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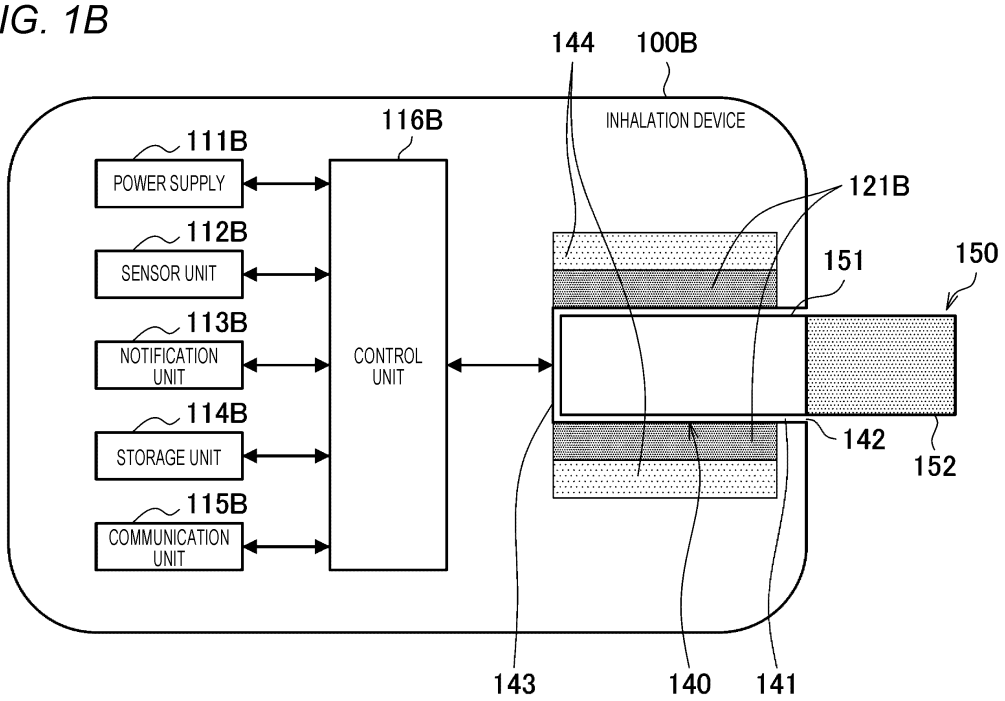
(54) **INHALATION DEVICE, CONTROL METHOD, AND PROGRAM**

(57) A control unit (116B) for an inhalation device (100B) acquires elevation information indicating the height at which the inhalation device (100B) is positioned, determines whether or not the height at which the inhalation device (100B) is positioned is less than a threshold value on the basis of the acquired elevation information, and restricts a prescribed operation in the inhalation device (100B) when it is determined that the height at which the inhalation device (100B) is positioned is less than the threshold value.

FIG. 1B



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Description

TECHNICAL FIELD

[0001] The present invention relates to an inhalation device, a control method, and a program.

BACKGROUND ART

[0002] In the related art, for example, there is known an inhaler that generates an aerosol to which a flavor component is applied and allows a user to inhale the generated aerosol. Such an inhaler typically delivers, to the user, the aerosol generated by heating a base material containing an aerosol source with a heating unit (also referred to as a "heating element") which is an electrical resistance heater or an induction heater. Further, such an inhaler also has a so-called "child resistance function" in order to prevent an occurrence of inconvenience caused by misuse by a child (for example, an infant and a young child).

[0003] For example, Patent Literature 1 below discloses that, in order to restrict access to contents of a container, a combination of two or more different operations such as squeezing while rotating a cap is required, as the child resistance function.

[0004] Further, Patent Literature 2 below discloses that a mouthpiece that moves relative to a main body portion between a first position and a second position to switch a device between a stopped state and an operating state is biased toward the first position by a spring or the like, and the device is maintained in the stopped state against a predetermined biasing force. It is disclosed that the predetermined biasing force can be selected to exceed a normal force of the infants (an expected hand force) in order to set the switching of the device in the operating state to be child-resistant.

CITATION LIST

PATENT LITERATURE

[0005]

Patent Literature 1: JP2020-506121A
Patent Literature 2: JP2019-505190A

SUMMARY OF INVENTION

TECHNICAL PROBLEM

[0006] However, a history of the technical development of the inhaler is still young. Therefore, there is a room for improvement in the child resistance function of the inhaler from a viewpoint of improving a performance.

[0007] The present invention is to provide an inhalation device, a control method, and a program capable of further preventing an occurrence of inconvenience caused by misuse by a child.

SOLUTION TO PROBLEM

[0008] A first aspect of the present invention is an inhalation device that generates an aerosol from a base material including an aerosol source, the inhalation device including:

a control unit configured to control an operation of the inhalation device, in which
the control unit

acquires height information indicating a height at which the inhalation device is located,
determines whether the height is less than a threshold based on the height information, and
restricts a predetermined operation in the inhalation device when it is determined that the height is less than the threshold.

[0009] A second aspect of the present invention is a control method, the control method including a computer, for controlling an operation of an inhalation device that generates an aerosol from a base material including an aerosol source, performing the following processing:

acquiring height information indicating a height at which the inhalation device is located;
determining whether the height is less than a threshold based on the height information; and
restricting a predetermined operation in the inhalation device when it is determined that the height is less than the threshold.

[0010] A third aspect of the present invention is a program causing a computer, for controlling an operation of an inhalation device that generates an aerosol from a base material including an aerosol source, to perform the following processing:

acquiring height information indicating a height at which the inhalation device is located;
determining whether the height is less than a threshold based on the height information; and
restricting a predetermined operation in the inhalation device when it is determined that the height is less than the threshold.

ADVANTAGEOUS EFFECTS OF INVENTION

[0011] According to the present invention, an inhalation device, a control method, and a program capable of further preventing an occurrence of inconvenience caused by misuse by a child can be provided.

BRIEF DESCRIPTION OF DRAWINGS

[0012]

[FIG. 1A] FIG. 1A is a schematic diagram schematically illustrating a first configuration example of an inhalation device.
[FIG. 1B] FIG. 1B is a schematic diagram schematically illustrating a second configuration example of the inhalation device.
[FIG. 2] FIG. 2 is an overall perspective view of an inhalation device 100B.
[FIG. 3] FIG. 3 is a top view of the inhalation device 100B.
[FIG. 4] FIG. 4 is a diagram illustrating the inhalation device 100B in a state where a panel 10 is removed therefrom.
[FIG. 5] FIG. 5 is a diagram illustrating an example of a threshold as a condition for restricting an operation of an inhalation device 100.
[FIG. 6] FIG. 6 is a diagram illustrating an example of a relationship between a height at which the inhalation device 100 is located and emission colors of a light emitting device 23a.
[FIG. 7] FIG. 7 is a diagram showing a modification of the light emitting device 23a.
[FIG. 8] FIG. 8 is a diagram illustrating an example of a relationship between the height at which the inhalation device 100 is located and the number of light emitting elements that emit light.
[FIG. 9] FIG. 9 is a diagram illustrating an example of a display device 23b.
[FIG. 10] FIG. 10 is a diagram illustrating an example of a relationship between the height at which the inhalation device 100 is located and a display mode of an indicator I of the display device 23b.
[FIG. 11] FIG. 11 is a flowchart (part 1) illustrating an example of processing performed by a control unit 116.
[FIG. 12] FIG. 12 is a flowchart (part 2) illustrating an example of the processing performed by the control unit 116.

DESCRIPTION OF EMBODIMENTS

[0013] Hereinafter, an inhalation device, a control method, and a program according to an embodiment of the present invention will be described with reference to the drawings. Hereinafter, the same or similar elements are denoted by the same or similar reference numerals, and the description thereof may be appropriately omitted or simplified.

<<1. Configuration Example of Inhalation Device>>

[0014] An inhalation device of the present embodiment is a device that generates a substance to be inhaled by a user. Hereinafter, the substance generated by the inhalation device will be described as an aerosol. Further, the substance generated by the inhalation device may be a gas.

(1) First Configuration Example

[0015] FIG. 1A is a schematic diagram schematically illustrating a first configuration example of the inhalation device. As illustrated in FIG. 1A, an inhalation 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 unit 112A, a notification unit 113A, a storage unit 114A, a communication unit 115A, and a control unit 116A. The cartridge 120 includes a heating unit 121A, a liquid guide portion 122, and a liquid storage portion 123. The flavor imparting cartridge 130 includes a flavor source 131 and a mouthpiece 124. An air flow path 180 is formed in the cartridge 120 and the flavor imparting cartridge 130.

[0016] The power supply 111A stores electric power. The power supply 111A supply the electric power to each component of the inhalation device 100A under control of the control unit 116A. The power supply 111A may be implemented by, for example, a rechargeable battery such as a lithium-ion secondary battery.

[0017] The sensor unit 112A acquires various types of information related to the inhalation device 100A. As an example, the sensor unit 112A is implemented by a pressure sensor such as a condenser microphone, a flow rate sensor, a temperature sensor, or the like, and acquires a value associated with inhalation of the user. As another example, the sensor unit 112A is implemented by an input device for receiving an input of information from the user, such as an operation button or a switch.

[0018] For example, the sensor unit 112A includes a pressure sensor (also referred to as a "puff sensor") that detects a change in a pressure (that is, an internal pressure) inside the inhalation device 100A caused by the inhalation of the user. Further, the sensor unit 112A may include a flow rate sensor that detects a flow rate generated by the inhalation of the user, and a temperature sensor (also referred to as a "puff thermistor") that detects a temperature of the heating unit 121A or around the heating unit 121A.

[0019] Further, the sensor unit 112A may include a height sensor that detects the height at which the inhalation device 100A is located. As an example, the height sensor is implemented by a pressure sensor (that is, an atmospheric pressure sensor) that detects an atmospheric pressure applied to the inhalation device 100A. As another example, the height sensor may be implemented by a distance measurement sensor that detects a distance between the inhalation device 100A and a target. The distance measurement sensor can be, for example, a radar sensor that detects a distance to the target by irradiating the target with a predetermined radar wave. In this case, a laser, a microwave, a millimeter wave, or an

ultrasonic wave may be adopted as the radar wave.

[0020] The notification unit 113A notifies the user of the information. Examples of the notification unit 113A include a light emitting device (for example, a light emitting device 23a to be described later) that emits light, a display device (for example, a display device 23b to be described later) that displays an image, a sound output device that outputs sound, or a vibration device that vibrates.

[0021] The storage unit 114A stores various types of information for an operation of the inhalation device 100A. The storage unit 114A is implemented by, for example, a nonvolatile storage medium such as a flash memory.

[0022] The communication unit 115A is a communication interface capable of performing communication conforming to any wired or wireless communication standard. As such a communication standard, for example, a standard using Wi-Fi (registered trademark), Bluetooth (registered trademark), Bluetooth Low Energy (BLE (registered trademark)), Near Field Communication (NFC), or Low Power Wide Area (LPWA) may be adopted.

[0023] The control unit 116A functions as an arithmetic processing device and a control device, and controls overall operations in the inhalation device 100A according to various programs. The control unit 116A is implemented by, for example, an electronic circuit such as a central processing unit (CPU) or a microprocessor.

[0024] The liquid storage portion 123 stores an aerosol source. That is, the cartridge 120 including the liquid storage portion 123 for storing the aerosol source is an example of a base material including the aerosol source. The aerosol source is atomized to generate an aerosol. The aerosol source is, for example, a liquid such as water or a polyhydric alcohol such as glycerin and propylene glycol. The aerosol source may contain a flavor component derived from tobacco or non-tobacco. When the inhalation device 100A is a medical inhaler such as a nebulizer, the aerosol source may include a medical agent.

[0025] The liquid guide portion 122 guides the aerosol source, which is a liquid stored in the liquid storage portion 123, from the liquid storage portion 123 and holds the aerosol source. The liquid guide portion 122 is, for example, a wick formed by twisting a fibrous material such as glass fibers or a porous material such as porous ceramics. In that case, the aerosol source stored in the liquid storage portion 123 is induced by a capillary effect of the wick.

[0026] The heating unit 121A heats the aerosol source to atomize the aerosol source to generate the aerosol. In the example illustrated in FIG. 1A, the heating unit 121A is implemented by a coil and wound around the liquid guide portion 122. When the heating unit 121A generates heat, the aerosol source held by the liquid guide portion 122 is heated and atomized, and the aerosol is generated. The heating unit 121A generates heat when supplied with power from the power supply 111A. As an example, the heating unit 121A may be supplied with power when the sensor unit 112A detects that the user starts the inhalation and/or that predetermined information is input. Further, when the sensor unit 112A detects that the user finishes the inhalation and/or that predetermined information is input, the supply of power to the heating unit 121A may be stopped. An inhalation operation of the user with respect to the inhalation device 100A can be detected, for example, based on the fact that the pressure (internal pressure) inside the inhalation device 100A detected by the puff sensor exceeds a predetermined threshold.

[0027] The flavor source 131 is a component for imparting the flavor component to the aerosol. The flavor source 131 may contain the flavor component derived from tobacco or non-tobacco.

[0028] The air flow path 180 is a flow path of air inhaled by the user. The air flow path 180 has a tubular structure having an air inflow hole 181 which is an inlet of air into the air flow path 180 and an air outflow hole 182 which is an outlet of air from the air flow path 180 as both ends. In the middle of the air flow path 180, the liquid guide portion 122 is disposed on an upstream side (a side close to the air inflow hole 181), and the flavor source 131 is disposed on a downstream side (a side close to the air outflow hole 182). The air flowing in from the air inflow hole 181 in response to the inhalation of the user is mixed with the aerosol generated by the heating unit 121A, passes through the flavor source 131, and is transported to the air outflow hole 182 as indicated by an arrow 190. When a mixed fluid of the aerosol and the air passes through the flavor source 131, the flavor component contained in the flavor source 131 is imparted to the aerosol.

[0029] The mouthpiece 124 is a member that can be held by the user in his/her mouth during the inhalation. The air outflow hole 182 is disposed in the mouthpiece 124. The user can take in the mixed fluid of the aerosol and the air into the oral cavity by holding the mouthpiece 124 in his/her mouth and inhaling the mouthpiece 124.

[0030] The configuration example of the inhalation device 100A has been described above. It is needless to say that the configuration of the inhalation device 100A is not limited to the above, and may adopt various configurations as exemplified below.

[0031] As an example, the inhalation device 100A may not include the flavor imparting cartridge 130. In this case, the mouthpiece 124 is provided on the cartridge 120.

