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(72) Inventors:
• **FUJINO, Yusuke**
Tokyo 130-8603 (JP)
• **SEMA, Hiroaki**
Tokyo 130-8603 (JP)
• **KIRISEKO, Akito**
Tokyo 130-8603 (JP)
• **TANIYAMA, Satoru**
Tokyo 130-8603 (JP)

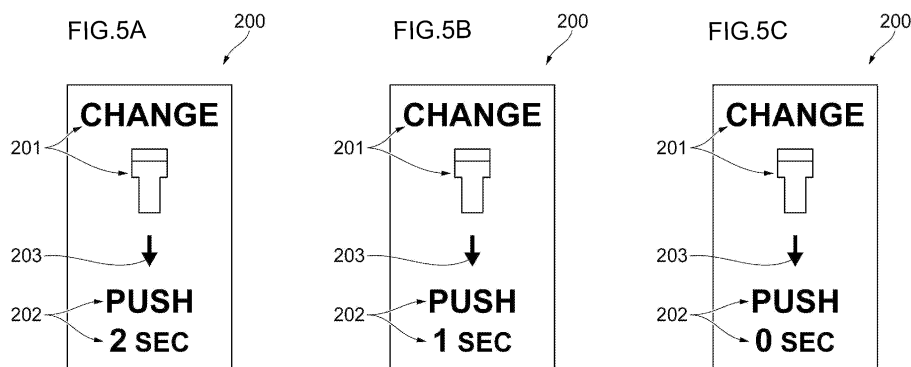
(71) Applicant: **Japan Tobacco Inc.**
Tokyo 105-6927 (JP)

(74) Representative: **Hoffmann Eitle**
Patent- und Rechtsanwälte PartmbB
Arabellastraße 30
81925 München (DE)

(54) **AEROSOL GENERATION DEVICE AND INFORMATION DISPLAY DEVICE**

(57) An aerosol generation device comprising: a heating unit that receives a supply of electric power and heats an aerosol source; a display unit for displaying information relating to the host device; an operation unit on which a pressing operation is performed by a user; and a control unit that performs control so as to display, on the display unit, a first display element representing that the pressing operation should be performed on the operation

unit continuously for a prescribed time after replacement of the aerosol source, and that, when the pressing operation is continuously performed on the operation unit by the user, performs control such that the first display element is displayed on the display unit while being changed in accordance with the time for which the pressing operation continues.



EP 4 449 922 A1

Description

Solution to Problem

Technical Field

[0001] The present invention relates to an aerosol generation device and an information display device.

Background Art

[0002] The following information processing device and information processing method are disclosed in PTL 1. When a button depressed by a user is a control target button, an integral control unit reads an initial remaining cancellation time out of a storage unit, and notifies a GUI display switching unit of the result of the depression of the control target button and the initial remaining cancellation time, and starts the timer of a counting unit. The GUI display switching unit switches the display of a "processing execution" button notified from the integral control unit to the display of a "cancellation" button, and displays the remaining cancelable time. Upon confirming the depression of the "cancellation" button within a predetermined time, the integral control unit notifies the GUI display switching unit to return the display of the "cancellation" button to the display of the original "processing execution" button.

Citation List

Patent Literature

[0003] PTL 1: Japanese Unexamined Patent Application Publication No. 2005-284404

Summary of Invention

Technical Problem

[0004] In some instances a user is asked to press an operation unit down continuously for predetermined time, for example, for the purpose of resuming the use of a device, after doing a predetermined task on the device. In such a case, a problem will arise if the user does not recognize the remaining time portion of the predetermined time for which the operation unit should be pressed down continuously. For example, if the user quits the operation of pressing the operation unit down continuously before the predetermined time elapses, there is a possibility that the device might be unable to be used immediately.

[0005] An object of the present invention is to enable the user to recognize the remaining time portion of the predetermined time for which the operation unit should be pressed down continuously when the user performs the operation of pressing the operation unit down continuously for the predetermined time.

[0006] To achieve the object, the present invention may provide an aerosol generation device, comprising: a heating unit that receives supply of power and heats an aerosol source; a display unit for displaying information regarding the aerosol generation device; an operation unit on which a pressing operation is performed by a user; and a control unit that performs control to display, on the display unit, a first display element representing that the pressing operation of pressing the operation unit down continuously for predetermined time needs to be performed after replacement of the aerosol source, and, when the pressing operation of pressing the operation unit down continuously is performed by the user, performs control to display the first display element on the display unit while changing the first display element in accordance with time for which the pressing operation continues.

[0007] The control unit may perform control to further display, on the display unit, a second display element representing that the replacement of the aerosol source needs to be performed, when a remaining amount of the aerosol source reaches a threshold or less.

[0008] Also provided by the present invention is an information display device, comprising: a display unit for displaying information regarding the information display device; an operation unit on which a pressing operation is performed by a user; and a control unit that performs control to display, on the display unit, a first display element representing that the pressing operation of pressing the operation unit down continuously for predetermined time needs to be performed after the user does a predetermined task, and, when the pressing operation of pressing the operation unit down continuously is performed by the user, performs control to display the first display element on the display unit while changing the first display element in accordance with time for which the pressing operation continues.

[0009] The control unit may perform control to further display, on the display unit, a second display element representing that, upon occurrence of a predetermined cause, the predetermined task needs to be done so as to obviate the predetermined cause. In that case, the predetermined cause may be that a remaining amount of a consumable used in the information display device reaches a threshold or less, and the predetermined task may be replacement of the consumable. The predetermined cause may be a breakdown of a component of the information display device, and the predetermined task may be replacement of the component.

[0010] The control unit may perform control to display, on the display unit, the first display element while changing the first display element at each lapse of time having been determined in advance when the pressing operation of pressing the operation unit down continuously is performed by the user.

Advantageous Effects of Invention

[0011] The present invention enables the user to recognize the remaining time portion of the predetermined time for which the operation unit should be pressed down continuously when the user performs the operation of pressing the operation unit down continuously for the predetermined time.

Brief Description of Drawings

[0012]

[Fig. 1] Fig. 1 is a diagram illustrating an example of appearance of an aerosol generation device taken as the subject of a first embodiment.

[Fig. 2] Fig. 2 is a diagram for explaining how aerosol sources, etc. taken as the subject of the first embodiment are attached to a device body.

[Fig. 3] Fig. 3 is a schematic view of an internal structure of the aerosol generation device taken as the subject of the first embodiment.

[Figs. 4A and 4B] Figs. 4A and 4B are diagrams for explaining a normal mode and a high mode, wherein Fig. 4A is a diagram for explaining an example of the timing of heating in the normal mode, and Fig. 4B is a diagram for explaining an example of the timing of heating in the high mode.

[Figs. 5A to 5C] Figs. 5A to 5C are diagrams illustrating a capsule replacement screen according to the first embodiment.

[Fig. 6] Fig. 6 is a flowchart illustrating display control of a display of the aerosol generation device according to the first embodiment when making a notification to the effect that the replacement of a capsule is needed.

[Fig. 7] Fig. 7 is a flowchart illustrating display control of the display of the aerosol generation device according to the first embodiment after completion of the replacement of the capsule.

[Figs. 8A to 8C] Figs. 8A to 8C are diagrams illustrating a cartridge replacement screen according to a second embodiment.

Description of Embodiments

[0013] With reference to the accompanying drawings, embodiments of the present invention will now be described in detail.

[First Embodiment]

(Overview)

[0014] An aerosol generation device taken as the subject of a first embodiment is a kind of electronic cigarette. In the description below, a substance that is generated by the aerosol generation device will be referred to as "aero-

sol". An aerosol is a mixture of airborne tiny particles of a liquid or a solid with air or another kind of gas.

[0015] The aerosol generation device taken as the subject of the first embodiment is capable of generating an aerosol without any combustion.

[0016] In the first embodiment, the user's act of inhaling the aerosol generated by the aerosol generation device will be simply referred to as "inhalation" or "puff".

[0017] In the first embodiment, the aerosol generation device is assumed to be a device to which both a liquid aerosol source and a solid aerosol source are attachable.

[0018] In the description below, a container that contains a liquid aerosol source will be referred to as "cartridge", and a container that contains a solid aerosol source will be referred to as "capsule". Both the cartridge and the capsule are consumables. Therefore, each of the cartridge and the capsule has its own estimated life for replacement. The estimated life for replacement varies depending on the difference between heating modes to be described later.

[0019] The aerosol generation device taken as the subject of the first embodiment includes a heater configured to generate an aerosol by heating a liquid aerosol source and a heater configured to generate an aerosol by heating a solid aerosol source.

[0020] The liquid aerosol source is an example of a first aerosol source. The solid aerosol source is an example of a second aerosol source.

(Appearance Example)

[0021] Fig. 1 is a diagram illustrating an example of appearance of an aerosol generation device taken as the subject of the first embodiment.

[0022] The appearance example illustrated in Fig. 1 can be obtained by observing the front of the aerosol generation device 10 obliquely from above. The aerosol generation device 10 taken as the subject of the first embodiment has a size that is small enough for the user to hold it with one hand. For example, the aerosol generation device 10 has a width of approximately 32 mm, a height of approximately 60 mm, and a depth of approximately 23 mm. The size described here is just an example. The width, height, and depth differ depending also on the design of the aerosol generation device 10.

[0023] Fig. 1 illustrates the aerosol generation device 10 that is in a state in which a capsule holder 12 is attached to a device body 11. As will be described later, the capsule holder 12 can be detachably attached to the device body 11.

[0024] A display 11A and an operation button 11B are disposed on the top surface of the device body 11. For example, a liquid crystal display or an organic EL (Electro Luminescence) display is used as the display 11A. The operation button 11B is used for, for example, turning power ON or OFF, confirming the remaining amount of the solid aerosol source, confirming the remaining amount of the battery, and for other operations. The

display 11A is an example of a display unit. The operation button 11B is an example of an operation unit.

(Example of Attachment of Aerosol Sources, etc.)

[0025] Fig. 2 is a diagram for explaining how the aerosol sources, etc. taken as the subject of the first embodiment are attached to the device body 11.

[0026] An opening that is not illustrated is provided in the top of the device body 11. The opening mentioned here constitutes an end portion of a non-illustrated tubular body provided inside the device body 11.

[0027] First, a cartridge 20 is inserted into the opening of the device body 11, followed by attachment of the capsule holder 12 thereto.

[0028] When attaching the capsule holder 12 to the opening of the device body 11 or detaching the capsule holder 12 from the opening, the user rotates the capsule holder 12 in relation to the opening by, for example, 120°.

