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(54) **AEROSOL-GENERATING ARTICLE AND AEROSOL-GENERATING SYSTEM**

(57) An aerosol generating article includes an atomization segment; and a medium segment configured to be pH-treated and disposed downstream of the atomization segment, wherein, when the atomization segment is heated, heat from the heated atomization segment may be transferred indirectly to the medium segment.

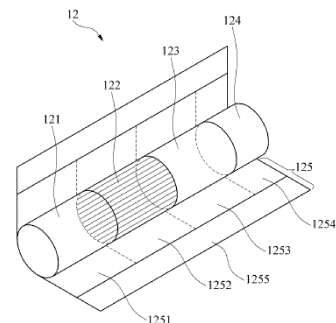


FIG. 3

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Description**Technical Field**

5 [0001] The following embodiments relate to an aerosol generating article and an aerosol generating system.

Background Art

10 [0002] Recently, the demand for alternative articles to overcome the disadvantages of traditional cigarettes has increased. For example, there is an increasing demand for a device (e.g., a cigarette-type electronic cigarette) that generates an aerosol by electrically heating a cigarette stick. Accordingly, research on an electrically heated aerosol generating device and a cigarette stick (or an aerosol generating article) applied thereto is being actively conducted. For example, KR Patent Application Publication No. 10-2017-0132823 discloses a non-combustion-type flavor inhaler, a flavor inhalation component source unit, and an atomizing unit.

Disclosure of the Invention**Technical Goals**

20 [0003] An embodiment is to provide an aerosol generating article that may implement a desired amount of nicotine transfer through indirect heating despite a relatively low level of pH treatment and an aerosol generating system including the same.

[0004] An embodiment is to provide an aerosol generating system that may generate an aerosol using an aerosol generating device not equipped with a separate vaporizer.

25 [0005] An embodiment is to provide an aerosol generating article that may minimize instability caused by free nicotine according to pH adjustment and an aerosol generating system including the same.

Technical Solutions

30 [0006] According to various embodiments, an aerosol generating article includes an atomization segment; and a medium segment configured to be pH-treated and disposed downstream of the atomization segment, wherein, when the atomization segment is heated, heat from the heated atomization segment may be transferred indirectly to the medium segment.

35 [0007] The aerosol generating article may further include a filter segment disposed downstream of the medium segment, the filter segment with nicotine adsorbed.

[0008] The nicotine adsorbed into the filter segment may be transferred from the medium segment.

[0009] The medium segment may be pH-treated such that the pH thereof may be in the range of 7.0 to 9.5.

[0010] The aerosol generating article may further include a thermally conductive wrapper configured to wrap the atomization segment, and the thermally conductive wrapper may further wrap the medium segment.

40 [0011] A medium used to fill the medium segment may include at least one component of reconstituted tobacco sheets and tobacco granules.

[0012] A moisturizing agent used to fill the atomization segment may include at least one component of glycerin and propylene glycol.

45 [0013] According to various embodiments, an aerosol generating system includes an aerosol generating article including an atomization segment, a medium segment disposed downstream of the atomization segment, and a filter segment disposed downstream of the medium segment, and an aerosol generating device including a controller including at least one processor; a heater configured to heat the aerosol generating article; and an elongated cavity configured to receive the aerosol generating article, wherein nicotine may be adsorbed into the filter segment.

50 [0014] The medium segment may be pH-treated, and the nicotine adsorbed into the filter segment may be transferred from the medium segment.

[0015] The medium segment may be pH-treated, and when the heater heats the atomization segment, heat from the heated atomization segment may be transferred indirectly to the medium segment.

55 [0016] The aerosol generating article may further include a thermally conductive wrapper configured to wrap at least one of the atomization segment and the medium segment, the thermally conductive wrapper including an aluminum component.

Effects

[0017] An aerosol generating article and aerosol generating system according to an embodiment may cause efficient and uniform nicotine transfer.

[0018] An aerosol generating article and aerosol generating system according to an embodiment may provide a uniform intensity of smoking taste.

[0019] An aerosol generating article and aerosol generating system according to an embodiment may reduce the appearance of off-flavors and off-odors.

[0020] The effects of the aerosol generating system according to an embodiment are not limited to the above-mentioned effects, and other unmentioned effects can be clearly understood from the following description by one of ordinary skill in the art.

Brief Description of Drawings

[0021] The accompanying drawings illustrate preferred embodiments of the present disclosure, and are provided together with the detailed description for better understanding of the technical idea of the present disclosure. Therefore, the present disclosure should not be construed as being limited to the embodiments set forth in the drawings.

FIG. 1 is a block diagram of an aerosol generating article according to an embodiment.

FIG. 2 is a diagram schematically illustrating the structure of an aerosol generating device.

FIG. 3 is a view schematically illustrating the structure of an aerosol generating article according to an embodiment.

FIG. 4 is a view schematically illustrating an aerosol generating system in which an aerosol generating article is coupled to an aerosol generating device according to an embodiment.

Best Mode for Carrying Out the Invention

[0022] Hereinafter, embodiments will be described in detail with reference to the accompanying drawings. However, various alterations and modifications may be made to the embodiments and thus, the scope of the disclosure is not limited or restricted to the embodiments. The embodiments should be understood to include all changes, equivalents, and replacements within the idea and the technical scope of the disclosure.

[0023] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting. The singular forms "a," "an," and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise. It will be further understood that the terms "comprises/comprising" and/or "includes/including" when used herein, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components and/or groups thereof.