[0032] As another example, the inhalation device 100A may further include a second heating unit that heats the flavor source 131. In this case, the second heating unit is formed in a film shape, for example, and is disposed to cover an outer periphery of the flavor imparting cartridge 130. Then, the second heating unit generates heat when being supplied with electric power from the power supply 111A, and heats the flavor imparting cartridge 130 from the outer periphery. By providing such a second heating unit, a temperature of the flavor source 131 can be increased and an amount of the flavor component applied to the aerosol can be increased, as compared with a

case where the second heating unit is not provided. When such a second heating unit is provided, the power to be supplied to the second heating unit may be controlled such that an actual temperature becomes a predetermined target temperature, for example, similarly to a heating unit 121B to be described later.

[0033] As another example, the inhalation device 100A may include a plurality of types of aerosol sources. A plurality of types of aerosols generated from the plurality of types of aerosol sources may be mixed in the air flow path 180 to cause a chemical reaction, thereby generating another type of aerosol.

[0034] A method for atomizing the aerosol source is not limited to heating by the heating unit 121A. For example, the method for atomizing the aerosol source may be vibratory atomization or induction heating.

(2) Second Configuration Example

[0035] FIG. 1B is a schematic diagram schematically illustrating a second configuration example of the inhalation device. As illustrated in FIG. 1B, an inhalation device 100B according to the present configuration example includes a power supply 111B, a sensor unit 112B, a notification unit 113B, a storage unit 114B, a communication unit 115B, a control unit 116B, a heating unit 121B, an accommodating portion 140, and a heat insulating portion 144.

[0036] The power supply 111B, the sensor unit 112B, the notification unit 113B, the storage unit 114B, the communication unit 115B, and the control unit 116B are substantially the same as the corresponding components provided in the inhalation device 100A according to the first configuration example.

[0037] The accommodating portion 140 has an internal space 141, and holds the stick-type base material 150 while accommodating a part of the stick-type base material 150 in the internal space 141. The accommodating portion 140 has an opening 142 through which the internal space 141 communicates with the outside, and holds the stick-type base material 150 inserted into the internal space 141 from the opening 142. For example, the accommodating portion 140 is a cylindrical body having the opening 142 and a bottom portion 143 as a bottom surface, and defines the columnar internal space 141. An air flow path for supplying air to the internal space 141 is connected to the accommodating portion 140. An air inflow hole, which is an inlet of air to the air flow path, is disposed, for example, in a side surface of the inhalation device 100. An air outflow hole, which is an outlet of air from the air flow path to the internal space 141, is disposed, for example, in the bottom portion 143.

[0038] The stick-type base material 150 includes a base material portion 151 and an inhalation port portion 152. The base material portion 151 includes the aerosol source. That is, the stick-type base material 150 is another example of the base material including the aerosol source. The aerosol source contains the flavor component derived from tobacco or non-tobacco. When the inhalation device 100B is a medical inhaler such as a nebulizer, the aerosol source may include a medical agent. For example, the aerosol source may be a liquid such as water and polyhydric alcohols such as glycerin and propylene glycol, including the flavor component derived from tobacco or non-tobacco, or may be a solid including the flavor component derived from tobacco or non-tobacco. In a state where the stick-type base material 150 is held by the accommodating portion 140, at least a part of the base material portion 151 is accommodated in the internal space 141, and at least a part of the inhalation port portion 152 protrudes from the opening 142. When the user holds the inhalation port portion 152 protruding from the opening 142 in his/her mouth and inhales, air flows into the internal space 141 through an air flow path that is not illustrated, and reaches the oral cavity of the user together with the aerosol generated from the base material portion 151.

[0039] In the example illustrated in FIG. 1B, the heating unit 121B is formed in a film shape, and is disposed to cover an outer periphery of the accommodating portion 140. Then, when the heating unit 121B generates heat, the base material portion 151 of the stick-type base material 150 is heated from the outer periphery thereof, and the aerosol is generated.

[0040] The heat insulating portion 144 prevents heat transfer from the heating unit 121B to other components. For example, the heat insulating portion 144 is made of a vacuum heat insulating material or an aerogel heat insulating material.

[0041] The configuration example of the inhalation device 100B has been described above. It is needless to say that the configuration of the inhalation device 100B is not limited to the above, and may adopt various configurations as exemplified below.

[0042] As an example, the heating unit 121B may be formed in a blade shape and disposed to protrude from the bottom portion 143 of the accommodating portion 140 into the internal space 141. In this case, the blade-shaped heating unit 121B is inserted into the base material portion 151 of the stick-type base material 150, and heats the base material portion 151 of the stick-type base material 150 from the inside. As another example, the heating unit 121B may be disposed to cover the bottom portion 143 of the accommodating portion 140. Further, the heating unit 121B may be configured as a combination of two or more of a first heating unit covering the outer periphery of the accommodating portion 140, a blade-shaped second heating unit, and a third heating unit covering the bottom portion 143 of the accommodating portion 140.

[0043] As another example, the accommodating portion 140 may include an opening and closing mechanism such as a hinge that opens and closes a part of an outer shell forming the internal space 141. The accommodating portion 140 may open and close the outer shell to sandwich and accommodate the stick-type base material 150 inserted into the internal space 141. In this case, the

heating unit 121B may be provided at a sandwiching place in the accommodating portion 140, and may heat the stick-type base material 150 while pressing the stick-type base material 150.

[0044] The method for atomizing the aerosol source is not limited to heating by the heating unit 121B. For example, the method for atomizing the aerosol source may be induction heating. In this case, the inhalation device 100B at least includes an electromagnetic induction source such as a coil for generating a magnetic field, instead of the heating unit 121B. A susceptor that generates heat due to the induction heating may be provided in the inhalation device 100B or may be provided in the stick-type base material 150.

[0045] The inhalation device 100B may further include the heating unit 121A, the liquid guide portion 122, the liquid storage portion 123, and the air flow path 180 according to the first configuration example, and the air flow path 180 may supply air to the internal space 141. In this case, the mixed fluid of the aerosol and the air generated by the heating unit 121A flows into the internal space 141, is further mixed with the aerosol generated by the heating unit 121B, and reaches the oral cavity of the user.

<<2. External Configuration Example of Inhalation Device>>

[0046] Next, an external configuration example of an inhalation device 100 (100A, 100B) of the present embodiment will be described. Here, the inhalation device 100 is described as being the inhalation device 100B illustrated in FIG. 1B, but the present invention is not limited thereto, and the same can be applied to a case where the inhalation device 100 is the inhalation device 100A illustrated in FIG. 1A.

(1) Example of Inhalation Device with Panel Attached

[0047] FIG. 2 is an overall perspective view of the inhalation device 100B. FIG. 3 illustrate top views of the inhalation device 100B, and specifically, (a) of FIG. 3 illustrates the inhalation device 100B in a state where the opening 142 is closed by a shutter 50 to be described later, and (b) of FIG. 3 illustrates the inhalation device 100B in a state where the opening 142 is opened.

[0048] As illustrated in FIGs. 2 and 3, the inhalation device 100B includes a panel 10, a main body housing 20 to which the panel 10 is detachably attached, and the shutter 50 which is slidable with respect to the main body housing 20. The panel 10 and the main body housing 20 are formed as separated members.

[0049] The panel 10 is mainly implemented by a member serving as a cover lid that forms at least a part of a housing 40 (to be described later) on the outmost of the inhalation device 100B. As illustrated in FIG. 2, the panel 10 includes, on a surface (outer surface) thereof, a display part 18 and an operation part 19. The display part 18 is made of a transparent material capable of transmitting light. Although details will be described later, the light emitting device 23a as an example of the notification unit 113B is provided inside the inhalation device 100B (inside a main body 30 to be described later). The user can visually recognize the light from the light emitting device 23a from the outer surface of the panel 10 via the display part 18.

[0050] For example, the operation part 19 is configured to form a recess toward the main body housing 20. Accordingly, a position of the operation part 19 can be indicated to the user. Further, the position of the operation part 19 may be indicated to the user by printing a predetermined mark (indication) on the surface of the panel 10.

[0051] The main body housing 20 accommodates the main body 30 of the inhalation device 100B. Components of the inhalation device 100B illustrated in FIG. 1B are accommodated in, for example, the main body 30.

[0052] The panel 10 is attached to the main body housing 20 to form the outermost housing 40 of the inhalation device 100B. For example, the user can make an appearance of the inhalation device 100B match his/her preference by attaching the panel 10 having a design matching his/her preference. Further, since the inhalation device 100B includes the panel 10, even when the main body 30 generates heat, the heat to be released to the outside can be buffered. That is, for example, the panel 10 may function to insulate heat generated from the heating unit 121B.

[0053] The housing 40 is preferably sized to be held in a hand of the user. For example, the user holds the inhalation device 100B with one hand while bringing a fingertip into contact with the surface of the panel 10. When the user presses the operation part 19 with the fingertip, the panel 10 is deformed such that the operation part 19 is further recessed toward the main body housing 20. As a result of such deformation of the panel 10, a bottom portion of the operation part 19 comes into contact with an operation button 22 (to be described later) provided on a surface of the main body housing 20, and the operation button 22 is pressed down. As an example, the user can power on the inhalation device 100B by pressing down the operation button 22 by pressing the operation part 19 with a finger.

[0054] FIG. 2 and (a) of FIG. 3 illustrate the inhalation device 100B in a state in which the opening 142 is closed by the shutter 50. When the inhalation device 100B is in the state illustrated in (a) of FIG. 3, by the user sliding the shutter 50 with a finger, the shutter 50 is moved from above the opening 142 and the opening 142 is opened, as illustrated in (b) of FIG. 3. In this way, by operating the shutter 50 to open the opening 142, the user can insert the stick-type base material 150 into the opening 142.

(2) Example of Inhalation Device with Panel Removed

[0055] FIG. 4 is a view illustrating the inhalation device

100B in a state where the panel 10 is removed therefrom, and specifically illustrates an outer surface of the main body housing 20 which is exposed when the panel 10 is removed from the main body housing 20. That is, the outer surface of the main body housing 20 illustrated in FIG. 4 is covered with the panel 10 in the state where the panel 10 is attached to the main body housing 20.

[0056] As illustrated in FIG. 4, for example, a magnet 21a, a magnet 21b, the operation button 22, and a display window 23 are provided on the outer surface of the main body housing 20. In addition to the above parts, for example, a sensor for detecting the attachment of the panel 10 to the main body housing 20 may be provided on the outer surface of the main body housing 20.

[0057] The magnet 21a and the magnet 21b attract the panel 10 to the main body housing 20 by magnetic force (magnetic attraction). Accordingly, the panel 10 is held on the main body housing 20. More specifically, magnets (not illustrated) corresponding to the magnet 21a and the magnet 21b are provided on an inner surface of the panel 10 facing the outer surface of the main body housing 20 when the panel 10 is attached to the main body housing 20. Further, the panel 10 is held on the main body housing 20 by the magnets provided on the panel 10, and the magnet 21a and the magnet 21b. Each of the magnet 21a, the magnet 21b, and the magnets of the panel 10 is preferably formed of, for example, a permanent magnet.

[0058] The operation button 22 is provided at a position corresponding to the operation part 19 of the panel 10 when the panel 10 is attached to the main body housing 20. Accordingly, as described above, the user can operate the operation button 22 via the operation part 19 of the panel 10.

[0059] The display window 23 is an opening aligned in position with the light emitting device 23a provided in the main body 30, and transmits light from the light emitting device 23a to the display part 18 of the panel 10. Accordingly, as described above, the user can visually recognize the light from the light emitting device 23a from the outer surface of the panel 10.

[0060] The light emitting device 23a is an example of a light emitting unit that emits light, and for example, includes one or more light emitting elements. As the light emitting elements of the light emitting device 23a, for example, light emitting diodes (LEDs) may be adopted. As an example, in the present embodiment, the light emitting device 23a includes a plurality of LEDs having different emission colors, and is configured to emit light in a plurality of emission colors including blue, yellow, and red.

[0061] The light emitting device 23a notifies the user of predetermined information by emitting light in a predetermined light emitting mode. Here, the light emitting mode can be, for example, a light emission color, but is not limited thereto, and may be, for example, an intensity of lighting (in other words, brightness) or a lighting pattern (for example, blinking at a predetermined time interval).

[0062] Examples of the notification performed by the light emitting device 23a include a notification on operation information of the inhalation device 100B indicating whether the power supply of the inhalation device 100B is turned on (that is, in a power-on state). In the present embodiment, the light emitting device 23a may notify the user of information related to a height at which the inhalation device 100 of the present embodiment including the inhalation device 100B is located (to be described later).

<<3. Operation Example of Inhalation Device>>

[0063] Next, an operation example of the inhalation device 100 of the present embodiment will be described. A control unit 116 (116A, 116B) may operate the inhalation device 100 based on an input from the user. As an example, the control unit 116 causes the inhalation device 100 to generate the aerosol in response to an aerosol generation request from the user.

[0064] Here, the aerosol generation request can be, for example, an operation (hereinafter, also referred to as a "heating start operation") instructing a start of the heating. For example, the heating start operation can be press-down of the operation button 22. As another example, the heating start operation may be an inhalation operation on the inhalation device 100. The aerosol generation request is not limited to a direct operation on the inhalation device 100, and may be reception of predetermined information from another device capable of communicating with the inhalation device 100, such as a smartphone. The control unit 116 can detect the aerosol generation request based on, for example, information acquired by a sensor unit 112 or a communication unit 115.

[0065] For example, in a case where the inhalation device 100 is the inhalation device 100A illustrated in FIG. 1A, when an inhalation operation on the inhalation device 100A is detected based on the detection result of the puff sensor, the control unit 116A supplies a predetermined amount of electric power to the heating unit 121A to generate the aerosol. At this time, the electric power supplied to the heating unit 121A is determined in advance by a manufacturer of the inhalation device 100A in order to generate an appropriate amount of aerosol including an appropriate amount of flavor components, for example. Accordingly, it is possible to provide a high-quality smoking experience to the user.

[0066] Further, in a case where the inhalation device 100 is the inhalation device 100B illustrated in FIG. 1B, when the heating start operation (for example, the press-down of the operation button 22) is detected, the control unit 116B controls the temperature of the heating unit 121B based on a heating profile prepared in advance to generate the aerosol. Here, the heating profile is information that defines a time-series transition of a target temperature that is a target value of the temperature of the heating unit 121B, and is stored in advance in the storage unit 114B, for example.

[0067] When the temperature control on the heating

unit 121B based on the heating profile (hereinafter also referred to as "heating control based on the heating profile") is described in detail, the control unit 116B controls the temperature of the heating unit 121B based on a deviation between the target temperature corresponding to an elapsed time from the start of the heating control based on the heating profile and an actual temperature of the heating unit 121B (hereinafter also referred to as an "actual temperature"). More specifically, at this time, the control unit 116B controls the temperature of the heating unit 121B such that a time-series transition of the actual temperature of the heating unit 121B is the same as the time-series transition of the target temperature defined in the heating profile.