[0029] The capsule holder 12 attached to the device body 11 functions as a stopper that prevents the cartridge 20 inserted in the device body 11 from slipping out.

[0030] The capsule holder 12 also has an opening. This opening constitutes an end portion of a non-illustrated tubular body provided inside the capsule holder 12. A capsule 30 is attached to this opening. The capsule 30 is attachable by being pushed into the opening of the capsule holder 12 and is detachable by being pulled out of the opening of the capsule holder 12.

[0031] Though the cartridge 20 is attached via the opening provided in the top surface of the device body 11 in the present embodiment, a structure for attachment from below the bottom surface of the device body 11 may be adopted.

(Internal Structure of Device)

[0032] Fig. 3 is a schematic view of the internal structure of the aerosol generation device 10 taken as the subject of the first embodiment. It should be noted that, however, the internal structure mentioned here includes the cartridge 20 (see Fig. 2) and the capsule 30 (see Fig. 2) that are attached to the device body 11.

[0033] The illustration of the internal structure in Fig. 3 is intended to explain parts that are provided inside the device body 11 and explain a positional relationship among them. For this reason, the appearance of the parts, etc. illustrated in Fig. 3, does not necessarily agree with that of the external view described above.

[0034] The aerosol generation device 10 illustrated in Fig. 3 includes a power supply unit 111L, a sensor unit 112L, a notification unit 113L, a storage unit 114L, a communication unit 115L, a control unit 116L, a liquid guiding unit 122L, a liquid reservoir unit 123L, a heating unit 121L-1, a heating unit 121L-2, a holding unit 140L, and a heat insulating unit 144L.

[0035] An airflow path 180L is formed inside the device body 11. The airflow path 180L serves as a passage

through which an aerosol generated from a liquid aerosol source stored in the liquid reservoir unit 123L is conveyed to a capsule-type container 130L filled with a solid aerosol source.

[0036] The liquid reservoir unit 123L corresponds to the cartridge 20 described earlier. The capsule-type container 130L corresponds to the capsule 30 described earlier.

[0037] In the present embodiment, inhalation is done by the user, with the capsule-type container 130L attached to the holding unit 140L. The holding unit 140L corresponds to the capsule holder 12 (see Fig. 2) described earlier and to the tubular body of the device body 11 to which the capsule holder 12 is attached.

[0038] Components that make up the device body 11 will be described below.

[0039] The power supply unit 111L is a device that stores power. The power supply unit 111L supplies power to components that make up the device body 11. A rechargeable battery such as a lithium ion secondary battery is used as the power supply unit 111L.

[0040] When the power supply unit 111L is a rechargeable battery, charging can be performed repeatedly from an external power supply connected via a cable such as a USB (Universal Serial Bus) cable.

[0041] Notwithstanding the above, when the device body 11 supports wireless power transmission, the power supply unit 111L can be charged in a state of not being in contact with an external device that is on the power-transmitter side.

[0042] When the power supply unit 111L is detachable from the device body 11, the power supply unit 111L having been used up can be replaced with a new power supply unit 111L.

[0043] The sensor unit 112L is a device that detects information regarding each component of the device body 11. The sensor unit 112L outputs the detected information to the control unit 116L.

[0044] Examples of the sensor unit 112L provided in the device body 11 are a pressure sensor such as a condenser microphone, a flow sensor, and a temperature sensor. The sensor unit 112L of this type is used for, for example, detecting inhalation by the user.

[0045] The sensor unit 112L provided in the device body 11 is, for example, an input device configured to receive user operations on buttons, switches, and the like. The buttons mentioned here include the operation button 11B (see Fig. 1) described earlier. The sensor unit 112L of this type is used for, for example, receiving user operations.

[0046] Another example of the sensor unit 112L provided in the device body 11 is a voltmeter configured to measure a voltage between two terminals of a battery. The battery mentioned here is an example of the power supply unit 111L. In the present embodiment, the voltmeter is used for calculating the remaining amount of the battery and the charging amount thereof.

[0047] The notification unit 113L is a device configured

to notify the user of information.

[0048] The notification unit 113L provided in the device body 11 is, for example, a light-emitting device such as an LED (Light Emitting Diode). When the notification unit 113L is a light-emitting device, the emission of the light-emitting device is controlled in a pattern that is in accordance with the content of the information to be notified. For example, the emission of the light-emitting device is controlled such that the pattern for a case where the user is notified of the need for charging the power supply unit 111L, the pattern for a case where the user is notified that the power supply unit 111L is now being charged, and the pattern for notification of abnormality occurrence are different from one another.

[0049] "Different emission pattern" is a concept that encompasses a color difference, a timing difference between ON and OFF, a difference in the degree of brightness during ON, and the like.

[0050] Other examples of the notification unit 113L provided in the device body 11 include a display device configured to display an image, a sound output device configured to output sound, and a vibration device configured to vibrate. These devices may each be used alone or in combination, and may be used together with or in place of the light-emitting device mentioned above. An example of the display device mentioned here is the display 11A (see Fig. 1).

[0051] The storage unit 114L stores various kinds of information regarding the operation of the device body 11. The storage unit 114L is made of, for example, a non-volatile storage medium such as a flash memory.

[0052] The information stored in the storage unit 114L includes, for example, programs to be run by the control unit 116L. The programs include application programs, besides OS (Operating System) and firmware.

[0053] Besides this, the information stored in the storage unit 114L includes information needed for controlling each component by the control unit 116L.

[0054] The information mentioned here includes information of each component detected by the sensor unit 112L described above. For example, the information mentioned here includes information regarding the heating mode that is currently being executed, information regarding the remaining amount of the solid aerosol source, and information regarding the remaining amount of the battery and the charging amount thereof. The information regarding the remaining amount of the solid aerosol source includes, besides the remaining amount itself, information for calculating the remaining amount, for example, the number of times of inhalation, the cumulative time of inhalation, and the like.

[0055] The communication unit 115L is a communication interface used for transmitting information to, and receiving information from, another device. The communication interface conforms to a wired or wireless communication standard.

[0056] Examples of the communication standard include wireless LAN (Local Area Network), wired LAN,

mobile communication systems such as 4G and 5G, and the like. In the present embodiment, Wi-Fi® or Bluetooth® is used.

[0057] The communication unit 115L is used for, for example, causing a smartphone, a tablet-type terminal, or the like to display information regarding the inhalation by the user.

[0058] Besides this, the communication unit 115L is used for, for example, receiving update data of the programs stored in the storage unit 114L from a server.

[0059] The control unit 116L functions as an arithmetic processor and a controller and controls the operation of each of the components that make up the device body 11 by running the programs.

[0060] Electronic circuitry such as a CPU (Central Processing Unit) and a microprocessor is provided in the control unit 116L.

[0061] Besides this, a ROM (Read Only Memory) for storing programs, arithmetic parameters, and the like, and a RAM (Random Access Memory) for temporarily storing parameters that change according to circumstances, and the like may be provided in the control unit 116L.

[0062] The control unit 116L controls, for example, the supply of power from the power supply unit 111L to each component, the charging of the power supply unit 111L, the detection of information by the sensor unit 112L, the notification of information by the notification unit 113L, the storing and readout of information by the storage unit 114L, and the transmission and reception of information by the communication unit 115L.

[0063] In addition, the control unit 116L performs processing for receiving information through user operations, processing based on information outputted from each component, and the like.

[0064] The control unit 116L performs control to, among others, display a screen on the display 11A.

[0065] The liquid reservoir unit 123L is a container in which a liquid aerosol source is stored. A liquid such as, for example, polyhydric alcohol such as glycerin and propylene glycol, and water or the like, is used as the liquid aerosol source.

[0066] The liquid aerosol source may contain tobacco ingredients that give off flavor components by being heated or extracts derived from such tobacco ingredients. The liquid aerosol source may contain nicotine components.

[0067] The liquid guiding unit 122L is a part that guides the liquid aerosol source stored in the liquid reservoir unit 123L from the liquid reservoir unit 123L and holds it. The liquid guiding unit 122L has, for example, a twisted structure of a fiber material such as a glass fiber or a porous material such as a porous ceramic. The part of this kind is also called "wick".

[0068] Both ends of the liquid guiding unit 122L are connected to the inside of the liquid reservoir unit 123L. Therefore, the aerosol source stored in the liquid reservoir unit 123L spreads throughout the liquid guiding unit

122L by capillary action.

[0069] The heating unit 121L-1 is a part that generates an aerosol by applying heat to the aerosol source held by the liquid guiding unit 122L and thus atomizing it.

[0070] The shape of the heating unit 121L-1 is not limited to a coil shape illustrated in Fig. 3; it may have any other shape such as a film shape or a blade shape. The shape of the heating unit 121L-1 differs depending on the method of heating and the like. The heating unit 121L-1 is made of any material such as metal or polyimide.

[0071] The heating unit 121L-1 is disposed in proximity to the liquid guiding unit 122L. In the present embodiment, the heating unit 121L-1 is a coil made of metal and wound around the outer circumferential surface of the liquid guiding unit 122L.

[0072] The heating unit 121L-1 generates heat by receiving power supplied from the power supply unit 111L, and heats the aerosol source held by the liquid guiding unit 122L up to a vaporizing temperature. The aerosol source the temperature of which has reached the vaporizing temperature is released into air from the liquid guiding unit 122L in the form of gas but is atomized by being cooled by ambient air, thereby turning into an aerosol.

[0073] In the present embodiment, the supply of power to the heating unit 121L-1 configured to heat the liquid aerosol source is linked with the inhalation by the user. That is, power is supplied to the heating unit 121L-1 from the start of the inhalation by the user to the end of the inhalation and, upon the end of the inhalation by the user, the supply of the power to the heating unit 121L-1 is stopped.

[0074] Instead of this, the supply of power to the heating unit 121L-1 configured to heat the liquid aerosol source may be, for example, started when a particular button is pressed in a state in which no aerosol is generated and may be stopped when the/a particular button is pressed in a state in which an aerosol is generated.

[0075] The button for an aerosol generation start instruction and the button for an aerosol generation stop instruction may be physically the same button or may be different buttons.

[0076] The capsule-type container 130L is a container filled with a solid aerosol source.

[0077] The solid aerosol source may contain a granular, sheet-shaped, or powdery processed material, etc. of shredded tobacco or tobacco ingredients configured to give off flavor components by being heated. That is, the solid aerosol source may contain a substance derived from tobacco. The solid aerosol source may contain, for example, nicotine components.