[0024] Unless otherwise defined, all terms including technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which embodiments belong. It will be further understood that terms, such as those defined in commonly-used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0025] When describing the embodiments with reference to the accompanying drawings, like reference numerals refer to like constituent elements and a repeated description related thereto will be omitted. In the description of embodiments, detailed description of well-known related structures or functions will be omitted when it is deemed that such description will cause ambiguous interpretation of the present disclosure.

[0026] Also, in the description of the components, terms such as first, second, A, B, (a), (b) or the like may be used herein when describing components of the present disclosure. These terms are used only for the purpose of discriminating one constituent element from another constituent element, and the nature, the sequences, or the orders of the constituent elements are not limited by the terms. When one constituent element is described as being "connected", "coupled", or "attached" to another constituent element, it should be understood that one constituent element can be connected or attached directly to another constituent element, and an intervening constituent element can also be "connected", "coupled", or "attached" to the constituent elements.

[0027] The same name may be used to describe an element included in the embodiments described above and an element having a common function. Unless otherwise mentioned, the descriptions of the examples may be applicable to the following examples and thus, duplicated descriptions will be omitted for conciseness.

[0028] In the following embodiments, the "moisturizing agent" may refer to a substance capable of facilitating the formation of visible smoke and/or an aerosol. The moisturizing agent may include, for example, glycerin (GLY), propylene glycol (PG), ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl

alcohol, but is not limited thereto. In the art, a moisturizing agent may be used interchangeably with a term such as an aerosol former, a humectant, or the like.

[0029] In the following embodiments, an "aerosol forming material" may refer to a material that forms an aerosol. The aerosol may include a volatile compound. The aerosol forming material may be solid or liquid. For example, a solid aerosol forming material may include solid materials based on tobacco raw materials such as reconstituted tobacco sheets, cut tobacco leaves, and reconstituted tobacco, and a liquid aerosol forming material may include a liquid composition based on nicotine, a tobacco extract, and/or various fragrances. However, the scope of the disclosure is not limited to these examples.

[0030] In the following embodiments, the term "aerosol generating article" may refer to an article that accommodates a medium, in which an aerosol passes through the article and the medium is transferred. A representative example of the aerosol generating article may be a cigarette. However, the scope of the disclosure is not limited thereto.

[0031] In the following embodiments, the term "aerosol generating device" may refer to a device that generates an aerosol using an aerosol forming material to generate an aerosol that may be inhaled through the mouth of a user directly to the lungs of the user.

[0032] In the following embodiments, the terms "upstream" or "upstream direction" may refer to a direction away from a mouth of a user (smoker), and the terms "downstream" or "downstream direction" may refer to a direction toward the mouth of the user. The terms "upstream" and "downstream" may be used to describe relative positions of components of the aerosol generating article.

[0033] In the following embodiments, the term "puff" refers to inhalation by a user, and inhalation refers to a situation in which a user draws in an aerosol into his or her oral cavity, nasal cavity, or lungs through the mouth or nose.

[0034] FIG. 1 is a block diagram of an aerosol generating article according to an embodiment, FIG. 2 is a diagram schematically illustrating the structure of an aerosol generating device, FIG. 3 is a view schematically illustrating the structure of the aerosol generating article according to an embodiment, and FIG. 4 is a view schematically illustrating an aerosol generating system in which the aerosol generating article is coupled to the aerosol generating device according to an embodiment.

[0035] Referring to FIGS. 1 and 2, an aerosol generating device 11 according to an embodiment includes a battery 111, a controller 112, a heater 113, and an elongated cavity 114.

[0036] Components related to the present embodiment are shown in the aerosol generating device 11 shown in FIGS. 1 and 2. Therefore, it is to be understood by those having ordinary skill in the art to which the disclosure pertains that the aerosol generating device 11 may further include other general-purpose components in addition to the components shown in FIGS. 1 and 2.

[0037] FIG. 2 illustrates a linear alignment of the battery 111, the controller 112, and the heater 113. However, the internal structure of the aerosol generating device 11 is not limited to what is shown in FIG 2. That is, the alignment of the battery 111, the controller 112, and the heater 113 may be changed depending on the design of the aerosol generating device 11.

[0038] When an aerosol generating article 12 is inserted into the aerosol generating device 11, the aerosol generating device 11 may operate the heater 113 to generate an aerosol. The aerosol generated by the heater 113 may pass through the aerosol generating article 12 into a user.

[0039] Even when the aerosol generating article 12 is not inserted in the aerosol generating device 11, the aerosol generating device 11 may heat the heater 113, as needed.

[0040] The battery 111 may supply power to be used to operate the aerosol generating device 11. For example, the battery 111 may supply power to heat the heater 113, and may supply power required to operate the controller 112. In addition, the battery 111 may supply power required to operate a display, a sensor, a motor, or the like installed in the aerosol generating device 11.

[0041] The controller 112 may control the overall operation of the aerosol generating device 11. Specifically, the controller 112 may control respective operations of other components included in the aerosol generating device 11, in addition to the battery 111 and the heater 113. In addition, the controller 112 may verify a state of each of the components of the aerosol generating device 11 to determine whether the aerosol generating device 11 is in an operable state.

[0042] The controller 112 includes at least one processor. The processor may be implemented as an array of a plurality of logic gates, or may be implemented as a combination of a general-purpose microprocessor and a memory in which a program executable by the microprocessor is stored. In addition, it is to be understood by those having ordinary skill in the art to which the disclosure pertains that the processor may be implemented in other types of hardware.