[0068] The heating profile is typically designed to optimize a flavor experienced by the user when the user inhales the aerosol generated from the stick-type base material 150. Thus, by controlling the temperature of the heating unit 121B based on the heating profile, it is possible to optimize the flavor experienced by the user, and provide a high-quality smoking experience to the user.

[0069] In an inhaler that generates a substance to be inhaled by a user, such as the inhalation device 100, in order to prevent an occurrence of inconvenience caused by misuse by a child (for example, an infant and a young child), a so-called "child resistance function (hereinafter also referred to as an "CR function")" may be implemented. It is conceivable that, as the CR function of such an inhaler, for example, when the substance to be inhaled is generated or the inhaler is powered on, a specific operation on the inhaler (for example, a so-called "long press" or a plurality of times of press-down of an operation button of the inhaler) may be required. Here, if the specific operation is complicated, the misuse by the child can be prevented, but it is troublesome for an adult who is a legitimate user of the inhaler.

[0070] It is desirable for the CR function in such an inhaler to be capable of preventing the occurrence of inconvenience caused by the misuse by the child, without compromising convenience for an adult who is a legitimate user of the inhaler as much as possible. However, a history of the technical development of the inhaler is still young, and there is a room for improvement in the CR function of the inhaler.

[0071] Therefore, the present embodiment is configured to focus on the fact that a height of a child of an age that may play around with the inhalation device 100 (for example, an infant and a young child who are three years old or younger. Hereinafter, also simply referred to as a "child") is lower than a height of an adult who may be a legitimate user of the inhalation device 100, and a predetermined operation in the inhalation device 100 is restricted according to a height at which the inhalation device 100 is located. Accordingly, a predetermined operation in the inhalation device 100 can be prevented from being performed at a low position at which it is assumed that a child is playing around with the inhalation device 100, and meanwhile the predetermined operation in the inhalation device 100 can be performed at a high position at which it is assumed that an adult is using the inhalation device 100. Thus, a decrease in convenience for an adult who is a legitimate user of the inhalation device 100 can be prevented while preventing the occurrence of inconvenience caused by misuse by a child. Therefore, a performance of the CR function in the inhalation device 100 is improved, and marketability of the inhalation device 100 is improved. Hereinafter, the operation example of the inhalation device 100 will be described more specifically.

[0072] The control unit 116 of the inhalation device 100 acquires "height information", which is information indicating the height at which the inhalation device 100 is located, at a predetermined timing. Here, the height at which the inhalation device 100 is located is a distance in a vertical direction from a predetermined reference point to the inhalation device 100. For example, in a case where the inhalation device 100 is located outdoors, a reference point serving as a reference of the height at which the inhalation device 100 is located (hereinafter, also simply referred to as the "reference point") can be a ground (that is, a ground surface) of a place where the user carrying the inhalation device 100 is located. Further, in a case where the inhalation device 100 is located indoors (also including a vehicle interior of an automobile or the like), the reference point can be a floor surface of a place where the user carrying the inhalation device 100 is located.

[0073] The reference point is not limited to the ground or the floor surface, and may be set by the user, for example. Accordingly, the user can set an appropriate position as the reference point in consideration of a place where the user is located. As an example, the reference point may be set by the user performing a predetermined operation on the inhalation device 100 or another device capable of communicating with the inhalation device 100.

[0074] For example, the control unit 116 acquires the height information based on a detection result of the height sensor included in the sensor unit 112 (112A, 112B).

[0075] For example, in a case where the atmospheric pressure sensor is adopted as the height sensor, the control unit 116 acquires the height information based on a detection result (that is, an atmospheric pressure) of the atmospheric pressure sensor. More specifically, in this case, for example, the inhalation device 100 sets, for the user, any position in the vertical direction in a vicinity of the floor surface (or the ground) of the place where the user is located as the reference point. Then, the inhalation device 100 uses the atmospheric pressure sensor to measure, for the user, an atmospheric pressure at the reference point and an atmospheric pressure at a position (for example, a position where an adult normally uses the inhalation device 100) where the inhalation device 100 is lifted up to a certain extent so as to be away from the reference point.

[0076] Then, the control unit 116 derives elevations (that is, heights from a mean sea level) at the reference point and the lifted position from the atmospheric pressures of the reference point and the lifted position detected by the measurement, and acquires the height information in which an elevation difference between the elevations is set as the height at which the inhalation device 100 is located. Accordingly, when the height information is to be acquired based on the detection result of the atmospheric pressure sensor, the height information indicating an appropriate value as the height at which the inhalation device 100 is located can also be acquired.

[0077] When the height sensor is a sensor capable of detecting the elevation (capable of outputting information indicating the elevation as a detection result), the control unit 116 may derive an elevation difference from the elevations at the reference point and the lifted position detected by the height sensor, and acquire the height information in which the elevation difference is set as the height at which the inhalation device 100 is located.

[0078] In a case where the distance measurement sensor is adopted as the height sensor, the control unit 116 acquires the height information based on a detection result of the distance measurement sensor. More specifically, in this case, for example, the inhalation device 100 uses the distance measurement sensor to measure, for the user, the distance from the floor surface (or the ground, that is, the reference point) of the place where the user is located to the inhalation device 100. Then, the control unit 116 acquires the height information indicating the distance detected by the measurement as the height at which the inhalation device 100 is located. Accordingly, when the height information is to be acquired based on the detection result of the distance measurement sensor, the height information indicating an appropriate value as the height at which the inhalation device 100 is located can also be acquired.

[0079] Further, the control unit 116 may acquire the height information based on information received from another device (that is, the outside of the inhalation device 100) capable of communicating with the inhalation device 100 via the communication unit 115 (115A, 115B). As an example, the control unit 116 may acquire the height information based on information received from a wearable device (for example, a smart watch worn by the user) including the height sensor (for example, the atmospheric pressure sensor).

[0080] For example, when a predetermined operation is performed on the inhalation device 100, the control unit 116 acquires the height information. Accordingly, as compared with a case where the height information is acquired periodically (for example, every minute) regardless of an operation of the user, it is possible to reduce the number of times of acquisition of the height information and prevent an increase in the power consumption of the inhalation device 100 associated with the acquisition of the height information.

[0081] The operation that triggers the acquisition of the height information can be, for example, an operation of sliding the shutter 50 to open the opening 142. In the case where the inhalation device 100 is the inhalation device 100A illustrated in FIG. 1A, the operation that triggers the acquisition of the height information may be an operation of mounting the flavor imparting cartridge 130 to the inhalation device 100A. As another example, in the case where the inhalation device 100 is the inhalation device 100B illustrated in FIG. 1B, the operation that triggers the acquisition of height information may be an operation of inserting the stick-type base material 150 into the opening 142.

[0082] In the present embodiment, the operation that triggers the acquisition of the height information is the operation of sliding the shutter 50 to open the opening 142, and when the operation is detected, the control unit 116 starts to acquire the height information. While the opening 142 is open, the control unit 116 acquires the height information at a predetermined cycle (for example, every 0.1 [s]). Accordingly, while the opening 142 is open, the control unit 116 can acquire the height information indicating, in real time, the height at which the inhalation device 100 is located.

[0083] It is conceivable that playing around with the inhalation device 100 may result in the operation that triggers the acquisition of the height information being repeated a plurality of times within a short period of time. In such a case, when the height information is acquired every time the operation that triggers the acquisition of the height information is performed, the number of times of acquisition of the height information is large, and the power consumption of the inhalation device 100 associated with the acquisition of the height information may increase.

[0084] Therefore, the control unit 116 may start the acquisition of the height information when a predetermined period of time (for example, 2 seconds) elapses since the operation that triggers the acquisition of the height information is performed. Accordingly, even if the operation that triggers the acquisition of the height information is repeated a plurality of times in a short period of time, an increase in the number of times of the acquisition of the height information can be prevented. Thus, an increase in the power consumption of the inhalation device 100 associated with the acquisition of the height information can be prevented. Here, the predetermined period of time can be appropriately determined by, for example, the manufacturer of the inhalation device 100.

[0085] As an example, it is assumed that the operation that triggers the acquisition of the height information is, for example, the operation of sliding the shutter 50 to open the opening 142. In this case, when the operation of sliding the shutter 50 to open the opening 142 is performed and a state where the opening 142 is open is maintained for a predetermined period of time, the control unit 116 may start the acquisition of the height information.

[0086] As another example, it is assumed that the

operation that triggers the acquisition of the height information is the operation of mounting the flavor imparting cartridge 130. In this case, when the operation of mounting the flavor imparting cartridge 130 is performed and a state where the flavor imparting cartridge 130 is mounted is maintained for a predetermined period of time, the control unit 116 may start the acquisition of the height information.

[0087] Further, as another example, it is assumed that the operation that triggers the acquisition of the height information is the operation of inserting the stick-type base material 150 into the opening 142. In this case, when the operation of inserting the stick-type base material 150 into the opening 142 is performed and a state where the stick-type base material 150 is inserted is maintained for a predetermined period of time, the control unit 116 may start the acquisition of the height information.

[0088] When acquiring the height information, the control unit 116 determines whether the height at which the inhalation device 100 is located is less than a threshold based on the acquired height information. For example, every time the height information is acquired, the control unit 116 determines whether the height indicated by the acquired height information is less than the threshold. Here, the threshold is determined by, for example, the manufacturer or the like of the inhalation device 100 in consideration of a typical height of a child of an age that may play around with the inhalation device 100.

[0089] FIG. 5 is a diagram illustrating an example of a threshold as a condition for restricting the operation of the inhalation device 100. In the present embodiment, it is assumed that a child who is a target of the CR function (that is, operation restriction) of the inhalation device 100 is an infant and a young child who are three years old or younger. An average height of a three-years-old child (that is, a child considered to have a highest average height among the children that are targets of the CR function of the inhalation device 100) is about 100 [cm].

[0090] Therefore, as illustrated in FIG. 5, in the present embodiment, a threshold that is a condition for restricting the operation of the inhalation device 100 is 130 [cm]. Accordingly, it is possible to set, as the threshold, a height that a young child having a height of about 100 [cm] does not reach even if the infant extends his/her hand upward. On the other hand, the threshold of 130 [cm] is lower than an average height of an adult (for example, an average height of an adult female). Accordingly, the threshold which is a condition for restricting the operation of the inhalation device 100 is prevented from being a height which it is difficult for an adult to reach. The threshold may be set by the user. In this way, the user can set a desired threshold in consideration of a height of the user or his/her child.

[0091] When it is determined whether the height at which the inhalation device 100 is located is less than the threshold, the control unit 116 restricts the predetermined operation in the inhalation device 100 based on a determination result. More specifically, when it is determined that the height at which the inhalation device 100 is located is equal to or greater than the threshold, the control unit 116 does not restrict the predetermined operation in the inhalation device 100. That is, in this case, the control unit 116 may cause the inhalation device 100 to perform the predetermined operation, in response to an input from the user. Accordingly, an adult who can set the inhalation device 100 to a height equal to or greater than the threshold can release the restriction on the predetermined operation by performing a simple operation of lifting the inhalation device 100 to a height equal to or greater than the threshold and cause the inhalation device 100 to perform the predetermined operation as appropriate. Thus, the predetermined operation can be restricted while preventing a decrease in the convenience for an adult user.

[0092] On the other hand, when it is determined that the height at which the inhalation device 100 is located is less than the threshold, the control unit 116 restricts the predetermined operation in the inhalation device 100. That is, in this case, even if there is an input from the user, the control unit 116 does not cause the inhalation device 100 to perform the predetermined operation. Accordingly, it is possible to prevent a predetermined operation from being performed for a child for whom it is difficult to set the inhalation device 100 to a height equal to or greater than the threshold. Thus, the occurrence of inconvenience caused by the misuse by the child can be prevented.

[0093] The predetermined operation restricted according to the height at which the inhalation device 100 is located includes, for example, generating the aerosol in response to the aerosol generation request from the user. Accordingly, the aerosol can be prevented from being generated for a child for whom it is difficult to set the inhalation device 100 to a height equal to or greater than the threshold.

[0094] More specifically, for example, in the case where the inhalation device 100 is the inhalation device 100A illustrated in FIG. 1A, the predetermined operation may be supplying the electric power to the heating unit 121A in response to the inhalation operation on the inhalation device 100A. Further, for example, in the case where the inhalation device 100 is the inhalation device 100B illustrated in FIG. 1B, the predetermined operation may be the heating control based on the heating profile in response to the heating start operation.

[0095] As another example, the predetermined operation may be an operation of turning on the power supply of the inhalation device 100 (that is, an operation of activating the inhalation device 100) in response to a power-on operation (for example, the press-down of the operation button 22) from the user. In addition to the above operations, any operation other than the operation related to the release of the operation restriction (that is, the CR function) in the inhalation device 100 may be the predetermined operation.

[0096] Further, when it is determined that the height at which the inhalation device 100 is located is equal to or greater than the threshold and there is the aerosol generation request after the predetermined operation is performed, the control unit 116 may cause the aerosol to be generated in response to the aerosol generation request. In this way, since it is necessary to perform a plurality of processes before generating the aerosol, the aerosol can be further prevented from being generated for the child.

[0097] As an example, when it is determined that the height at which the inhalation device 100 is located is equal to or greater than the threshold and the operation button 22 is long-pressed or pressed down a plurality of times, the control unit 116 may turn on the power supply of the inhalation device 100. Thereafter, when the operation button 22 is further long-pressed or pressed down a plurality of times in a state where the power supply of the inhalation device 100 is turned on, the control unit 116 may cause the aerosol to be generated.

[0098] More specifically, for example, in the case where the inhalation device 100 is the inhalation device 100A illustrated in FIG. 1A, when it is determined that the height at which the inhalation device 100 is located is equal to or greater than the threshold and the operation button 22 is long-pressed or pressed down a plurality of times, the control unit 116A may turn on the power supply of the inhalation device 100A. Thereafter, when the operation button 22 is further long-pressed or pressed down a plurality of times in a state where the power supply of the inhalation device 100A is turned on, the control unit 116 may supply electric power to the heating unit 121A in response to the inhalation operation on the inhalation device 100A.

[0099] More specifically, for example, in the case where the inhalation device 100 is the inhalation device 100B illustrated in FIG. 1B, when it is determined that the height at which the inhalation device 100 is located is equal to or greater than the threshold and the operation button 22 is long-pressed or pressed down a plurality of times, the control unit 116B may turn on the power supply of the inhalation device 100B. Thereafter, when the operation button 22 is further long-pressed or pressed down a plurality of times in a state where the power supply of the inhalation device 100B is turned on, the control unit 116 may start the heating control based on the heating profile.

