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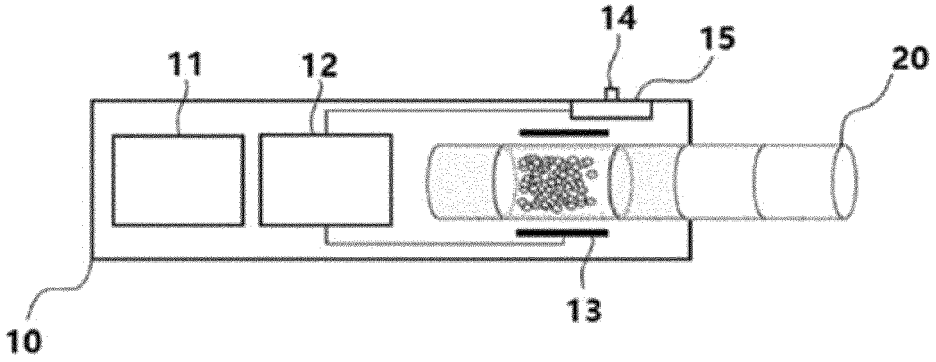
(54) **AEROSOL-GENERATING DEVICE HAVING HEATER TEMPERATURE CONTROL BUTTON, AND AEROSOL-GENERATING ITEM USED THEREWITH**

(57) Provided is an aerosol generating apparatus including a housing that forms an accommodation space in which an aerosol generating article is accommodated, a heater unit that heats a cartridge included in an aerosol generating article or an aerosol generating apparatus accommodated in the accommodating space, a control unit that adjusts a temperature of the heater unit, and a temperature control button that is disposed on an outer wall surface of the housing and transmits a temperature control signal to the control unit. The aerosol generating apparatus according to an embodiment of the present invention may generate various components or amounts of aerosol according to consumer's preference even for one aerosol generating article.

【Figure 1】



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Description

[Technical Field]

[0001] The present invention relates to an aerosol generating apparatus having a temperature control button of a heater and an aerosol generating article used together therewith. More particularly, the present invention relates to an aerosol generating apparatus having a temperature control button for transmitting a temperature control signal to a control unit to adjust a heating temperature of a heater, and an aerosol generating article used together therewith.

[0002] This application claims the benefit of priority based on Korean Patent Application No. 10-2021-0145569 filed on October 28, 2021, the entire contents of which are incorporated as a part of the present specification by reference.

[Background Art]

[0003] In recent years, demand for alternative products that overcome the disadvantages of traditional cigarettes is increasing. For example, there is an increasing demand for apparatuses (e.g., cigarette type electronic cigarette) that generate aerosols by electrically heating a cigarette stick. Accordingly, research on an electrically heated aerosol generating apparatus and a cigarette stick (or aerosol generating article) applied thereto is being actively conducted.

[0004] Specifically, the electrically heated aerosol generating apparatus and the cigarette stick applied thereto are being developed in various forms to meet consumer's tastes by using granules including the corresponding components instead of sheet leaf and leaf tobacco cut grass as tobacco materials of the cigarette stick, introducing a separate atomizing unit in the form of a cartridge into the electrically heated aerosol generating apparatus, and the like. Nevertheless, there is a limit to satisfying various consumers, such as being able to satisfy only consumers with specific preferences through the single cigarette stick and the electrically heated aerosol generating apparatus.

[0005] Accordingly, the present inventor completed the present invention after studying an electrically heated aerosol generating apparatus capable of generating aerosol of various components or amounts according to the consumer's preference even for one cigarette stick.

[Prior Art Document]

[Patent Document]

[0006] (Patent Document 1) Korean Patent Laid-Open Publication No. 10-2014-7021388

[Disclosure]

[Technical Problem]

[0007] The present invention provides an aerosol generating apparatus capable of generating aerosols of various components or amounts according to consumer's preference for one aerosol generating article.

[Technical Solution]

[0008] According to a first aspect of the present invention, an aerosol generating apparatus includes a housing that forms an accommodation space in which an aerosol generating article is accommodated, a heater unit that heats a cartridge included in an aerosol generating article or an aerosol generating apparatus accommodated in the accommodating space, a control unit that adjusts a temperature of the heater unit, and a temperature control button that is disposed on an outer wall surface of the housing and transmits a temperature control signal to the control unit.

[0009] In an embodiment of the present invention, the temperature control button may transmit a temperature control signal to the control unit through a variable resistor.

[0010] In an embodiment of the present invention, the control unit may output the temperature control signal received from the temperature control button as a supply voltage in a form of a pulse and transmit the temperature control signal to the heater unit.

[0011] In an embodiment of the present invention, the temperature control signal may be formed by a value input in an analog format or a digital format.

[0012] In an embodiment of the present invention, the heater unit may include a first heater unit that heats an atomizing unit located in an aerosol generating apparatus or an aerosol generating article and a second heater unit that heats a substrate part located in an aerosol generating article, the temperature control button may include a first temperature control button that transmits a temperature control signal for adjusting a temperature of the first heater unit and a second temperature control button that transmits a temperature control signal for adjusting a temperature of the second heater unit, and the control unit may output the temperature control signal received from the first temperature control button and transmit the temperature control signal to the first heater unit, and outputs the temperature control signal received from the second temperature control button and transmits the temperature control signal to the second heater unit.

[0013] In an embodiment of the present invention, the first temperature control button may be adjusted to an on mode or an off mode, and in the on mode, the temperature at which the first heater unit is driven may be adjusted within a range of 180°C to 240°C.

[0014] In an embodiment of the present invention, the second temperature control button may be adjusted to

an on mode or an off mode, and in the on mode, the temperature at which the second heater unit is driven is may be adjusted within a range of 150°C to 260°C.

[0015] In an embodiment of the present invention, the aerosol generating article may include a first filter segment, a second filter segment, and a cavity segment, the cavity segment may be formed by the first filter segment and the second filter segment, the cavity segment may be filled with a tobacco granule, and the first filter segment may be located upstream of the cavity segment, and the second filter segment may be located downstream of the cavity segment.

[0016] In an embodiment of the present invention, when the atomizing unit may be located in the aerosol generating apparatus, the atomizing unit may be located adjacent to the first heater unit in a form of a cartridge.

[0017] In an embodiment of the present invention, when the atomizing unit is located in the aerosol generating apparatus, the atomizing unit may be located in the first filter segment.

[Advantageous Effects]

[0018] An aerosol generating apparatus according to an embodiment of the present invention includes a temperature control button for transmitting a temperature control signal to a control unit to adjust a heating temperature of a heater unit, so for one aerosol generating article, a large amount of nicotine may be transferred to give a high satisfaction to consumers who prefer a strong tobacco taste and a small amount of nicotine may be transferred to give a high satisfaction to consumers who prefer a soft tobacco taste.

