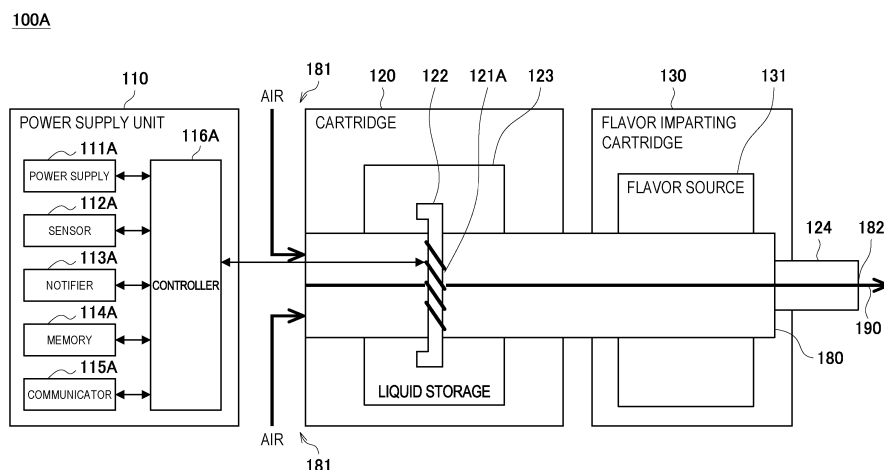
(54) **INHALATION DEVICE, TERMINAL DEVICE, AND PROGRAM**

(57) [Problem] To provide a contrivance with which it is possible to maintain a fixed level of reliability in relation to information stored by an inhalation device even when the action of the inhalation device is destabilized.

[Solution] An inhalation device comprising a generation part that generates an aerosol using a base material, a storage part that stores information, a power supply part that accumulates and supplies electric power for the

action of the inhalation device, and a control part that controls the action of the inhalation device, the control part storing, in the storage part, log information acquired when a prescribed action relating to the inhalation device is performed, and executing a prescribed process on the log information stored in the storage part using, as a trigger, a decrease in the amount of electric power remaining in the power supply part to less than a threshold value.

FIG. 1



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Description

Technical Field

[0001] The present invention relates to an inhaler device, a terminal device, and a program.

Background Art

[0002] Inhaler devices that generate a substance to be inhaled by the user, such as electronic cigarettes and nebulizers, are widely used. An inhaler device generates an aerosol with a flavor component, for example, using a substrate including an aerosol source for generating an aerosol and a flavor source for imparting a flavor component to the generated aerosol. A user can taste a flavor by inhaling the aerosol with the flavor component generated by the inhaler device.

[0003] During these years, it is being considered to provide various services by equipping an inhaler device with a communication function and allowing the inhaler device to communicate with a terminal device such as a smartphone. The following Patent Literature 1, for example, discloses a technique for displaying, using a terminal device, a use history of an inhaler device on the basis of information received from the inhaler device.

Citation List

Patent Literature

[0004] Patent Literature 1: WO 2020/006311 A

Summary of Invention

Technical Problem

[0005] When the amount of power remaining becomes small, that is, when an inhaler device enters an over-discharged state, for example, operation of the inhaler device can become instable. In the above Patent Literature 1, however, no consideration is given in this regard.

[0006] The present invention has been conceived in view of the above problem and aims to provide a mechanism capable of maintaining a certain level of reliability about information stored in an inhaler device even when operation of the inhaler device becomes instable.

Solution to Problem

[0007] In order to solve the above problem, according to an aspect of the present invention, there is provided an inhaler device including a generation unit that generates an aerosol using a substrate, a memory that stores information, a power supply that accumulates and supplies power for operating the inhaler device, and a controller that controls operation of the inhaler device. The controller stores, in the memory, log information, which

is information obtained when a certain operation relating to the inhaler device is performed. The controller performs a certain type of processing on the log information stored in the memory using, as a trigger, a fact that an amount of power remaining in the power supply has fallen below a threshold.

[0008] The certain type of processing may be addition of a certain flag to the log information stored in the memory.

[0009] The inhaler device may further include a communicator that communicates with another device. The controller may control the communicator such that the communicator transmits the log information stored in the memory along with the certain flag added to the log information.

[0010] The controller may remove, from the memory, the log information to which the certain flag is added using, as a trigger, a start of charging of the power supply.

[0011] The controller may remove information indicating a time at which the log information to which the certain flag is added was obtained, the information being included in the log information, using, as a trigger, a start of charging of the power supply.

[0012] The certain type of processing may be removal of information indicating a time at which the log information was obtained, the information being included in the log information.

[0013] The certain type of processing may be removal of the log information from the memory.

[0014] The controller may change a value of a counter each time unit time has elapsed. The log information may include, as information indicating a time at which the certain operation was performed, the value of the counter at a first timing, at which the certain operation was performed.

[0015] The inhaler device may further include a communicator that communicates with another device. The communicator may transmit, at a second timing, the log information stored in the memory and then transmit the value of the counter at the second timing.

[0016] The certain operation may include the generation unit starting to generate the aerosol.

[0017] The certain operation may include inhalation of the aerosol by the user.

[0018] The certain operation may include charging of the power supply.

[0019] If a first condition is satisfied, the controller may permit the generation of the aerosol. The certain operation may include an operation that satisfies the first condition.

[0020] If a second condition is satisfied, the controller may inhibit the generation of the aerosol. The certain operation may include an operation that satisfies the second condition.

[0021] In order to solve the above problem, according to another aspect of the present invention, there is provided a terminal device including a communicator that communicates with another device and a controller that

performs different types of processing on log information that is obtained by an inhaler device, which generates an aerosol using a substrate, when a certain operation relating to the inhaler device is performed and that is received by the communicator depending on whether a certain flag is added to the log information.

[0022] The terminal device may further include a memory that stores information. The controller may discard the log information to which the certain flag is added and store, in the memory, the log information to which the certain flag is not added.

[0023] The terminal device may further include an outputter that outputs information. The controller may control the outputter such that the outputter outputs the log information in different modes depending on whether the certain flag is added to the log information.

[0024] The controller may control the outputter such that the outputter outputs information indicating that information indicating a time at which the log information to which the certain flag is added was obtained is not accurate.

[0025] The inhaler device may change a value of a counter each time unit time has elapsed. The log information may include the value of the counter at a first timing, at which the certain operation was performed. The communicator may receive the value of the counter at a second timing, at which the inhaler device transmitted the log information. The controller may calculate a time corresponding to the first timing on a basis of the value of the counter at the first timing, the value of the counter at the second timing, and a time at which the communicator received the log information.

[0026] In order to solve the above problem, according to another aspect of the present invention, there is provided a program for causing a computer to control a terminal device that communicates with another device to perform different types of processing on log information that is obtained by an inhaler device, which generates an aerosol using a substrate, when a certain operation relating to the inhaler device is performed and that is received by the terminal device depending on whether a certain flag is added to the log information.

Advantageous Effects of Invention

[0027] As described above, according to the present invention, a mechanism capable of maintaining a certain level of reliability about information stored in an inhaler device even when operation of the inhaler device becomes instable is provided.

Brief Description of Drawings

[0028]

[Fig. 1] Fig. 1 is a schematic diagram of an inhaler device according to a first configuration example.

[Fig. 2] Fig. 2 is a schematic diagram of an inhaler

device according to a second configuration example.

[Fig. 3] Fig. 3 is a diagram illustrating an example of the configuration of a system according to the present embodiment.

[Fig. 4] Fig. 4 is a sequence diagram illustrating an example of a procedure of a process relating to log information performed by the system according to the present embodiment.

[Fig. 5] Fig. 5 is a flowchart illustrating an example of a procedure of a process relating to log information performed by an inhaler device 100 according to the present embodiment.

[Fig. 6] Fig. 6 is a flowchart illustrating an example of a procedure of a process relating to log information performed by a terminal device 200 according to the present embodiment.

Description of Embodiments

[0029] A preferred embodiment of the present invention will be described in detail hereinafter with reference to the accompanying drawings. Components having substantially the same functional configuration will be given the same reference numerals herein and in the drawings, and redundant description thereof is omitted.

[0030] In addition, elements having substantially the same functional configuration might be given different alphabets after the same reference numeral herein and in the drawings. For example, a plurality of elements having substantially the same functional configuration will be distinguished from each other like inhaler devices 100A and 100B as necessary. When a plurality of elements having substantially the same functional configuration need not be particularly distinguished from each other, however, only the same reference numeral will be given. When the inhaler devices 100A and 100B need not be particularly distinguished from each other, for example, the inhaler devices 100A and 100B will be simply referred to as inhaler devices 100.

<< 1. Configuration Example of Inhaler Device >>

[0031] An inhaler device generates material to be inhaled by a user. In the example described below, the material generated by the inhaler device is an aerosol. Alternatively, the material generated by the inhaler device may be gas.

(1) First configuration example

[0032] Fig. 1 is a schematic diagram of the inhaler device according to the first configuration example. As illustrated in Fig. 1, an inhaler device 100A according to the present configuration example includes a power supply unit 110, a cartridge 120, and a flavor imparting cartridge 130. The power supply unit 110 includes a power supply 111A, a sensor 112A, a notifier 113A, a memory 114A, a communicator 115A, and a controller 116A. The

cartridge 120 includes a heater 121A, a liquid guide 122, and a liquid storage 123. The flavor imparting cartridge 130 includes a flavor source 131 and a mouthpiece 124. In the cartridge 120 and the flavor imparting cartridge 130, an airflow path 180 is defined.

[0033] The power supply 111A stores electric power. The power supply 111A supplies electric power to the structural elements of the inhaler device 100A under the control of the controller 116A. The power supply 111A may be a rechargeable battery such as a lithium ion secondary battery.

[0034] The sensor 112A acquires various items of information regarding the inhaler device 100A. In an example, the sensor 112A may be a pressure sensor such as a microphone condenser, a flow sensor, or a temperature sensor, and acquire a value generated in accordance with the user's inhalation. In another example, the sensor 112A may be an input device that receives information input by the user, such as a button or a switch.