[0100] As another example, for example, in the case where the inhalation device 100 is the inhalation device 100B illustrated in FIG. 1B, when it is determined that the height at which the inhalation device 100 is located is equal to or greater than the threshold and the operation button 22 is long-pressed or pressed down a plurality of times, the control unit 116B may turn on the power supply of the inhalation device 100B. Thereafter, when the stick-type base material 150 is inserted into the opening 142 in a state where the power supply of the inhalation device 100B is turned on, the control unit 116 may start the heating control based on the heating profile.

[0101] Further, because the user is in the vehicle interior of an automobile, even if the user is an adult, it may be difficult to set the inhalation device 100 to a height equal to or greater than the threshold (for example, 130 [cm]). In such a case, when the inhalation device 100 cannot be used even though the user is an adult, the convenience of the inhalation device 100 may be decreased, and the marketability of the inhalation device 100 may be decreased.

[0102] Therefore, when an input of predetermined release information is received, the control unit 116 may disable the restriction on the predetermined operation in the inhalation device 100 for a certain period of time since the input of the release information is received. That is, when the input of the release information is received, the control unit 116 may cause the inhalation device 100 to perform the predetermined operation for a certain period of time regardless of the height at which the inhalation device 100 is located. Accordingly, even when it is difficult for the user to set the inhalation device 100 to a height equal to or greater than the threshold, the inhalation device 100 can be used by inputting the release information, and the decrease in the convenience of the inhalation device 100 can be prevented.

[0103] As an example, the release information may be input to the control unit 116 by the user performing a predetermined operation on the inhalation device 100 or another device capable of communicating with the inhalation device 100. That is, the control unit 116 may acquire the release information via the sensor unit 112 or the communication unit 115.

[0104] When the operation that triggers the input of the release information is a direct operation on the inhalation device 100, the operation is preferably an operation complicated to some extent, such as a long press or a plurality of times of press down of the operation button 22. In this way, the release information can be prevented from being unintentionally input due to playing around with the inhalation device 100.

[0105] The release information may be input when a biometric authentication (for example, a fingerprint authentication) of the user is performed by the inhalation device 100 or another device capable of communicating with the inhalation device 100. In this way, the release information can be more firmly prevented from being unintentionally input. Of course, instead of the biometric authentication, other types of user authentication such as a gesture authentication, a personal identification number (PIN) authentication, a password authentication, or a voice authentication may be adopted.

[0106] Further, for example, there is a user who performs so-called "chain smoking" by smoking using two or more stick-type base materials 150 continuously. When an operation for releasing the operation restriction (that is, the CR function) of the inhalation device 100 is performed for such a user every time the new stick-type base material 150 is used, time and efforts of the user at the time of the chain smoking may be increased, and the convenience of the inhalation device 100 may be de-

creased.

[0107] Therefore, when the predetermined operation is performed in the inhalation device 100, the control unit 116 may disable the restriction on the predetermined operation in the inhalation device 100 for a certain period of time since the predetermined operation is completed. That is, when the predetermined operation is performed in the inhalation device 100, the control unit 116 may cause the inhalation device 100 to perform the predetermined operation for a certain period of time regardless of the height at which the inhalation device 100 is located. In such a case, the certain period of time since the predetermined operation in the inhalation device 100 is completed (that is, a period of time during which the restriction on the predetermined operation is disabled) is hereinafter also referred to as a "restriction-disabled period of time". A length of the restriction-disabled period of time is determined in advance by, for example, the manufacturer of the inhalation device 100.

[0108] As an example, when there is the aerosol generation request from the user within a certain period of time (that is, within the restriction-disabled period of time) after the heating control based on the heating profile is completed, the control unit 116 may start the heating control based on the heating profile again without requiring the operation for releasing the operation restriction in the inhalation device 100. Accordingly, an increase in the time and efforts of the user at the time of the chain smoking is prevented, and the convenience of the inhalation device 100 is improved.

[0109] Here, a period from when the heating control based on the heating profile is started to when the heating control is completed is set as X [s] (for example, 300 [s]). Typically, the user who performs the chain smoking starts the heating control based on the heating profile again before $2 \times X$ [s] elapses, after the heating control based on the heating profile is completed. That is, if the heating control based on the heating profile is not started again before $2 \times X$ [s] elapses after the heating control based on the heating profile is completed, there is a high possibility that the user does not intend to perform the chain smoking.

[0110] Therefore, the restriction-disabled period of time may be a period of time having a length twice the period of time from when the heating control based on the heating profile is started to when the heating control is completed, that is, a period of time having a length of $2 \times X$ [s]. Accordingly, a period of time of an appropriate length as the restriction-disabled period of time can be set while preventing the increase in the time and efforts of the user at the time of chain smoking.

[0111] Further, it is also assumed that it is difficult for the user to understand how much the inhalation device 100 is to be lifted up to release the operation restriction in the inhalation device 100.

[0112] Therefore, the control unit 116 may notify the user of information related to the height, at which the inhalation device 100 is located, via a notification unit 113 (113A, 113B), based on the acquired height information. Accordingly, the user can grasp the height at which the inhalation device 100 is located, and can get an idea of how much the inhalation device 100 is to be lifted up.

[0113] The information related to the height at which the inhalation device 100 is located can be, for example, information indicating the height at which the inhalation device 100 is located. In this case, the information related to the height at which the inhalation device 100 is located is not limited to information clearly indicating the height at which the inhalation device 100 is located as "OO [cm]", and may be, for example, information indicating the height at which the inhalation device 100 is located to an extent that the user can roughly grasp the height. Further, the information related to the height at which the inhalation device 100 is located may be, for example, information indicating the presence or absence of the operation restriction corresponding to a height at which the inhalation device 100 is currently located.

[0114] As an example, in the present embodiment, as described above, the notification unit 113 includes the light emitting device 23a configured to emit light in a plurality of emission colors including blue, yellow, and red. Then, the control unit 116 notifies the user of the information related to the height at which the inhalation device 100 is located by making the emission color of the light emitting device 23a different according to the height at which the inhalation device 100 is located. Accordingly, the height at which the inhalation device 100 is located can be notified to the user in an intuitive and easy-to-understand manner.

[0115] FIG. 6 is a diagram illustrating an example of a relationship between the height at which the inhalation device 100 is located and the emission colors of the light emitting device 23a. As illustrated in FIG. 6, for example, when the height at which the inhalation device 100 is located is equal to or greater than 0 [cm] and less than 100 [cm], the control unit 116 causes the light emitting device 23a to emit red light.

[0116] For example, when the height at which the inhalation device 100 is located is equal to or greater than 100 [cm] and less than 130 [cm], the control unit 116 causes the light emitting device 23a to emit yellow light.

[0117] For example, when the height at which the inhalation device 100 is located is equal to or greater than 130 [cm], the control unit 116 causes the light emitting device 23a to emit blue light.

[0118] In this way, by making the emission color of the light emitting device 23a different according to the height at which the inhalation device 100 is located, the user can roughly grasp the height at which the inhalation device 100 is located according to the emission color of the light emitting device 23a.

[0119] More specifically, as indicated by a white arrow α in FIG. 6, it is assumed that, for example, the inhalation device 100 is lifted up from a height of less than 100 [cm] at which smoking using the inhalation device 100 is impossible to a height of equal to or greater than 130

[cm] at which the smoking using the inhalation device 100 is possible. At this time, the emission color of the light emitting device 23a first changes from red to yellow, and then changes from yellow to blue. Thus, by lifting up the inhalation device 100 while confirming the emission color of the light emitting device 23a, the user can efficiently lift up the inhalation device 100 to a height at which the operation restriction in the inhalation device 100 is released.

[0120] In the example described above, the information related to the height at which the inhalation device 100 is located is notified to the user by making the emission color of the light emitting device 23a different according to the height at which the inhalation device 100 is located, but the present invention is not limited thereto. Hereinafter, examples of a case where the information related to the height at which the inhalation device 100 is located is notified to the user by methods other than the emission color of the light emitting device 23a will be described.

[0121] FIG. 7 is a diagram showing a modification of the light emitting device 23a. As illustrated in FIG. 7, in the present example, the light emitting device 23a includes a first light emitting element 23a_1, a second light emitting element 23a_2, and a third light emitting element 23a_3. For example, LEDs may be adopted as the first light emitting element 23a_1, the second light emitting element 23a_2, and the third light emitting element 23a_3. Emission colors of the first light emitting element 23a_1, the second light emitting element 23a_2, and the third light emitting element 23a_3 may be the same or different.

[0122] In the present example, for example, the control unit 116 notifies the user of the information related to the height at which the inhalation device 100 is located, by making the number of light emitting elements that emit light among the light emitting elements provided in the light emitting device 23a different according to the height at which the inhalation device 100 is located. Accordingly, the height at which the inhalation device 100 is located can be notified to the user in an intuitive and easy-to-understand manner.

[0123] FIG. 8 is a diagram illustrating an example of a relationship between the height at which the inhalation device 100 is located and the number of light emitting elements that emit light. As illustrated in FIG. 8, for example, when the height at which the inhalation device 100 is located is equal to or greater than 0 [cm] and less than 100 [cm], the control unit 116 causes one light emitting element (for example, the first light emitting element 23a_1) among the light emitting elements provided in the light emitting device 23a to emit light.

[0124] Further, for example, when the height at which the inhalation device 100 is located is equal to or greater than 100 [cm] and less than 130 [cm], the control unit 116 causes two light emitting elements (for example, the first light emitting element 23a_1 and the second light emitting element 23a_2) among the light emitting elements provided in the light emitting device 23a to emit light.

[0125] For example, when the height at which the inhalation device 100 is located is equal to or greater than 130 [cm], the control unit 116 causes three light emitting elements (that is, the first light emitting element 23a_1, the second light emitting element 23a_2, and the third light emitting element 23a_3) among the light emitting elements provided in the light emitting device 23a to emit light.

[0126] In this way, by making the number of light emitting elements that emit light among the light emitting elements provided in the light emitting device 23a different according to the height at which the inhalation device 100 is located, the user can roughly grasp the height at which the inhalation device 100 is located according to the number of light emitting elements that emit light.

[0127] More specifically, as indicated by a white arrow β in FIG. 8, it is assumed that, for example, the inhalation device 100 is lifted up from a height of less than 100 [cm] at which the smoking using the inhalation device 100 is impossible to a height of equal to or greater than 130 [cm] at which the smoking using the inhalation device 100 is possible. At this time, among the light emitting elements provided in the light emitting device 23a, the number of light emitting elements that emit light is first changed from one to two, and then changed from two to three. Thus, by lifting up the inhalation device 100 while confirming the number of light emitting elements that emit light, the user can efficiently lift up the inhalation device 100 to the height at which the operation restriction in the inhalation device 100 is released.

[0128] Further, the control unit 116 may notify the user of the information related to the height at which the inhalation device 100 is located by making the light emitting element that emits light among the light emitting elements provided in the light emitting device 23a different according to the height at which the inhalation device 100 is located. In this case, the height at which the inhalation device 100 is located can also be notified to the user in an intuitive and easy-to-understand manner.

[0129] More specifically, for example, when the height at which the inhalation device 100 is located is equal to or greater than 0 [cm] and less than 100 [cm], the control unit 116 causes the first light emitting element 23a_1 to emit light.

[0130] When the height at which the inhalation device 100 is located is equal to or greater than 100 [cm] and less than 130 [cm], the control unit 116 causes the second light emitting element 23a_2 to emit light.

[0131] When the height at which the inhalation device 100 is located is equal to or greater than 130 [cm], the control unit 116 causes the third light emitting element 23a_3 to emit light.

[0132] In this way, by making the light emitting element that emits light among the light emitting elements provided in the light emitting device 23a different according to the height at which the inhalation device 100 is located, the user can roughly grasp the height at which the in-

halation device 100 is located according to the light emitting element that emits light. Thus, by lifting up the inhalation device 100 while confirming the light emitting element that emits light, the user can efficiently lift up the inhalation device 100 to the height at which the operation restriction in the inhalation device 100 is released.

[0133] Further, when the notification unit 113 includes a display unit that displays an image, the control unit 116 may notify the user of the information related to the height at which the inhalation device 100 is located, by making a display mode of the display unit different according to the height at which the inhalation device 100 is located. In this case, the height at which the inhalation device 100 is located can also be notified to the user in an intuitive and easy-to-understand manner. Hereinafter, an example will be described in which the user is notified of the information related to the height at which the inhalation device 100 is located via a display device 23b as an example of the display unit provided in the notification unit 113.

[0134] FIG. 9 is a diagram illustrating an example of the display device 23b. The display device 23b is provided at a position visible to the user in the inhalation device 100. As the display device 23b, for example, a liquid crystal display or an organic electroluminescence (EL) display may be adopted.

[0135] In the present example, the display device 23b displays, for example, an indicator I as an image for notifying the user of the information related to the height at which the inhalation device 100 is located. The indicator I indicates the height at which the inhalation device 100 is located in three stages.

[0136] FIG. 10 is a diagram illustrating an example of a relationship between the height at which the inhalation device 100 is located and a display mode of the indicator I of the display device 23b. As illustrated in FIG. 10, for example, when the height at which the inhalation device 100 is located is equal to or greater than 0 [cm] and less than 100 [cm], the control unit 116 displays the indicator I of the display device 23b in one-stage display.

[0137] For example, when the height at which the inhalation device 100 is located is equal to or greater than 100 [cm] and less than 130 [cm], the control unit 116 displays the indicator I of the display device 23b in two-stage display.

[0138] For example, when the height at which the inhalation device 100 is equal to or greater than 130 [cm], the control unit 116 displays the indicator I of the display device 23b in three-stage display.

[0139] In this way, by making a display mode of the display device 23b (the display mode of the indicator I in the example described here) different according to the height at which the inhalation device 100 is located, the user can grasp the height at which the inhalation device 100 is located according to the display mode of the display device 23b.

[0140] More specifically, as indicated by a white arrow γ in FIG. 10, it is assumed that, for example, the inhalation device 100 is lifted up from a height of less than 100 [cm] at which the smoking using the inhalation device 100 is impossible to a height of equal to or greater than 130 [cm] at which the smoking using the inhalation device 100 is possible. At this time, the indicator I of the display device 23b first changes from the one-step display to the two-stage display, and then changes from the two-stage display to the three-stage display. Thus, by lifting up the inhalation device 100 while confirming the indicator I of the display device 23b, the user can efficiently lift up the inhalation device 100 to the height at which the operation restriction in the inhalation device 100 is released.

[0141] In each of the examples described above, the height at which the inhalation device 100 is located is notified to the user in three stages, but the present invention is not limited thereto. For example, the height at which the inhalation device 100 is located may be notified to the user in two stages including whether the height is less than 130 [cm] which is a threshold and whether the height is equal to or greater than 130 [cm]. Alternatively, the height at which the inhalation device 100 is located may be notified to the user in four or more stages.