[Description of Drawings]

[0019]

FIG. 1 is a diagram schematically illustrating an aerosol generating apparatus to which an aerosol generating article is applied according to an embodiment of the present invention.

FIG. 2 is a diagram schematically illustrating the aerosol generating apparatus to which the aerosol generating article is applied according to the embodiment of the present invention.

FIG. 3 is a diagram schematically illustrating the aerosol generating apparatus to which the aerosol generating article is applied according to the embodiment of the present invention.

FIG. 4 is a diagram schematically illustrating the aerosol generating article according to the embodiment of the present invention.

[Best Mode]

[0020] Hereinafter, specific embodiments will be described in detail with reference to the accompanying drawings. It is to be noted that in giving reference numerals to components of the respective drawings, the same components will be denoted by the same reference numerals even though they are illustrated in different drawings. Further, in describing specific embodiments, well-known constructions or functions will not be described in detail in the case in which it is determined that they may unnecessarily obscure the understanding of specific embodiments of the present disclosure.

[0021] In addition, the terms first, second, A, B, (a), (b), and the like may be used in describing components of specific embodiments. These terms are only for distinguishing the components from other components, and the nature, sequence, order, or the like of the components are not limited by the terms. When it is described that any component is "connected" or "coupled" to another component, it is to be understood that any component is directly connected or coupled to another component or is connected or coupled to another component with the other component interposed therebetween.

[0022] Components included in any one specific embodiment and components including common functions will be described using the same names in other specific embodiments. Unless described to the contrary, the description described in any one specific embodiment may be applied to other embodiments, and specific descriptions will be omitted to the extent of overlapping.

[0023] In this specification, the term "aerosol generating apparatus" refers to an apparatus capable of generating an aerosol by applying an aerosol generating article to generate an aerosol that may be directly inhaled into a user's lung through a user's mouth. An exemplary structure of the aerosol generating apparatus will be described with reference to FIGS. 1 to 3.

[0024] In this specification, the term "aerosol generating article" refers to an article capable of generating an aerosol, such as a cigarette or cigar. The aerosol generating article may include at least one of an aerosol forming agent and an aerosol forming substrate. The aerosol generating article may include several segments each having functionality. In general, the aerosol generating article includes a combustion-type an aerosol generating article that is used by direct fire, a heating-type an aerosol generating article that is used along with an aerosol generating apparatus, and the like. In the present invention, the heating-type an aerosol generating article used along with the aerosol generating apparatus may be preferably applied.

[0025] As used herein, the term "aerosol forming agent" means a substance capable of facilitating the formation of visible smoke and/or aerosol. Examples of the aerosol generating material include, but are not limited to, glycerin (GLY), propylene glycol (PG), ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl alcohol. In the art, the aerosol forming agent may be used interchangeably with the terms such as a moisturizer and a humectant.

[0026] As used herein, the term "aerosol forming sub-

strate" means a material capable of forming an aerosol. The aerosol may include volatile compounds. The aerosol forming substrate may be solid or liquid.

[0027] For example, the solid aerosol forming substrate may include a solid material based on tobacco raw materials such as planar leaf tobacco, cut filler, and reconstituted tobacco, and the liquid aerosol forming substrate may include liquid compositions based on nicotine, tobacco extracts, and/or various flavoring agents. However, it is not necessarily limited thereto. The aerosol forming substrate may further include an aerosol forming agent in order to stably form visible smoke and/or aerosol.

[0028] In this specification, the terms "upstream" and "downstream" are terms used to represent relative positions of segments constituting the aerosol generating article based on a direction in which a user inhales air using the aerosol generating article. The aerosol generating article includes an upstream end portion (i.e., a portion through which air enters) and a downstream end portion (i.e., a portion through which air exits) opposite thereto. When using the aerosol generating article, a user may bite the downstream end portion of the aerosol generating article. The downstream end portion is located downstream of the upstream end portion, while the term "end portion" may also be described as "distal end."

[0029] In this specification, the term "puff" refers to user's inhalation, and the inhalation refers to a situation in which air is drawn through a user's mouth or nose into a user's oral cavity, nasal cavity, or lung.

[0030] In this specification, the term "longitudinal direction" refers to a direction corresponding to a longitudinal axis of the aerosol generating article.

[0031] The present invention relates to an aerosol generating apparatus, and is intended to provide an aerosol generating apparatus capable of generating various components or amounts of aerosol according to consumer's preference even when one aerosol generating article is applied. In the present specification, in order to help understand the aerosol generating apparatus, FIGS. 1 to 3 schematically illustrate an exemplary an aerosol generating apparatus.

[0032] According to an embodiment of the present invention, the aerosol generating apparatus 10 includes a housing, a control unit 12, a heater unit 13, and a temperature control button 14. The aerosol generating apparatus 10 may further include a battery 11, and may further include general-purpose components for those skilled in the art in addition to the above components. For example, the aerosol generating apparatus 10 may further include an input module (e.g., a button, a touchable display, etc.) for receiving a command from a user, or the like, and an output module (e.g., an LED, a display, a vibration motor, etc.) for outputting information such as an apparatus state and smoking information Hereinafter, each component of the aerosol generating apparatus 10 will be described in detail.

[0033] The housing forms an appearance of the aerosol generating apparatus 10. When forming the appearance of the aerosol generating apparatus 10, an accommodation space capable of accommodating the aerosol generating article 20 is formed. The housing may be preferably formed of a material capable of protecting internal components.

[0034] The heater unit 13 heats the aerosol generating article 20 accommodated in the accommodation space or the cartridge 16 included in the aerosol generating apparatus. Specifically, when the aerosol generating article 20 is accommodated in the accommodation space of the aerosol generating apparatus 10, the heater unit 13 may heat the aerosol generating article 20 or the cartridge 16 by the power supplied from the battery 11.

[0035] The heater unit 13 may be configured in various forms and/or manners.

[0036] The heater unit 13 may be configured to include, for example, an electrical resistive heating element. For example, the heater unit 13 may include an electrically insulating substrate (for example, a substrate made of polyimide) and an electrically conductive track, and include a heating element that generates heat as current flows through the electrically conductive track. However, the heater unit 13 is not limited thereto, and the heating element may be applicable without limitation as long as it may be heated to a desired temperature. Here, the desired temperature may be preset (for example, when a temperature profile is pre-stored) in the aerosol generating apparatus 10 or may be set to a desired temperature by a user.

[0037] As another example, the heater unit 13 may be configured to include a heating element operating in an induction heating method. Specifically, the heater unit 13 may include an inductor (e.g., an induction coil) for heating the aerosol generating article 20 or the cartridge 16 by the induction heating method and a susceptor for induction heating by the inductor. The susceptor may be located inside or outside the aerosol generating article 20 or the cartridge 16.