[0078] Notwithstanding the above, the solid aerosol source may contain a non-tobacco-derived substance extracted from a plant other than tobacco (for example, mint, herb, or the like). The solid aerosol source may contain a flavor component such as, for example, menthol.

[0079] The holding unit 140L corresponds to, for example, the capsule holder 12 (see Fig. 2), and has an internal space 141L into which the capsule-type container 130L is attachable. The holding unit 140L has a tubular body with a bottom 143L, and defines the pillar-shaped internal space 141L.

[0080] A part of the capsule-type container 130L is held by the holding unit 140L, and the rest of it is exposed to the outside of the holding unit 140L. The portion, of the capsule-type container 130L, exposed from the holding unit 140L is used as a mouthpiece 124L. The mouthpiece 124L is held in the mouth of the user who inhales the aerosol.

[0081] An entrance for air (i.e., air inlet hole) to the holding unit 140L is provided in, for example, the bottom 143L. A hole through which air can flow in is formed in the bottom of the capsule-type container 130L. Therefore, air having flowed in through the bottom 143L passes through the inside of the capsule-type container 130L to reach the mouthpiece 124L. That is, the mouthpiece 124L serves as an exit for the air (i.e., air outlet hole).

[0082] The bottom 143L is in communication with an air outlet hole 182L of the airflow path 180L formed inside the device body 11, incidentally. The internal space 141L of the holding unit 140L is in communication with the airflow path 180L through the air outlet hole 182L.

[0083] The heating unit 121L-2 heats the solid aerosol source with which the capsule-type container 130L is filled.

[0084] The heating unit 121L-2 is made of metal, polyimide, or the like. The heating unit 121L-2 is provided at a position where it is in contact with the outer circumferential surface of a metal portion of the holding unit 140L.

[0085] The heating unit 121L-2 generates heat by receiving power supplied from the power supply unit 111L, and heats the outer circumferential surface of the capsule-type container 130L that is in contact with the metal portion of the holding unit 140L.

[0086] Therefore, heat is applied first at the position near the outer circumferential surface of the capsule-type container 130L, and the heated region thereafter spreads toward the center.

[0087] The aerosol source the temperature of which has reached the vaporizing temperature vaporizes. However, it is atomized by being cooled by ambient air, thereby turning into an aerosol.

[0088] The supply of power to the heating unit 121L-2, and heating that results from the supply of the power, are controlled by the control unit 116L.

[0089] The heat insulating unit 144L is a member configured to prevent the propagation of heat from the heating unit 121L-2 to the other structural elements of the device body 11. The heat insulating unit 144L covers at least the outer circumferential surface of the heating unit 121L-2.

[0090] The heat insulating unit 144L is made of, for example, a vacuum heat insulator or an aerogel heat insulator. The vacuum heat insulator refers to a heat

insulator whose heat conduction by gas is brought as close to zero as possible by wrapping glass wool, silica (silicon powder), or the like with a resin-made film and thus producing a high-vacuum state.

[0091] As described earlier, the airflow path 180L is an air passage provided inside the device body 11. The airflow path 180L has a tubular structure that includes an air inlet hole 181L as its one end, which is the entrance for air into the airflow path 180L, and the air outlet hole 182L as its opposite end, which is the exit for the air out of the airflow path 180L.

[0092] Driven by the inhalation by the user, air flows into the airflow path 180L through the air inlet hole 181L, and the air flows out through the air outlet hole 182L to the bottom 143L of the holding unit 140L.

[0093] The liquid guiding unit 122L is disposed on the airflow path 180L at a position between its ends. The liquid-derived aerosol generated due to heating by the heating unit 121L-1 is mixed with air that has flowed in through the air inlet hole 181L. The mixture of the liquid-derived aerosol and the air flows through the inside of the capsule-type container 130L to be outputted from the mouthpiece 124L into the oral cavity of the user. This flow path is indicated by an arrow 190L in Fig. 3.

[0094] To the mixture of the liquid-derived aerosol and the air, in the process of flowing through the inside of the capsule-type container 130L, a solid-derived aerosol is added.

[0095] The concentration of the solid-derived aerosol rises when the heating control of the heating unit 121L-2 is combined therewith.

[0096] However, as will be described later, in the present embodiment, a heating mode without combination with the heating control of the heating unit 121L-2 is also available.

[0097] When not combined with the heating control of the heating unit 121L-2, the liquid-derived aerosol heats the solid aerosol source in the process of flowing through the inside of the capsule-type container 130L, thereby generating the solid-derived aerosol.

[0098] However, the amount of the solid-derived aerosol generated due to heating by the liquid-derived aerosol is smaller than in a case where the heating control of the heating unit 121L-2 is combined therewith.

(Heating Modes)

[0099] Two heating modes are available for the aerosol generation device 10 taken as the subject of the first embodiment.

[0100] The first one of these heating modes is a first mode, which uses only the heating unit 121L-1 configured to heat the aerosol source stored in the cartridge 20 (see Fig. 2). That is, this is a heating mode in which the cartridge 20 only is heated.

[0101] This heating mode will be hereinafter referred to as "normal mode". In the normal mode, the heating unit 121L-2 configured to heat the solid aerosol source is

always controlled to be OFF.

[0102] The second one of these heating modes is a second mode, which uses both the heating unit 121L-1 configured to heat the aerosol source stored in the cartridge 20 and the heating unit 121L-2 configured to heat the aerosol source with which the capsule 30 (see Fig. 2) is filled. That is, this is a heating mode in which both the cartridge 20 and the capsule 30 are heated.

[0103] This heating mode will be hereinafter referred to as "high mode". In the high mode, the heating of the cartridge 20 by the heating unit 121L-1 and the heating of the capsule 30 by the heating unit 121L-2 are performed alternately.

[0104] The switching between the heating modes is performed by, for example, holding the operation button 11B (see Fig. 1) down for two seconds or longer

[0105] For example, the heating mode is switched to the normal mode if the operation button 11B is held down for two seconds or longer during the high mode. On the contrary, the heating mode is switched to the high mode if the operation button 11B is held down for two seconds or longer during the normal mode.

[0106] In the high mode, the heating of the cartridge 20 by the heating unit 121L-1 takes precedence over the heating of the capsule 30 by the heating unit 121L-2.

[0107] That is, during the heating by the heating unit 121L-1, the heating by the heating unit 121L-2 is stopped by the control. Moreover, if an event of starting the heating of the cartridge 20 occurs during the heating of the capsule 30 by the heating unit 121L-2, the heating by the heating unit 121L-2 is stopped by the control.

[0108] In the aerosol generation device 10 taken as the subject of the first embodiment, control for avoiding concurrent execution of the heating by the heating unit 121L-1 and the heating by the heating unit 121L-2 is performed so as not to exceed the upper limit of an output current of the battery used as the power supply unit 111L. In other words, the period of the heating by the heating unit 121L-1 and the period of the heating by the heating unit 121L-2 are separated from each other.

[0109] The term "concurrent" used here does not mean a perfect non-overlap in terms of heating timing. Accordingly, for example, an overlap arising from an error in operation timing is not precluded.

[0110] Figs. 4A and 4B are diagrams for explaining the normal mode and the high mode, wherein Fig. 4A is a diagram for explaining an example of the timing of heating in the normal mode, and Fig. 4B is a diagram for explaining an example of the timing of heating in the high mode.

[0111] (A1) in Fig. 4A illustrates the timing of the heating of the cartridge 20 in the normal mode. (A2) in Fig. 4A illustrates the timing of the heating of the capsule 30 in the normal mode.

[0112] The horizontal axis in (A1) and (A2) in Fig. 4A represents time, and the vertical axis represents whether heat is applied or not.

[0113] Power is supplied to the corresponding heating

unit during a period in which heat is applied. Power is not supplied to the corresponding heating unit during a period in which heat is not applied.

[0114] The heating control in the normal mode is initiated by releasing a locked state.

[0115] The locked state is a state in which the control by the control unit 116L is stopped. For this reason, no aerosol is generated even when the user holding the mouthpiece 124L (see Fig. 3) in the mouth does inhalation.

[0116] The locked state is released when, for example, the operation button 11B (see Fig. 1) is pressed down three times successively within two seconds. All of the number of times of press-down operation, the button that is operated, and the time taken for the operation are just examples.

[0117] Upon initiation of the heating control in the normal mode, as illustrated in (A1) in Fig. 4A, the heating of the cartridge 20 is executed in link with the time period of inhalation.

[0118] The meaning of "in link with the time period of inhalation" is a link to the detection of inhalation by the sensor unit 112L.

[0119] Therefore, the cartridge 20 is heated for one second when inhalation for one second is detected, and the cartridge 20 is heated for two seconds when inhalation for two seconds is detected.

[0120] As illustrated in (A2) in Fig. 4A, in the normal mode, the heating of the capsule 30 is not executed regardless of whether or not inhalation is performed.

[0121] In the present embodiment, upon a lapse of preset time since the last detection of inhalation, the control unit 116L goes into a locked state.

[0122] Even with a transition to the locked state, the heating mode remains unchanged. There is no change in the heating mode at the time of recovery from the locked state either.

[0123] In the present embodiment, the preset time is six minutes (i.e., 360 seconds). This time is just an example. The lapse of six minutes since the last inhalation connotes that there is a high probability of cessation of the inhalation of an aerosol by the user.

[0124] Therefore, in the present embodiment, a transition to a locked state is executed for the purpose of reducing power consumed in the device body 11 (see Fig. 2). The same holds true for the high mode. That is, upon the lapse of six minutes since the last inhalation, the aerosol generation device 10 is controlled into the locked state.

[0125] A transition to the locked state is executed also when the user gives an instruction for the transition to the locked state. A manual transition to the locked state by the user is executed when, for example, before the lapse of six minutes since the last inhalation, the operation button 11B (see Fig. 1) is pressed down three times successively within two seconds. All of the number of times of press-down operation, the button that is operated, and the time taken for the operation are just ex-

amples.

[0126] (B1) in Fig. 4B illustrates the timing of the heating of the cartridge 20 in the high mode. (B2) in Fig. 4B illustrates the timing of the heating of the capsule 30 in the high mode.

The horizontal axis in (B1) and (B2) in Fig. 4B represents time, and the vertical axis represents whether heat is applied or not.

[0127] As described above, in the present embodiment, concurrent heating of the cartridge 20 and the capsule 30 is precluded. Therefore, the timing of the heating of the cartridge 20 does not overlap with the timing of the heating of the capsule 30.

[0128] Power is supplied to the corresponding heating unit during a period in which heat is applied. Power is not supplied to the corresponding heating unit during a period in which heat is not applied.