[0035] The notifier 113A provides information to the user. The notifier 113A may be a light-emitting device that emits light, a display device that displays an image, a sound output device that outputs sound, or a vibration device that vibrates.

[0036] The memory 114A stores various items of information for operation of the inhaler device 100A. The memory 114A may be a non-volatile storage medium such as flash memory.

[0037] The communicator 115A is a communication interface capable of communication in conformity with any wired or wireless communication standard. Such a communication standard may be, for example, Wi-Fi (registered trademark), Bluetooth (registered trademark), or the like.

[0038] The controller 116A functions as an arithmetic processing unit and a control circuit, and controls the overall operations of the inhaler device 100A in accordance with various programs. The controller 116A includes an electronic circuit such as a CPU (central processing unit) or a microprocessor, for example.

[0039] The liquid storage 123 stores an aerosol source. The aerosol source is atomized to generate an aerosol. The aerosol source is a liquid such as polyhydric alcohol or water. Examples of the polyhydric alcohol include glycerine and propylene glycol. The aerosol source may include a flavor component that is either derived from tobacco or not derived from tobacco. For the inhaler device 100A that is a medical inhaler such as a nebulizer, the aerosol source may include a medicine.

[0040] The liquid guide 122 guides, from the liquid storage 123, the aerosol source that is the liquid stored in the liquid storage 123, and holds the aerosol source. The liquid guide 122 is, for example, a wick formed by twining fiber material such as glass fiber or porous material such as porous ceramic. In this case, the capillary action of the wick guides the aerosol source stored in the liquid storage 123.

[0041] The heater 121A heats the aerosol source to

atomize the aerosol source and generate the aerosol. In the example illustrated in Fig. 1, the heater 121A includes a coil wound around the liquid guide 122. When the heater 121A produces heat, the aerosol source held by the liquid guide 122 is heated and atomized to generate the aerosol. The heater 121A produces heat when receiving electric power from the power supply 111A. In an example, the electric power may be supplied in response to the sensor 112A detecting a start of the user's inhalation and/or an input of predetermined information. Subsequently, the supply of the electric power may be stopped in response to the sensor 112A detecting an end of the user's inhalation and/or an input of predetermined information.

[0042] The flavor source 131 is a structural element for imparting a flavor component to the aerosol. The flavor source 131 may include a flavor component that is either derived from tobacco or not derived from tobacco.

[0043] The airflow path 180 is a flow path of air to be inhaled by the user. The airflow path 180 has a tubular structure having an air inlet hole 181 and an air outlet hole 182 at both ends. The air inlet hole 181 is an inlet of air into the airflow path 180, and the air outlet hole 182 is an outlet of the air from the airflow path 180. The liquid guide 122 is on the airflow path 180 at an upstream position (closer to the air inlet hole 181), and the flavor source 131 is on the airflow path 180 at a downstream position (closer to the air outlet hole 182). Air flowing in through the air inlet hole 181 when the user inhales mixes with the aerosol generated by the heater 121A. Subsequently, as indicated by an arrow 190, the mixture fluid of the aerosol and the air passes through the flavor source 131 and is conveyed to the air outlet hole 182. When the mixture fluid of the aerosol and the air passes through the flavor source 131, the flavor component included in the flavor source 131 is imparted to the aerosol.

[0044] The mouthpiece 124 is to be held in a mouth of the user during inhalation. The mouthpiece 124 has the air outlet hole 182. When the user inhales with the mouthpiece 124 in his/her mouth, the mixture fluid of the aerosol and the air enters the oral cavity of the user.

[0045] The configuration example of the inhaler device 100A has been described above. The inhaler device 100A is not limited to the above configuration, and may be configured in various ways as exemplified below.

[0046] In an example, the inhaler device 100A does not have to include the flavor imparting cartridge 130. In this case, the cartridge 120 includes the mouthpiece 124.

[0047] In another example, the inhaler device 100A may include various types of aerosol sources. Still another type of aerosol may be generated by mixing a plurality of types of aerosols generated from the plurality of types of aerosol sources in the airflow path 180 and causing a chemical reaction.

[0048] In addition, means for atomizing the aerosol source is not limited to heating by the heater 121A. For example, the means for atomizing the aerosol source may be vibration atomization or induction heating.

(2) Second configuration example

[0049] Fig. 2 is a schematic diagram of the inhaler device according to the second configuration example. As illustrated in Fig. 2, an inhaler device 100B according to the present configuration example includes a power supply 111B, a sensor 112B, a notifier 113B, a memory 114B, a communicator 115B, a controller 116B, a heater 121B, a holder 140, and a heat insulator 144.

[0050] The power supply 111B, the sensor 112B, the notifier 113B, the memory 114B, the communicator 115B, and the controller 116B are substantially the same as the respective corresponding structural elements included in the inhaler device 100A according to the first configuration example.

[0051] The holder 140 has an internal space 141, and holds a stick substrate 150 in a manner partially accommodated in the internal space 141. The holder 140 has an opening 142 that allows the internal space 141 to communicate with outside. The holder 140 holds the stick substrate 150 that is inserted into the internal space 141 through the opening 142. For example, the holder 140 may be a tubular body having the opening 142 and a bottom 143 on its ends, and may define the pillar-shaped internal space 141. The holder 140 also has a function of defining a path of air supplied to the stick substrate 150. For example, the bottom 143 has an air inlet hole that is an inlet of air into the airflow path. The opening 142, on the other hand, has an air outlet hole that is an outlet of the air from the airflow path.

[0052] The stick substrate 150 includes a substrate 151 and an inhalation port 152. The substrate 151 includes an aerosol source. The aerosol source according to the present configuration example is not limited to a liquid, and may be a solid. The stick substrate 150 held by the holder 140 includes the substrate 151 at least partially accommodated in the internal space 141 and the inhalation port 152 at least partially protruding from the opening 142. When the user inhales with the inhalation port 152 protruding from the opening 142 in his/her mouth, air flows into the internal space 141 from the airflow path (not illustrated), and the air and an aerosol generated from the substrate 151 reach inside the mouth of the user.

[0053] The heater 121B has the same configuration as the heater 121A according to the first configuration example. In the example illustrated in Fig. 2, however, the heater 121B has a film-like shape and surrounds the outer circumference of the holder 140. Subsequently, heat produced from the heater 121B heats the substrate 151 of the stick substrate 150 from the outer circumference, generating the aerosol.

[0054] The heat insulator 144 prevents heat from transferring from the heater 121B to the other structural elements. For example, the heat insulator 144 may be a vacuum heat insulator or an aerogel heat insulator.

[0055] The configuration example of the inhaler device 100B has been described above. The inhaler device

100B is not limited to the above configuration, and may be configured in various ways as exemplified below.

[0056] In an example, the heater 121B may have a blade-like shape, and may be disposed so that the heater 121B protrudes from the bottom 143 of the holder 140 toward the internal space 141. In this case, the heater 121B having the blade-like shape is inserted into the substrate 151 of the stick substrate 150 and heats the substrate 151 of the stick substrate 150 from its inside. In another example, the heater 121B may be disposed so that the heater 121B covers the bottom 143 of the holder 140. In still another example, the heater 121B may be implemented as a combination of two or more selected from a first heater that covers the outer circumference of the holder 140, a second heater having the blade-like shape, and a third heater that covers the bottom 143 of the holder 140.

[0057] In another example, the holder 140 may include an opening/closing mechanism that at least partially opens and closes an outer shell defining the internal space 141. Examples of the opening/closing mechanism include a hinge. In addition, the holder 140 may accommodate the stick substrate 150 while sandwiching the stick substrate 150 inserted into the internal space 141 by opening and closing the outer shell. In this case, the heater 121B may be at the sandwiching position of the holder 140 and may produce heat while pressing the stick substrate 150.

[0058] In addition, means for atomizing the aerosol source is not limited to heating by the heater 121B. For example, the means for atomizing the aerosol source may be induction heating.

[0059] In addition, the inhaler device 100B may also include the heater 121A, the liquid guide 122, the liquid storage 123, and the airflow path 180 according to the first configuration example. The air outlet hole 182 of the airflow path 180 may also service as an air inlet hole for the internal space 141. In this case, a mixture fluid of the air and an aerosol generated by the heater 121A flows into the internal space 141, mixes further with an aerosol generated by the heater 121B, and then reaches the oral cavity of the user.

«2. First Embodiment»

(1) Configuration Example of System

[0060] Fig. 3 is a diagram illustrating an example of the configuration of a system 1 according to the present embodiment. As illustrated in Fig. 3, the system 1 includes an inhaler device 100 and a terminal device 200.

- Configuration of Inhaler Device 100

[0061] The inhaler device 100 according to the present embodiment generates, using a substrate, an aerosol to be inhaled by the user. A heater 121 is an example of a generation unit that generates an aerosol using a sub-

strate. The cartridge 120 and the flavor imparting cartridge 130 in the first configuration example and the stick substrate 150 in the second configuration example are examples of the substrate in the present embodiment. The inhaler device 100 generates the aerosol using a substrate attached to the inhaler device 100. In the first configuration example, the cartridge 120 and the flavor imparting cartridge 130 connected to the power supply unit 110 are examples of the substrate attached to the inhaler device 100. In the second configuration example, the stick substrate 150 inserted into the inhaler device 100 is an example of the substrate attached to the inhaler device 100.

[0062] The heater 121 may heat an aerosol source as liquid guided from the substrate, instead. As described in the first configuration example, for example, the inhaler device 100 may generate the aerosol by heating the aerosol source guided by the liquid guide 122 from the liquid storage 123.

[0063] The heater 121 may heat a substrate containing an aerosol source and formed in a certain shape, instead. An example of the certain shape is a stick. As described in the second configuration example, for example, the inhaler device 100 may generate the aerosol by heating the stick substrate 150. Another example of the certain shape is a card. Another example of the certain shape is a cube.

[0064] The inhaler device 100 can take any of the above-described first and second configuration examples. An example of a case where the inhaler device 100 takes the second configuration example will be mainly described hereinafter in order to simplify description. In addition, in the following description, inhalation, by the user, of the aerosol generated by the inhaler device 100 will be simply referred to as an "inhalation" or a "puff". In addition, when the user inhales, it will be paraphrased as the "user puffs" hereinafter.