[0038] As another example, the heater unit 13 may be configured to include a heating element (hereinafter referred to as an "internal heating element") for internally heating the aerosol generating article 20 and a heating element (hereinafter referred to as "external heating element") for externally heating the aerosol generating article 20, or a combination thereof. The internal heating element may have, for example, a tubular shape, a needle shape, a rod shape, or the like, and may be disposed to penetrate through at least a portion of an aerosol generating article 20. The external heating element may be formed in a shape such as a plate shape or a cylinder shape and may be disposed in a shape that encloses at least a portion of the aerosol generating article 20. However, the scope of the present disclosure is not limited thereto, and the shape, number, and arrangement of heating elements may be designed in various manners.

[0039] According to an embodiment of the present invention, the heater unit 13 includes a first heater unit 13A and a second heater unit 13B disposed to heat different

positions, respectively. The first heater unit 13A heats an atomizing unit located in an aerosol generating apparatus or an aerosol generating article, and the second heater unit 13B heats a substrate part located in the first heater unit and the aerosol generating article. The atomization part includes an aerosol forming agent, and is a place where visible smoke and/or aerosol may be intensively formed. Referring to FIGS. 2 and 4, the first filter segment may correspond thereto, and referring to FIGS. 3 and 4, a cartridge may correspond thereto. The shapes of the first heater unit 13A and the second heater unit 13B are not particularly limited as long as they are located separately.

[0040] The battery 11 supplies power used to operate the aerosol generating apparatus 10. For example, the battery 11 may supply power to allow the heater unit 13 to heat the aerosol generating article 20 or the cartridge 16, and may supply power required for the control unit 12 to operate. In addition, the battery 11 may supply power required for electrical components such as a display (not illustrated), a sensor (not illustrated), and a motor (not illustrated) installed in the aerosol generating apparatus 10 to operate.

[0041] The control unit 12 may control the overall operation of the aerosol generating apparatus 10. For example, the control unit 12 may control operations of the heater unit 13 and the battery 11, and may also control operations of other components included in the aerosol generating apparatus 10. The control unit 12 may control the power supplied by the battery 11, and control a heating temperature of the heater unit 13. The control unit 12 may determine whether or not the aerosol generating apparatus 10 is in an operable state by confirming a state of each of the components of the aerosol generating apparatus 10. As described above, when the heater unit 13 includes the first heater unit 13A and the second heater unit 13B, the control unit 12 also includes the first control unit 12A and the second control unit 12B in order to separately control each of the first heater unit 13A and the second heater unit 13B. The first control unit 12A outputs the temperature control signal received from the first temperature control button 14A and transmits the temperature control signal to the first heater part 13A, and the second control unit 12B outputs the temperature control signal received from the second temperature control button 14B and transmits the temperature control signal to the second heater unit 13B.

[0042] The control unit 12 may be implemented by at least one processor. The control unit may be implemented as an array of a plurality of logic gates or may be implemented as a combination of a general-purpose microcontrol unit and a memory in which a program executable in the microcontrol unit is stored. In addition, those skilled in the art may clearly understand that the control unit 12 may be implemented with other types of hardware.

[0043] The temperature control button 14 is disposed on an outer wall surface of the housing and transmits the temperature control signal to the control unit 12. The temperature control button 14 may be driven in analog or digital form, and the temperature control signal is formed by a value input in analog or digital form. According to an embodiment of the present invention, the aerosol generating apparatus 10 further includes a variable resistor 15. The variable resistor 15 is connected to the temperature control button 14 and transmits the temperature control signal generated by a change value of the button to the control unit 12. The control unit 12 outputs the temperature control signal received from the temperature control button 14 as a supply voltage in the form of a pulse and transmits the temperature control signal to the heater unit 13. In the pulse-shaped supply voltage, the effective voltage increases as the pulse width (or duty ratio) increases, and the effective voltage decreases as the pulse width (or duty ratio) decreases.

[0044] As described above, when the heater unit 13 includes the first heater unit 13A and the second heater unit 13B, the control unit 14 also includes the first control unit 14A and the second control unit 14B so that the temperature control button 14 allows a user to separately control the first heater unit 13A and the second heater unit 13B, respectively. The first temperature control button 14A transmits the temperature control signal for adjusting the temperature of the first heater part 13A, and the second temperature control button 14B transmits the temperature control signal for adjusting the temperature of the second heater unit 13B.

[0045] The first temperature control button 14A may adjust the temperature of the first heater unit 13A which is the heating means of the atomizing unit. According to an embodiment of the present invention, the first temperature control button 14A is adjusted in an on mode or an off mode, and in the on mode, the temperature at which the first heater unit is driven is adjusted within the range of 180°C to 240°C. In the off mode, the first heater unit 13A is not heated, and in the on mode, the first heater unit 13A is heated to maintain a set temperature. The temperature range in the on mode is a temperature set so that while a user smokes one aerosol generating article 20, the supplemented aerosol or visible smoke may be sufficiently perceived, and the aerosol or visible smoke may be maintained until the smoking ends. When the above temperature range is exceeded, the aerosol forming agent or the like included at a certain level may be exhausted before smoking is finished, and then the paper material without the aerosol forming agent may be directly heated and the smoking taste may be reduced. Considering this, it is not preferable from the practical point of view of adding a large amount of aerosol forming agent.

[0046] The second temperature control button 14B may adjust the temperature of the second heater unit 13B which is the heating means of the aerosol generating substrate. According to an embodiment of the present invention, the second temperature control button 14B is adjusted in an on mode or an off mode, and in the on

mode, the temperature at which the first heater unit is driven is adjusted within the range of 150°C to 260°C. In the off mode, the second heater unit 13B is not heated, and in the on mode, the first heater unit 13B is heated to maintain a set temperature. The temperature range in the on mode is a temperature set so that a user may adjust aerosol components such as nicotine to a degree that satisfies the smoking sensation according to his or her preference while smoking one aerosol generating article 20. When the temperature is less than the above range, the transfer of nicotine and the like may be insufficient, so the user's smoking sensation may be very low, and when the temperature exceeds the above range, the tobacco granule or the like is excessively heated, so the smoking flavor may be reduced.

[0047] According to an embodiment of the present invention, the first heater unit 13A and the second heater unit 13B may be driven in a form of being reheated when they are out of a set range after being initially preheated. Therefore, even if the first temperature control button 14A or the second temperature control button 14B is set to a specific temperature within the above-described temperature range, it is not continuously heated to that temperature, but the first heater unit 13A and the second heater unit 13B may be driven to maintain a temperature profile within a range of ±10% of a specific temperature.