[0129] The heating control in the high mode is initiated by releasing the locked state or by switching from the normal mode to the high mode.

[0130] Upon initiation of the heating control in the high mode, as illustrated in (B2) in Fig. 4B, the heating of the capsule 30 starts. Basically, this heating continues until inhalation is detected, and the heating of the capsule 30 is stopped while the inhalation is detected.

[0131] As illustrated (B1) and (B2) in Fig. 4B, the heating of the capsule 30 is stopped at the timing of the start of the heating of the cartridge 20. The initial temperature of the capsule 30 is, for example, the temperature of an environment in which the aerosol generation device 10 is used, for example, a room temperature.

[0132] In the aerosol generation device 10 according to the present embodiment, as illustrated in (B1) and (B2) in Fig. 4B, upon a lapse of 30 seconds since the last detection of inhalation, the heating of the capsule 30 is stopped forcibly to suppress the power consumption. That is, a transition to a sleep state occurs. In the sleep state, the temperature of the capsule 30 decreases gradually.

[0133] In the sleep state, the sensor unit 112L configured to detect inhalation is up and running although the heating of the capsule 30 is stopped. Therefore, upon detection of inhalation by the user in the sleep state, as illustrated in (B1) in Fig. 4B, the heating of the cartridge 20 is executed. Upon completion of the heating of the cartridge 20, as illustrated in (B2) in Fig. 4B, the heating of the capsule 30 starts.

[0134] In the present embodiment, the user is not notified of the transition to the sleep state; however, the user may be notified of it.

[0135] A transition to the locked state described earlier occurs upon a lapse of five minutes and thirty seconds in the sleep state.

(Display Content of Display)

[0136] Figs. 5A to 5C are diagrams for explaining a capsule replacement screen 200 displayed on the dis-

play 11A in the first embodiment.

[0137] The capsule replacement screen 200 is a screen that represents an operation needed regarding the replacement of the capsule 30, and is displayed when a remaining amount of the solid aerosol source inside the capsule 30 has run out. The capsule replacement screen 200 is displayed while blinking for no longer than, for example, 40 seconds until the operation button 11B (see Fig. 1) is pressed down.

[0138] On the capsule replacement screen 200 illustrated in Figs. 5A to 5C, a capsule replacement icon 201, a long-press icon 202, and an arrow icon 203 are arranged. The capsule replacement icon 201 is an icon representing that the capsule 30 should be replaced. The long-press icon 202 is an icon representing that an operation of holding the operation button 11B down, that is, an operation of keeping it pressed down for a predetermined time, should be performed. The operation of holding the operation button 11B down is performed for the purpose of giving an instruction for use preparation processing after the replacement of the capsule 30. The use preparation processing for the capsule 30 includes, for example, processing of resetting the number of times of puff that was counted regarding the before-replacement capsule 30. The arrow icon 203 is an icon representing an order that the operation button 11B should be held down after the replacement of the capsule 30. The capsule replacement icon 201 is an example of a second display element. The long-press icon 202 is an example of a first display element.

[0139] The long-press icon 202 illustrated in Figs. 5A to 5C changes in accordance with the time for which the long press continues. Specifically, the long-press icon 202 includes a character string representing remaining time for which the operation button 11B should be held down.

[0140] For example, at the point in time at which the capsule replacement screen 200 is displayed, as illustrated in Fig. 5A, the long-press icon 202 includes a character string "PUSH" and a character string "2 SEC". By this means, the capsule replacement screen 200 represents that the remaining time for which the operation button 11B should be held down is two seconds.

[0141] Viewing the capsule replacement screen 200, the user keeps the operation button 11B pressed down, and, upon a lapse of one second, as illustrated in Fig. 5B, the character string "2 SEC" of the long-press icon 202 changes into a character string "1 SEC". Therefore, it follows that the capsule replacement screen 200 represents that the remaining time for which the operation button 11B should be held down is one second.

[0142] Viewing the capsule replacement screen 200, the user further keeps the operation button 11B pressed down, and, upon a lapse of another one second, as illustrated in Fig. 5C, the character string "1 SEC" of the long-press icon 202 changes into a character string "0 SEC". Therefore, it follows that the capsule replacement screen 200 represents that the remaining time for which

the operation button 11B should be held down is zero second, meaning that the originally-notified time for which the operation button 11B should be held down has elapsed.

[0143] In the above description, the length of the time for which the long-press icon 202 should be held down is two seconds, the time interval of switching of the character string in the long-press icon 202 is one second, and the number of times of the switching of the long-press icon 202 is twice; therefore, these time and number of times will be used also in the description below. However, this is just an example; the time and the number of times may be any time having been determined in advance and any number of times having been determined in advance.

(Display Control of Display)

[0144] Figs. 6 and 7 are flowcharts for explaining display control of the display 11A of the aerosol generation device 10 according to the first embodiment.

[0145] The alphabet S in these drawings means step.

[0146] The processing illustrated in Figs. 6 and 7 is implemented through running programs. The programs mentioned here are stored in the storage unit 114L (see Fig. 3) and are run by the control unit 116L (see Fig. 3).

[0147] Fig. 6 illustrates display control of the display 11A of the aerosol generation device 10 when a notification to the effect that the replacement of the capsule 30 is needed is made.

[0148] First, the control unit 116L acquires the remaining amount of the capsule 30 (step 301). As the remaining amount of the capsule 30, a value calculated on the basis of the number of times of inhalation, the cumulative time of inhalation, and the like is stored in the storage unit 114L; therefore, the control unit 116L acquires this value.

[0149] Next, based on the remaining amount of the capsule 30 acquired in step 301, the control unit 116L determines whether the content of the capsule 30 is left or not (step 302).

[0150] For example, if the remaining amount of the capsule 30 is greater than a threshold, the control unit 116L obtains an affirmative result in step 302.

[0151] On the other hand, if the remaining amount of the capsule 30 is not greater than the threshold, the control unit 116L obtains a negative result in step 302.

[0152] The control unit 116L repeats the processing in step 301 and the determination in step 302 while affirmative results are obtained in step 302.

[0153] Upon obtaining the negative result in step 302, the control unit 116L sets the capsule replacement icon 201 representing that the capsule 30 should be replaced on screen data prepared in the RAM (step 303).

[0154] For example, the control unit 116L sets the capsule replacement icon 201 including a character string "CHANGE" and a mark of the capsule 30.

[0155] Next, the control unit 116L sets the arrow icon 203 on the screen data prepared in the RAM (step 304).

[0156] Next, the control unit 116L sets the long-press

icon 202 representing that the remaining time for which the long press should be performed is two seconds on the screen data prepared in the RAM (step 305).

[0157] For example, the control unit 116L sets the long-press icon 202 including a character string "PUSH" and a character string "2 SEC".

[0158] After that, the control unit 116L causes the display 11A to display the capsule replacement screen 200 obtained by setting the capsule replacement icon 201, the arrow icon 203, and the long-press icon 202 on the screen data in steps 303 to 305 (step 306). For example, the control unit 116L outputs data of the capsule replacement screen 200 to the notification unit 113L, and the notification unit 113L outputs this data to the display 11A; by this means, the capsule replacement screen 200 is displayed on the display 11A.

[0159] When the capsule replacement screen 200 is displayed on the display 11A in this way, the user recognizes that the replacement of the capsule 30 is needed, and does a task of the replacement of the capsule 30.

[0160] Though the capsule replacement icon 201, the arrow icon 203, and the long-press icon 202 are set in this order in the description above, the order of setting these icons may be changed.

[0161] Though the capsule replacement icon 201, the arrow icon 203, and the long-press icon 202 are set as display elements distinct from one another in the description above, they do not necessarily have to be set as display elements distinct from one another. For example, the capsule replacement icon 201, the arrow icon 203, and the long-press icon 202 may be set as a single integrated display element.

[0162] Fig. 7 illustrates display control of the display 11A of the aerosol generation device 10 after completion of the replacement of the capsule 30.

[0163] First, the control unit 116L determines whether or not an operation of pressing the operation button 11B (see Fig. 1) down is detected (step 321).

[0164] For example, the control unit 116L obtains an affirmative result in step 321 when the sensor unit 112L (see Fig. 3) detects an operation of pressing the operation button 11B down.

[0165] On the other hand, the control unit 116L obtains a negative result in step 321 when the sensor unit 112L does not detect an operation of pressing the operation button 11B down.

[0166] The control unit 116L repeats the determination in step 321 while negative results are obtained in step 321.

[0167] Upon obtaining the affirmative result in step 321, the control unit 116L starts a timer (step 322).

[0168] Next, the control unit 116L determines whether or not the operation button 11B is released (step 323).

[0169] For example, the control unit 116L obtains an affirmative result in step 323 when the sensor unit 112L detects an operation of releasing the operation of pressing the operation button 11B down.

[0170] On the other hand, the control unit 116L obtains

a negative result in step 323 when the sensor unit 112L does not detect an operation of releasing the operation of pressing the operation button 11B down.

[0171] Upon obtaining the affirmative result in step 323, the control unit 116L stops the timer (step 324).

[0172] Then, the control unit 116L returns the process to step 321.

[0173] Upon obtaining the negative result in step 323, the control unit 116L determines whether or not one second has elapsed according to the timer (step 325).

[0174] For example, the control unit 116L obtains an affirmative result in step 325 when a lapse of one second since the start of the timer in step 322 is detected.

[0175] On the other hand, the control unit 116L obtains a negative result in step 325 when a lapse of one second since the start of the timer in step 322 is not detected.

[0176] Upon obtaining the negative result in step 325, the control unit 116L returns the process to step 323.

[0177] Upon obtaining the affirmative result in step 325, the control unit 116L sets the long-press icon 202 representing that the remaining time for which the long press should be performed is one second on the screen data prepared in the RAM (step 326).

[0178] For example, the control unit 116L sets the long-press icon 202 including a character string "PUSH" and a character string "1 SEC". It is assumed that, at this time, the capsule replacement icon 201 and the arrow icon 203 that were set in steps 303 and 304 of Fig. 6 remain set on the screen data prepared in the RAM.

[0179] After that, the control unit 116L causes the display 11A to display the capsule replacement screen 200 changed by setting the long-press icon 202 on the screen data in step 326 (step 327). For example, the control unit 116L outputs data of the capsule replacement screen 200 to the notification unit 113L, and the notification unit 113L outputs this data to the display 11A; by this means, the capsule replacement screen 200 is displayed on the display 11A.