[0043] The heater 113 may be heated by the power supplied by the battery 111. For example, when the aerosol generating article 12 is inserted in the aerosol generating device 11, the heater 113 may be disposed outside the aerosol generating article 12. The heated heater 113 may thus raise the temperature of an aerosol generating material in the aerosol generating article 12.

[0044] The heater 113 may be an electrically resistive heater 113. In this example, the heater 113 may include an electrically conductive track, and the heater 113 may be heated as a current flows through the electrically conductive

track. However, the heater 113 is not limited to the foregoing example, and any example of heating the heater 113 up to a desired temperature may be applicable without limitation. Here, the desired temperature may be preset in the aerosol generating device 11 or may be set by the user.

[0045] Meanwhile, as another example, the heater 113 may be an induction heater 113. Specifically, the heater 113 may include an electrically conductive coil for heating the aerosol generating article 12 in an induction heating manner, and the aerosol generating article 12 may include a susceptor to be heated by the induction heater 113.

[0046] For example, the heater 113 may include a tubular heat transfer element, a plate-shaped heat transfer element, a needle-shaped heat transfer element, or a rod-shaped heat transfer element, and may heat the inside or outside of the aerosol generating article 12 according to the shape of a heat transfer element.

[0047] In addition, the heater 113 may be provided as a plurality of heaters in the aerosol generating device 11. In this case, the plurality of heaters 113 may be disposed to be inserted into the aerosol generating article 12 or may be disposed outside the aerosol generating article 12. In addition, some of the plurality of heaters 113 may be disposed to be inserted into the aerosol generating article 12, and the rest may be disposed outside the aerosol generating article 12. However, the shape of the heater 113 is not limited to what is shown in FIG. 2, and the heater 113 may be provided in various shapes.

[0048] In an embodiment, the aerosol generating article 12 may be received in the elongated cavity 114. In an embodiment, the heater 113 may be disposed to surround the outer surface of the elongated cavity 114, thereby heating the aerosol generating article received in the elongated cavity 114. The heater 113 according to an embodiment may be disposed to surround at least a portion of the outer surface of the elongated cavity 114.

[0049] Meanwhile, the aerosol generating device 11 may further include general-purpose components in addition to the battery 111, the controller 112, the heater 113, and the elongated cavity 114. For example, the aerosol generating device 11 may further include a sensing unit 115, an output unit 116, a user input unit 117, a memory 118, and a communication unit 119.

[0050] The sensing unit 115 may sense a state of the aerosol generating device 11 or a state of an environment around the aerosol generating device 11, and transmit sensed information to the controller 112. Based on the sensed information, the controller 112 may control the aerosol generating device 11 to perform various functions, such as controlling the operation of the heater 113, restricting smoking, determining whether the aerosol generating article 12 (e.g., a cigarette, a cartridge, etc.) is inserted, displaying a notification, and the like.

[0051] The sensing unit 115 may include at least one of a temperature sensor 1151, an insertion detection sensor 1152, or a puff sensor 1153, but is not limited thereto.

[0052] The temperature sensor 1151 may sense a temperature at which the heater 113 (or an aerosol generating material) is heated. The aerosol generating device 11 may include a separate temperature sensor for sensing the temperature of the heater 113, or the heater 113 itself may perform a function as a temperature sensor. Alternatively, the temperature sensor 1151 may be arranged around the battery 111 to monitor the temperature of the battery 111.

[0053] The insertion detection sensor 1152 may sense an insertion and/or removal of the aerosol generating article 12. The insertion detection sensor 1152 may include, for example, at least one of a film sensor, a pressure sensor, a light sensor, a resistive sensor, a capacitive sensor, an inductive sensor, and an infrared sensor, and may sense a signal change caused when the aerosol generating article 12 is inserted and/or removed.

[0054] The puff sensor 1153 may sense a puff from the user based on various physical changes in an airflow path or airflow channel. For example, the puff sensor 1153 may sense the puff from the user based on any one of a temperature change, a flow change, a voltage change, and a pressure change.

[0055] The sensing unit 115 may further include at least one of a temperature/humidity sensor, an atmospheric pressure sensor, a magnetic sensor, an acceleration sensor, a gyroscope sensor, a position sensor (e.g., a global positioning system (GPS)), a proximity sensor, and a red, green, blue (RGB) sensor (e.g., an illuminance sensor), in addition to the sensors 1151 to 1153 described above. A function of each sensor may be intuitively inferable from its name by one of ordinary skill in the art, and thus, a more detailed description thereof will be omitted here.

[0056] The output unit 116 may output information about the state of the aerosol generating device 11 and provide the information to the user. The output unit 116 may include at least one of a display 1161, a haptic portion 1162, and a sound outputter 1163, but is not limited thereto. When the display 1161 and a touchpad are provided in a layered structure to form a touchscreen, the display 1161 may be used as an input device in addition to an output device.

[0057] The display 1161 may visually provide information about the aerosol generating device 11 to the user. The information about the aerosol generating device 11 may include, for example, a charging/discharging state of the battery 111 of the aerosol generating device 11, a preheating state of the heater 113, an insertion/removal state of the aerosol generating article 12, a limited usage state (e.g., an abnormal article detected) of the aerosol generating device 11, or the like, and the display 1161 may externally output the information. The display 1161 may be, for example, a liquid-crystal display (LCD) panel, an organic light-emitting diode (OLED) panel, or the like. The display 1161 may also be in the form of a light-emitting diode (LED) device.

[0058] The haptic portion 1162 may provide information about the aerosol generating device 11 to the user in a haptic

way by converting an electrical signal into a mechanical stimulus or an electrical stimulus. The haptic portion 1162 may include, for example, a motor, a piezoelectric element, or an electrical stimulation device.