[0048] According to an embodiment of the present invention, the aerosol generating apparatus 10 may further include the cartridge 16 and the cartridge heater unit. The cartridge 16 may be referred to as an atomizing unit in this specification, and the cartridge heater unit may be referred to as the first heater unit 13A in this specification as a means for heating the atomizing unit. FIG. 3 illustrates the structure of the aerosol generating apparatus 10 in which the aerosol generating article 20 and the cartridge 16 are arranged in line (or in series), but the aerosol generating article 20 and the cartridge 16 may be arranged in parallel. The internal structure of the aerosol generating apparatus 10 is not limited to the examples of FIGS. 1 to 3, and the arrangement of the components may be changed as desired.

[0049] The cartridge 16 may include a liquid storage tank and a liquid delivery means. However, the cartridge 16 is not limited thereto, and may further include other components. In addition, the cartridge 16 may be manufactured to be detachable/attachable from/to the cartridge heater unit, or may be manufactured integrally with the cartridge heater unit.

[0050] The liquid storage tank may store a liquid composition. For example, the liquid composition may be a liquid including a tobacco-containing substance (or a nicotine-containing substance) or may be a liquid including a non-tobacco substance. For example, the liquid composition may include water, a solvent, ethanol, a plant extract (e.g., a tobacco extract), nicotine, a perfume, an aerosol forming agent, a flavoring agent, or a vitamin mixture. The perfume may include menthol, peppermint, spearmint oil, various fruit flavor components, and the like, but is not limited thereto. The flavoring agent is a material that may include a component capable of providing various flavors and savors. The vitamin mixture may be a mixture of at least one of vitamin A, vitamin B, vitamin C, and vitamin E, but is not limited thereto. Examples of the aerosol forming agent may include, but are not limited thereto, glycerin or propylene glycol.

[0051] The liquid delivery means may deliver the liquid composition stored in the liquid storage tank to the cartridge heater unit. For example, the liquid delivery means may be a wick element such as a cotton fiber, a ceramic fiber, a glass fiber, or a porous ceramic, but is not limited thereto.

[0052] The cartridge heater unit may form an aerosol by heating a liquid aerosol forming substrate (e.g., a liquid composition) stored in the cartridge 16. The cartridge heater unit 14 may form an aerosol by heating, for example, the liquid composition delivered by the liquid delivery means. The formed aerosol may pass through the aerosol generating article 20 and be delivered to the user. In other words, the aerosol formed by the heating of the first cartridge heater unit may move along an airflow path of the aerosol generating apparatus 10, and the airflow path may be configured so that the formed aerosol passes through the aerosol generating article 20 and be delivered to the user. The operation, the heating temperature, and the like of the cartridge heater unit may be controlled by the control unit 12.

[0053] The cartridge heater unit may be, for example, a metal hot wire, a metal hot plate, a ceramic heater unit, and the like, but is not limited thereto. In addition, the cartridge heater unit may be composed of, for example, a conductive filament such as nichrome wire, and may be disposed in a structure wound around a liquid delivery means. However, the present invention is not limited thereto.

[0054] For reference, in the art, the cartridge heater unit and the cartridge 16 may be referred to as terms such as a cartomizer, an atomizer, and a vaporizer.

[0055] The aerosol generating article 20 applied to the aerosol generating apparatus 10 may have a structure similar to that of a general combustion type cigarette. The aerosol generating article 20 may be divided into, for example, a first part (e.g., a tobacco rod) including a tobacco material (or an aerosol forming substrate) and a second part (e.g., a filter rod) including a filter and the like. The entire first part may be inserted into the aerosol generating apparatus 10, and the second part may be exposed to the outside. Alternatively, only a portion of the first portion may be inserted into the aerosol generating apparatus 10, or the entire first portion and a portion of the second portion may be inserted. A user may smoke while holding the second part with his or her mouth.

[0056] In the present specification, in order to help understand the aerosol generating article applied to the aerosol generating apparatus described above, FIG. 4 schematically illustrates an exemplary aerosol generating article. According to an embodiment of the present inven-

tion, the aerosol generating article 20 includes a first filter segment 21, a second filter segment 23, and a cavity segment 22. The cavity segment 22 is formed by the first filter segment 21 and the second filter segment 23. The first filter segment 21, the second filter segment 23, and the cavity segment 22 are components included in the above-described first part (or tobacco rod), and supply tobacco components (or smoking flavor components) such as nicotine as the first portion is heated. Regarding the tobacco component in the first part, the cavity segment 22 may be filled with tobacco granules 22A, which are tobacco materials in the form of granules. The tobacco material included in the aerosol generating article according to the present invention is not limited to tobacco granules, but may be preferably applied in the aerosol generating apparatus according to the present invention. The first filter segment 21 and the second filter segment 23 basically have functionality as a filter, but also have a function of designating a compartment in which the tobacco granules 22A may be retained without leaking when the tobacco granules 22A are filled in the cavity segment 22. The first part including the first filter segment 21, the second filter segment 23, and the cavity segment 22 may be wrapped with a wrapper.

[0057] The first filter segment 21 is a filter segment forming the cavity segment 22 and may be located upstream of the cavity segment 22. The first filter segment 21 has a basically similar configuration to the second filter segment 22 to be described later, but additional functionality is required. The first filter segment 21 may perform a function of preventing the tobacco granules 22A from falling off. In addition, when the aerosol generating article 20 is inserted into the aerosol generating apparatus 10, the first filter segment 21 may allow the cavity segment 22 to be disposed at an appropriate position within the aerosol generating apparatus 10. In addition, the first filter segment 21 may prevent the tobacco rod from escaping to the outside and prevent the aerosol liquefied from the tobacco rod from flowing into the aerosol generating apparatus 10 during smoking.

[0058] According to an embodiment of the present invention, the first filter segment 21 may include a paper material. In other words, the first filter segment 21 may be composed of a paper filter. It may be preferable that the paper material is arranged in the longitudinal direction to secure a smooth air flow path. However, it is not limited thereto. However, the present invention is not limited thereto. A tobacco rod suitable for the heating type aerosol generating apparatus 10 according to the embodiment of the present invention may be manufactured. Specifically, the cellulose acetate fibers may be melted or contracted upon contact with the internal heating element, accelerating the falling-off phenomenon of the tobacco granules 22A. However, paper materials that are resistant to heat may greatly mitigate this phenomenon. According to the embodiment of the present invention, the first filter segment 21 may include a water-resistant or oil-resistant paper material.

[0059] The second filter segment 23 is a filter segment forming the cavity segment 22 and may be located upstream of the cavity segment 22. In addition to the cavity forming function, the first filter segment 21 may further perform functions of filtering, cooling, and the like an aerosol.

