



(11)

EP 4 144 238 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:

08.03.2023 Bulletin 2023/10

(21) Application number: **22781501.6**

(22) Date of filing: **25.03.2022**

(51) International Patent Classification (IPC):

A24F 40/30 ^(2020.01) **A24F 40/42** ^(2020.01)
A24F 40/10 ^(2020.01) **A24F 40/485** ^(2020.01)
A24B 15/167 ^(2020.01) **A24F 40/60** ^(2020.01)
A24F 40/50 ^(2020.01)

(52) Cooperative Patent Classification (CPC):

A24B 15/167; A24F 40/10; A24F 40/30;
A24F 40/42; A24F 40/485; A24F 40/50;
A24F 40/60

(86) International application number:

PCT/KR2022/004203

(87) International publication number:

WO 2022/211382 (06.10.2022 Gazette 2022/40)

(84) Designated Contracting States:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR

Designated Extension States:

BA ME

Designated Validation States:

KH MA MD TN

(30) Priority: **02.04.2021 KR 20210043059**

(71) Applicant: **KT&G Corporation**

Daedeok-gu
Daejeon 34337 (KR)

(72) Inventor: **JANG, Yong Joon**

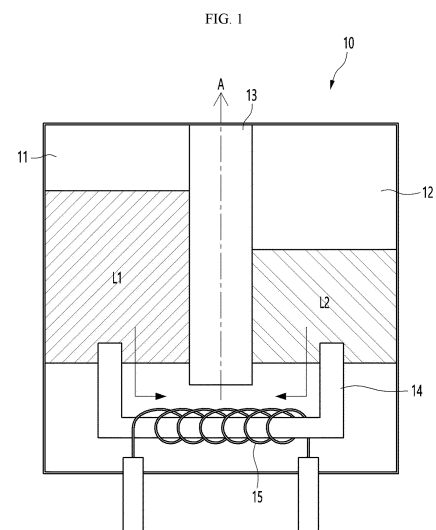
Daejeon 34128 (KR)

(74) Representative: **Ter Meer Steinmeister & Partner**
Patentanwälte mbB

Nymphenburger Straße 4
80335 München (DE)

(54) **MULTI-CARTRIDGE AND AEROSOL-GENERATING DEVICE COMPRISING SAME**

(57) A multi-cartridge and an aerosol generation device including the same are provided. The aerosol generation device according to some embodiments of the present disclosure may include a first liquid reservoir in which a first liquid composition is stored, a second liquid reservoir in which a second liquid composition different from the first liquid composition is stored, and a vaporizing element configured to vaporize at least one of the first liquid composition and the second liquid composition to generate an aerosol.



Description

[Technical Field]

[0001] The present disclosure relates to a multi-cartridge and an aerosol generation device including the same, and more particularly, to a multi-cartridge which is capable of storing and supplying a plurality of liquid compositions having different compositions and an aerosol generation device including the same.

[Background Art]

[0002] In recent years, demand for alternative articles that overcome the disadvantages of traditional cigarettes has increased. For example, demand for devices that electrically heat a cigarette to generate an aerosol (e.g., cigarette-type electronic cigarettes) has increased, and accordingly, active research has been carried out on electric heating-type aerosol generation devices.

[0003] Recently, a hybrid-type aerosol generation device that uses a cartridge, which holds a liquid composition including an aerosol-forming agent, and a cigarette together has been proposed. In the proposed aerosol generation device, an aerosol is formed as the liquid composition in the cartridge vaporizes, and the formed aerosol is inhaled through the oral region of a user after passing through the cigarette.

[0004] However, in the proposed aerosol generation device, due to removability of the cigarette, the actual amount of vapor produced is significantly less as compared to the aerosol formed in the cartridge. Further, when a flavoring agent is added to the liquid composition, a proportion of the aerosol-forming agent decreases, causing the vapor production to be further reduced. Also, accordingly, the amount of flavoring agent added to the liquid composition is limited, and a problem that it is difficult to improve flavor expression also occurs.

[Disclosure]

[Technical Problem]

[0005] Some embodiments of the present disclosure are directed to providing a multi-cartridge which is capable of storing and supplying a plurality of liquid compositions having different compositions and an aerosol generation device including the same.

[0006] Some embodiments of the present disclosure are also directed to providing a method of adjusting a degree of vaporization of a plurality of liquid compositions stored in a multi-cartridge.