[0059] The sound outputter 1163 may provide information about the aerosol generating device 11 to the user in an auditory way. For example, the sound outputter 1163 may convert an electrical signal into a sound signal and externally output the sound signal.

[0060] The user input unit 117 may receive information input from the user or may output information to the user. For example, the user input unit 117 may include a keypad, a dome switch, a touchpad (e.g., a contact capacitive type, a pressure resistive film type, an infrared sensing type, a surface ultrasonic conduction type, an integral tension measurement type, a piezo effect type, etc.), a jog wheel, a jog switch, or the like, but is not limited thereto. In addition, although not shown in FIG. 1, the aerosol generating device 11 may further include a connection interface such as a universal serial bus (USB) interface, and may be connected to another external device through the connection interface such as a USB interface to transmit and receive information or to charge the battery 111.

[0061] The memory 118, which is hardware for storing various pieces of data processed in the aerosol generating device 11, may store data processed by the controller 112 and data to be processed thereby. The memory 118 may include at least one type of storage medium of a flash memory type memory, a hard disk type memory, a multimedia card micro type memory, a card type memory (e.g., an SD or XE memory), a random-access memory (RAM), a static random-access memory (SRAM), a read-only memory (ROM), an electrically erasable programmable read-only memory (EEPROM), a programmable read-only memory (PROM), a magnetic memory, a magnetic disk, or an optical disk. The memory 118 may store an operating time of the aerosol generating device 11, a maximum number of puffs, a current number of puffs, at least one temperature profile, data associated with a smoking pattern of the user, and the like.

[0062] The communication unit 119 may include at least one component for communicating with another electronic device. For example, the communication unit 119 may include a short-range wireless communication unit 1191 and a wireless communication unit 1192.

[0063] The short-range wireless communication unit 1191 may include a Bluetooth communication unit, a Bluetooth low energy (BLE) communication unit, a near-field communication unit, a WLAN (Wi-Fi) communication unit, a ZigBee communication unit, an infrared data association (IrDA) communication unit, a Wi-Fi direct (WFD) communication unit, an ultra-wideband (UWB) communication unit, and an Ant+ communication unit, but is not limited thereto.

[0064] The wireless communication unit 1192 may include, for example, a cellular network communicator, an Internet communicator, a computer network (e.g., a local area network (LAN) or a wide-area network (WAN)) communicator, and the like, but is not limited thereto. The wireless communication unit 1192 may use subscriber information (e.g., international mobile subscriber identity (IMSI)) to identify and authenticate the aerosol generating device 11 in a communication network.

[0065] Although not shown in FIGS. 1 and 2, the aerosol generating device 11 may constitute a system along with a separate cradle. For example, the cradle may be used to charge the battery 111 of the aerosol generating device 11. Alternatively, the heater 113 may be heated in a state in which the cradle and the aerosol generating device 11 are coupled.

[0066] As an example, the external air may be introduced through at least one air path formed in the aerosol generating device 11. For example, the opening or closing and/or the size of the air path formed in the aerosol generating device 11 may be adjusted by the user. Accordingly, an amount of atomization, a sense of smoking, or the like may be adjusted by the user. As another example, the external air may be introduced into the inside of the aerosol generating article 12 through at least one hole formed in the surface of the aerosol generating article 12.

[0067] Referring to FIG. 3, the aerosol generating article 12 according to an embodiment may include an atomization segment 121, a medium segment 122, a cooling segment 123, a filter segment 124, and a wrapper 125.

[0068] The atomization segment 121 may be positioned upstream or in an upstream direction of the medium segment 122, the medium segment 122 may be positioned upstream or in an upstream direction of the cooling segment 123, and the cooling segment 123 may be positioned upstream or in an upstream direction of the filter segment 124.

[0069] The atomization segment 121 may include an aerosol generating material excluding nicotine. A moisturizing agent used to fill the atomization segment 121 may include, for example, at least one of glycerin, propylene glycol, ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl alcohol, but is not limited thereto. Further, the atomization segment 121 may include other additives such as a flavoring agent, a humectant, and/or organic acid. In addition, the atomization segment 121 may contain a flavoring liquid such as menthol or a moisturizing agent. The atomization segment may allow an aerosol to be generated even when a separate vaporizer is not provided in the aerosol generating device.

[0070] The atomization segment 121 may include a crimped sheet, and the moisturizing agent may be included in the atomization segment 121 in a state of being adsorbed into the crimped sheet. In addition, the additives such as a flavoring agent, a humectant, and/or organic acid, and the flavoring liquid may be included in the atomization segment 121 in a state of being adsorbed into the crimped sheet.

[0071] A desirable length of the atomization segment 121 may be adopted from a range of 4 mm to 12 mm, but is not limited thereto.

[0072] The medium segment 122 may include nicotine. Also, the medium segment 122 may include an aerosol generating material such as glycerin or the like. Further, the medium segment 122 may include other additives such as a flavoring agent, a humectant, and/or organic acid. In addition, the medium segment 122 may include a flavoring liquid such as menthol or a moisturizing agent that is added as being sprayed onto the medium segment 122.

[0073] The medium segment 122 may be manufactured in various manners. For example, the medium used to fill the medium segment 122 may include at least one component of reconstituted tobacco sheets, tobacco granules, reconstituted tobacco, and cut tobacco leaves.

[0074] A desirable length of the medium segment 122 may be adopted from a range of 6 mm to 18 mm, but is not limited thereto.

[0075] The cooling segment 123 may produce an effect of cooling an aerosol. The user may thus inhale the aerosol cooled down to a suitable temperature.