[0142] When the notification unit 113 includes a vibration device (so-called vibrator) that vibrates, the control unit 116 may notify the user of the information related to the height at which the inhalation device 100 is located, by a vibration mode of the vibration device. In this case, the number of times of vibration or a vibration pattern of the vibration device may be changed according to the height at which the inhalation device 100 is located.

[0143] Further, when the notification unit 113 includes a sound output device (for example, a speaker) that outputs sound, the control unit 116 may notify the user of the information related to the height at which the inhalation device 100 is located, by the sound output from the sound output device.

<<4. Example of Processing Performed by Control Unit>>

[0144] Next, an example of processing performed by the control unit 116 will be described. Here, as an example, the processing performed by the control unit 116 when the inhalation device 100 is the inhalation device 100B illustrated in FIG. 1B will be described.

[0145] FIG. 11 is a flowchart (part 1) illustrating an example of the processing performed by the control unit 116. FIG. 12 is a flowchart (part 2) illustrating an example of the processing performed by the control unit 116.

[0146] As illustrated in FIG. 11, the control unit 116 first determines whether the aerosol generation request is received within the restriction-disabled period of time (step S1). When it is determined that the aerosol generation request is received within the restriction-disabled period of time (step S1: Yes), the control unit 116 proceeds to processing of step S7.

[0147] When it is determined that the aerosol generation request is not received within the restriction-disabled

period of time (step S1: No), the control unit 116 determines whether the input of the release information is received (step S2). When it is determined that the input of the release information is received (step S2: Yes), the control unit 116 proceeds to the processing of step S7.

[0148] When it is determined that the input of the release information is not received (step S2: No), the control unit 116 determines whether the operation that triggers the acquisition of the height information is performed (step S3). When it is determined that there is no operation that triggers the acquisition of the height information (step S3: No), the control unit 116 returns to the processing of step S1.

[0149] When it is determined that the operation that triggers the acquisition of the height information is performed (step S3: Yes), the control unit 116 starts the acquisition of the height information and notifies the user of the information related to the height at which the inhalation device 100 is located via the notification unit 113 based on the acquired height information (step S4).

[0150] More specifically, in the present embodiment, as described above, when an operation of sliding the shutter 50 as the operation that triggers the acquisition of the height information is performed, the control unit 116 starts the acquisition of the height information. Then, while the opening 142 is open, the control unit 116 acquires the height information at a predetermined cycle (that is, in real time). Further, every time the height information is acquired, the control unit 116 notifies, by the light emitting device 23a or the like, the user of the information related to the height indicated by the acquired height information (that is, the height at which the inhalation device 100 is currently located).

[0151] Further, every time the height information is acquired, the control unit 116 determines whether the height indicated by the acquired height information is less than the threshold (step S5). When it is determined that the height indicated by the acquired height information is less than the threshold (step S5: Yes), the control unit 116 performs the processing of step S5 every time the height information is acquired while continuing the acquisition of the height information at a predetermined cycle and the notification of the information related to the height at which the inhalation device 100 is located until a timeout occurs (step S6: No). When the timeout occurs (step S6: Yes), the control unit 116 ends the series of processing illustrated in FIGs. 11 and 12.

[0152] In step S6, the control unit 116 may determine the timeout, for example, under a condition that a predetermined period of time (for example, 180 [s]) elapses since the operation that triggers the acquisition of the height information is performed.

[0153] When it is determined that the height indicated by the acquired height information is equal to or greater than the threshold (step S5: No), the control unit 116 determines whether a power-on operation is performed (step S7). When it is determined that no power-on operation is performed (step S7: No), the control unit 116 repeats the processing of step S7 until a timeout occurs (step S8: No). When the timeout occurs (step S8: Yes), the control unit 116 ends the series of processing illustrated in FIGSs. 11 and 12.

[0154] In step S8, as in step S6, for example, the control unit 116 may determine the timeout under a condition that a predetermined period of time elapses since the operation that triggers the acquisition of the height information is performed.

[0155] When it is determined the power-on operation is performed (step S7: Yes), the control unit 116 turns on the power supply of the inhalation device 100 (step S9). Then, the control unit 116 determines whether the heating start operation is performed (step S10). When it is determined that no heating start operation is performed (step S10: No), the control unit 116 repeats the processing of step S10 until a timeout occurs (step S11: No). When the timeout occurs (step S11: Yes), the control unit 116 ends the series of processing illustrated in FIGs. 11 and 12.

[0156] In step S11, as in steps S6 and S8, for example, the control unit 116 may determine the timeout under a condition that a predetermined period of time elapses since the operation that triggers the acquisition of the height information is performed.

[0157] When it is determined that the heating start operation is performed (step S10: Yes), as illustrated in FIG. 12, the control unit 116 starts the heating control based on the heating profile (step S12). Then, the control unit 116 waits for the completion of the heating control (step S13: No), and when the heating control is completed (step S13: Yes), the control unit 116 sets a certain period of time after the completion of the heating control as the restriction-disabled period of time (step S14), and ends the series of processing illustrated in FIGs. 11 and 12.

[0158] As described above, according to the inhalation device 100, a predetermined operation (for example, generating the aerosol) in the inhalation device 100 is restricted according to the height at which the inhalation device 100 is located. Accordingly, the predetermined operation in the inhalation device 100 can be prevented from being performed at a low position at which it is assumed that a child is playing around with the inhalation device 100, and meanwhile the predetermined operation in the inhalation device 100 (that is, normal use of the inhalation device 100) can be performed at a high position at which it is assumed that an adult who is a legitimate user is using the inhalation device 100. Thus, the decrease in convenience for an adult who is a legitimate user of the inhalation device 100 can be prevented while preventing the occurrence of inconvenience caused by the misuse by a child. That is, according to the inhalation device 100, an appropriate CR function can be provided for the user, and the marketability of the inhalation device 100 can be improved.

[0159] A control method of the inhalation device 100 described in the above embodiment can be achieved by

executing a program prepared in advance on a computer (a processor). The program is stored in a computer-readable storage medium and is executed by being read from the storage medium. Further, the program may be provided in a form of being stored in a non-transitory storage medium such as a flash memory, and may be provided via a network such as the Internet. Although the computer that executes the program can be, for example, a component provided in the inhalation device 100 (for example, the CPU of the inhalation device 100), but is not limited thereto, and may be a component provided in another device (for example, a smartphone or a server) capable of communicating with the inhalation device 100.

[0160] Although the embodiments of the present invention have been described above with reference to the accompanying drawings, it is needless to say that the present invention is not limited to such an embodiment. It is apparent to a person skilled in the art that various changes and modifications may be conceived within the scope described in the claims, and it is understood that the changes and the modifications naturally fall within the technical scope of the present invention. In addition, the constituent components described in the above embodiments may be optionally combined without departing from the spirit of the invention.

[0161] In the present description or the like, at least the following matters are described. In parentheses, corresponding components and the like in the above-described embodiments are illustrated as an example, and the present invention is not limited thereto.

(1) An inhalation device (inhalation device 100, 100A, 100B) that generates an aerosol from a base material (cartridge 120, flavor imparting cartridge 130, stick-type base material 150) including an aerosol source, the inhalation device including:
a control unit (control unit 116, 116A, 116B) configured to control an operation of the inhalation device, in which the control unit

acquires height information indicating a height at which the inhalation device is located,
determines whether the height is less than a threshold based on the height information, and
restricts a predetermined operation in the inhalation device when it is determined that the height is less than the threshold.

[0162] According to (1), since the predetermined operation in the inhalation device is restricted when it is determined that the height at which the inhalation device is located is less than the threshold, the predetermined operation can be prevented from being performed for a child for whom it is difficult to set the inhalation device to a height equal to or greater than the threshold. Thus, an occurrence of inconvenience caused by misuse by a child can be prevented.

[0163] (2) The inhalation device according to (1), further including:

a heating unit (heating unit 121, 121B) configured to heat the base material to generate the aerosol, in which
in response to an aerosol generation request from a user, the control unit causes the inhalation device to generate the aerosol, by controlling a temperature of the heating unit based on a heating profile defining a time-series transition of a target temperature which is a target value of the temperature of the heating unit, and
the predetermined operation includes generating the aerosol in response to the aerosol generation request.

[0164] According to (2), since the predetermined operation restricted according to the height at which the inhalation device is located includes generating the aerosol, the aerosol can be prevented from being generated for the child for whom it is difficult to set the inhalation device to a height equal to or greater than the threshold.

[0165] (3) The inhalation device according to (1), further including:

a heating unit (heating unit 121, 121A) configured to, when supplied with electric power, heat the base material to generate the aerosol, in which
in response to an aerosol generation request from a user, the control unit causes the inhalation device to generate the aerosol, by supplying a predetermined amount of electric power to the heating unit, and
the predetermined operation includes generating the aerosol in response to the aerosol generation request.

[0166] According to (3), since the predetermined operation restricted according to the height at which the inhalation device is located includes generating the aerosol, the aerosol can be prevented from being generated for the child for whom it is difficult to set the inhalation device to a height equal to or greater than the threshold.

[0167] (4) The inhalation device according to (2) or (3), in which
when it is determined that the height is equal to or greater than the threshold and there is the aerosol generation request after the predetermined operation is performed, the control unit causes the aerosol to be generated in response to the aerosol generation request.

[0168] According to (4), since it is necessary to perform a plurality of processes before generating the aerosol, the aerosol can be further prevented from being generated for the child.

[0169] (5) The inhalation device according to any one of (1) to (4), further including:

a notification unit (notification unit 113, 113A, 113B) configured to notify a user of predetermined informa-

tion, in which
the control unit further notifies the user of information related to the height via the notification unit based on the height information.

[0170] According to (5), since the information related to the height at which the inhalation device is located can be notified to the user via the notification unit, the user can grasp the height at which the inhalation device is located.

[0171] (6) The inhalation device according to (5), in which

the notification unit includes a light emitting unit (light emitting device 23a) configured to emit light, and
the control unit notifies the user of the information related to the height by making a light emitting mode of the light emitting unit different according to the height.

[0172] According to (6), since the light emitting mode of the light emitting unit is made different according to the height at which the inhalation device is located, the height at which the inhalation device is located can be notified to the user in an intuitive and easy-to-understand manner.

[0173] (7) The inhalation device according to (6), in which

the light emitting unit is configured to emit light in a plurality of emission colors, and
the control unit makes the emission colors of the light emitting unit different according to the height.

[0174] According to (7), since the emission colors of the light emitting unit are made different according to the height at which the inhalation device is located, the height at which the inhalation device is located can be notified to the user in an intuitive and easy-to-understand manner.

[0175] (8) The inhalation device according to (6), in which

the light emitting unit includes a plurality of light emitting elements (first light emitting element 23a_1, second light emitting element 23a_2, third light emitting element 23a_3), and
the control unit makes the light emitting element that emits light or the number of light emitting elements that emit light among the plurality of light emitting elements different according to the height.

[0176] According to (8), since the light emitting element that emits light or the number of light emitting elements that emit light among the plurality of light emitting elements provided in the light emitting unit is made different according to the height at which the inhalation device is located, the height at which the inhalation device is located can be notified to the user in an intuitive and easy-to-understand manner.

[0177] (9) The inhalation device according to (5), in which

the notification unit includes a display unit (display device 23b) configured to display an image, and
the control unit notifies the user of the information related to the height by making a display mode of the display unit different according to the height.

[0178] According to (9), since the display mode of the display unit is made different according to the height at which the inhalation device is located, the height at which the inhalation device is located can be notified to the user in an intuitive and easy-to-understand manner.

[0179] (10) The inhalation device according to any one of (1) to (9), in which
the control unit acquires the height information when an operation that triggers the acquisition of the height information is performed.

[0180] According to (10), as compared with a case where, in order to acquire the height information when the operation that triggers the acquisition of the height information is performed, the height information is acquired periodically regardless of an operation of the user, it is possible to reduce the number of times of acquisition of the height information and prevent an increase in power consumption of the inhalation device associated with the acquisition of the height information.

[0181] (11) The inhalation device according to (10), in which
the control unit starts the acquisition of the height information when a predetermined period of time elapses since the operation that triggers the acquisition of the height information is performed.

[0182] According to (11), since the acquisition of the height information is started when a predetermined period of time elapses since the operation that triggers the acquisition of the height information is performed, even if the operation that triggers the acquisition of the height information is repeated a plurality of times in a short period of time, an increase in the number of times of the acquisition of the height information can be prevented.

[0183] (12) The inhalation device according to any one of (1) to (11), in which
when an input of predetermined release information is received, the control unit disables the restriction on the predetermined operation for a certain period of time since the input of the release information is received.

[0184] According to (12), even when it is difficult for the user to set the inhalation device to a height equal to or greater than the threshold, the inhalation device can be used by inputting the release information, and the decrease in convenience of the inhalation device can be prevented.

[0185] (13) The inhalation device according to any one of (1) to (12), in which
when the predetermined operation is performed, the control unit disables the restriction on the predetermined

operation for a certain period of time since the predetermined operation is completed.

[0186] According to (13), as compared with a case where an operation for releasing the restriction on the predetermined operation is required for each predetermined operation, an increase in time and efforts of the user can be prevented.

[0187] (14) The inhalation device according to (13), further including:

a heating unit configured to heat the base material to generate the aerosol, in which
in response to an aerosol generation request from a user, the control unit causes the inhalation device to generate the aerosol, by controlling a temperature of the heating unit based on a heating profile defining a time-series transition of a target temperature which is a target value of the temperature of the heating unit,
the predetermined operation includes generating the aerosol in response to the aerosol generation request,
when the aerosol is generated, the control unit disables the restriction on the predetermined operation for the certain period of time since the generation of the aerosol is completed, and
the certain period of time is twice as long as a period of time from when the heating control based on the heating profile is started to when the heating control is completed.

[0188] According to (14), a period of time of an appropriate length as a period of time for disabling the restriction on the predetermined operation can be set while preventing the increase in the time and efforts of the user at the time of chain smoking.

[0189] (15) The inhalation device according to any one of (1) to (14), in which

the control unit acquires the height information indicating a distance in a vertical direction from a predetermined reference point to the inhalation device as the height, and
the reference point is able to be set by a user.

[0190] According to (15), an appropriate position can be set as the reference point.

[0191] (16) A control method including:
a computer (control unit 116, 116A, 116B), for controlling an operation of an inhalation device (inhalation device 100, 100A, 100B) that generates an aerosol from a base material (cartridge 120, flavor imparting cartridge 130, stick-type base material 150) including an aerosol source, performing the following processing:

acquiring height information indicating a height at which the inhalation device is located;
determining whether the height is less than a threshold based on the height information; and
restricting a predetermined operation in the inhalation device when it is determined that the height is less than the threshold.