- Configuration of Terminal Device 200

[0065] The terminal device 200 is a device used by the user of the inhaler device 100. For example, the terminal device 200 is any information processing device such as a smartphone, a tablet terminal, or a wearable device. As illustrated in FIG. 3, the terminal device 200 includes an inputter 210, an outputter 220, a communicator 230, a memory 240, and a controller 250.

[0066] The inputter 210 has a function of receiving inputs of various pieces of information. The inputter 210 may include an input device for receiving inputs of information from the user. The input device is, for example, a button, a keyboard, a touch panel, a microphone, or the like. The inputter 210 may also include various sensors including an image sensor.

[0067] The outputter 220 has a function of outputting information. The outputter 220 may include an output device that outputs information for the user. The output device is, for example, a display device that displays infor-

mation, a light emission device that emits light, a vibration device that vibrates, a sound output device that outputs sound, or the like. An example of the display device is a display. An example of the light emission device is an LED (light-emitting diode). An example of the vibration device is an eccentric motor. An example of the sound output device is a speaker. The outputter 220 notifies the user of information input from the controller 250 by outputting the information.

[0068] The communicator 230 is a communication interface for communicating information between the terminal device 200 and another device. The communicator 230 performs communication based on any wired or wireless communication standard. Such a communication standard may be, for example, USB (universal serial bus), Wi-Fi (registered trademark), Bluetooth (registered trademark), or the like.

[0069] The memory 240 stores various pieces of information. The memory 240 is, for example, a nonvolatile storage medium such as a flash memory.

[0070] The controller 250 functions as an arithmetic processing device or a control device and controls overall operations in the terminal device 200 in accordance with various programs. The controller 250 is achieved, for example, by an electronic circuit such as a CPU (central processing unit) or a microprocessor. The controller 250 may also include a ROM (read-only memory) that stores programs to be used and arithmetic parameters and a RAM (random-access memory) that temporarily stores parameters which change as necessary and the like. The terminal device 200 performs various types of processing under control of the controller 250. Processing of information input using the inputter 210, output of information using the outputter 220, communication of information performed by the communicator 230, and storing and reading of information performed by the memory 240 are examples of processing controlled by the controller 250. The controller 250 also controls other types of processing performed by the terminal device 200, such as input of information to each component and processing based on information output from each component.

[0071] The functions of the controller 250 may be achieved by applications. The applications may be pre-installed or downloaded. Alternatively, the functions of the controller 250 may be achieved by PWAs (progressive web apps).

- Communication between Devices

[0072] The inhaler device 100 can communicate with other devices. A communication link used for the communication between the inhaler device 100 and other devices may be wireless or wired. The present embodiment will be described on an assumption that the communication link is wireless.

[0073] The inhaler device 100 establishes connections especially with other devices paired therewith and communicates information. In pairing, two devices exchange

and save information regarding the two devices. Examples of the information to be exchanged include identification information regarding a paired device, such as SSIDs (service set identifiers) and information regarding encryption keys to be used to encrypt information to be communicated.

[0074] The inhaler device 100 and the terminal device 200 perform pairing first, and then communicate information. A wireless communication standard used for wireless communication between the inhaler device 100 and the terminal device 200 is desirably a short-distance wireless communication standard such as Bluetooth. In this case, the inhaler device 100 and the terminal device 200 can establish a connection and communicate with each other if located within a range where short-distance wireless communication is possible. It is assumed in the following description that the inhaler device 100 and the terminal device 200 perform communication based on BLE (Bluetooth Low Energy (registered trademark)).

(2) Locking Function

[0075] The inhaler device 100 has a locking function. The locking function is a function of controlling whether the heater 121 is to produce heat. Inhibition of the heating performed by the heater 121 will also be referred to as locking hereinafter. Permission of the heating performed by the heater 121 will also be referred to as unlocking.

[0076] When a user operation for requesting a start of the heating is performed in an unlocked state, the inhaler device 100 starts the heating using the heater 121. An example of the operation for requesting a start of the heating is pressing of a button provided for the inhaler device 100. When a user operation for requesting a start of the heating is performed in a locked state, on the other hand, the inhaler device 100 does not start the heating performed by the heater 121. With this configuration, since the heating by the heater 121 does not start in the locked state should the button be pressed by mistake inside a bag, for example, safety in use of the inhaler device 100 can be improved.

[0077] If a first condition is satisfied, the inhaler device 100 unlocks. When a plurality of first conditions are set, the inhaler device 100 may unlock if one of the plurality of first conditions is satisfied.

[0078] The first condition may include detection of operations corresponding to a preset first operation pattern. An operation pattern refers to a combination of operations performed on operation units that are provided for the inhaler device 100 and that are capable of receiving physical operations. The inhaler device 100 may be provided with a button and a slider for opening and closing the opening 142, for example, as the operation units. In this case, a combination of pressing of the button and an operation for opening and closing the opening 142 is set as the first operation pattern. With this configuration, the inhaler device 100 does not unlock unless the operations corresponding to the first operation pattern are per-

formed. As a result, misuse by a person other than the user, such as a child, can be prevented, and the safety in use of the inhaler device 100 can be improved.

[0079] The first condition may include communication that is being performed between the inhaler device 100 and the terminal device 200. Here, an example of the communication that is being performed between the inhaler device 100 and the terminal device 200 is establishment of a connection between the inhaler device 100 and the terminal device 200 based on a short-distance wireless communication standard such as BLE. With this configuration, the inhaler device 100 unlocks when the inhaler device 100 and the terminal device 200 are located within a range where short-distance wireless communication is possible, and does not unlock when the inhaler device 100 and the terminal device 200 are not located within the range. When the user is going out carrying the terminal device 200, therefore, misuse, by a child, for example, of the inhaler device 100 left at home can be prevented. As a result, the safety in use of the inhaler device 100 can be improved. When the user uses the inhaler device 100 while carrying the terminal device 200, on the other hand, the inhaler device 100 automatically unlocks, thereby sparing the user from performing an unlocking operation and increasing usability.

[0080] If a second condition is satisfied, the inhaler device 100 locks. When a plurality of second conditions are set, the inhaler device 100 may lock if one of the plurality of second conditions is satisfied.

[0081] The second condition may include detection of operations corresponding to a preset second operation pattern. With this configuration, the inhaler device 100 can be locked on the basis of explicit operations performed by the user.

[0082] The second condition may include an end of communication between the inhaler device 100 and the terminal device 200. That is, the second condition may include an end of a connection established between the inhaler device 100 and the terminal device 200 based on a short-distance wireless communication standard such as BLE. With this configuration, when the user is going out carrying the terminal device 200, the inhaler device 100 left at home automatically locks.

(3) Obtaining Log Information

[0083] The inhaler device 100 stores log information, which is information obtained in accordance with use of the inhaler device 100, in a memory 114. The log information is obtained when a certain operation relating to the inhaler device 100 is performed. The log information includes a time at which the certain operation relating to the inhaler device 100 was performed. For example, the inhaler device 100 stores information indicating a time at which a certain operation relating to the inhaler device 100 was performed and identification information indicating the certain operation while associating these pieces of information with each other. The inhaler device 100

then transmits the log information stored in the memory 114 to the terminal device 200. It is assumed that the inhaler device 100 and the terminal device 200 are not constantly connected to each other. The inhaler device 100, therefore, accumulates the log information while not being connected to the terminal device 200 and transmits the accumulated log information when connected to the terminal device 200.

[0084] The terminal device 200 transfers, to another device, log information received from the inhaler device 100. An example of the other device is a server that provides services relating to the inhaler device 100. The server collects and analyzes the log information and uses the log information for services including update of firmware of the inhaler device 100. With this configuration, services provided in relation to the inhaler device 100 can be improved.

[0085] Alternatively, the terminal device 200 may output the log information received from the inhaler device 100 to the user. In this case, the user can view a use history of the inhaler device 100 thereby.

- Information Indicating Time

[0086] The inhaler device 100 includes a counter. The counter is a logical or physical component for counting a number.

[0087] The inhaler device 100 changes a value of the counter each time unit time has elapsed. An example of the change is counting up. The counter may count the number of clock pulses of the CPU included in the controller 116, for example, and in this case, the unit time corresponds to the length of each clock pulse. Alternatively, the counter may be an RTC (real-time clock), and the unit time may be 1 second. The inhaler device 100 starts to change the value of the counter when the inhaler device 100 is activated for a first time. With this configuration, it is guaranteed that the counter indicates different values at different timings. Time, therefore, can be calculated on the basis of the value of the counter.

[0088] The log information includes the value of the counter as the information indicating a time. That is, the log information includes the value of the counter at a first timing, at which the certain operation relating to the inhaler device 100 was performed, as the information indicating a time at which the certain operation relating to the inhaler device 100 was performed. With this configuration, the terminal device 200 can calculate, as described later, a time corresponding to the first timing at which the certain operation relating to the inhaler device 100 was performed.

[0089] The inhaler device 100 transmits the stored log information at a second timing and also transmits the value of the counter at the second timing. As a result, the terminal device 200 receives the log information including the value of the counter at the first timing, at which the certain operation relating to the inhaler device 100 was performed, and the value of the counter at the second

timing, at which the inhaler device 100 transmitted the log information. The terminal device 200 then calculates the time corresponding to the first timing on the basis of the value of the counter at the first timing, the value of the counter at the second timing, and a time at which the terminal device 200 received the log information. The time corresponding to the first timing here is a time indicated by a clock included in the terminal device 200 when the certain operation relating to the inhaler device 100 was performed. The time at which the terminal device 200 received the log information corresponds to the value of the counter at the second timing. A time obtained by multiplying a difference between the value of the counter at the first timing and the value of the counter at the second timing by the unit time of the counter corresponds to a period of time from the first timing to the second timing. The terminal device 200, therefore, calculates, as the time corresponding to the first timing, a time the calculated period of time from the first timing to the second timing before the time at which the terminal device 200 received the log information.