[0076] For example, the cooling segment 123 may be made of cellulose acetate and may be a tubular structure including a hollow therein. For example, the cooling segment 123 may be manufactured by adding a plasticizer (e.g., triacetin) to cellulose acetate tow.

[0077] For example, the cooling segment 123 may be made of paper and may be a tubular structure including a hollow therein.

[0078] A desirable diameter of the hollow included in the cooling segment 123 may be adopted from a range of 4 mm to 8 mm, but is not limited thereto. A desirable length of the cooling segment 123 may be adopted from a range of 4 mm to 30 mm, but is not limited thereto.

[0079] The cooling segment 123 is not limited to the above example, and may be applicable without limitation as long as it may perform a function of cooling an aerosol.

[0080] The filter segment 124 may be manufactured by adding a plasticizer (e.g., triacetin) to cellulose acetate tow. A desirable length of the filter segment 124 may be adopted from a range of 4 mm to 30 mm, but is not limited thereto.

[0081] The filter segment 124 may be manufactured to generate a flavor. As an example, a flavoring liquid may be sprayed onto the filter segment 124, or separate fibers coated with the flavoring liquid may be inserted into the filter segment 124.

[0082] In addition, at least one capsule may be included in the filter segment 124. Here, the capsule may perform a function of generating a flavor or a function of generating an aerosol. For example, the capsule may have a structure in which a liquid containing a fragrance is coated with a film. The capsule may have a spherical or cylindrical shape, but is not limited thereto.

[0083] The aerosol generating article 12 may be wrapped by at least one wrapper 125. The wrapper 125 may have at least one hole through which external air flows in or internal gas flows out.

[0084] For example, the atomization segment 121 may be wrapped with a first wrapper 1251, the medium segment 122 may be wrapped with a second wrapper 1252, the cooling segment 123 may be wrapped with a third wrapper 1253, and the filter segment 124 may be wrapped with a fourth wrapper 1254. In addition, the aerosol generating article 12 may be entirely wrapped again with a fifth wrapper 1255.

[0085] In an embodiment, the first wrapper 1251 may include an aluminum component. The first wrapper 1251 may be a combination of general filter wrapping paper and a metal foil such as aluminum foil. For example, the total thickness of the first wrapper 1251 may be in the range of 40 μm to 80 μm . In addition, the thickness of the metal foil of the first wrapper 1251 may be in the range of 6 μm to 20 μm .

[0086] The second wrapper 1252 and the third wrapper 1253 may be formed with porous wrapping paper.

[0087] For example, the porosity of the second wrapper 1252 may be about 35000 CU, but is not limited thereto. Also, the thickness of the second wrapper 1252 may be in the range of 70 μm to 80 μm . In addition, the basis weight of the second wrapper 1252 may be in the range of 20 g/m² to 25 g/m².

[0088] For example, the porosity of the third wrapper 1253 may be about 35000 CU, but is not limited thereto. Also, the thickness of the third wrapper 1253 may be in the range of 70 μm to 80 μm . In addition, the basis weight of the third wrapper 1253 may be in the range of 20 g/m² to 25 g/m².

[0089] In an embodiment, the second wrapper 1252 may include an aluminum component. For example, the second wrapper 1252 may be a combination of general filter wrapping paper and a metal foil such as aluminum foil.

[0090] Also, the second wrapper 1252 may be made of a final outer covering.

[0091] The fourth wrapper 1254 may be formed with polylactic acid (PLA) laminated paper. Here, the PLA laminated paper may refer to three-ply paper including a paper layer, a PLA layer, and a paper layer. For example, the thickness of the fourth wrapper 1254 may be in the range of 100 μm to 120 μm . In addition, the basis weight of the fourth wrapper 1254 may be in the range of 80 g/m² to 100 g/m².

[0092] The fifth wrapper 1255 may be made of a final outer covering. For example, the basis weight of the fifth wrapper 1255 may be in the range of 57 g/m² to 63 g/m². Also, the thickness of the fifth wrapper 1255 may be in the range of 64 μm to 70 μm .

[0093] Referring to FIGS. 3 and 4, the medium segment 122 according to an embodiment may be pH-treated and

indirectly heated by the heater 113.

[0094] In an embodiment, a pH-treated medium may be included in the medium segment 122. For example, the medium may be pH-treated by a pH control agent to have basicity, and the pH control agent may be basic and may include, for example, at least one of potassium carbonate (K_2CO_3), sodium bicarbonate ($NaHCO_3$), and calcium oxide (CaO). However, the material included in the pH control agent is not limited to the above examples, and a material that generates less negative odor during smoking may be used. A basic pH control agent may increase the pH of the medium included in the medium segment 122. Compared to a medium not treated with a basic pH control agent, a medium pH-treated with a basic pH control agent may increase the amount of nicotine released therefrom when heated. That is, a medium pH-treated with a basic pH control agent may achieve a sufficient nicotine yield even when the medium segment 122 is heated at a low temperature.

[0095] In an embodiment, the medium segment 122 may include reconstituted tobacco sheets having a pH adjusted to a range of 7.0 to 9.5, or may be filled with tobacco granules having a pH adjusted to a range of 7.0 to 9.5. The medium such as reconstituted tobacco sheets or tobacco granules may include nicotine, and when the medium is pH-treated, free nicotine may be easily transferred from the medium even under non-heating conditions or relatively low temperature conditions. That is, by adjusting the pH of the medium in the medium segment 122 to a range of 7.0 to 9.5, a low amount of volatile free nicotine may be transferred even under non-heating conditions, and a low level to moderate level of intensity of smoking taste may be implemented. In addition, by increasing the amount of nicotine transfer by promoting the transfer of nicotine in low-temperature heating, a moderate level to high level of intensity of smoking taste may be implemented. As such, the amount of nicotine transfer may be easily adjusted even through non-heating or low-temperature heating in the aerosol generating article 12 according to an embodiment.