[0007] Some embodiments of the present disclosure are also directed to providing an aerosol generation device capable of providing a customized smoking experience using a multi-cartridge.

[0008] Objectives of the present disclosure are not limited to the above-mentioned objectives, and other un-

mentioned objectives should be clearly understood by those of ordinary skill in the art to which the present disclosure pertains from the description below.

5 [Technical Solution]

[0009] Some embodiments of the present disclosure provide an aerosol generation device including a first liquid reservoir in which a first liquid composition is stored, a second liquid reservoir in which a second liquid composition different from the first liquid composition is stored, and a vaporizing element configured to vaporize at least one of the first liquid composition and the second liquid composition to generate an aerosol.

10 **[0010]** In some embodiments, the aerosol generation device may further include a housing configured to form an accommodation space for accommodating an aerosol-generating article, an airflow path may be formed to allow the generated aerosol to pass through the aerosol-generating article accommodated in the accommodation space, the first liquid composition may include an aerosol-forming agent, and the second liquid composition may include a flavoring agent.

15 **[0011]** In some embodiments, the vaporizing element may vaporize the first liquid composition and the second liquid composition together in a vaporization space.

20 **[0012]** In some embodiments, the vaporizing element may include a first vaporizing element configured to vaporize the first liquid composition to generate a first aerosol and a second vaporizing element configured to vaporize the second liquid composition to generate a second aerosol, and an airflow path may be formed so that the first aerosol and the second aerosol are mixed.

25 **[0013]** In some embodiments, the first liquid reservoir may be included in a first cartridge, the second liquid reservoir may be included in a second cartridge, and the aerosol generation device may further include a cartridge holder on which the first cartridge and the second cartridge are mounted.

30 **[0014]** In some embodiments, a degree of vaporization of the first liquid composition and the second liquid composition may be adjusted on the basis of a user input.

35 **[0015]** In some embodiments, the vaporizing element may include a first vaporizing element configured to vaporize the first liquid composition to generate a first aerosol and a second vaporizing element configured to vaporize the second liquid composition to generate a second aerosol, and the aerosol generation device may further include a controller configured to control power supplied to the first vaporizing element and the second vaporizing element to adjust a degree of vaporization of the first liquid composition and the second liquid composition.

40 **[0016]** In some embodiments, the first liquid composition may be transferred to the vaporizing element through a first transfer path, and a degree of vaporization of the first liquid composition may be adjusted by a degree of opening of the first transfer path.

[0017] Some embodiments of the present disclosure provide a multi-cartridge including a first liquid reservoir in which a first liquid composition is stored, a second liquid reservoir in which a second liquid composition different from the first liquid composition is stored, and a vaporizing element configured to vaporize at least one of the first liquid composition and the second liquid composition.

[Advantageous Effects]

[0018] According to some embodiments of the present disclosure, a multi-cartridge that stores and supplies a plurality of liquid compositions having different compositions can be provided. For example, a multi-cartridge that supplies a first liquid composition containing an aerosol-forming agent and a second liquid composition containing a flavoring agent can be provided. The multi-cartridge can simultaneously increase proportions of the aerosol-forming agent and the flavoring agent, and thus vapor production and flavor expression can be simultaneously enhanced.

[0019] Also, by adjusting a degree of opening of a path along which a liquid composition is transferred or adjusting power supplied to a vaporizing element, a degree of vaporization of each liquid composition can be accurately adjusted.

[0020] In addition, a degree of vaporization of a liquid composition can be adjusted by a user, and thus a customized smoking experience can be provided to the user. For example, a user may receive a customized smoking experience by freely adjusting a degree of vaporization of each flavoring agent in a multi-cartridge in which different flavoring agents are stored.

[0021] The advantageous effects according to the technical spirit of the present disclosure are not limited to those mentioned above, and other unmentioned advantageous effects should be clearly understood by those of ordinary skill in the art from the description below.

[Description of Drawings]

[0022]

FIG. 1 is an exemplary view for describing a multi-cartridge according to some embodiments of the present disclosure.

FIG. 2 is an exemplary view for describing a multi-cartridge according to some other embodiments of the present disclosure.

FIG. 3 is an exemplary view for describing a multi-cartridge according to still some embodiments of the present disclosure.

FIGS. 4 and 5 are exemplary views for describing ways in which a degree of vaporization is adjusted in a multi-cartridge according to some embodiments of the present disclosure.