[0192] According to (16), since the predetermined operation in the inhalation device is restricted when it is determined that the height at which the inhalation device is located is less than the threshold, the predetermined operation can be prevented from being performed for a child for whom it is difficult to set the inhalation device to a height equal to or greater than the threshold. Thus, the occurrence of inconvenience caused by the misuse by a child can be prevented.

[0193] (17) A program causing a computer (control unit 116, 116A, 116B), for controlling an operation of an inhalation device (inhalation device 100, 100A, 100B) that generates an aerosol from a base material (cartridge 120, flavor imparting cartridge 130, stick-type base material 150) including an aerosol source, to perform the following processing:

acquiring height information indicating a height at which the inhalation device is located;
determining whether the height is less than a threshold based on the height information; and
restricting a predetermined operation in the inhalation device when it is determined that the height is less than the threshold.

[0194] According to (17), since the predetermined operation in the inhalation device is restricted when it is determined that the height at which the inhalation device is located is less than the threshold, the predetermined operation can be prevented from being performed for a child for whom it is difficult to set the inhalation device to a height equal to or greater than the threshold. Thus, the occurrence of inconvenience caused by the misuse by a child can be prevented.

REFERENCE SIGNS LIST

[0195]

100, 100A, 100B: inhalation device
113, 113A, 113B: notification unit
116, 116A, 116B: control unit
121, 121A, 121B: heating unit
23a: light emitting device (light emitting unit)
23a_1: first light emitting element (light emitting element)
23a_2: second light emitting element (light emitting element)
23a_3: third light emitting element (light emitting element)
23b: display device (display unit)

Claims

1. An inhalation device that generates an aerosol from a base material including an aerosol source, the inhalation device comprising:

   a control unit configured to control an operation of the inhalation device, wherein
   the control unit

   acquires height information indicating a height at which the inhalation device is located,
   determines whether the height is less than a threshold based on the height information, and
   restricts a predetermined operation in the inhalation device when it is determined that the height is less than the threshold.

2. The inhalation device according to claim 1, further comprising:

   a heating unit configured to heat the base material to generate the aerosol, wherein
   in response to an aerosol generation request from a user, the control unit causes the inhalation device to generate the aerosol, by controlling a temperature of the heating unit based on a heating profile defining a time-series transition of a target temperature which is a target value of the temperature of the heating unit, and
   the predetermined operation includes generating the aerosol in response to the aerosol generation request.

3. The inhalation device according to claim 1, further comprising:

   a heating unit configured to, when supplied with electric power, heat the base material to generate the aerosol, wherein
   in response to an aerosol generation request from a user, the control unit causes the inhalation device to generate the aerosol, by supplying a predetermined amount of electric power to the heating unit, and
   the predetermined operation includes generating the aerosol in response to the aerosol generation request.

4. The inhalation device according to claim 2 or 3, wherein
   when it is determined that the height is equal to or greater than the threshold and there is the aerosol generation request after the predetermined operation is performed, the control unit causes the aerosol to be generated in response to the aerosol generation request.

5. The inhalation device according to any one of claims 1 to 4, further comprising:

   a notification unit configured to notify a user of predetermined information, wherein
   the control unit further notifies the user of information related to the height via the notification unit based on the height information.

6. The inhalation device according to claim 5, wherein

   the notification unit includes a light emitting unit configured to emit light, and
   the control unit notifies the user of the information related to the height by making a light emitting mode of the light emitting unit different according to the height.

7. The inhalation device according to claim 6, wherein

   the light emitting unit is configured to emit light in a plurality of emission colors, and
   the control unit makes the emission colors of the light emitting unit different according to the height.

8. The inhalation device according to claim 6, wherein

   the light emitting unit includes a plurality of light emitting elements, and
   the control unit makes the light emitting element that emits light or the number of light emitting elements that emit light among the plurality of light emitting elements different according to the height.

9. The inhalation device according to claim 5, wherein

   the notification unit includes a display unit configured to display an image, and
   the control unit notifies the user of the information related to the height by making a display mode of the display unit different according to the height.

10. The inhalation device according to any one of claims 1 to 9, wherein
    the control unit acquires the height information when an operation that triggers the acquisition of the height information is performed.

11. The inhalation device according to claim 10, wherein the control unit starts the acquisition of the height information when a predetermined period of time elapses since the operation that triggers the acquisition of the height information is performed.

12. The inhalation device according to any one of claims 1 to 11, wherein
when an input of predetermined release information is received, the control unit disables the restriction on the predetermined operation for a certain period of time since the input of the release information is received.

13. The inhalation device according to any one of claims 1 to 12, wherein
when the predetermined operation is performed, the control unit disables the restriction on the predetermined operation for a certain period of time since the predetermined operation is completed.

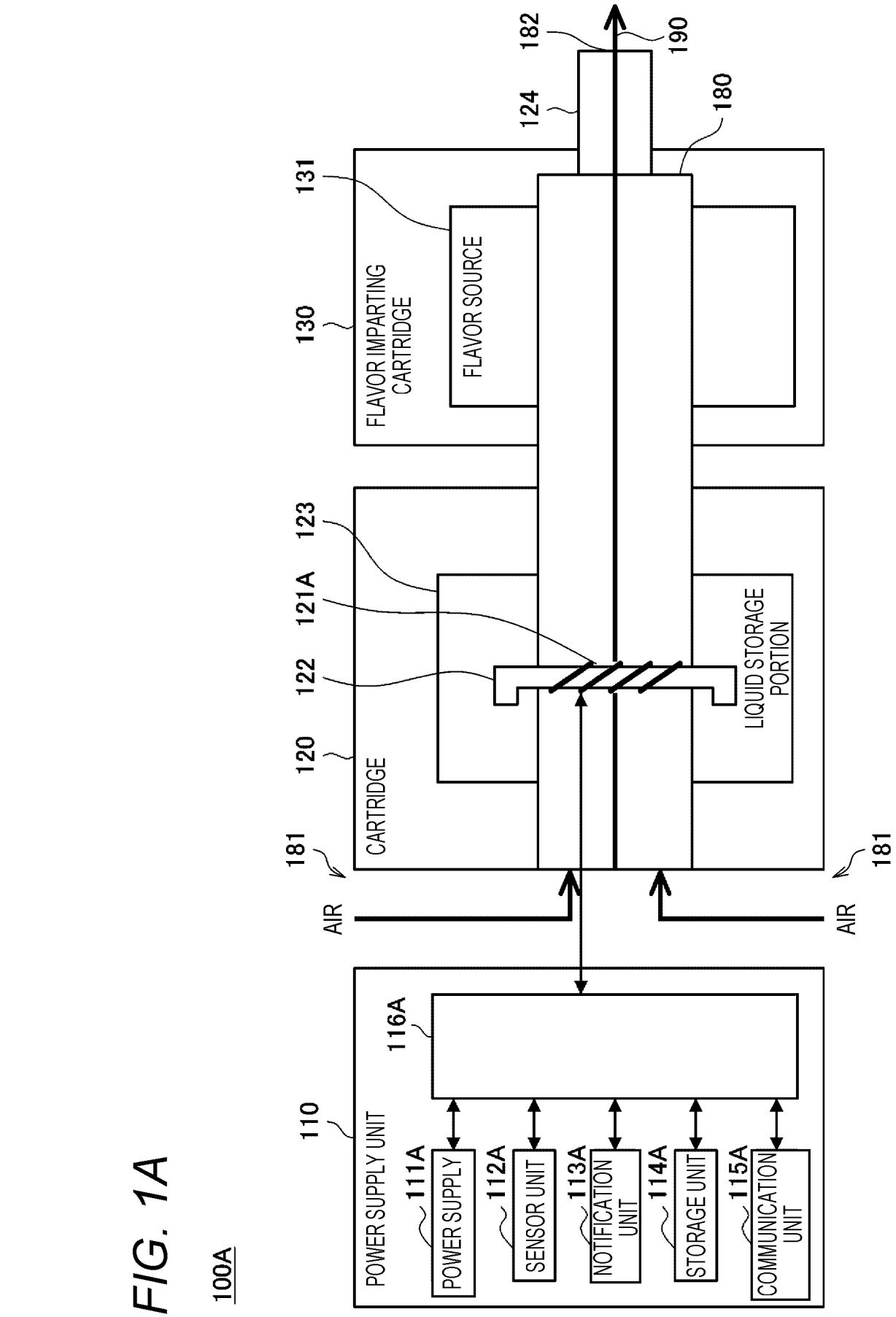
14. A control method comprising:
a computer, for controlling an operation of an inhalation device that generates an aerosol from a base material including an aerosol source, performing the following processing:

acquiring height information indicating a height at which the inhalation device is located;
determining whether the height is less than a threshold based on the height information; and
restricting a predetermined operation in the inhalation device when it is determined that the height is less than the threshold.

15. A program causing a computer, for controlling an operation of an inhalation device that generates an aerosol from a base material including an aerosol source, to perform the following processing:

acquiring height information indicating a height at which the inhalation device is located;
determining whether the height is less than a threshold based on the height information; and
restricting a predetermined operation in the inhalation device when it is determined that the height is less than the threshold.

FIG. 1A


100A
110
POWER SUPPLY UNIT
116A
111A
POWER SUPPLY
112A
SENSOR UNIT
113A
NOTIFICATION UNIT
114A
STORAGE UNIT
115A
COMMUNICATION UNIT
AIR
AIR
181
181
120
CARTRIDGE
122
121A
123
LIQUID STORAGE PORTION
130
FLAVOR IMPARTING CARTRIDGE
131
FLAVOR SOURCE
124
180
182
190

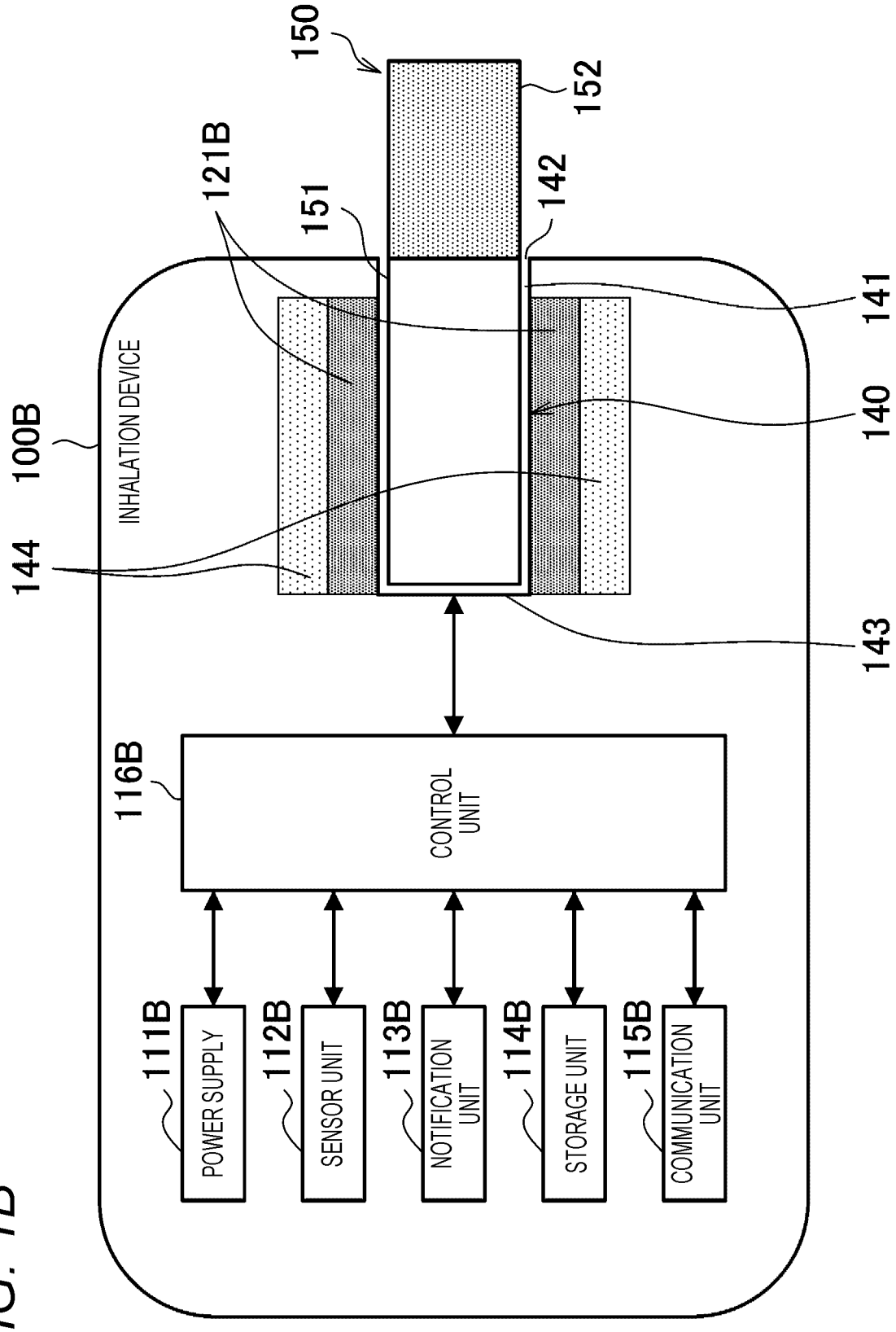

150
152
121B
151
142
141
140
144
143
100B
INHALATION DEVICE
116B
CONTROL UNIT
111B
POWER SUPPLY
112B
SENSOR UNIT
113B
NOTIFICATION UNIT
114B
STORAGE UNIT
115B
COMMUNICATION UNIT