[0096] The first wrapper 1251 of the aerosol generating article 12 according to an embodiment may include a thermally conductive material (e.g., an aluminum component), and the second wrapper 1252 may also include a thermally conductive material (e.g., an aluminum component). The aerosol generating article 12 according to an embodiment may be received in the elongated cavity 114 of the aerosol generating device 11, and in a state in which the aerosol generating article 12 is received in the elongated cavity 114, the heater 113 may surround the atomization segment 121. For example, the downstream end portion of the heater 113 may be adjacent to the downstream end portion of the atomization segment 121 or may be disposed between the upstream end portion and the downstream end portion of the atomization segment 121. As the heater 113 is heated, the temperature of the atomization segment 121 may increase. The atomization segment 121 is surrounded by the heater 113 and thus receives heat directly through the first wrapper 1251, and the medium segment 122 may receive the heat conducted along the second wrapper 1252 through the first wrapper 1251 indirectly. Even if the second wrapper 1252 is not surrounded by the heater 113, the medium segment 122 may receive the heat indirectly from the heater 113 and thus, may be heated at a low temperature.

[0097] Alternatively, the first wrapper 1251 of the aerosol generating article 12 according to an embodiment may include a thermally conductive material (e.g., an aluminum component), and the second wrapper 1252 may not include a thermally conductive material. In this case, when the atomization segment 121 is heated, the heat transferred from the heater 113 to the atomization segment 121 through the first wrapper 1251 may be indirectly transferred to the medium segment 122, or the heat included in the aerosol from the atomization segment 121 may be indirectly transferred to the medium segment 122.

[0098] When heat is not transferred to the medium segment 122, a relatively high pH treatment is required, but the aerosol generating system 1 according to an embodiment may implement low-temperature heating of the medium segment 122, and thus, the medium segment 122 may achieve efficient and uniform nicotine transfer even when treated to have a pH in the range of 7.0 to 9.5, which is not relatively high. When the medium segment 122 is treated to have a relatively low pH in the range of 7.0 to 9.5, which is not relatively high, instability due to volatile free nicotine may be reduced, leading to an increase in the uniformity of intensity of smoking taste and a reduction of off-flavors and off-odors.

[0099] In an embodiment, nicotine may be adsorbed into the filter segment 124. The nicotine adsorbed into filter segment 124 may be transferred from the medium segment 122. For example, as the medium segment 122 is pH-treated in the range of 7.0 to 9.5, nicotine in the medium segment 122 may be actively transferred even at room temperature. Thus, the nicotine transferred from the medium segment 122 may be adsorbed into the filter segment 124. That is, the nicotine in the medium segment 122 may be transferred and adsorbed into the filter segment 124. When the user puffs, while the aerosol generated in the atomization segment 121 passes through the filter segment 124, the nicotine adsorbed into the filter segment 124 may also be inhaled by the user. As described above, since nicotine in the filter segment 124 as well as nicotine in the medium segment 122 may be transferred, sufficient nicotine transfer may be guaranteed even in non-heating or indirect heating.

[0100] In an embodiment, the nicotine transfer described above may be performed at room temperature for a set period of time. Table 1 below shows the amounts of nicotine transfer for a first medium segment (e.g., the medium segment 122), a second medium segment, and the filter segment 124 over time, and the experiment was conducted under a temperature condition of 22°C. The experiment according to Table 1 below was conducted in a state in which the second medium segment was applied instead of the cooling segment 123, and the same/similar experimental results

may be obtained even when the cooling segment 123 is applied instead of the second medium segment. Referring to Table 1, it may be learned that nicotine is transferred to the filter segment 124 after 4 weeks. Further, according to the smoke component analysis values, it may be learned that the amount of nicotine increases while the amount of atomization remains constant.

[0101] In addition, it may be learned that the amount of nicotine transfer is stabilized without a significant change in the amount of nicotine transferred to the filter segment 124 even after 4 weeks. Further, in view of the smoke component analysis values, it may be learned that the amount of atomization and the amount of nicotine are also stabilized.

[0102] Consequently, it may be learned that it is ideal to transfer nicotine to the filter segment 124 for 4 weeks. In addition, it may be learned that the amount of nicotine transfer, the amount of atomization of smoke components, and the amount of nicotine are continuously stabilized even after 4 weeks. Therefore, it is preferable to set the nicotine transfer treatment period to 4 weeks.

[Table 1]

Classification	Nicotine Transfer Amount (mg/seg)			Smoke Component Analysis Value (mg/stick)	
Time	First medium segment	Second medium segment	Filter segment	Atomization Amount	Nicotine
0 weeks	-	-	-	37.8	0.15
4 weeks	0.60	1.05	0.27	38.8	0.31
6 weeks	0.55	0.98	0.31	38.6	0.32
8 weeks	0.66	0.75	0.30	39.0	0.31

[0103] The descriptions of the above-described embodiments are merely examples, and it will be understood by one of ordinary skill in the art that various changes and equivalents may be made thereto. Therefore, the scope of the disclosure should be defined by the appended claims, and all differences within the scope equivalent to those described in the claims will be construed as being included in the scope of protection defined by the claims.