[0090] In an example, an example is assumed where the time at which the terminal device 200 received the log information was 10:15. It is assumed that the value of the counter at the first timing was 400 and the value of the counter at the second timing was 1000. It is assumed that the unit time of the counter was 1 second. In this case, 600 seconds, which is obtained by multiplying 600, which is obtained by subtracting 400 from 1000, by 1 second, which is the unit time, is the period of time from the first timing to the second timing. 10:05, which is 600 seconds before 10:15, therefore, is calculated as the time corresponding to the first timing.

[0091] With this configuration, the terminal device 200 can calculate the time corresponding to the first timing. In addition, even when the inhaler device 100 does not include a clock, or even when there is a discrepancy between the clock included in the inhaler device 100 and the clock included in the terminal device 200, the time corresponding to the first timing based on the clock included in the terminal device 200 can be obtained.

[0092] The terminal device 200 may convert the value of the counter included in the log information into the calculated time. The terminal device 200 may then store the log information after the conversion or transfer the log information after the conversion to another device. An example of the other device is a server that provides services relating to the inhaler device 100. With this configuration, a time at which the log information was obtained can be used for an analysis conducted by the server.

[0093] The inhaler device 100 may transmit information indicating the unit time of the counter. In this case, the terminal device 200 calculates the time corresponding to the first timing further on the basis of the unit time of the counter indicated by the received information. More specifically, when calculating the period of time from the first timing to the second timing, the terminal device 200

multiplies the difference between the value of the counter at the first timing and the value of the counter at the second timing by the unit time of the counter indicated by the received information. With this configuration, an accurate time can be calculated even when the unit time of the counter is different between inhaler devices 100.

- Example of Certain Operation

[0094] The certain operation may include the heater 121 starting to generate the aerosol. For example, the inhaler device 100 stores log information including the value of the counter at a timing when a user operation for requesting a start of the heating was performed and the heater 121 started the heating. With this configuration, the terminal device 200 can calculate a time at which the inhaler device 100 started to generate the aerosol.

[0095] The certain operation may include inhalation of the aerosol by the user. For example, the inhaler device 100 stores log information including the value of the counter at a timing when a value accompanying a puff by the user, such as a decrease in temperature of the heater 121 or an increase in an airflow rate of the airflow path 180. With this configuration, the terminal device 200 can calculate a time at which the user puffed.

[0096] The certain operation may include charging of a power supply 111 that accumulates power and that supplies the power for the operation of the inhaler device 100. When the inhaler device 100 is connected to an external power supply through USB or the like, for example, the inhaler device 100 starts to charge the power supply 111. In this case, the inhaler device 100 stores log information including the value of the counter at a timing when the inhaler device 100 was connected to the external power supply and started the charging. With this configuration, the terminal device 200 can calculate a time at which the inhaler device 100 started the charging.

[0097] The certain operation may include an operation that satisfies the first condition set for the locking function. For example, the inhaler device 100 stores log information including the value of the counter at a timing when the inhaler device 100 unlocked on the basis of detection of the operations corresponding to the preset first operation pattern or establishment of a connection between the inhaler device 100 and the terminal device 200. With this configuration, the terminal device 200 can calculate a time at which the inhaler device 100 unlocked.

[0098] The certain operation may include an operation that satisfies the second condition set for the locking function. For example, the inhaler device 100 stores log information including the value of the counter at a timing when the inhaler device 100 locked on the basis of detection of the operations corresponding to the preset second operation pattern or an end of a connection between the inhaler device 100 and the terminal device 200. With this configuration, the terminal device 200 can calculate a time at which the inhaler device 100 locked.

(4) What To Do When Amount of Power Remaining Becomes Small

[0099] The inhaler device 100 performs a certain type of processing on the log information stored in the memory 114 using, as a trigger, a fact that the amount of power remaining in the power supply 111 has fallen below a threshold. An example of the threshold is a discharge end voltage or a value obtained by adding a certain value to the discharge end voltage. The discharge end voltage is a voltage at or below which discharge is not recommended. In this case, the inhaler device 100 performs a certain type of processing on the log information stored in the memory 114 using, as a trigger, a fact that the power supply 111 has entered an over-discharged state or that the power supply 111 has entered a nearly over-discharged state. In the over-discharged state or the nearly over-discharged state, it can be difficult to store log information correctly. With this configuration, however, a certain level of reliability can be maintained for the log information stored in the inhaler device 100.

[0100] It is to be noted here that when the amount of power remaining in the power supply 111 falls below the threshold, the counter can stop or be reset. This is because there is not enough power to operate the counter. In this case, it is difficult to accurately calculate a time at which log information was obtained on the basis of the value of the counter included in the log information. This is because once the counter stops or is reset, the difference between the value of the counter at the first timing and the value of the counter at the second timing, at which the log information is transmitted, does not match the period of time between the first timing and the second timing.

[0101] As a specific example, an example is possible where the inhaler device 100 has not been used for an extended period of time and the counter has stopped. After the non-use for the extended period of time, the inhaler device 100 is charged and activated again and, after the counter restarts, transmits log information stored before the non-use of the inhaler device 100. In this case, a difference between the value of the counter at the first timing, at which the log information was obtained, before the stop and the value of the counter at the second timing, at which the log information was transmitted, after the restart does not reflect the period of time for which the counter had remained stopped. The terminal device 200, therefore, erroneously calculates, as a time at which the log information was obtained, a time later than an actual one by the period of time for which the counter had remained stopped. In the present embodiment, however, a certain level of reliability can be maintained for the log information stored in the inhaler device 100, especially the information indicating the time at which the log information was obtained.

[0102] An example of the certain type of processing is addition of a certain flag to the log information stored in the memory 114. The certain flag may be included in the

log information. With this configuration, log information stored when the amount of power remaining in the power supply 111 falls below the threshold and log information stored after the power supply 111 is charged and the amount of power remaining becomes larger than or equal to the threshold can be distinguished from each other.

[0103] The inhaler device 100 may then transmit the log information stored in the memory 114 along with the certain flag added to the log information. With this configuration, the terminal device 200 can distinguish log information stored when the amount of power remaining in the power supply 111 falls below the threshold and log information stored after the power supply 111 is charged and the amount of power remaining becomes larger than or equal to the threshold.

[0104] The terminal device 200 performs different types of processing on received log information depending on whether the certain flag is added to the log information. With this configuration, different types of processing are used for log information in which information indicating a time is inaccurate and log information in which information indicating a time is accurate. The terminal device 200, therefore, can maintain a certain level of reliability for the log information.

[0105] In an example, the terminal device 200 may discard log information to which the certain flag is added and store, in the memory 240, log information to which the certain flag is not added. With this configuration, log information in which information indicating a time is inaccurate can be discarded, and only log information in which information indicating a time is accurate can be selectively stored.

[0106] In another example, the terminal device 200 may cause the output unit 220 to output the log information in different modes depending on whether the certain flag is added. With this configuration, log information in which information indicating a time is inaccurate and log information in which information indicating a time is accurate can be provided for the user in a distinguishable manner. For example, the terminal device 200 outputs information indicating that information indicating a time at which log information to which the certain flag is added was obtained is inaccurate. With this configuration, the user can be alerted to log information in which information indicating a time is inaccurate.

[0107] In another example, the terminal device 200 may remove information (e.g., the value of the counter) indicating a time at which log information was obtained, the information being included in the log information. With this configuration, only information indicating an inaccurate time can be removed in log information. Since log information that does not include information indicating an inaccurate time is transferred to the server, services relating to the inhaler device 100 can be improved.

(5) Procedure of Process

- Procedure of Process Relating to Log Information

[0108] Fig. 4 is a sequence diagram illustrating an example of a procedure of a process relating to log information performed by the system 1 according to the present embodiment. The inhaler device 100 and the terminal device 200 are involved in this sequence. A process when log information regarding a puff, which is an example of the certain operation relating to the inhaler device 100, is obtained will be described hereinafter.

[0109] As illustrated in Fig. 4, first, when the user puffs, the inhaler device 100 stores log information including the value of the counter at the first timing, at which the user puffed (step S102). The inhaler device 100 performs the processing in step S102 each time the user puffs.

[0110] Next, the inhaler device 100 and the terminal device 200 establish a connection therebetween (step S104). When the inhaler device 100 and the terminal device 200 are located within a range where short-distance wireless communication is possible and a certain user operation is performed on the inhaler device 100, for example, the inhaler device 100 and the terminal device 200 establish a connection therebetween.

[0111] Next, the inhaler device 100 transmits the log information stored in step S102 and also transmits the value of the counter at the second timing, at which the inhaler device 100 transmitted the log information (step S106). The terminal device 200 receives these pieces of information.

[0112] The terminal device 200 then calculates a time corresponding to the first timing, at which the user puffed, on the basis of the received information and a time at which the terminal device 200 received the log information (step S108). More specifically, first, the terminal device 200 calculates a period of time between the first timing, at which the user puffed, and the second timing, at which the inhaler device 100 transmitted the log, by multiplying a difference between the value of the counter at the first timing and the value of the counter at the second timing by the unit time of the counter. The terminal device 200 then calculates, as the time corresponding to the first timing, a time the calculated period of time earlier than the time at which the terminal device 200 received the log information.

[0113] Next, the terminal device 200 outputs the time at which the user puffed (step S110). The process then ends.

- Process in Inhaler Device 100 Relating to Small Amount of Power Remaining

[0114] Fig. 5 is a flowchart illustrating an example of a procedure of a process relating to log information performed by the inhaler device 100 according to the present embodiment. A process when log information regarding a puff, which is an example of the certain operation re-

lating to the inhaler device 100, is obtained will be described hereinafter.

[0115] As illustrated in Fig. 5, first, when the user puffs, the controller 116 stores, in the memory 114, log information including the value of the counter at the first timing, at which the user puffed (step S202).

[0116] Next, the controller 116 determines whether the amount of power remaining in the power supply 111 is smaller than the threshold (step S204).

[0117] If determining that the amount of power remaining in the power supply 111 is larger than or equal to the threshold (step S204: NO), the controller 116 transmits the log information stored in the memory 114 and also transmits the value of the counter at the second timing, at which the controller 116 transmitted the log information (step S212). The process then ends.

[0118] If determining that the amount of power remaining in the power supply 111 is smaller than the threshold (step S204: YES), on the other hand, the controller 116 adds the certain flag to the log information stored in the memory 114 (step S206).