[0060] According to the embodiment of the present invention, the second filter segment 23 may include a paper material. In other words, the second filter segment 23 may be composed of a paper filter. It may be preferable that the paper material is arranged in the longitudinal direction to secure a smooth air flow path. However, it is not limited thereto. However, the present invention is not limited thereto. A tobacco rod suitable for the heating type aerosol generating apparatus 10 according to the embodiment of the present invention may be manufactured. Specifically, since the cellulose acetate fibers melt or shrink when heated above a certain temperature, it is difficult to apply the cellulose acetate fibers to the portion of the tobacco rod heated by the heater unit 13. On the other hand, since the paper material is hardly denatured by heat, the paper material may be easily applied to the tobacco rod portion, so the tobacco rod suitable for the heating type aerosol generating apparatus 10 may be manufactured. However, in another embodiment, the second filter segment 23 may be composed of the cellulose acetate filter. In this case, an improvement effect of removal ability of the second filter segment 23 may be achieved.

[0061] According to the embodiment of the present invention, the second filter segment 23 may include a water-resistant or oil-resistant paper material. In this case, the problem (e.g., the problem of reducing the amount of atomization in a smoky mode) that the smoke component (e.g., moisture, aerosol forming agent component) contained in the aerosol is absorbed while passing through the second filter segment 23 and the amount of visible atomization is reduced may be greatly alleviated. For example, when the first filter segment 23 includes a general paper material, the above-described smoke component may be absorbed due to the hygroscopicity of the paper material, thereby reducing the amount of visible atomization. However, when a water-resistant or oil-resistant paper material is applied, the absorption of the above-described smoke component hardly occurs, and thus the problem of reducing the amount of atomization may be solved.

[0062] According to an embodiment of the present invention, the suction resistance of the first filter segment 21 or the second filter segment 23 may be $50mmH_2O/60mm$ to $150mmH_2O/60mm$, preferably $50mmH_2O/60mm$ to $130mmH_2O/60mm$, $50mmH_2O/60mm$ to $120mmH_2O/60mm$, $50mmH_2O/60mm$ to $110mmH_2O/60mm$, $50mmH_2O/60mm$ to $100mmH_2O/60mm$, $50mmH_2O/60mm$ to $90mmH_2O/60mm$, $50mmH_2O/60mm$ to $100mmH_2O/80mm$, or $50mmH_2O/60mm$ to $70mmH_2O/60mm$. Within such a nu-

merical range, appropriate suckability may be ensured. In addition, the probability of occurrence of a vortex flow in the cavity segment 22 is increased by the appropriate suckability, and accordingly, an effect of uniformly heating a plurality of tobacco granules 22A may be achieved.

[0063] Meanwhile, physical properties of paper materials included in the first filter segment 21 and the second filter segment 23 may vary.

[0064] According to an embodiment of the present invention, the oil resistance of the paper material may be 4 or more (i.e., 4 or more in the range of 1 to 12), preferably 5, 6, 7, or 8 or more when measured by 3M Kit Test. Within this numerical range, the problem (e.g., reducing the amount of visible smoke in the smoky mode) of reducing the visible amount of smoke (i.e., the amount of visible smoke generated) due to the moisture absorption of the paper material may be solved.

[0065] According to an embodiment of the present invention, the thickness of the paper material may be 30 μm to 50 μm, and preferably 33 μm to 47 μm, 35 μm to 45 μm, or 37 μm to 42 μm.

[0066] According to an embodiment of the present invention, the paper material may have a basis weight of 20 g/m^2 to 40 g/m^2, and preferably 23 g/m^2 to 37 g/m^2, 25 g/m^2 to 35 g/m^2, or 27 g/m^2 to 33 g/m^2.

[0067] According to an embodiment of the present invention, the tensile strength of the paper material may be 2.5 kgf/15 mm or more, and preferably 2.8 kgf/15 mm, 3.2 kgf/15 mm, or 3.5 kgf/15 mm or more.

[0068] According to an embodiment of the present invention, the elongation of the paper material may be 0.8% or more, and preferably 1.0%, 1.2% or 1.5% or more.

[0069] According to an embodiment of the present invention, the stiffness of the paper material may be 100 cm^3 or more, and preferably 120 cm^3, 150 cm^3, or 180 cm^3 or more.

[0070] According to an embodiment of the present invention, the ash content of the paper material may be 1.5% or less, and preferably 1.2%, 1.0%, or 0.8% or less.

[0071] According to an embodiment of the present invention, the paper width of the paper material may be 80 mm to 250 mm, and preferably 90 mm to 230 mm, 100 mm to 200 mm, 120 mm to 180 mm, or 120 mm to 150 mm. Within this numerical range, it was confirmed that the first filter segment 21 and the second filter segment 23 had an appropriate suction resistance and an appropriate amount of atomization was ensured.

[0072] The aerosol generating article 20 according to the embodiment of the present invention is an article filled with the tobacco granules 22A, and the aerosol generating apparatus 10 may operate to heat the aerosol generating article 20 at a heating temperature of about 270°C or lower. In this case, no visible smoke may be generated or the generation of visible smoke may be minimized during smoking. This is because the tobacco granules 22A have a significantly lower content of moisture and/or aerosol forming agent than the tobacco substances such as cut filler (e.g., leaf tobacco cut filler, sheet leaf cut filler), thereby reducing the generation of the visible smoke. In addition, this is because the tobacco granules 22A may exhibit a sufficient smoking flavor even at a lower heating temperature (e.g., the heating temperature of the cut filler is usually 270°C or higher) than the tobacco substances such as cut filler and sheet leaf (i.e., nicotine may be sufficiently transferred), so the heating temperature of the heater unit 13 may be lowered, and the generation of the visible smoke may be further reduced as the heating temperature is lowered.

[0073] As described above, when the aerosol generating article 20 includes the tobacco granules 22A as the tobacco material, the generation of aerosol or visible smoke may be reduced, so a configuration capable of supplementing this is required. With this configuration, as described above, the cartridge including the aerosol forming agent can be added to the aerosol generating apparatus 10, and this configuration may also be included in the aerosol generating article 20 instead of the aerosol generating apparatus 10.

[0074] According to the embodiment of the present invention, the first filter segment 21 includes the aerosol forming agent. Considering the flow of the aerosol within the aerosol generating article 20, in order for the generated aerosol to pass through the cavity segment 22 including the tobacco granules, the aerosol needs to be generated upstream of the cavity segment 22, and the first filter segment 21 may be preferable as a location for generating the aerosol. In this case, the first filter segment 21 becomes an atomizing unit. The aerosol forming agent may be applied in the form of being impregnated into the paper material constituting the first filter segment 21. Examples of the aerosol forming agent include, but are not limited to, glycerin (GLY), propylene glycol (PG), ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl alcohol.