[0180] Next, the control unit 116L determines whether or not the operation of pressing the operation button 11B down is released (step 328).

[0181] For example, the control unit 116L obtains an affirmative result in step 328 when the sensor unit 112L detects an operation of releasing the operation of pressing the operation button 11B down.

[0182] On the other hand, the control unit 116L obtains a negative result in step 328 when the sensor unit 112L does not detect an operation of releasing the operation of pressing the operation button 11B down.

[0183] Upon obtaining the affirmative result in step 328, the control unit 116L stops the timer (step 329).

[0184] Next, the control unit 116L sets the long-press icon 202 representing that the remaining time for which the long press should be performed is two seconds on the screen data prepared in the RAM (step 330). That is, the long-press icon 202 is returned to its default state.

[0185] For example, the control unit 116L sets the long-press icon 202 including a character string "PUSH" and a

character string "2 SEC". It is assumed that, at this time, the capsule replacement icon 201 and the arrow icon 203 that were set in steps 303 and 304 of Fig. 6 remain set on the screen data prepared in the RAM.

[0186] After that, the control unit 116L causes the display 11A to display the capsule replacement screen 200 returned to its default state by setting the long-press icon 202 on the screen data in step 330 (step 331). For example, the control unit 116L outputs data of the capsule replacement screen 200 to the notification unit 113L, and the notification unit 113L outputs this data to the display 11A; by this means, the capsule replacement screen 200 is displayed on the display 11A.

[0187] Then, the control unit 116L returns the process to step 321.

[0188] Upon obtaining the negative result in step 328, the control unit 116L determines whether or not two seconds have elapsed according to the timer (step 332).

[0189] For example, the control unit 116L obtains an affirmative result in step 332 when a lapse of another one second since the detection of the lapse of one second according to the timer in step 325 is detected.

[0190] On the other hand, the control unit 116L obtains a negative result in step 332 when a lapse of another one second since the detection of the lapse of one second according to the timer in step 325 is not detected.

[0191] Upon obtaining the negative result in step 332, the control unit 116L returns the process to step 328.

[0192] Upon obtaining the affirmative result in step 332, the control unit 116L sets the long-press icon 202 representing that the remaining time for which the long press should be performed is zero second on the screen data prepared in the RAM (step 333).

[0193] For example, the control unit 116L sets the long-press icon 202 including a character string "PUSH" and a character string "0 SEC". It is assumed that, at this time, the capsule replacement icon 201 and the arrow icon 203 that were set in steps 303 and 304 of Fig. 6 remain set on the screen data prepared in the RAM.

[0194] After that, the control unit 116L causes the display 11A to display the capsule replacement screen 200 changed by setting the long-press icon 202 on the screen data in step 333 (step 334). For example, the control unit 116L outputs data of the capsule replacement screen 200 to the notification unit 113L, and the notification unit 113L outputs this data to the display 11A; by this means, the capsule replacement screen 200 is displayed on the display 11A.

[0195] When the capsule replacement screen 200 is displayed on the display 11A in this way, the user recognizes that the time for which the long press should be continued has ended because, on the capsule replacement screen 200, the long-press icon 202 represents that the remaining time for which the long press should be performed is zero second.

[0196] Then, the control unit 116L performs use preparation processing for the capsule 30 (step 335). For example, the control unit 116L performs processing of

resetting the number of times of puff that was counted regarding the before-replacement capsule 30.

[0197] The control unit 116L may delete the capsule replacement screen 200 from the display 11A upon completion of the use preparation processing for the capsule 30.

(Conclusion)

[0198] In the aerosol generation device 10 according to the first embodiment, the long-press icon 202 representing that an operation of holding the operation button 11B down should be performed after doing a task of the replacement of the capsule 30 is displayed, and, when an operation of holding the operation button 11B down is performed by the user, the long-press icon 202 is displayed while being changed in accordance with the time for which the long-press operation continues. This enables the user to recognize the remaining time for which the operation button 11B should be held down when the user performs the operation of holding the operation button 11B down.

[Second Embodiment]

(Overview, etc.)

[0199] In the present embodiment, an example of performing the replacement of the cartridge 20 in place of the replacement of the capsule 30 will be described.

[0200] The appearance, internal structure, and the like of the aerosol generation device 10 taken as the subject of the present embodiment are the same as those of the aerosol generation device 10 having been described in the first embodiment. However, the sensor unit 112L provided in the device body 11 includes a liquid amount sensor that detects the remaining amount of the liquid aerosol source inside the cartridge 20. As the liquid amount sensor, a sensor that detects a liquid amount optically such as, for example, a sensor that detects a liquid-surface position based on reflected light coming from a liquid surface, may be preferably used. In addition, the storage unit 114L provided in the device body 11 stores information regarding the remaining amount of the liquid aerosol source inside the cartridge 20, too, as the information detected by the sensor unit 112L.

(Display Content of Display)

[0201] Figs. 8A to 8C are diagrams for explaining a cartridge replacement screen 400 displayed on the display 11A in a second embodiment.

[0202] The cartridge replacement screen 400 is a screen that represents an operation needed regarding the replacement of the cartridge 20, and is displayed when the liquid aerosol source inside the cartridge 20 has run out. The cartridge replacement screen 400 is displayed while blinking for no longer than, for example,

40 seconds until the operation button 11B (see Fig. 1) is pressed down.

[0203] On the cartridge replacement screen 400 illustrated in Figs. 8A to 8C, a cartridge replacement icon 401, a long-press icon 402, and an arrow icon 403 are arranged. The cartridge replacement icon 401 is an icon representing that the cartridge 20 should be replaced. The long-press icon 402 is an icon representing that an operation of holding the operation button 11B down, that is, an operation of keeping it pressed down for a predetermined time, should be performed. The operation of holding the operation button 11B down is performed for the purpose of giving an instruction for use preparation processing after the replacement of the cartridge 20. The arrow icon 403 is an icon representing an order that the operation button 11B should be held down after the replacement of the cartridge 20. The cartridge replacement icon 401 is an example of a second display element. The long-press icon 402 is an example of a first display element.

[0204] The long-press icon 402 illustrated in Figs. 8A to 8C changes in accordance with the time for which the long press continues. Specifically, the long-press icon 402 includes a character string representing remaining time for which the operation button 11B should be held down.

[0205] For example, at the point in time at which the cartridge replacement screen 400 is displayed, as illustrated in Fig. 8A, the long-press icon 402 includes a character string "PUSH" and a character string "2 SEC". By this means, the cartridge replacement screen 400 represents that the remaining time for which the operation button 11B should be held down is two seconds.

[0206] Viewing the cartridge replacement screen 400, the user keeps the operation button 11B pressed down, and, upon a lapse of one second, as illustrated in Fig. 8B, the character string "2 SEC" of the long-press icon 402 changes into a character string "1 SEC". Therefore, it follows that the cartridge replacement screen 400 represents that the remaining time for which the operation button 11B should be held down is one second.

[0207] Viewing the cartridge replacement screen 400, the user further keeps the operation button 11B pressed down, and, upon a lapse of another one second, as illustrated in Fig. 8C, the character string "1 SEC" of the long-press icon 402 changes into a character string "0 SEC". Therefore, it follows that the cartridge replacement screen 400 represents that the remaining time for which the operation button 11B should be held down is zero second, meaning that the originally-notified time for which the operation button 11B should be held down has elapsed.

[0208] In the above description, the length of the time for which the long-press icon 402 should be held down is two seconds, the time interval of switching of the character string in the long-press icon 402 is one second, and the number of times of the switching of the long-press icon 402 is twice; therefore, these time and number of

times will be used also in the description below. However, this is just an example; the time and the number of times may be any time having been determined in advance and any number of times having been determined in advance.

(Display Control of Display)

[0209] Display control of the display 11A of the aerosol generation device 10 in the second embodiment is the same as that of Figs. 6 and 7 except that processing regarding the capsule 30 in the flowchart therein is replaced with processing regarding the cartridge 20.

(Conclusion)

[0210] In the aerosol generation device 10 according to the second embodiment, the long-press icon 402 representing that an operation of holding the operation button 11B down should be performed after doing a task of the replacement of the cartridge 20 is displayed, and, when an operation of holding the operation button 11B down is performed by the user, the long-press icon 402 is displayed while being changed in accordance with the time for which the long-press operation continues. This enables the user to recognize the remaining time for which the operation button 11B should be held down when the user performs the operation of holding the operation button 11B down.

[Other Embodiments]

[0211] Though embodiments of the present invention have been described above, the technical scope of the present invention is not limited to the scope of description in the foregoing embodiments. It is apparent from the recitation in the claims that the foregoing embodiments with various kinds of changes or improvements applied thereto are also encompassed within the technical scope of the present invention.

[0212] In the foregoing embodiments, an aerosol is generated by heating a liquid aerosol source by using the heating unit 121L-1; however, the aerosol may be generated by vibrating the liquid aerosol source by using a vibrator. The heating unit 121L-1 may be configured as a susceptor made of a conductive material such as metal, and an aerosol may be generated by induction heating of the susceptor by using an electromagnetic induction source.

[0213] Though a case where the aerosol generation device 10 (see Fig. 1) is an electronic cigarette has been described in the foregoing embodiments, it may be a medical inhaler such as a nebulizer. In a case where the aerosol generation device 10 is a nebulizer, the liquid aerosol source and/or the solid aerosol source may contain medicine to be inhaled by a patient.

[0214] Though a case where the present invention is applied to the aerosol generation device 10 has been described in the foregoing embodiments, this does not

imply any limitation. The present invention can be applied to any kind of device as long as the device includes an operation button that can be pressed down by a user and a display capable of displaying information regarding the device. In particular, the present invention can be applied to a device that displays, on a display, a need to do a predetermined task so as to obviate a predetermined cause when the predetermined cause has occurred. The predetermined cause may be that the remaining amount of a consumable used in the device reaches a threshold or less. The predetermined task may be the replacement of the consumable. The capsule 30 according to the first embodiment and the cartridge 20 according to the second embodiment are examples of the consumable. Alternatively, the predetermined cause may be a breakdown of a component of the device. The predetermined task may be the replacement of the component. The device is an example an information display device.