[0119] Next, the controller 116 determines whether the amount of power remaining in the power supply 111 has become larger than or equal to the threshold (step S208).

[0120] If determining that the amount of power remaining in the power supply 111 is smaller than the threshold (step S208: NO), the controller 116 waits until the amount of power remaining in the power supply 111 becomes larger than or equal to the threshold. For example, the controller 116 waits until the inhaler device 100 is connected to an external power supply through USB and the power supply 111 is charged.

[0121] If determining that the amount of power remaining in the power supply 111 is larger than or equal to the threshold (step S208: YES), on the other hand, the controller 116 transmits the log information stored in the memory 114 and the certain flag added to the log information and also controls a communicator 115 such that the communicator 115 transmits the value of the counter at the second timing, at which the controller 116 transmitted the log information (step S210). After the controller 116 transmits the log information, the flag added to the log information may be removed from the memory 114. The process then ends.

- Process in Terminal Device 200 Relating to Small Amount of Power Remaining

[0122] Fig. 6 is a flowchart illustrating an example of a procedure of a process relating to log information performed by the terminal device 200 according to the present embodiment. A process when log information regarding a puff, which is an example of the certain operation relating to the inhaler device 100, is obtained will be described hereinafter.

[0123] As illustrated in Fig. 6, first, the communicator 230 receives log information including the value of the counter at the first timing, at which the user puffed, and

the value of the counter at the second timing, at which the inhaler device 100 transmitted the log information (step S302).

[0124] Next, the controller 250 calculates a time corresponding to the first timing, at which the user puffed, on the basis of the received information and a time at which the terminal device 200 received the log information (step S304).

[0125] Next, the controller 250 determines whether the certain flag is added to the log information (step S306).

[0126] If determining that the certain flag is added to the log information (step S306: YES), the controller 250 controls the outputter 220 such that the outputter 220 outputs information indicating a time at which the user puffed and information indicating that the time is not accurate (step S308).

[0127] If determining that the certain flag is not added to the log information (step S306: NO), on the other hand, the controller 250 controls the outputter 220 such that the outputter 220 outputs the information indicating the time at which the user puffed (step S310).

«3. Appendix»

[0128] Although a preferred embodiment of the present invention has been described in detail above with reference to the accompanying drawings, the present invention is not limited to this example. It is obvious that those who have ordinary knowledge in the technical field to which the present invention belongs can come up with various modifications or corrections within the scope of the technical idea described in the claims, and it should be understood that these modifications or corrections naturally belong to the technical scope of the present disclosure.

[0129] Although an example where a certain flag is added to log information has been described as an example of the certain type of processing performed when the amount of power remaining becomes small in the above embodiment, for example, the present invention is not limited to this example.

[0130] In an example, the certain type of processing performed when the amount of power remaining becomes small may be removal of information (i.e., the value of the counter) indicating a time at which log information was obtained, the information being included in the log information. With this configuration, only information indicating an inaccurate time included in log information can be removed. Since log information that does not include information indicating an inaccurate time is transmitted after charging, a decrease in the amount of information provided for the user can be prevented, and services relating to the inhaler device 100 provided by the server can be improved.

[0131] In another example, the certain type of processing performed when the amount of power remaining becomes small may be removal of log information from the memory 114. With this configuration, log information in

which information indicating a time is inaccurate is not left in the inhaler device 100.

[0132] Here, the memory 114 may also include a volatile storage medium in addition to the nonvolatile storage medium. The nonvolatile storage medium may store log information, and the volatile storage medium stores logical position information indicating an area of the non-volatile storage medium where the log information is stored. In this case, the removal of log information performed when the amount of power remaining becomes small may be achieved by removing the logical position information stored in the volatile storage medium. This is because when the logical position information is removed, the log information stored in the nonvolatile storage medium can no longer be accessed. The removal of the logical position information stored in the volatile storage medium may be removal accompanying a stop of supply of power to the volatile storage medium.

[0133] Although an example where the inhaler device 100 transmits a certain flag added to log information along with the log information has been described in the above embodiment, the present invention is not limited to this example. The inhaler device 100 may perform another type of processing in accordance with the certain flag, instead.

[0134] In an example, the inhaler device 100 may remove log information to which a certain flag is added from the memory 114 using, as a trigger, satisfaction of a certain condition. An example of the certain condition is a start of charging of the power supply 111. Another example of the certain condition is the amount of power remaining in the power supply 111 becoming larger than or equal to the threshold as a result of charging of the power supply 111. When log information is removed after the amount of power remaining in the inhaler device 100 falls below the threshold, the removal process might abruptly end due to power shortage, which lacks in reliability. With this configuration, however, log information can be removed with a sufficient amount of power remaining, and reliability about the removal process can be improved. In addition, with this configuration, log information in which information indicating a time is inaccurate can be removed without being transmitted, which reduces the amount of data communicated.

[0135] In another example, the inhaler device 100 may remove information (i.e., the value of the counter) indicating a time at which log information to which a certain flag is added was obtained, the information being included in the log information, using, as a trigger, satisfaction of a certain condition. An example of the certain condition is a start of charging of the power supply 111. Another example of the certain condition is the amount of power remaining in the power supply 111 becoming larger than or equal to the threshold as a result of charging of the power supply 111. With this configuration, only information indicating an inaccurate time is removed, and other pieces of information are transmitted. A decrease in the amount of information provided for the user, therefore,

can be prevented, and services relating to the inhaler device 100 provided by the server can be improved. In addition, with the above configuration, removal in an unreliable state can be avoided, and information indicating an inaccurate time can be removed with a sufficient amount of power remaining.

[0136] Although an example where the inhaler device 100 and the terminal device 200 directly communicate with each other has been described in the above embodiment, for example, the present invention is not limited to this example. The inhaler device 100 and the terminal device 200 may communicate with each other indirectly through a relay device, instead. The relay device may be a charger for charging the inhaler device 100. The relay device receives, from the inhaler device 100, the log information and the value of the counter at the second timing and transfers the log information and the value of the counter to the terminal device 200. When the relay device can transfer the log information without delay, the terminal device 200 can calculate, using the method described in the above embodiment, a time at which the inhaler device 100 obtained the log information. The log information, however, might remain in the relay device, and a time lag might occur until the relay device transfers the log information. In this case, the relay device also transmits, to the terminal device 200, a value of a counter included in the relay device at a second timing, at which the relay device received the information from the inhaler device 100, and the value of the counter at a third timing, at which the relay device transmitted information to the terminal device 200. The terminal device 200 calculates the length of time for which the log information had remained in the relay device on the basis of a difference between the values of the counter at the second and third timings. The terminal device 200 can then calculate a time at which the inhaler device 100 obtained the log information by taking into consideration the length of time for which the log information had remained in the relay device.

[0137] The processes performed by the devices described herein may be achieved by software, hardware, or a combination of software and hardware. Programs constituting software are stored in advance in storage media (non-transitory media) provided inside or outside the devices. When each of the programs is executed, for example, a computer that controls a corresponding one of the devices described herein loads the program into a RAM, and a processor such as a CPU executes the program. The storage media may include, for example, a magnetic disk, an optical disc, a magneto-optical disk, and a flash memory. The computer programs may be distributed over a network, for example, without using the storage media.

[0138] The processes described using flowcharts and sequence diagrams herein need not necessarily be performed in illustrated order. Some processing steps may be performed in parallel with each other. Additional processing steps may be employed, and some process-

ing steps may be omitted.

[0139] The following configurations also belong to the technical scope of the present invention.

- (1) An inhaler device including: 5
- a generation unit that generates an aerosol using a substrate;
 - a memory that stores information;
 - a power supply that accumulates and supplies 10 power for operating the inhaler device; and
 - a controller that controls operation of the inhaler device,
 - in which the controller stores, in the memory, log information, which is information obtained when 15 a certain operation relating to the inhaler device is performed, and
 - in which the controller performs a certain type of processing on the log information stored in the memory using, as a trigger, a fact that an amount of power remaining in the power supply 20 has fallen below a threshold.
- (2) The inhaler device according to (1), in which the certain type of processing is addition of 25 a certain flag to the log information stored in the memory.
- (3) The inhaler device according to (2), further including:
- a communicator that communicates with another device, 30
 - in which the controller controls the communicator such that the communicator transmits the log information stored in the memory along with the 35 certain flag added to the log information.
- (4) The inhaler device according to (2), in which the controller removes, from the memory, the log information to which the certain flag is added 40 using, as a trigger, a start of charging of the power supply.
- (5) The inhaler device according to (2), in which the controller removes information indicating a time at which the log information to which the 45 certain flag is added was obtained, the information being included in the log information, using, as a trigger, a start of charging of the power supply.
- (6) The inhaler device according to (1), in which the certain type of processing is removal of 50 information indicating a time at which the log information was obtained, the information being included in the log information.
- (7) The inhaler device according to (1), in which the certain type of processing is removal of 55 the log information from the memory.
- (8) The inhaler device according to any of (1) to (7),

in which the controller changes a value of a counter each time unit time has elapsed, and in which the log information includes, as information indicating a time at which the certain operation was performed, the value of the counter at a first timing, at which the certain operation was performed.

(9) The inhaler device according to (8), further including:

- a communicator that communicates with another device,
- in which the communicator transmits, at a second timing, the log information stored in the memory and also transmits the value of the counter at the second timing.

(10) The inhaler device according to any of (1) to (9), in which the certain operation includes the generation unit starting to generate the aerosol.

(11) The inhaler device according to any of (1) to (10), in which the certain operation includes inhalation of the aerosol by the user.

(12) The inhaler device according to any of (1) to (11), in which the certain operation includes charging of the power supply.

(13) The inhaler device according to any of (1) to (12),

- in which, if a first condition is satisfied, the controller permits the generation of the aerosol, and
- in which the certain operation includes an operation that satisfies the first condition.

(14) The inhaler device according to any of (1) to (13),

- in which, if a second condition is satisfied, the controller inhibits the generation of the aerosol, and
- in which the certain operation includes an operation that satisfies the second condition.