[0075] Additives commonly used in the art, such as perfumes, flavoring agents, and vitamin mixtures, may be used together with the aerosol forming agent. The perfume may include menthol, peppermint, spearmint oil, various fruit flavor components, and the like, but is not limited thereto. The flavoring agent is a material that may include a component capable of providing various flavors and savors. The vitamin mixture may be a mixture of at least one of vitamin A, vitamin B, vitamin C, and vitamin E, but is not limited thereto.

[0076] The cavity segment 22 is a segment including a cavity, and may be located between the first filter segment 21 and the second filter segment 23. That is, the cavity segment 22 may be formed by the first filter segment 21 and the second filter segment 23.

[0077] The cavity segment 22 may be manufactured in various manners. The cavity segment 22 may be manufactured in a form including, for example, a tubular structure such as a branch pipe. As another example, the cavity segment 22 may be manufactured by wrapping the cavity formed by the first filter segment 21 and the second filter segment 23 with a wrapper of an appropriate mate-

rial. However, the cavity segment 22 may be manufactured in any way without any limitation as long as the cavity segment 22 may fill the tobacco granules 22. According to an embodiment of the present invention, the length of the cavity segment 22 may be freely selected within the range of 8 mm to 12 mm.

[0078] As illustrated in FIG. 4, the cavity segment 22 may be filled with the tobacco granules 22A. Generally, since the tobacco granules 22Ahave significantly less moisture and/or aerosol forming agent content than other types of tobacco materials (e.g., leaf tobacco cut filler, sheet leaf, etc.), it is possible to greatly reduce the generation of the visible smoke, so a separate configuration capable of supplementing the generation of the aerosol and visible smoke is required. According to the above description, the first filter segment 21 may also have this configuration. A diameter, a density, a filling rate, a composition ratio of constituent materials, a heating temperature, and the like, of the tobacco granules 22 may be various, and may change according to embodiments.

[0079] According to an embodiment of the present invention, the diameter of the tobacco granules 22A may be 0.3mm to 1.2mm. Within such a numerical range, proper hardness and the manufacturing easiness of the tobacco granules 22 may be ensured, and the probability of occurrence of a vortex flow in the cavity segment 212 may be increased.

[0080] According to an embodiment of the present invention, the size of the tobacco granules 22A may be 15 meshes to 50 meshes, and preferably 15 meshes to 45 meshes, 20 meshes to 45 meshes, 25 meshes to 45 meshes, or 25 meshes to 40 meshes. Within such a numerical range, proper hardness and the manufacturing easiness of the tobacco granules 22A may be ensured, the fall-off phenomenon of the tobacco granules 22A may be minimized, and the probability of occurrence of a vortex flow in the cavity segment 22 may be increased.

[0081] According to an embodiment of the present invention, the density of the tobacco granules 22A may be 0.5g/cm^3 to 1.2g/cm3, and preferably 0.6g/cm^3 to 1.0g/cm^3, 0.7g/cm^3 to 0.9g/cm^3, or 0.6 g/cm3 to 0.8 g/cm^3. Within such a numerical range, proper hardness and the manufacturing easiness of the tobacco granules 22A may be ensured, and the probability of occurrence of a vortex flow in the cavity segment 212 may be increased.

[0082] According to an embodiment of the present invention, the hardness of the tobacco granules 22A may be 80% or more, preferably 85% or 90% or more, and more preferably 91%, 93%, 95%, or 97% or more. Within such a numerical range, the manufacturing easiness of the tobacco granules 22A may be improved, and a crumbling phenomenon of the tobacco granules 22A may be minimized, such that the manufacturing easiness of the aerosol generating article 20 may also be improved. In this specification, the hardness of the tobacco granules 22A may be a numerical value measured in accordance with the national standard test method KSM-1802 ("Activated carbon test method"). For details of a hardness measurement method and the meaning of the measured values, the national standard KSM-1802 is referred to.

[0083] According to the embodiment of the present invention, the filling ratio of the tobacco granules 22 of the cavity segment 22 may be 80 vol% or less, and preferably 70 vol% less, 60 vol%, or 50 vol% or less. Within such a numerical range, the probability of occurrence of a vortex flow in the cavity segment 22 may be increased. In addition, the filling rate of the tobacco granules 22A may be preferably 20 vol%, 30 vol%, or 40 vol% in order to ensure an appropriate smoking flavor.

[0084] According to an embodiment of the present invention, the tobacco granules 22A may include 20 wt% or less of moisture, and preferably 15 wt%, 12 wt%, 10 wt%, 7 wt%, or 5 wt% or less of moisture. Within such a numerical range, the generation of visible smoke may be significantly decreased, and a smokeless function of the aerosol generating apparatus 10 may be easily implemented.

[0085] According to the embodiment of the present invention, the tobacco granules 22A may include about 10 wt% or less of an aerosol forming agent, and preferably about 7 wt%, 5 wt%, 3 wt%, or 1 wt% of an aerosol forming agent. Alternatively, the tobacco granules 22A may not include the aerosol forming agent. Within such a numerical range, the generation of visible smoke may be significantly decreased, and a smokeless function of the aerosol generating apparatus 10 may be easily implemented.

[0086] According to the embodiment of the present invention, a content of nicotine on a wet basis in the tobacco granules may be about 1.0% to 4.0%, and preferably about 1.5% to 3.5%, 1.8% to 3.0%, or 2.0% to 2.5%. Within such a numerical range, an appropriate level of smoking flavor may be ensured.

[0087] According to the embodiment of the present invention, a content of nicotine on a dry basis in the tobacco granules 22Amay be 1.2% to 4.2%, and preferably about 1.7% to 3.7%, 2.0% to 3.2%, or 2.2% to 2.7%. Within such a numerical range, an appropriate level of smoking flavor may be ensured.

[0088] According to an embodiment of the present invention, the aerosol generating article 20 further includes a cooling segment 24 and a mouthpiece segment 25. The cooling segment 24 and the mouthpiece segment 25 are components included in the above-described second part (or filter rod), and are located downstream of the tobacco rod to perform the function of filtering an aerosol. The filter rod may include a filter material such as paper, cellulose acetate fibers, and the like. The filter rod may further include a wrapper wrapping the filter material.

[0089] The filter rod may be manufactured in various shapes. For example, the filter rod may be a cylindrical rod or a tubular rod including a hollow therein. In addition, the filter rod may be a recessed rod. If the filter rod is composed of a plurality of segments, at least one of the plurality of segments may be manufactured in a different

shape.

[0090] The filter rod may be manufactured to generate flavor. For example, a flavoring solution may be sprayed into the filter rod 12 or a separate fiber to which a flavoring solution is applied may be inserted into the filter rod. As another example, the filter rod may include at least one capsule (not illustrated) containing a flavoring solution.