Reference Signs List

[0215]

10 aerosol generation device
 11A display
 11B operation button
 20 cartridge
 30 capsule
 116L control unit
 121L-1, 121L-2 heating unit
 200 capsule replacement screen
 201 capsule replacement icon
 202, 402 long-press icon
 203, 403 arrow icon
 400 cartridge replacement screen
 401 cartridge replacement icon

Claims

1. An aerosol generation device, comprising:

a heating unit that receives supply of power and heats an aerosol source;
 a display unit for displaying information regarding the aerosol generation device;
 an operation unit on which a pressing operation is performed by a user; and
 a control unit that performs control to display, on the display unit, a first display element representing that the pressing operation of pressing the operation unit down continuously for predetermined time needs to be performed after replacement of the aerosol source, and, when the pressing operation of pressing the operation unit down continuously is performed by the user, performs control to display the first display element on the display unit while changing the first

display element in accordance with time for which the pressing operation continues.

2. The aerosol generation device according to claim 1, wherein
 the control unit performs control to further display, on the display unit, a second display element representing that the replacement of the aerosol source needs to be performed, when a remaining amount of the aerosol source reaches a threshold or less.

3. An information display device, comprising:

a display unit for displaying information regarding the information display device;
 an operation unit on which a pressing operation is performed by a user; and
 a control unit that performs control to display, on the display unit, a first display element representing that the pressing operation of pressing the operation unit down continuously for predetermined time needs to be performed after the user does a predetermined task, and, when the pressing operation of pressing the operation unit down continuously is performed by the user, performs control to display the first display element on the display unit while changing the first display element in accordance with time for which the pressing operation continues.

4. The information display device according to claim 3, wherein
 the control unit performs control to further display, on the display unit, a second display element representing that, upon occurrence of a predetermined cause, the predetermined task needs to be done so as to obviate the predetermined cause.

5. The information display device according to claim 4, wherein

the predetermined cause is that a remaining amount of a consumable used in the information display device reaches a threshold or less, and the predetermined task is replacement of the consumable.

6. The information display device according to claim 4, wherein

the predetermined cause is a breakdown of a component of the information display device, and
 the predetermined task is replacement of the component.

7. The information display device according to claim 3, wherein

the control unit performs control to display, on the display unit, the first display element while changing the first display element at each lapse of time having been determined in advance when the pressing operation of pressing the operation unit down continuously is performed by the user. 5