FIG. 1B

FIG. 2

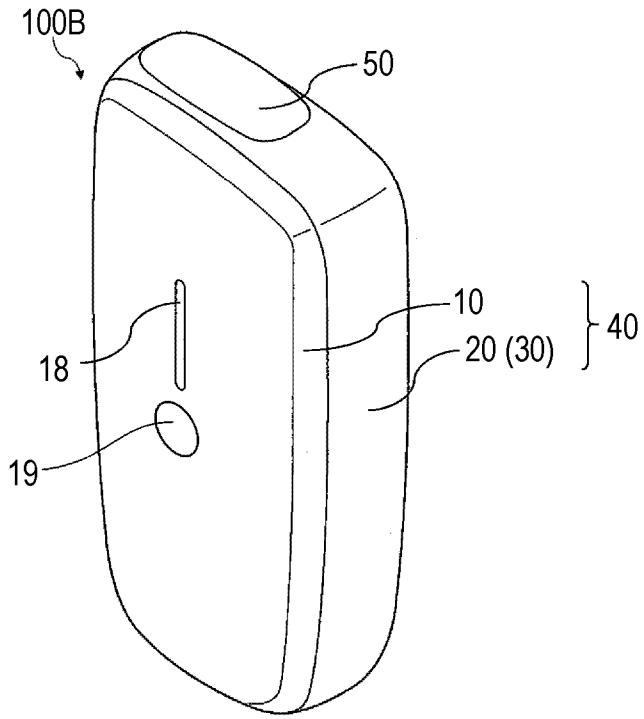

100B
50
10
20 (30)
40
18
19

FIG. 3

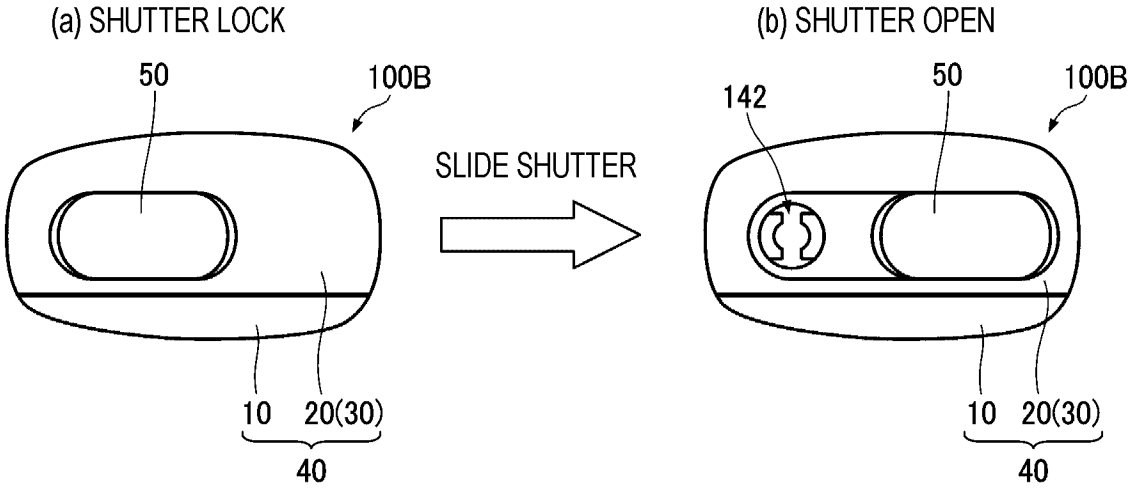

(a) SHUTTER LOCK
50
100B
10
20(30)
40
SLIDE SHUTTER
(b) SHUTTER OPEN
142
50
100B
10
20(30)
40

FIG. 4

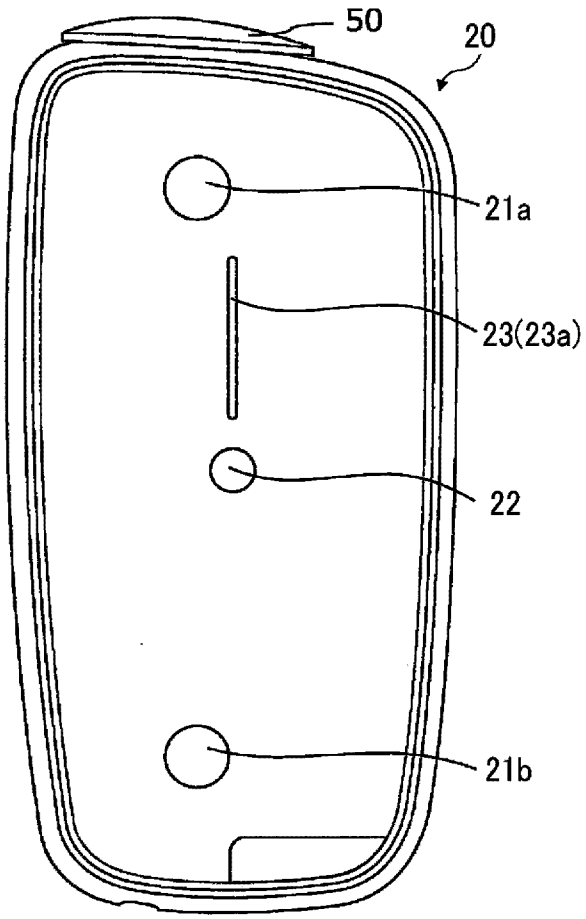


FIG. 5

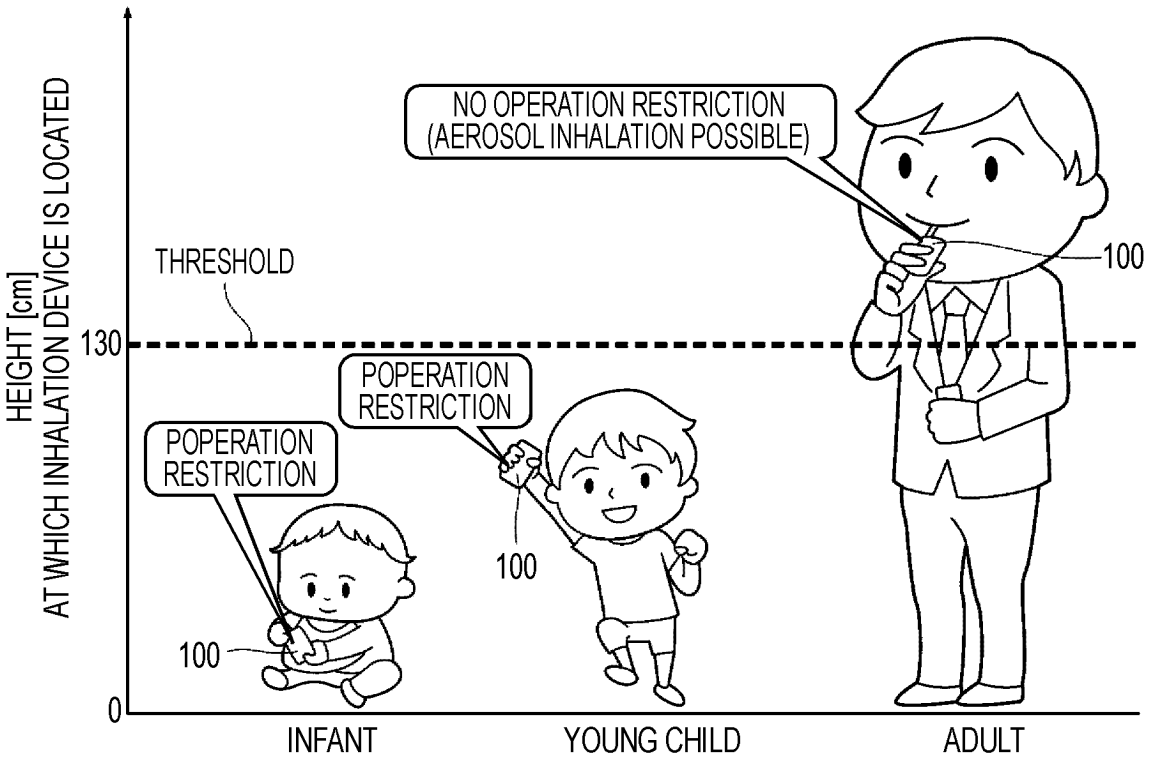

HEIGHT [cm] AT WHICH INHALATION DEVICE IS LOCATED
NO OPERATION RESTRICTION (AEROSOL INHALATION POSSIBLE)
THRESHOLD
130
0
POPERATION RESTRICTION
POPERATION RESTRICTION
100
100
100
INFANT
YOUNG CHILD
ADULT

FIG. 6

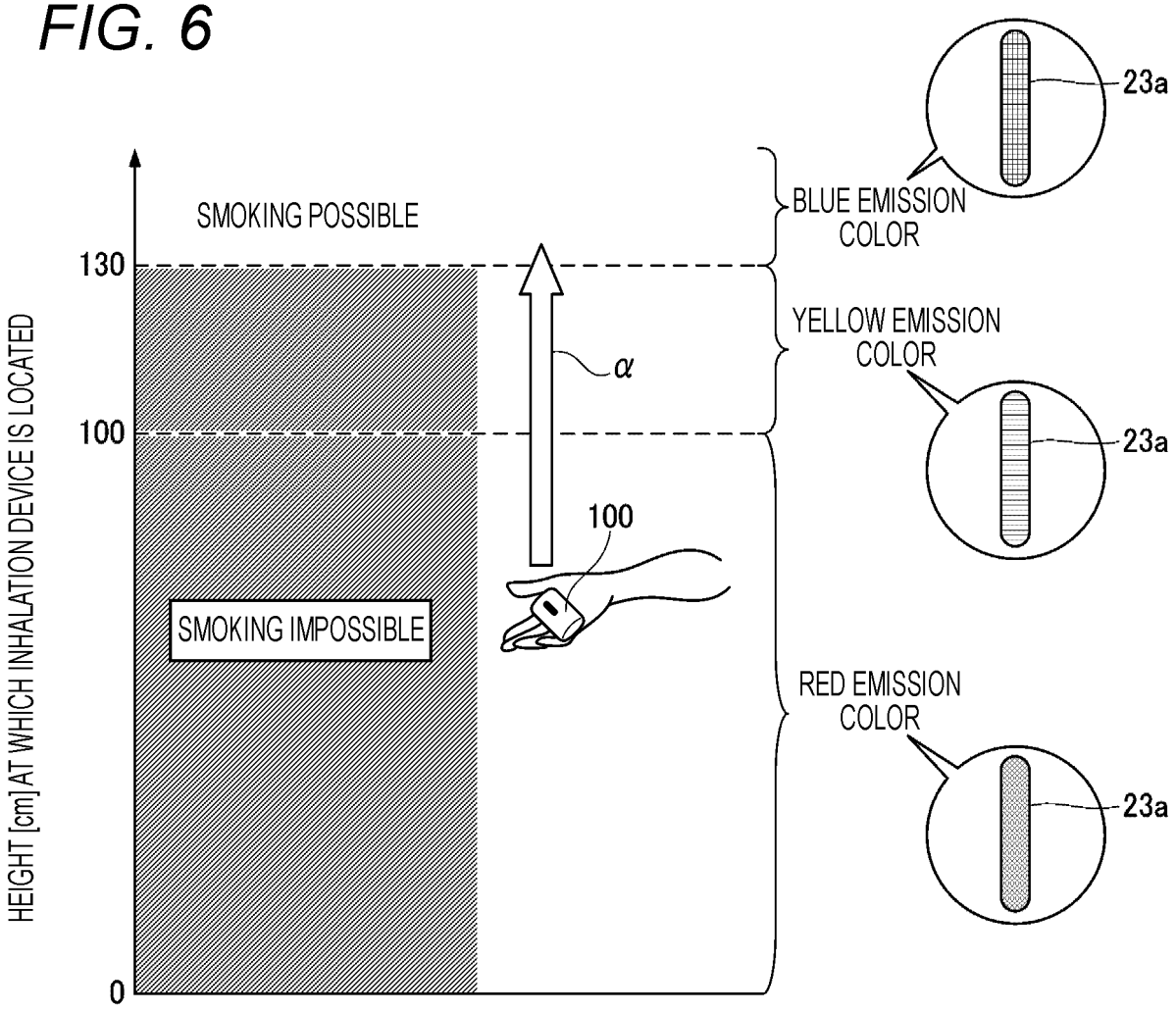

23a
BLUE EMISSION COLOR
SMOKING POSSIBLE
130
YELLOW EMISSION COLOR
α
100
23a
100
SMOKING IMPOSSIBLE
RED EMISSION COLOR
23a
HEIGHT [cm] AT WHICH INHALATION DEVICE IS LOCATED
0

FIG. 7

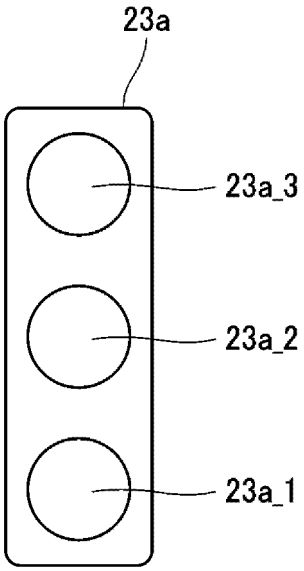

23a
23a_3
23a_2
23a_1

FIG. 8

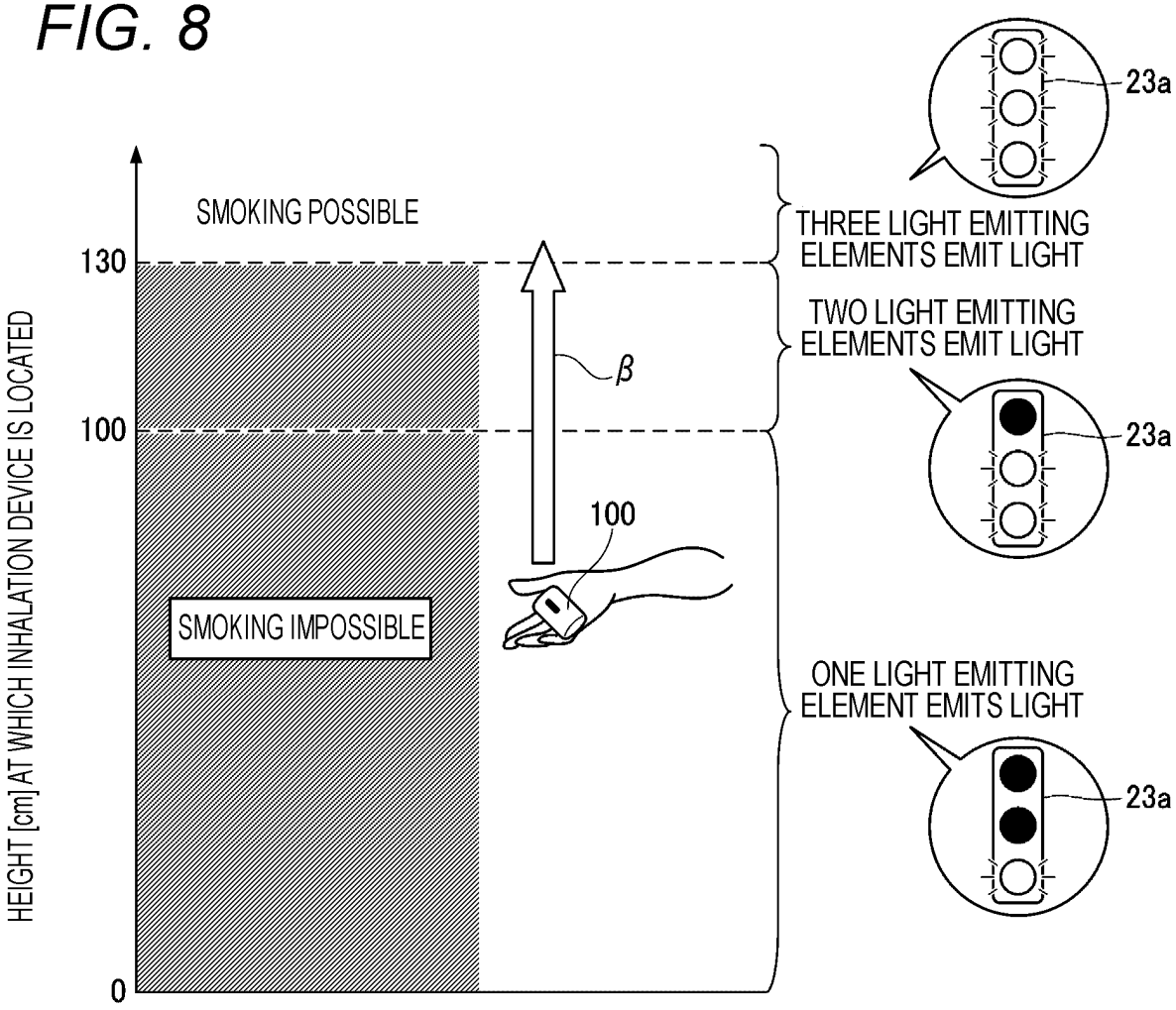

23a
SMOKING POSSIBLE
130
100
0
HEIGHT [cm] AT WHICH INHALATION DEVICE IS LOCATED
β
100
SMOKING IMPOSSIBLE
THREE LIGHT EMITTING ELEMENTS EMIT LIGHT
TWO LIGHT EMITTING ELEMENTS EMIT LIGHT
23a
ONE LIGHT EMITTING ELEMENT EMITS LIGHT
23a