[0091] The filter rod may include the cooling segment 24 performing the function of cooling the aerosol and the mouthpiece segment 25 performing the function of filtering the aerosol. Alternatively, in some cases, the filter rod may further include at least one segment performing other functions.

[0092] The cooling segment 24 may be manufactured in various forms. The cooling segment 24 may be manufactured in the form of, for example, a paper pipe, a hollow cellulose acetate filter, a cellulose acetate filter having a plurality of holes, a filter filled with a polymer material or a biodegradable polymer material, and the like. However, the cooling segment 24 may be manufactured in any shape without limitation as long as the cooling segment 24 may perform the function of cooling the aerosol. The polymer material or biodegradable polymer material may be a woven material of polylactic acid (PLA), but is not limited thereto.

[0093] The mouthpiece segment 25 may be, for example, a cellulose acetate filter (i.e., a filter made of a cellulose acetate fiber), but is not limited thereto. The above description of the filter rod may also be applied to the mouthpiece segment 25.

[0094] The aerosol generating article 20 may be wrapped by at least one wrapper (not illustrated). As an example, the aerosol generating article 20 may be wrapped by one wrapper. As another example, the aerosol generating article 20 may be wrapped in an overlapping manner by two or more wrappers. For example, the tobacco rod may be wrapped by a first wrapper and the filter rod may be wrapped by a second wrapper. In addition, the tobacco rod and the filter rod wrapped by individual wrappers may be coupled to each other, and the entire aerosol generating article 20 may be rewrapped by a third wrapper. If each of the tobacco rod 21 or the filter rod 22 is composed of a plurality of segments, each segment may be wrapped by an individual wrapper. In addition, the entire aerosol generating article 20 in which segments wrapped by individual wrappers are coupled to each other may be rewrapped by another wrapper. At least one hole through which external air is introduced or internal gas is discharged may be formed in the wrapper.

[0095] As illustrated in FIGS. 1 to 3, the first filter segment 21 and the cavity segment 22 of the aerosol generating article 20 are accommodated in the accommodation space of the aerosol generating apparatus 10, and the heater unit 13 may be located to heat the cavity segment 23. Specifically, FIG. 1 relates to a specific example in which the aerosol generating apparatus 10 and the aerosol generating article 20 do not have a separate atomizing unit. In this case, the heater unit 13 of the aerosol generating apparatus 10 is located to heat the cavity segment 23 including the aerosol generating substrate, FIG. 2 relates to a specific example in which the first filter segment 21 of the aerosol generating article 20 has the atomizing unit. In this case, the first heater unit 13A of the aerosol generating apparatus 10 is located to heat the first filter segment 21 including the aerosol forming agent, and the second heater unit 13B of the aerosol generating apparatus 10 is located to heat the cavity segment 23 including the aerosol generating substrate. FIG. 3 relates to a specific example in which the cartridge 16 of the aerosol generating apparatus 10 has the atomizing unit. In this case, the first heater unit 13A of the aerosol generating apparatus 10 is located to heat the cartridge 16 including the aerosol forming agent, and the second heater unit 13B of the aerosol generating apparatus 10 is located to heat the cavity segment 23 including the aerosol generating substrate. In FIG. 1, the temperature control button 14, the variable resistor 15, the control unit 12, and the heater unit 13 are electrically connected and operate in relation to each other. In addition, in FIGS. 2 and 3, the first temperature control button 14A, the first variable resistor 15A, the first control unit 12A, and the first heater unit 13A are electrically connected and operate in relation to each other. The second temperature control buttons 14B, the second variable resistor 15B, the second control unit 12B, and the second heater unit 13B are electrically connected and operate in relation to each other.

[0096] As described above, although the embodiments have been described by the limited embodiments and drawings, various modifications and alternations are possible by those of ordinary skill in the art from the above description. For example, even though the described techniques may be performed in a different order than the described method, and/or components of the described systems, structures, devices, circuits, etc. may be combined or combined in a different manner than the described method, or replaced or substituted by other components, appropriate results may be achieved.

[Detailed Description of Main Elements]

[0097]

10: Aerosol generating apparatus
11: Battery
12: Control unit
12A: First control unit
12B: Second control unit
13: Heater unit
13A: First heater unit
13B: Second heater unit
14: Temperature control button
14A: First temperature control button
14B: Second temperature control button
15: Variable resistor

15A: First variable resistor
15B: Second variable resistor
16: Cartridge
20: Aerosol generating article
21: First filter segment
22: Cavity segment
22A: Tobacco granule
23: Second filter segment
24: Cooling segment
25: Mouthpiece segment

Claims

1. An aerosol generating apparatus, comprising:

   a housing that forms an accommodation space in which an aerosol generating article is accommodated;
   a heater unit that heats a cartridge included in an aerosol generating article or an aerosol generating apparatus accommodated in the accommodating space;
   a control unit that adjusts a temperature of the heater unit; and
   a temperature control button that is disposed on an outer wall surface of the housing and transmits a temperature control signal to the control unit.

2. The aerosol generating apparatus of claim 1, wherein the temperature control button transmits a temperature control signal to the control unit through a variable resistor.

3. The aerosol generating apparatus of claim 1, wherein the control unit outputs the temperature control signal received from the temperature control button as a supply voltage in a form of a pulse and transmits the temperature control signal to the heater unit.

4. The aerosol generating apparatus of claim 1, wherein the temperature control signal is formed by a value input in an analog format or a digital format.

5. The aerosol generating apparatus of claim 1, wherein the heater unit includes a first heater unit that heats an atomizing unit located in an aerosol generating apparatus or an aerosol generating article and a second heater unit that heats a substrate part located in an aerosol generating article,

   the temperature control button comprises a first temperature control button that transmits a temperature control signal for adjusting a temperature of the first heater unit and a second temperature control button that transmits a temperature control signal for adjusting a temperature of the second heater unit, and
   the control unit outputs the temperature control signal received from the first temperature control button and transmits the temperature control signal to the first heater unit, and outputs the temperature control signal received from the second temperature control button and transmits the temperature control signal to the second heater unit.

6. The aerosol generating apparatus of claim 5, wherein the first temperature control button is adjusted to an on mode or an off mode, and
   in the on mode, the temperature at which the first heater unit is driven is adjusted within a range of 180°C to 240°C.

7. The aerosol generating apparatus of claim 5, wherein the second temperature control button is adjusted to an on mode or an off mode, and
   in the on mode, the temperature at which the second heater unit is driven is adjusted within a range of 150°C to 260°C.