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FIG. 1

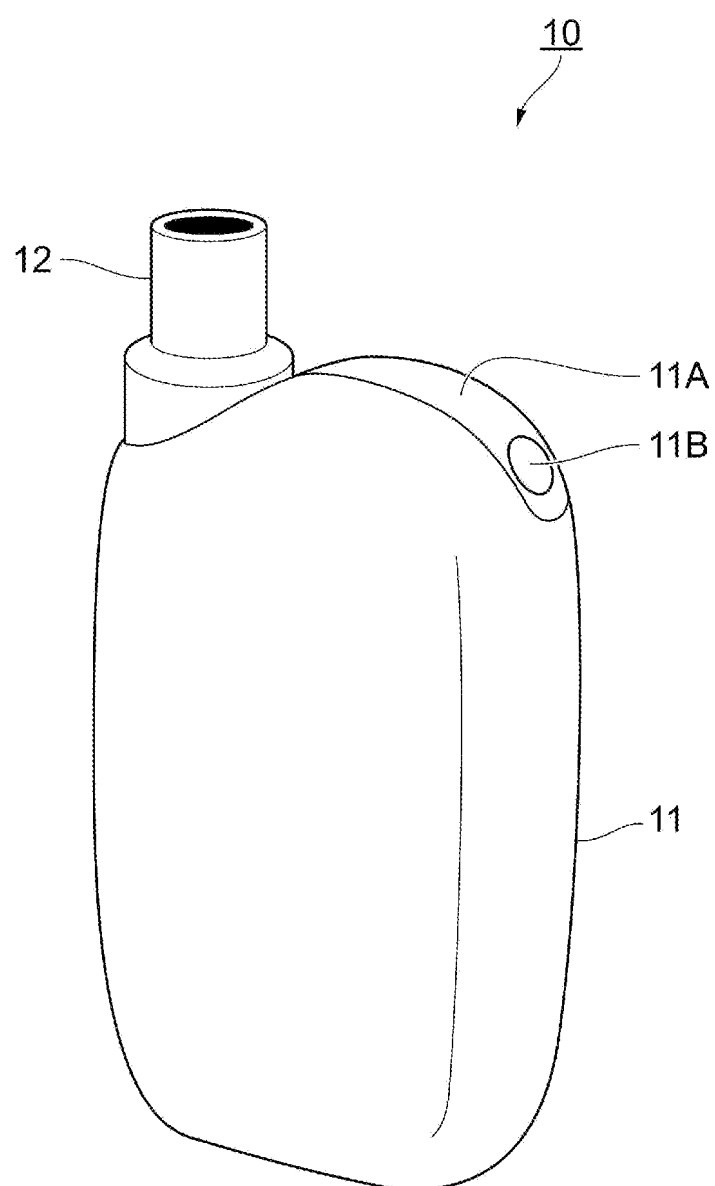


FIG. 2

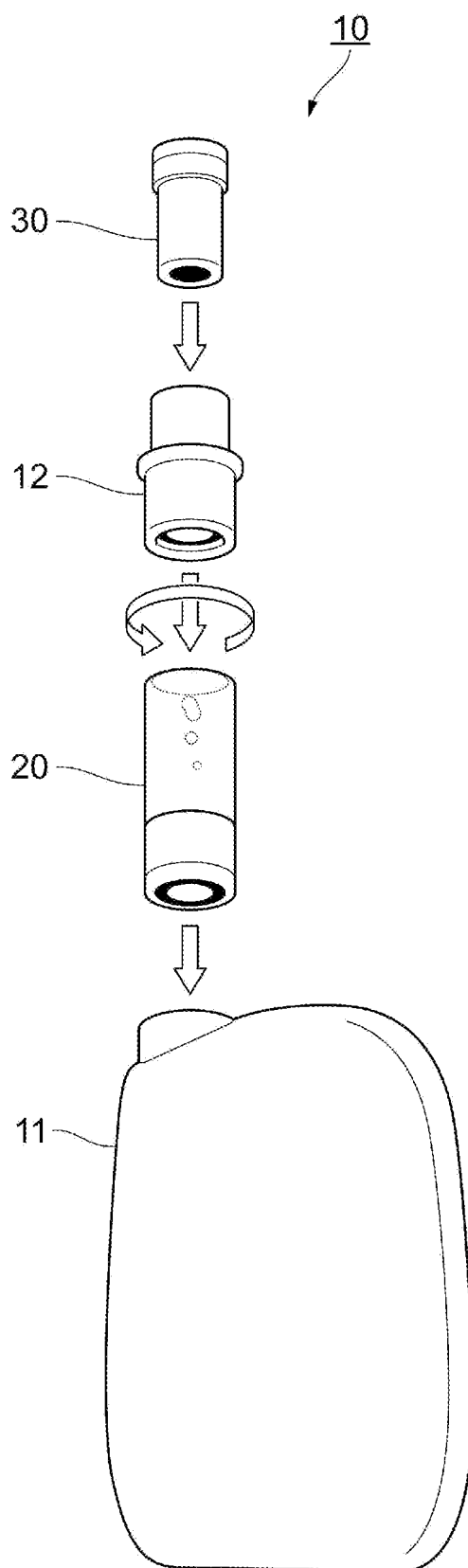


FIG. 3

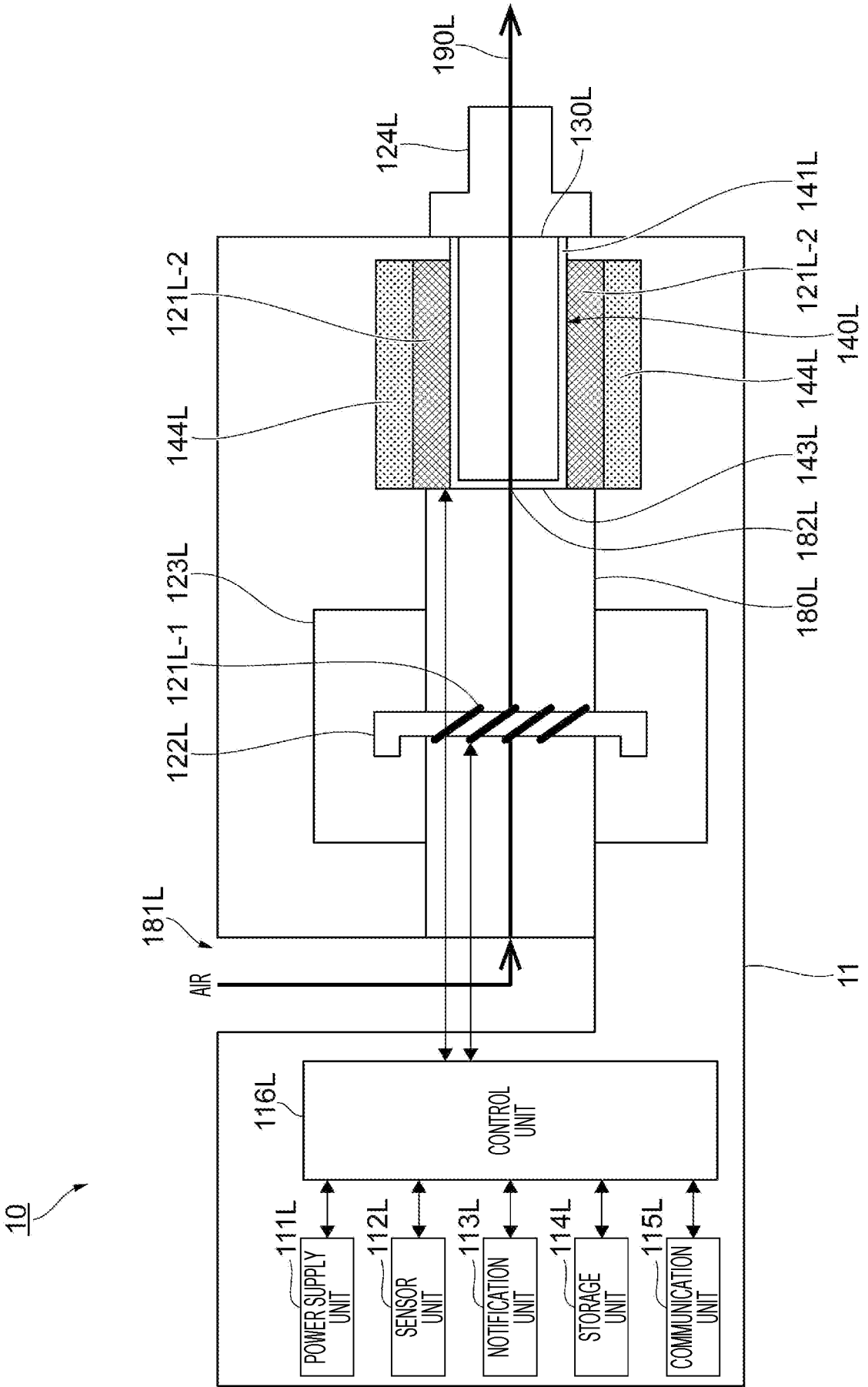


FIG.4A

NORMAL MODE

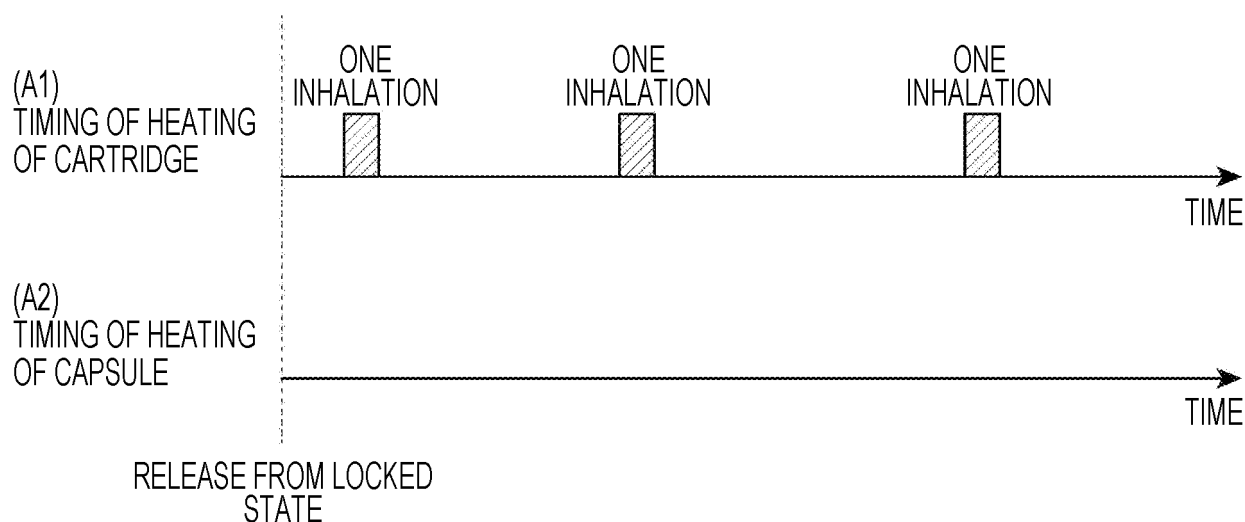
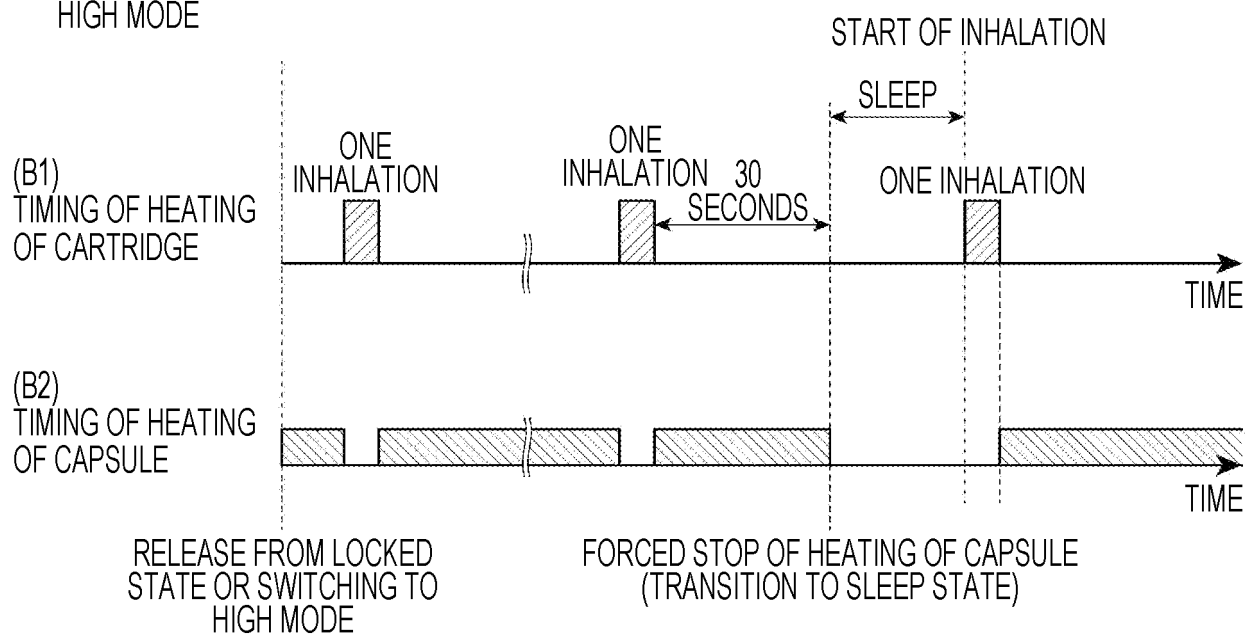


FIG.4B

HIGH MODE



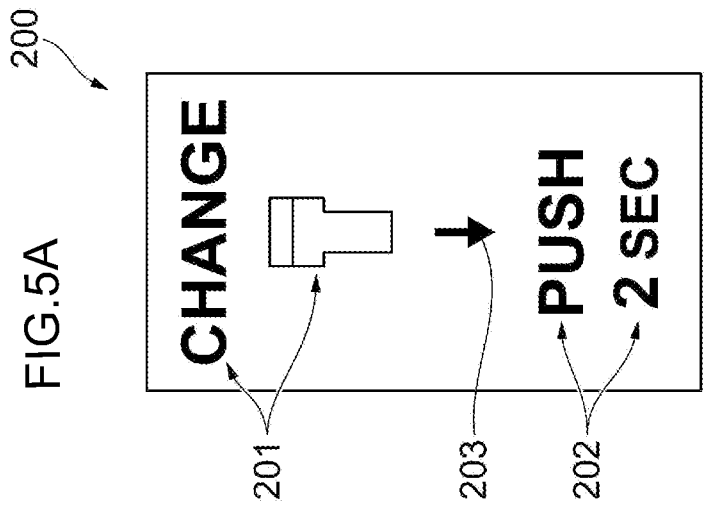
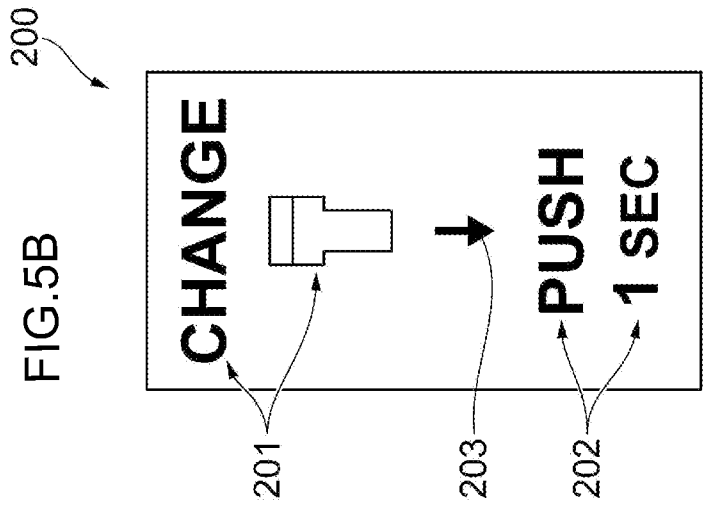
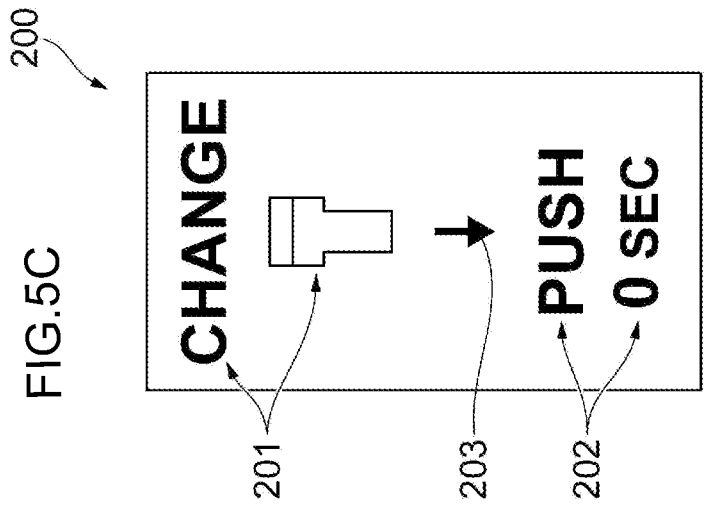