[0104] The features and aspects of any embodiment(s) described above may be combined with features and aspects of any other embodiment(s) without resulting in apparent technical conflicts.

Claims

1. An aerosol generating article comprising:

an atomization segment; and

a medium segment configured to be pH-treated and disposed downstream of the atomization segment,

wherein, when the atomization segment is heated, heat from the heated atomization segment is transferred indirectly to the medium segment.

2. The aerosol generating article of claim 1, further comprising:

a filter segment disposed downstream of the medium segment, the filter segment with nicotine adsorbed.

3. The aerosol generating article of claim 2, wherein the nicotine adsorbed into the filter segment is transferred from the medium segment.

4. The aerosol generating article of claim 1, wherein a medium used to fill the medium segment is pH-treated such that the pH thereof is in the range of 7.0 to 9.5.

5. The aerosol generating article of claim 1, further comprising:

a thermally conductive wrapper configured to wrap the atomization segment.

6. The aerosol generating article of claim 5, wherein the thermally conductive wrapper extends to further wrap the medium segment.

7. The aerosol generating article of claim 1, wherein a medium used to fill the medium segment comprises at least one component of reconstituted tobacco sheets and tobacco granules.

8. The aerosol generating article of claim 1, wherein a moisturizing agent used to fill the atomization segment comprises at least one component of glycerin and propylene glycol.

9. An aerosol generating system comprising:

an aerosol generating article comprising an atomization segment, a medium segment disposed downstream of the atomization segment, and a filter segment disposed downstream of the medium segment; and an aerosol generating device comprising a controller comprising at least one processor; a heater configured to heat the aerosol generating article; and an elongated cavity configured to receive the aerosol generating article, wherein nicotine is adsorbed into the filter segment.

10. The aerosol generating system of claim 9, wherein

a medium used to fill the medium segment is pH-treated, and the nicotine adsorbed into the filter segment is transferred from the medium segment.

11. The aerosol generating system of claim 9, wherein

a medium used to fill the medium segment is pH-treated, and when the heater heats the atomization segment, heat from the heated atomization segment is transferred indirectly to the medium segment.

12. The aerosol generating system of claim 11, wherein the aerosol generating article further comprises a thermally conductive wrapper configured to wrap at least one of the atomization segment and the medium segment, the thermally conductive wrapper comprising an aluminum component.