(15) A terminal device including:

- a communicator that communicates with another device; and
- a controller that performs different types of processing on log information that is obtained by an inhaler device, which generates an aerosol using a substrate, when a certain operation relating to the inhaler device is performed and that is received by the communicator depending on whether a certain flag is added to the log information.

(16) The terminal device according to (15), further including:

a memory that stores information,
in which the controller discards the log information to which the certain flag is added and stores, in the memory, the log information to which the certain flag is not added.

(17) The terminal device according to (15) or (16), further including:

an outputter that outputs information,
in which the controller controls the outputter such that the outputter outputs the log information in different modes depending on whether the certain flag is added to the log information.

(18) The terminal device according to (17), in which the controller controls the outputter such that the outputter outputs information indicating that information indicating a time at which the log information to which the certain flag is added was obtained is not accurate.

(19) The terminal device according to any of claims (15) to (18),

in which the inhaler device changes a value of a counter each time unit time has elapsed,
in which the log information includes the value of the counter at a first timing, at which the certain operation was performed,
in which the communicator receives the value of the counter at a second timing, at which the inhaler device transmitted the log information, and
in which the controller calculates a time corresponding to the first timing on a basis of the value of the counter at the first timing, the value of the counter at the second timing, and a time at which the communicator received the log information.

(20) A program for causing a computer to control a terminal device that communicates with another device to perform different types of processing on log information that is obtained by an inhaler device, which generates an aerosol using a substrate, when a certain operation relating to the inhaler device is performed and that is received by the terminal device depending on whether a certain flag is added to the log information.

Reference Signs List

[0140]

1 system
100 inhaler device
110 power supply unit
111 power supply
112 sensor

113 notifier
114 memory
115 communicator
116 controller
5 120 cartridge
121 heater
122 liquid guide
123 liquid storage
124 mouthpiece
10 130 flavor imparting cartridge
131 flavor source
140 holder
141 internal space
142 opening
15 143 bottom
144 heat insulator
150 stick substrate
151 substrate
152 inhalation port
20 180 airflow path
181 air inlet hole
182 air outlet hole
200 terminal device
210 inputter
25 220 outputter
230 communicator
240 memory
250 controller

Claims

1. An inhaler device comprising:

a generation unit that generates an aerosol using a substrate;
a memory that stores information;
a power supply that accumulates and supplies power for operating the inhaler device; and
a controller that controls operation of the inhaler device,
wherein the controller stores, in the memory, log information, which is information obtained when a certain operation relating to the inhaler device is performed, and
wherein the controller performs a certain type of processing on the log information stored in the memory using, as a trigger, a fact that an amount of power remaining in the power supply has fallen below a threshold.

2. The inhaler device according to claim 1, wherein the certain type of processing is addition of a certain flag to the log information stored in the memory.

3. The inhaler device according to claim 2, further comprising:

- a communicator that communicates with another device,
wherein the controller controls the communicator such that the communicator transmits the log information stored in the memory along with the certain flag added to the log information.
4. The inhaler device according to claim 2,
wherein the controller removes, from the memory, the log information to which the certain flag is added using, as a trigger, a start of charging of the power supply.
5. The inhaler device according to claim 2,
wherein the controller removes information indicating a time at which the log information to which the certain flag is added was obtained, the information being included in the log information, using, as a trigger, a start of charging of the power supply.
6. The inhaler device according to claim 1,
wherein the certain type of processing is removal of information indicating a time at which the log information was obtained, the information being included in the log information.
7. The inhaler device according to claim 1,
wherein the certain type of processing is removal of the log information from the memory.
8. The inhaler device according to any of claims 1 to 7,

wherein the controller changes a value of a counter each time unit time has elapsed, and wherein the log information includes, as information indicating a time at which the certain operation was performed, the value of the counter at a first timing, at which the certain operation was performed.
9. The inhaler device according to claim 8, further comprising:

a communicator that communicates with another device,
wherein the communicator transmits, at a second timing, the log information stored in the memory and also transmits the value of the counter at the second timing.
10. The inhaler device according to any of claims 1 to 9,
wherein the certain operation includes the generation unit starting to generate the aerosol.
11. The inhaler device according to any of claims 1 to 10,
wherein the certain operation includes inhalation of the aerosol by a user.
12. The inhaler device according to any of claims 1 to 11,
wherein the certain operation includes charging of the power supply.
13. The inhaler device according to any of claims 1 to 12,

wherein, if a first condition is satisfied, the controller permits the generation of the aerosol, and wherein the certain operation includes an operation that satisfies the first condition.
14. The inhaler device according to any of claims 1 to 13,

wherein, if a second condition is satisfied, the controller inhibits the generation of the aerosol, and wherein the certain operation includes an operation that satisfies the second condition.
15. A terminal device comprising:

a communicator that communicates with another device; and
a controller that performs different types of processing on log information that is obtained by an inhaler device, which generates an aerosol using a substrate, when a certain operation relating to the inhaler device is performed and that is received by the communicator depending on whether a certain flag is added to the log information.
16. The terminal device according to claim 15, further comprising:

a memory that stores information,
wherein the controller discards the log information to which the certain flag is added and stores, in the memory, the log information to which the certain flag is not added.
17. The terminal device according to claim 15 or 16, further comprising:

an outputter that outputs information,
wherein the controller controls the outputter such that the outputter outputs the log information in different modes depending on whether the certain flag is added to the log information.
18. The terminal device according to claim 17,
wherein the controller controls the outputter such that the outputter outputs information indicating that information indicating a time at which the log information to which the certain flag is added was obtained is not accurate.
19. The terminal device according to any of claims 15 to

18,

wherein the inhaler device changes a value of
a counter each time unit time has elapsed,
wherein the log information includes the value 5
of the counter at a first timing, at which the cer-
tain operation was performed,
wherein the communicator receives the value of
the counter at a second timing, at which the in-
haler device transmitted the log information, and 10
wherein the controller calculates a time corre-
sponding to the first timing on a basis of the value
of the counter at the first timing, the value of the
counter at the second timing, and a time at which
the communicator received the log information. 15

20. A program for causing a computer to control a ter-
minal device that communicates with another device
to perform different types of processing on log infor-
mation that is obtained by an inhaler device, which 20
generates an aerosol using a substrate, when a cer-
tain operation relating to the inhaler device is per-
formed and that is received by the terminal device
depending on whether a certain flag is added to the
log information. 25