FIG. 6

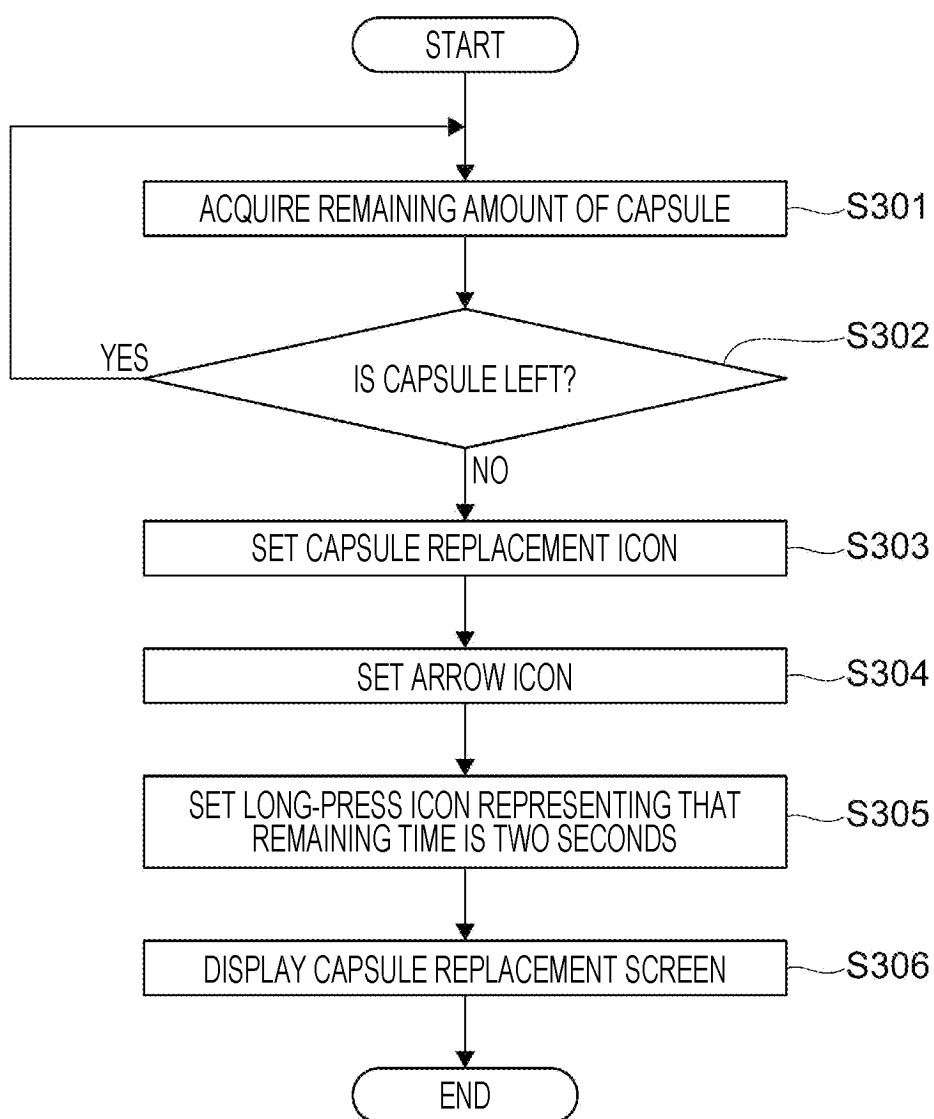
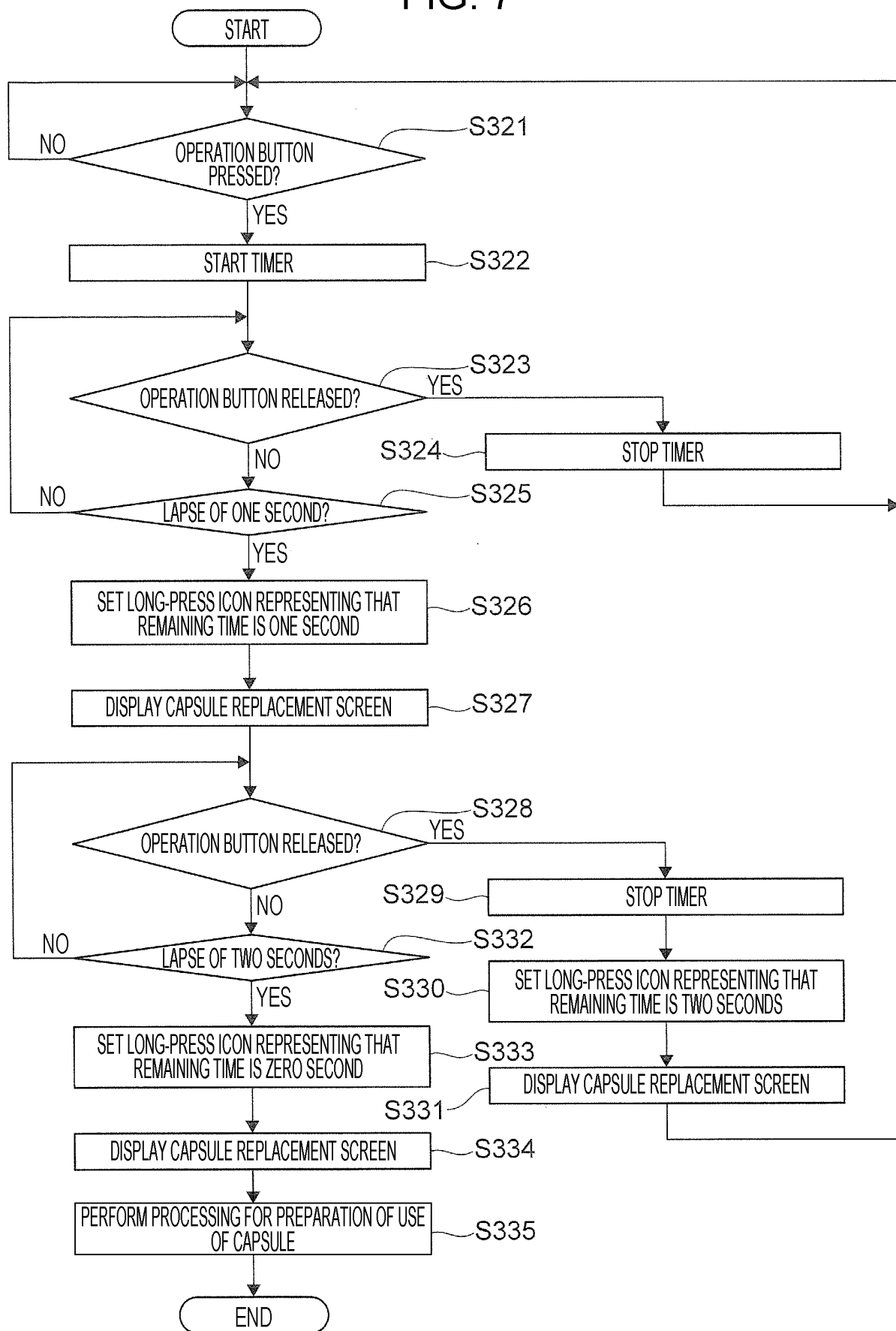
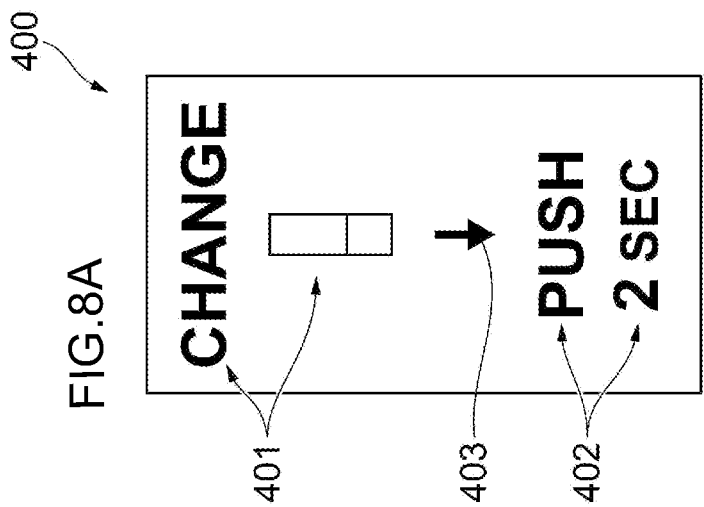
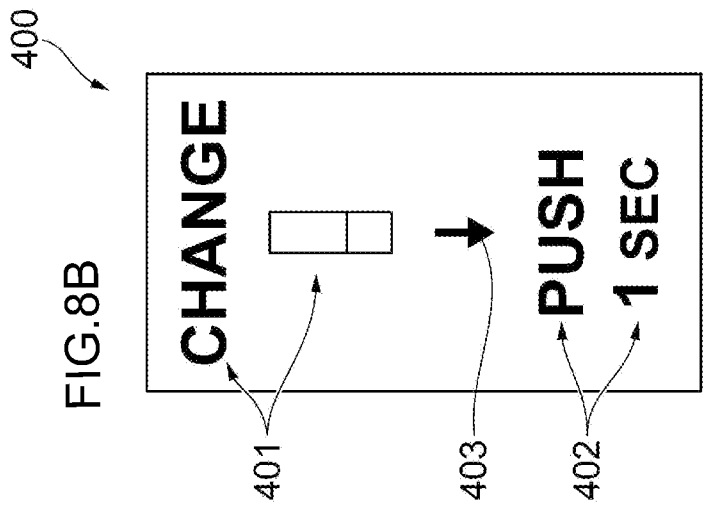
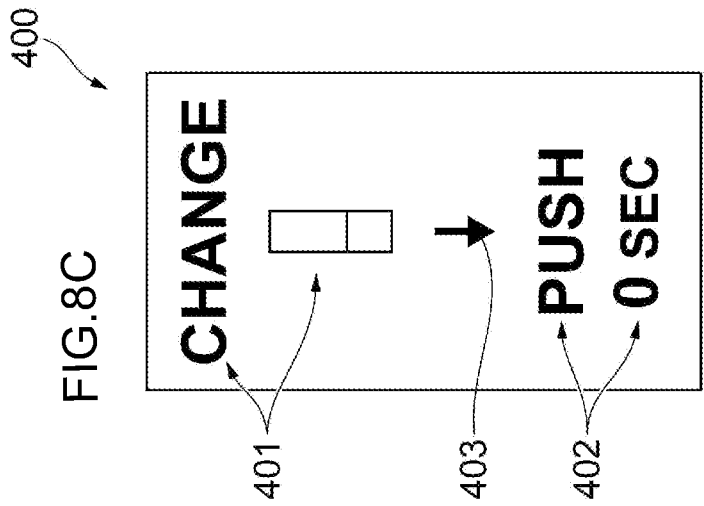


FIG. 7





INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2021/046873

A. CLASSIFICATION OF SUBJECT MATTER <i>A24F 40/53</i> (2020.01)i; <i>A24F 40/60</i> (2020.01)i FI: A24F40/53; A24F40/60 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) A24F40/00-40/95	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							
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>US 2017/0119053 A1 (R. J. REYNOLDS TOBACCO CO.) 04 May 2017 (2017-05-04) paragraphs [0047]-[0064], [0082]-[0090], [0099], fig. 2, 3, 7, 9, 10</td> <td>1-7</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	US 2017/0119053 A1 (R. J. REYNOLDS TOBACCO CO.) 04 May 2017 (2017-05-04) paragraphs [0047]-[0064], [0082]-[0090], [0099], fig. 2, 3, 7, 9, 10	1-7	
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.					
X	US 2017/0119053 A1 (R. J. REYNOLDS TOBACCO CO.) 04 May 2017 (2017-05-04) paragraphs [0047]-[0064], [0082]-[0090], [0099], fig. 2, 3, 7, 9, 10	1-7					
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.							
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Date of the actual completion of the international search 20 January 2022	Date of mailing of the international search report 08 February 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.						

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/JP2021/046873

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
US	2017/0119053	A1	04 May 2017	EP	3370552	A1	
				CN	108471806	A	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2005284404 A [0003]