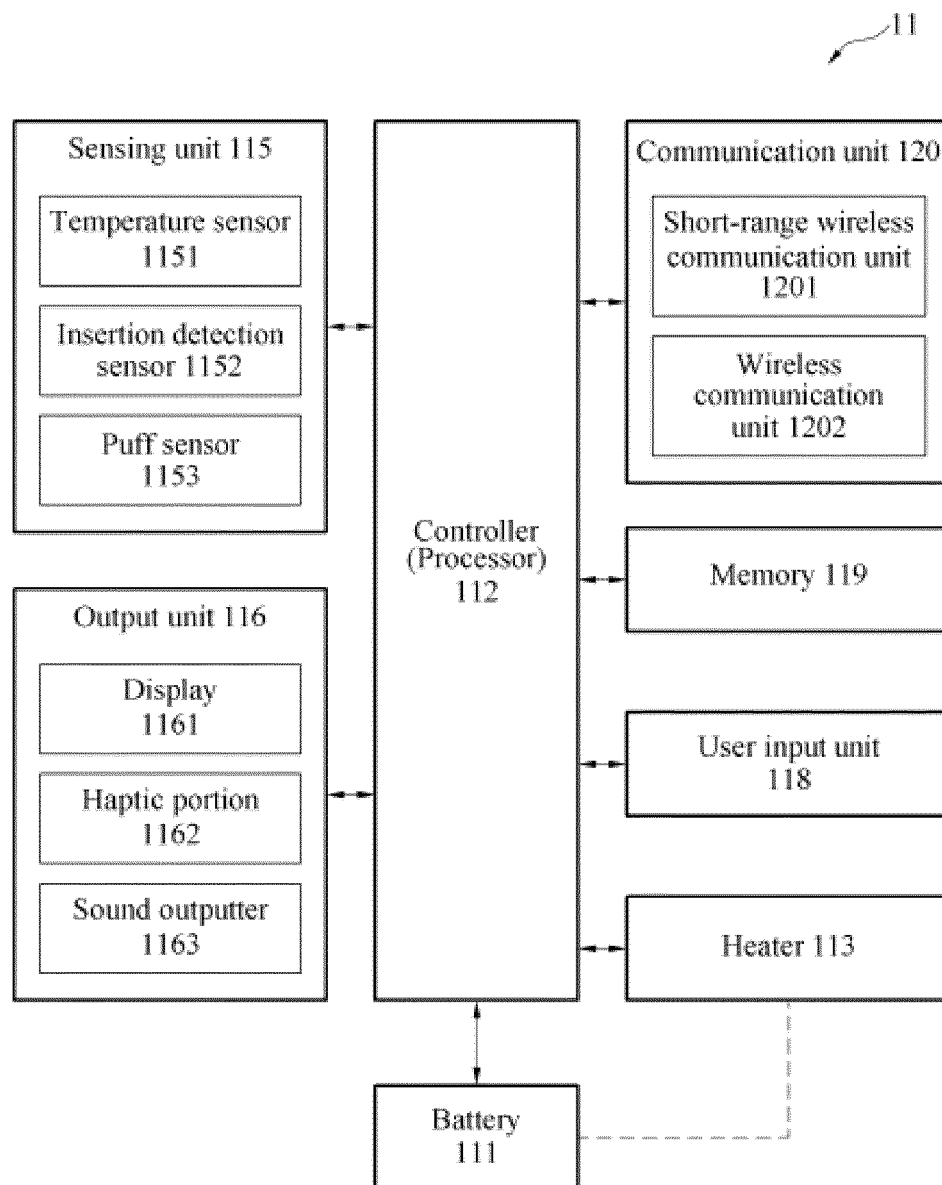


FIG. 1

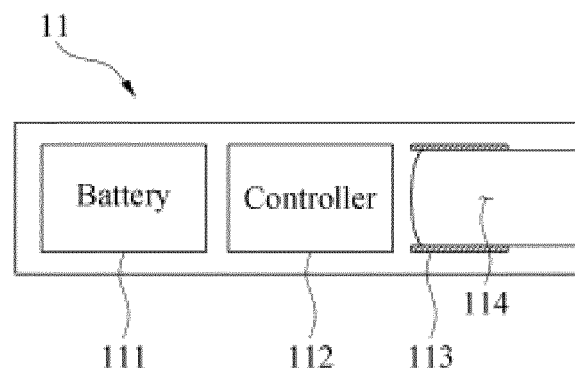


FIG. 2

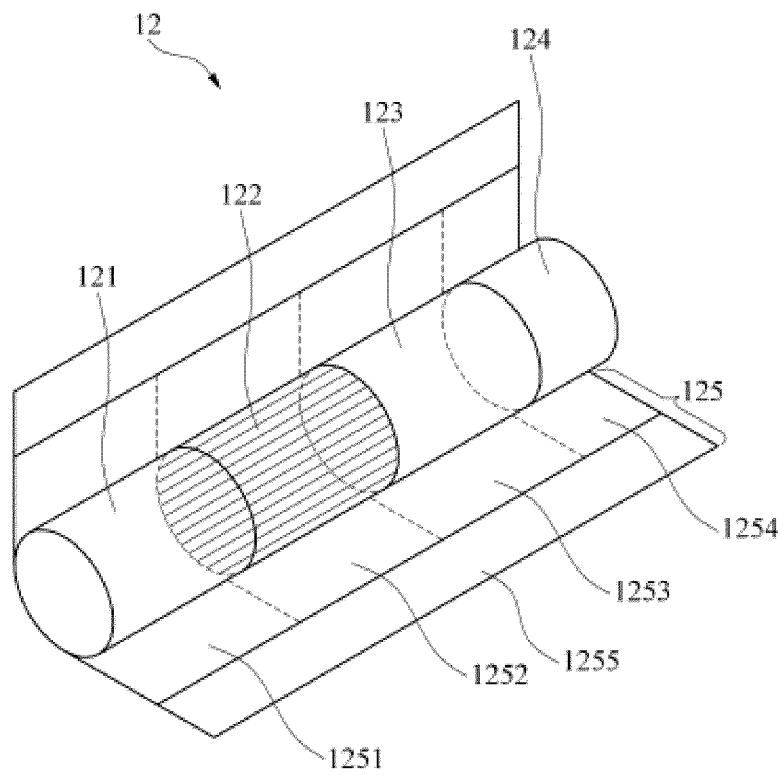


FIG. 3

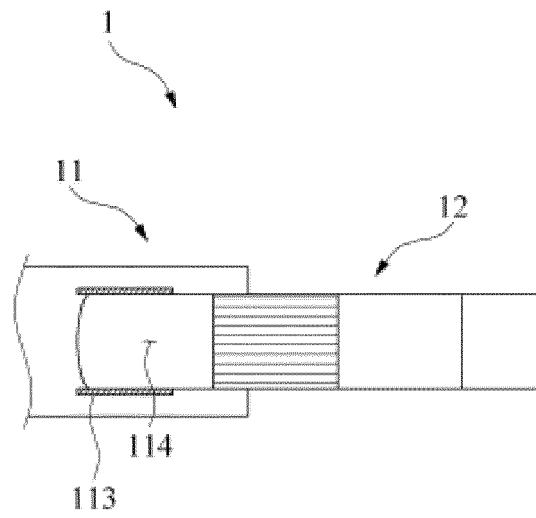


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/002878

A. CLASSIFICATION OF SUBJECT MATTER

A24D 1/20(2020.01)i; A24D 1/04(2006.01)i; A24D 3/02(2006.01)i; A24D 3/04(2006.01)i; A24D 1/02(2006.01)i;
A24B 13/02(2006.01)i; A24B 15/32(2006.01)i; A24F 40/50(2020.01)i; A24F 40/46(2020.01)i; A24B 15/24(2006.01)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)

A24D 1/20(2020.01); A24B 15/00(2006.01); A24B 15/167(2020.01); A24B 15/24(2006.01); A24D 3/04(2006.01);
A24D 3/06(2006.01); A24F 40/10(2020.01); A24F 40/40(2020.01)

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), 담배(tobacco), pH, 니코틴(nicotine), 필터(filter)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2021-0114795 A (KT & G CORPORATION) 24 September 2021 (2021-09-24) See claims 1-11; paragraphs [0034]-[0072]; and figures 1-4b.	1-12
A	WO 2020-245410 A1 (PHILIP MORRIS PRODUCTS S.A.) 10 December 2020 (2020-12-10) See entire document.	1-12
A	WO 2020-148538 A1 (BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED) 23 July 2020 (2020-07-23) See entire document.	1-12
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A	KR 10-2021-0136474 A (KT & G CORPORATION) 17 November 2021 (2021-11-17) See entire document.	1-12

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

* Special categories of cited documents:

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“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

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Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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