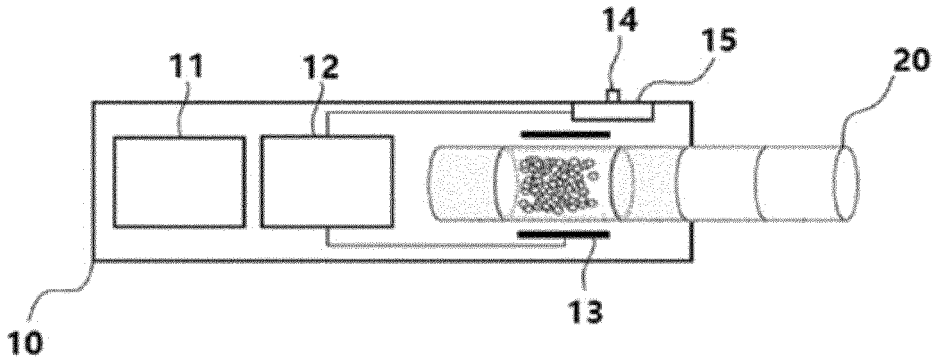
8. The aerosol generating apparatus of claim 5, wherein the aerosol generating article includes a first filter segment, a second filter segment, and a cavity segment,

   the cavity segment is formed by the first filter segment and the second filter segment,
   the cavity segment is filled with a tobacco granule, and
   the first filter segment is located upstream of the cavity segment, and the second filter segment is located downstream of the cavity segment.

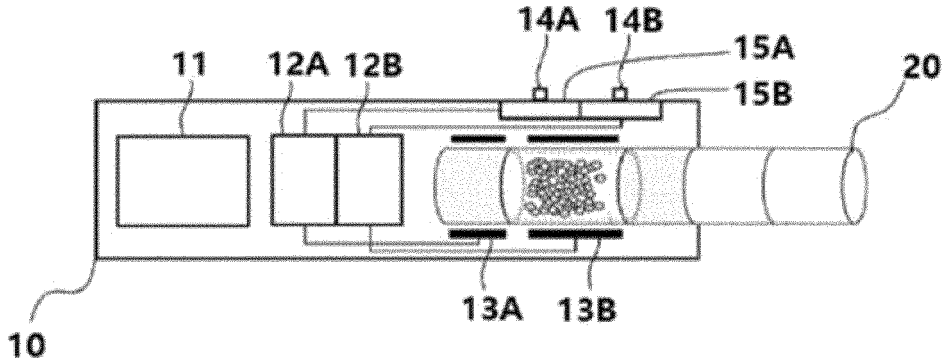
9. The aerosol generating apparatus of claim 8, wherein when the atomizing unit is located in the aerosol generating apparatus, the atomizing unit is located adjacent to the first heater unit in a form of a cartridge.

10. The aerosol generating apparatus of claim 8, wherein when the atomizing unit is located in the aerosol generating apparatus, the atomizing unit is located in the first filter segment.

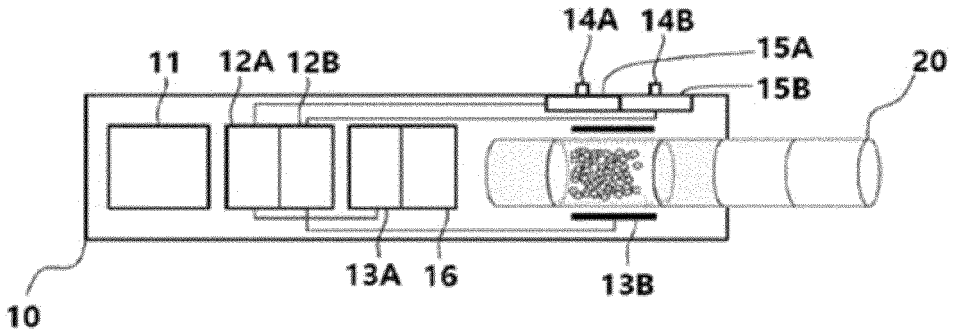
【Figure 1】



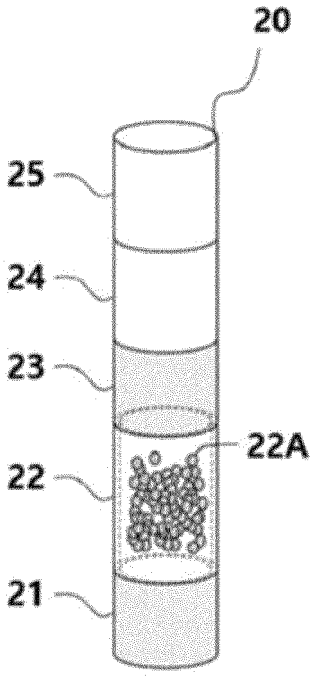
【Figure 2】



【Figure 3】



【Figure 4】



INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2022/015570

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/57(2020.01)i; **A24F 40/40**(2020.01)i; **A24F 40/46**(2020.01)i; **A24D 1/04**(2006.01)i; **A24D 3/02**(2006.01)i; **A24D 3/04**(2006.01)i; **A24B 13/02**(2006.01)i; **A24D 1/20**(2020.01)i; **A24F 40/42**(2020.01)i

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)

A24F 40/57(2020.01); A24B 15/16(2006.01); A24F 40/20(2020.01); A24F 40/60(2020.01); A24F 47/00(2006.01); H01H 15/10(2006.01); H01H 9/02(2006.01); H05B 1/02(2006.01)

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

Korean utility models and applications for utility models: IPC as above
Japanese utility models and applications for utility models: IPC as above

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

eKOMPASS (KIPO internal) & keywords: 에어로졸(aerosol), 히터(heater), 온도(temperature), 조절(control), 신호(signal), 버튼(button)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 112289602 A (SHENZHEN JIER TECHNOLOGY CO., LTD.) 29 January 2021 (2021-01-29) See abstract; claims 1-7; paragraph [0031]; and figures 1-6.	1-4
Y		5-10
Y	KR 10-2020-0057487 A (KT & G CORPORATION) 26 May 2020 (2020-05-26) See claims 1-3; paragraphs [0031] and [0053]; and figure 1.	5-10
A	KR 10-2187256 B1 (KT & G CORPORATION) 04 December 2020 (2020-12-04) See entire document.	1-10
A	WO 2020-233938 A1 (PHILIP MORRIS PRODUCTS S.A.) 26 November 2020 (2020-11-26) See entire document.	1-10
A	US 2017-0119058 A1 (LUNATECH, LLC) 04 May 2017 (2017-05-04) See entire document.	1-10

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 January 2023	**19 January 2023**

Name and mailing address of the ISA/KR	Authorized officer
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Facsimile No. **+82-42-481-8578**	Telephone No.

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2022/015570

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		CN 111511230 A	07 August 2020
		EP 3818870 A1	12 May 2021
		EP 3818870 A4	24 November 2021
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		JP 7128894 B2	31 August 2022
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- KR 1020147021388 **[0006]**