FIG. 9

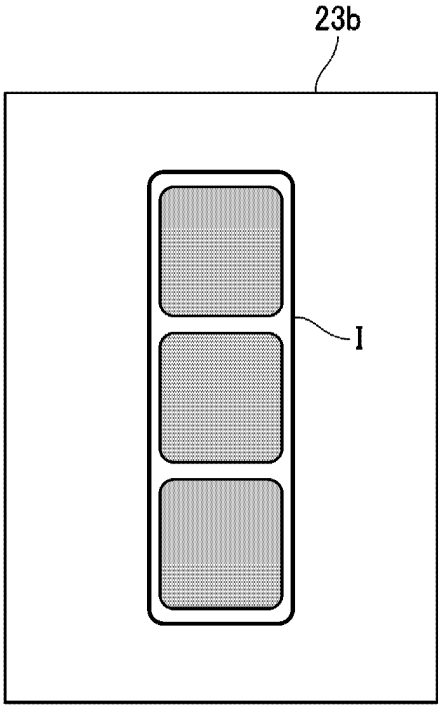

23b
I

FIG. 10

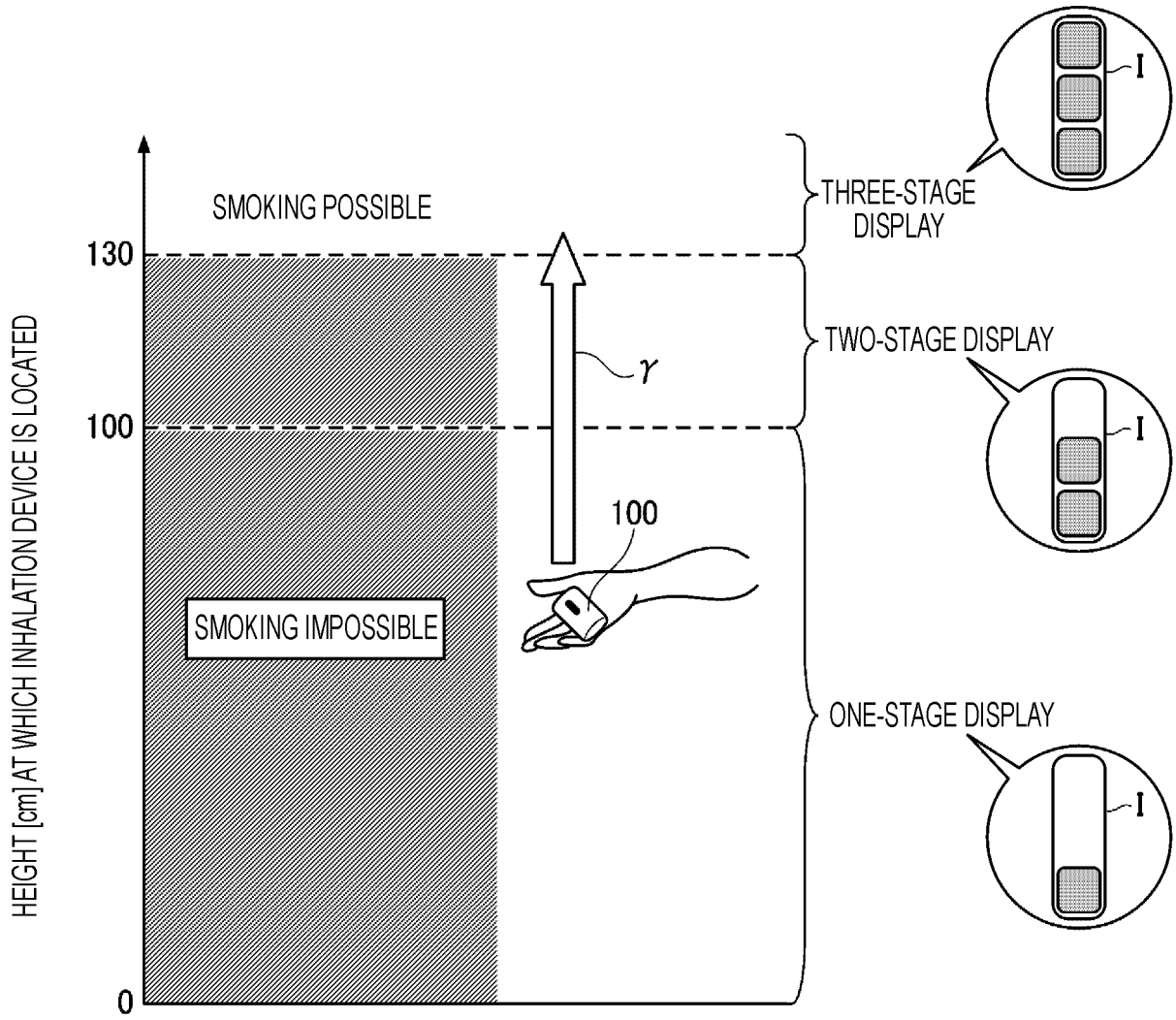

HEIGHT [cm] AT WHICH INHALATION DEVICE IS LOCATED
SMOKING POSSIBLE
SMOKING IMPOSSIBLE
130
100
0
r
100
THREE-STAGE DISPLAY
TWO-STAGE DISPLAY
ONE-STAGE DISPLAY
I
I
I

FIG. 11

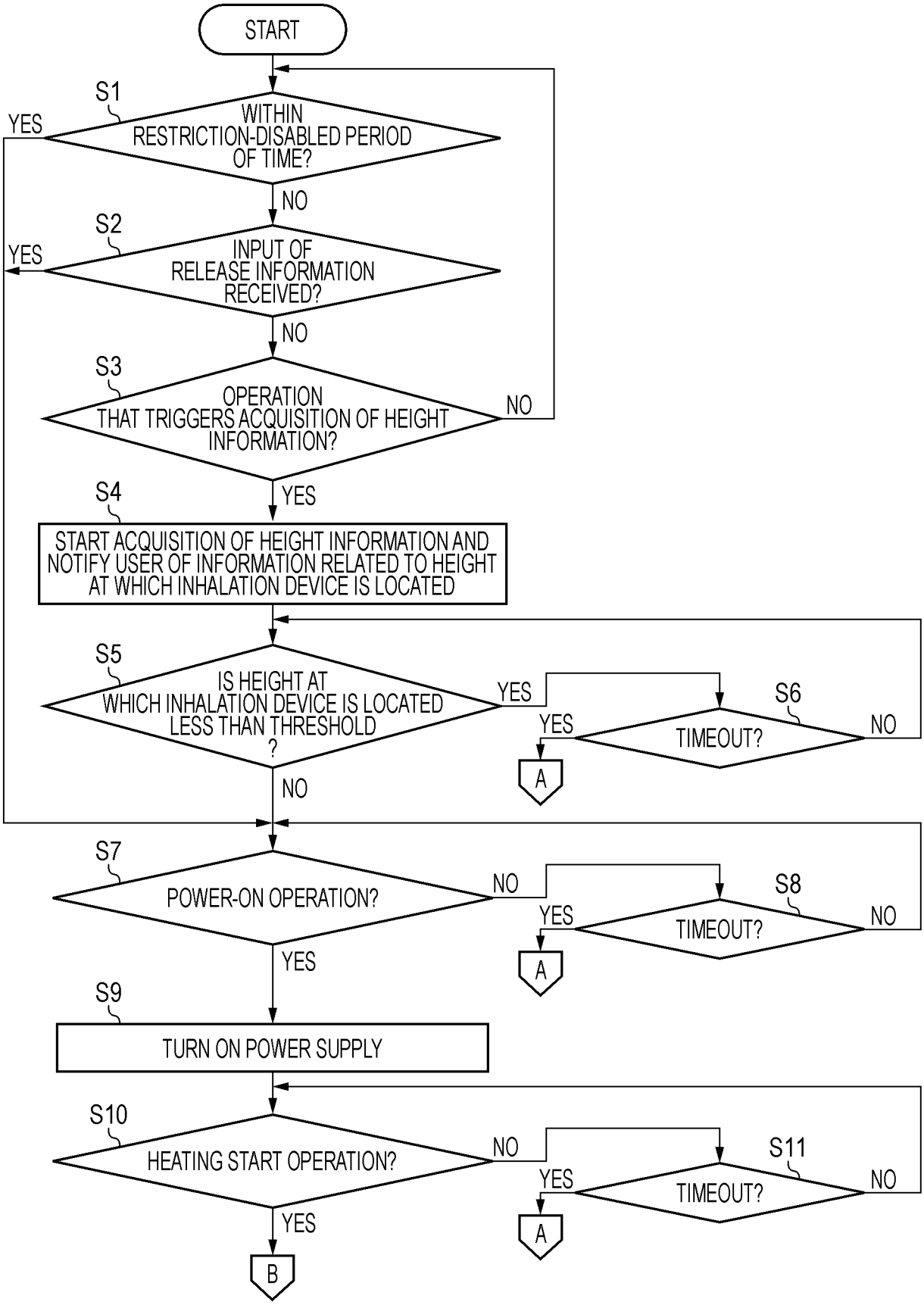
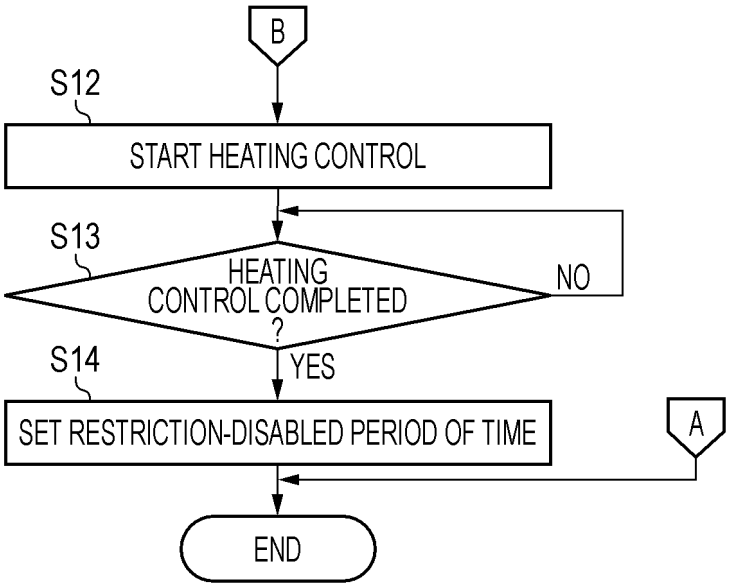

START
S1
WITHIN RESTRICTION-DISABLED PERIOD OF TIME?
YES
NO
S2
INPUT OF RELEASE INFORMATION RECEIVED?
YES
NO
S3
OPERATION THAT TRIGGERS ACQUISITION OF HEIGHT INFORMATION?
NO
YES
S4
START ACQUISITION OF HEIGHT INFORMATION AND NOTIFY USER OF INFORMATION RELATED TO HEIGHT AT WHICH INHALATION DEVICE IS LOCATED
S5
IS HEIGHT AT WHICH INHALATION DEVICE IS LOCATED LESS THAN THRESHOLD ?
YES
NO
S6
TIMEOUT?
YES
NO
A
S7
POWER-ON OPERATION?
NO
YES
S8
TIMEOUT?
YES
NO
A
S9
TURN ON POWER SUPPLY
S10
HEATING START OPERATION?
NO
YES
S11
TIMEOUT?
YES
NO
A
B

FIG. 12


B
S12
START HEATING CONTROL
S13
HEATING CONTROL COMPLETED ?
NO
YES
S14
SET RESTRICTION-DISABLED PERIOD OF TIME
A
END

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2022/031137

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/49(2020.01)i
FI: A24F40/49

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)

A24F40/49

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 1971-2022
Registered utility model specifications of Japan 1996-2022
Published registered utility model applications of Japan 1994-2022

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 2020-513851 A (CANOPY GROWTH CORP.) 21 May 2020 (2020-05-21) paragraphs [0049], [0053], [0087], fig. 1	1-11, 14-15
Y		12-13
Y	WO 2022/130465 A1 (JAPAN TOBACCO INC.) 23 June 2022 (2022-06-23) paragraphs [0091]-[0097]	12-13

☐ Further documents are listed in the continuation of Box C.

☑ See patent family annex.

* Special categories of cited documents:
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 September 2022	**18 October 2022**
Name and mailing address of the ISA/JP **Japan Patent Office (ISA/JP)** **3-4-3 Kasumigaseki, Chiyoda-ku, Tokyo 100-8915** **Japan**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2022/031137

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
JP 2020-513851 A	21 May 2020	US 2018/0263283 A1 paragraphs [0051], [0058], [0092], fig. 1 WO 2018/165758 A1 EP 3595468 A1 KR 10-2019-0131053 A CN 111315244 A	
WO 2022/130465 A1	23 June 2022	(Family: none)	

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2020506121 A **[0005]**
- JP 2019505190 A **[0005]**