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FIG. 1

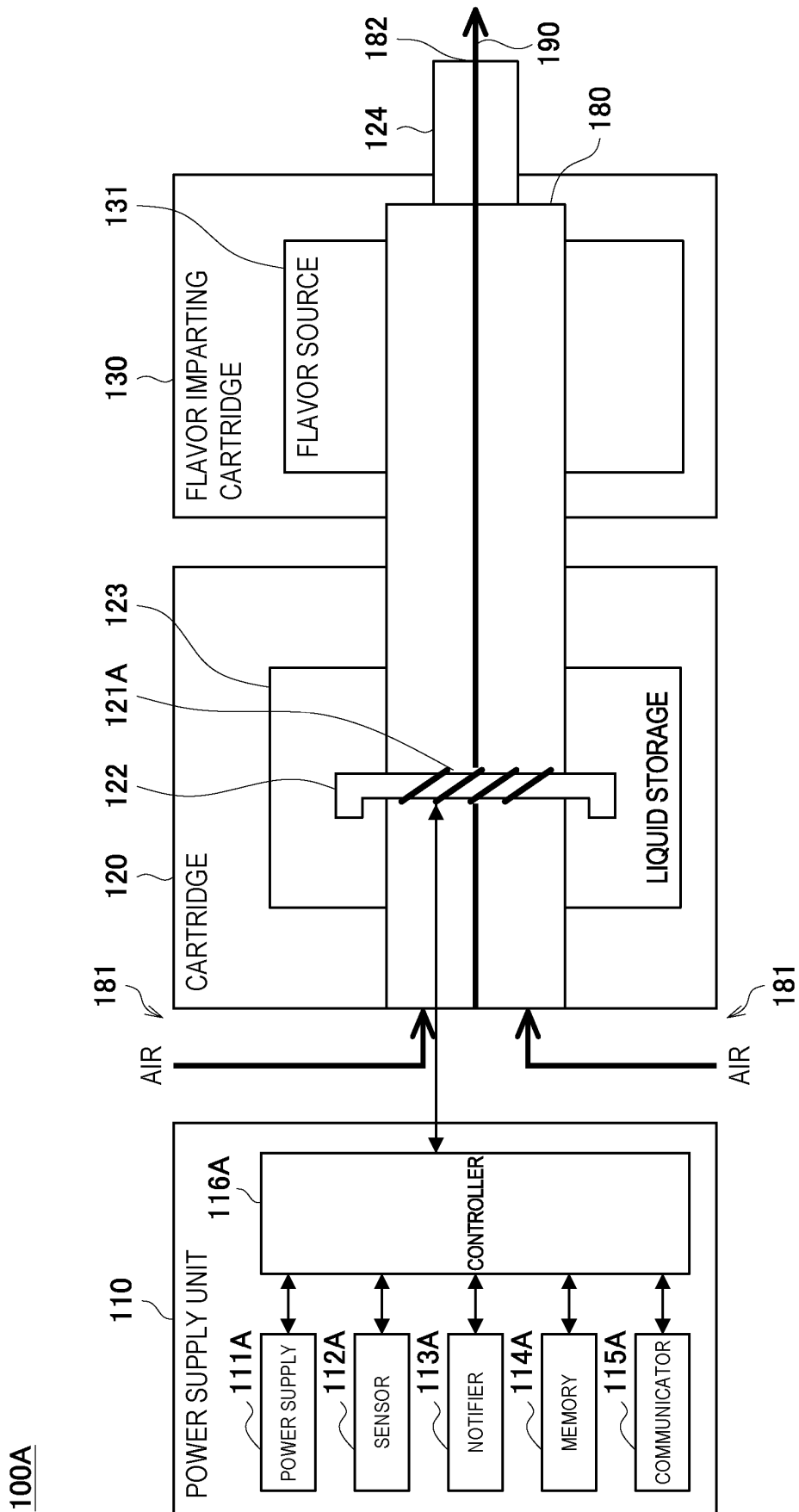


FIG. 2

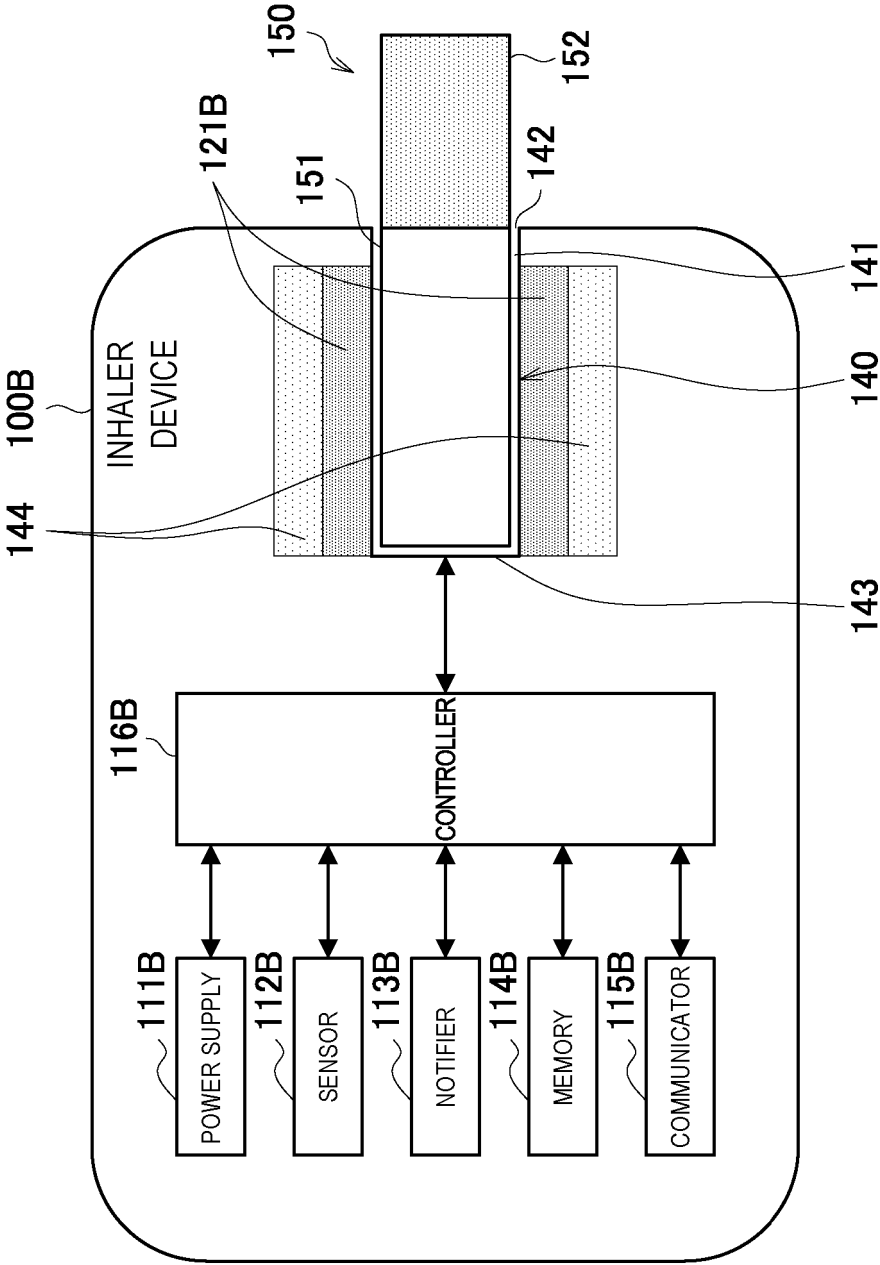


FIG. 3

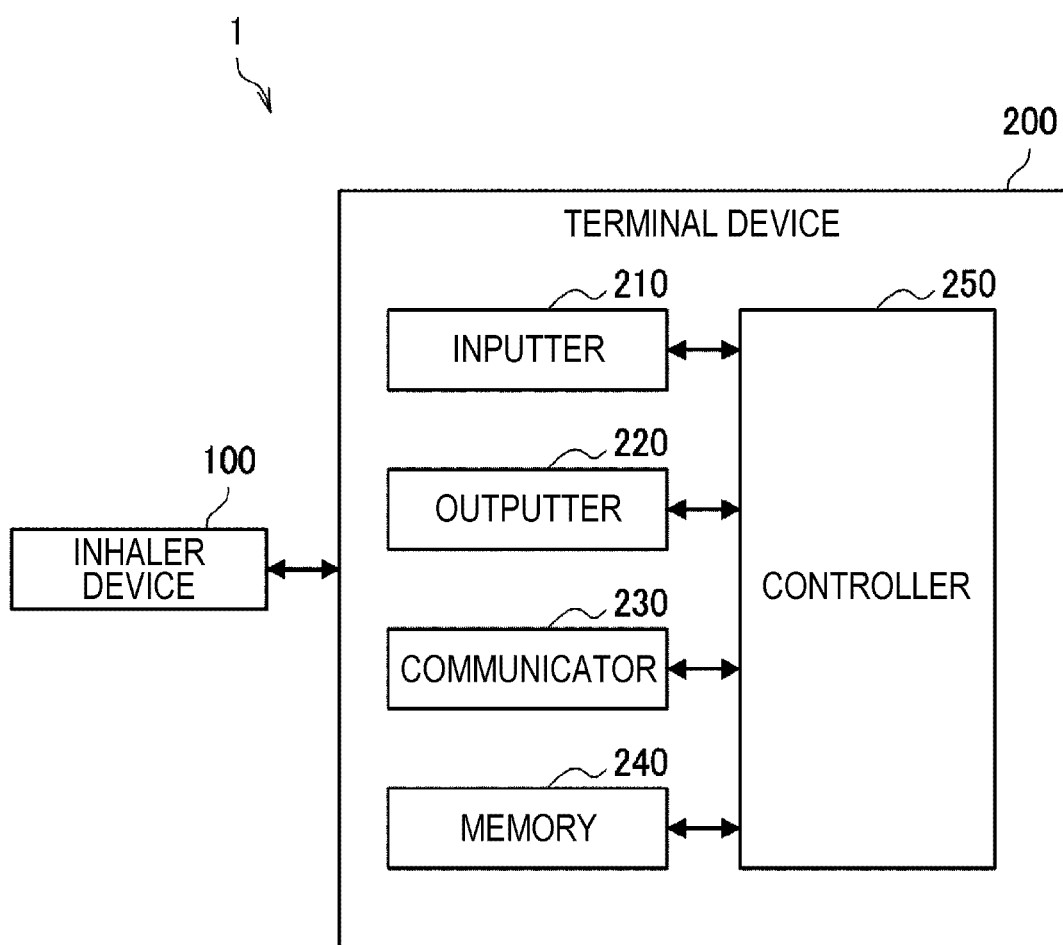


FIG. 4

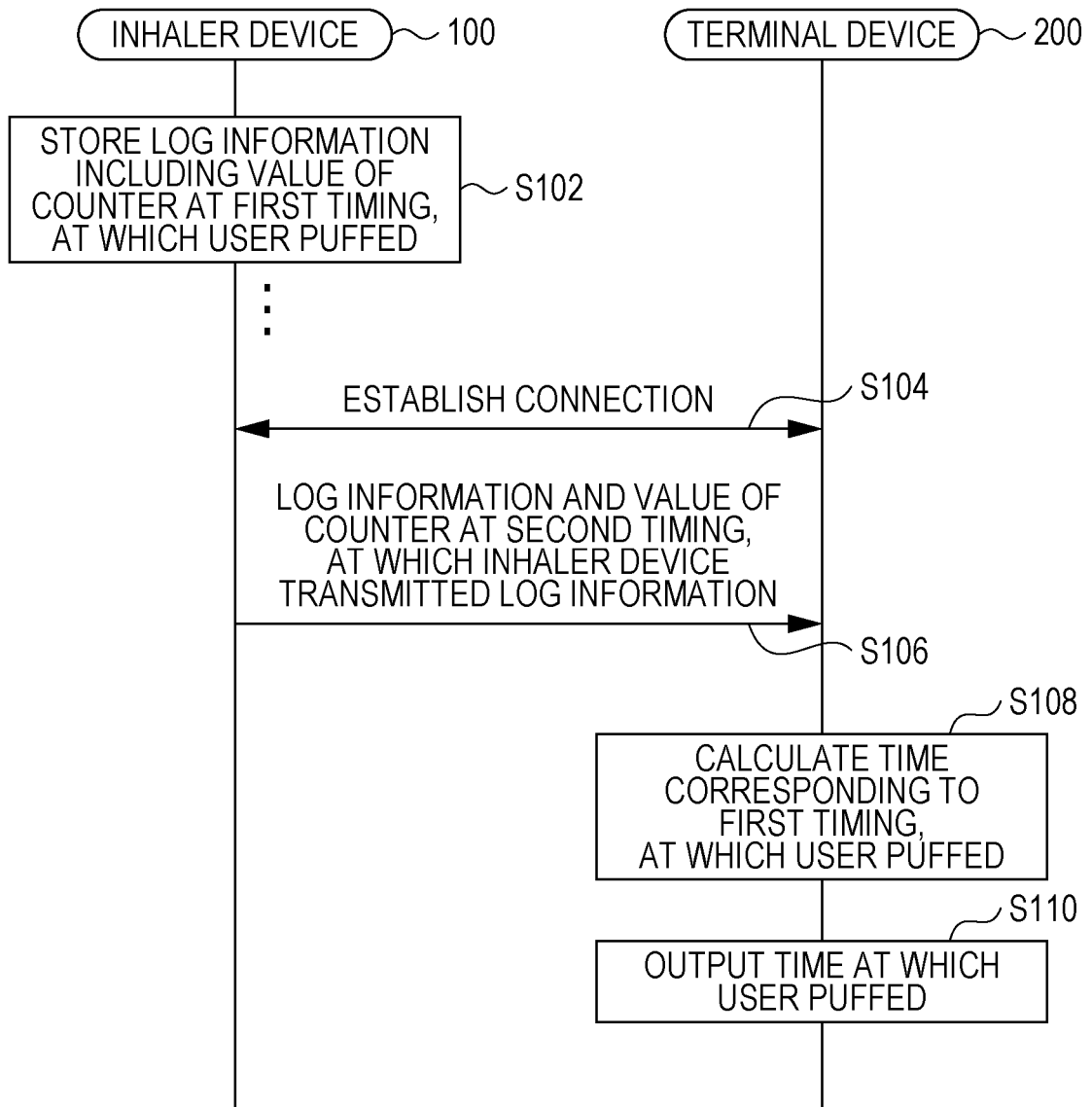


FIG. 5

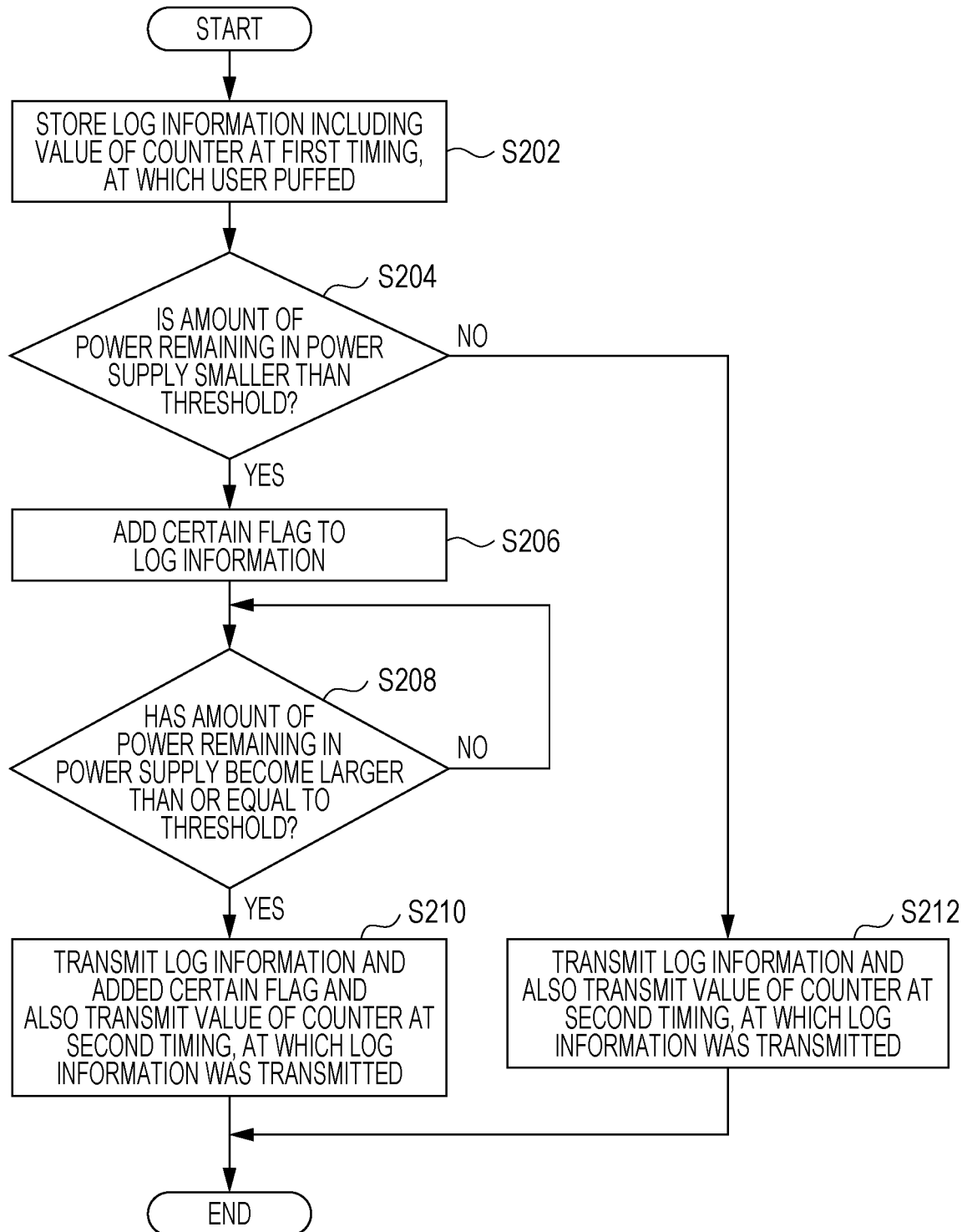
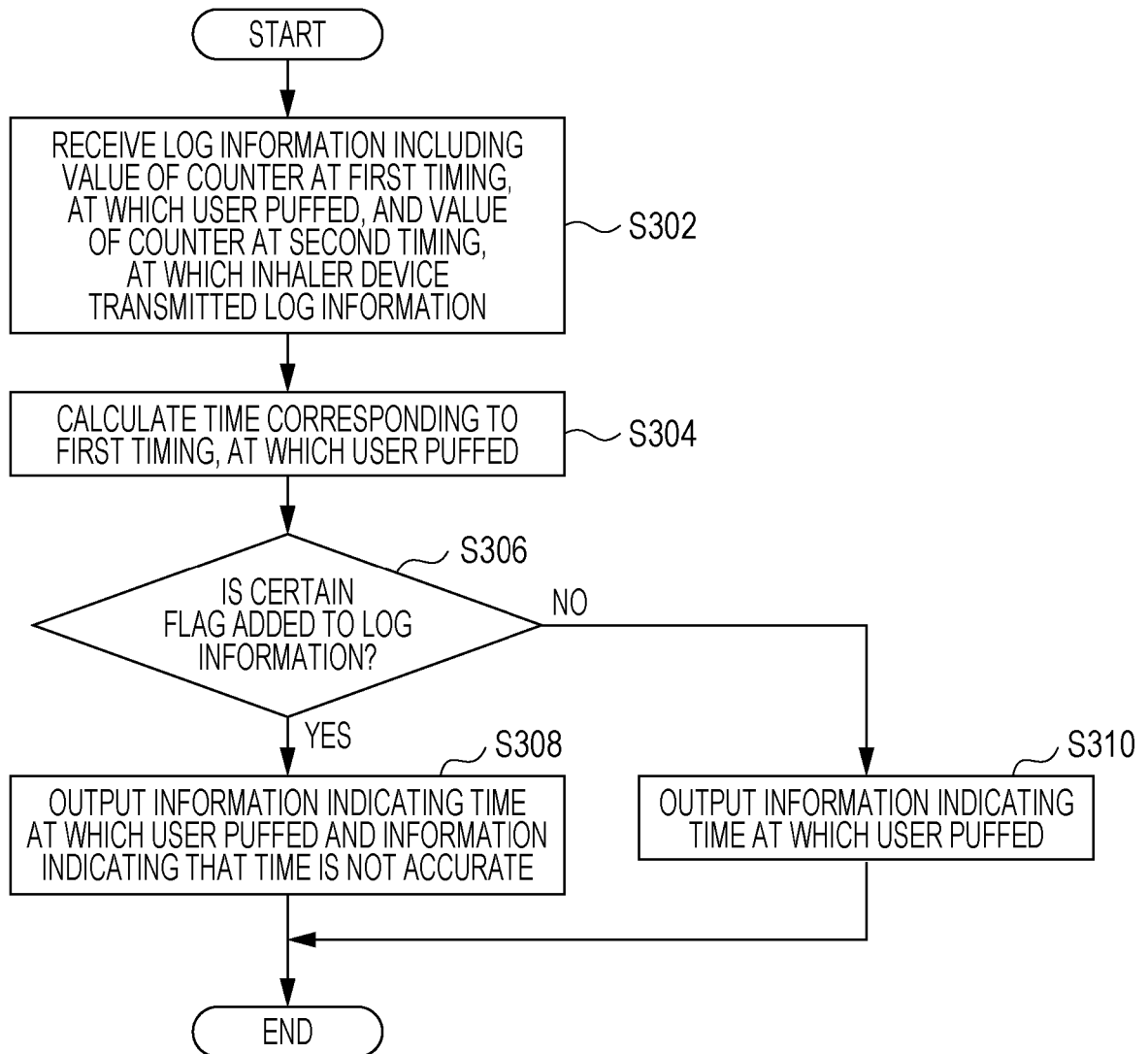


FIG. 6



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2020/047141

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/65 (2020.01) i

FI: A24F40/65

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24F40/65

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Published examined utility model applications of Japan 1922-1996

Published unexamined utility model applications of Japan 1971-2021

Registered utility model specifications of Japan 1996-2021

Published registered utility model applications of Japan 1994-2021

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2019-512245 A (PHILIP MORRIS PRODUCTS S.A.) 16	15, 17, 20
Y	May 2019 (2019-05-16) paragraphs [0048]-[0151],	1-14, 19
A	fig. 1-7	16, 18
Y	WO 2011/083801 A1 (NEC CORP.) 14 July 2011 (2011-07-14) paragraphs [0023]-[0026], [0038]-[0043], [0061]	1-14, 19
Y	WO 2015/182688 A1 (KYOCERA CORP.) 03 December 2015 (2015-12-03) paragraphs [0071]-[0073]	4-5, 8-14
Y	JP 2005-217621 A (KYOCERA CORP.) 11 August 2005 (2005-08-11) paragraph [0029]	4-5, 8-14
Y	WO 2020/026320 A1 (JAPAN TOBACCO INC.) 06 February 2020 (2020-02-06) paragraph [0050]	12-14
Y	JP 2020-195347 A (SMK CORPORATION) 10 December 2020 (2020-12-10) paragraphs [0012]-[0020]	13-14



Further documents are listed in the continuation of Box C.



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Date of the actual completion of the international search

22 January 2021 (22.01.2021)

Date of mailing of the international search report

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Name and mailing address of the ISA/
Japan Patent Office
3-4-3, Kasumigaseki, Chiyoda-ku,
Tokyo 100-8915, Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application no.

PCT/JP2020/047141

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JP 2020-195347 A	10 Dec. 2020	(Family: none)	

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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