FIG. 6 is an exemplary view for describing a method

of providing a customized smoking experience using a multi-cartridge according to some other embodiments of the present disclosure.

FIGS. 7 to 9 illustrate various types of aerosol generation devices to which a multi-cartridge according to some embodiments of the present disclosure may be applied.

[Modes of the Invention]

[0023] Hereinafter, exemplary embodiments of the present disclosure will be described in detail with reference to the accompanying drawings. Advantages and features of the present disclosure and methods of achieving the same should become clear from embodiments described in detail below with reference to the accompanying drawings. However, the technical spirit of the present disclosure is not limited to the following embodiments and may be implemented in various different forms. The following embodiments only make the technical spirit of the present disclosure complete and are provided to completely inform those of ordinary skill in the art to which the present disclosure pertains of the scope of the disclosure. The technical spirit of the present disclosure is defined only by the scope of the claims.

[0024] In assigning reference numerals to components of each drawing, it should be noted that the same reference numerals are assigned to the same components where possible even when the components are illustrated in different drawings. Also, in describing the present disclosure, when detailed description of a known related configuration or function is deemed as having the possibility of obscuring the gist of the present disclosure, the detailed description thereof will be omitted.

[0025] Unless otherwise defined, all terms including technical or scientific terms used in this specification have the same meaning as commonly understood by those of ordinary skill in the art to which the present disclosure pertains. Terms defined in commonly used dictionaries should not be construed in an idealized or overly formal sense unless expressly so defined herein. Terms used in this specification are for describing the embodiments and are not intended to limit the present disclosure. In this specification, a singular expression includes a plural expression unless the context clearly indicates otherwise.

[0026] Also, in describing components of the present disclosure, terms such as first, second, A, B, (a), and (b) may be used. Such terms are only used for distinguishing one component from another component, and the essence, order, sequence, or the like of the corresponding component is not limited by the terms. In a case in which a certain component is described as being "connected," "coupled," or "linked" to another component, it should be understood that, although the component may be directly connected or linked to the other component, still another component may also be "connected," "coupled," or "linked" between the two components.

[0027] The terms "comprises" and/or "comprising" used herein do not preclude the possibility of presence or addition of one or more components, steps, operations, and/or devices other than those mentioned.

[0028] Prior to description of various embodiments of the present disclosure, some terms used in the following embodiments will be clarified.

[0029] In the following embodiments, "aerosol-forming agent" may refer to a material that can facilitate aerosol formation. Examples of the aerosol-forming agent may include glycerin, propylene glycol, ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl alcohol, but the aerosol-forming agent is not limited thereto. The term "aerosol-forming agent" may be interchangeably used with the term "moisturizer" or "wetting agent" in the art.

[0030] In the following embodiments, "aerosol-forming substrate" may refer to a material that is able to form an aerosol. The aerosol may include a volatile compound. The aerosol-forming substrate may be a solid or liquid.

[0031] For example, solid aerosol-forming substrates may include solid materials based on tobacco raw materials such as reconstituted tobacco leaves, shredded tobacco, and reconstituted tobacco, and liquid aerosol-forming substrates may include liquid compositions based on nicotine, tobacco extracts, and/or various flavoring agents. However, the scope of the present disclosure is not limited to the above-listed examples. The aerosol-forming substrate may further include an aerosol-forming agent in order to stably form an aerosol.

[0032] In the following embodiments, "aerosol generation device" may refer to a device that generates an aerosol using an aerosol-forming substrate in order to generate an aerosol that can be inhaled directly into the user's lungs through the user's mouth. Some examples of the aerosol generation device will be described below with reference to FIGS. 7 to 9.

[0033] In the following embodiments, "aerosol-generating article" may refer to an article that is able to generate an aerosol. The aerosol-generating article may include an aerosol-forming substrate. A typical example of the aerosol-generating article may include a cigarette, but the scope of the present disclosure is not limited thereto.

[0034] In the following embodiments, "puff" refers to inhalation by a user, and the inhalation may be a situation in which a user draws smoke into his or her oral cavity, nasal cavity, or lungs through the mouth or nose.

[0035] In the following embodiments, "longitudinal direction" may refer to a direction corresponding to a longitudinal axis of an aerosol-generating article.

[0036] In the following embodiments, "multi-cartridge" may be a term that conceptually refers to a cartridge and/or a cartridge system capable of storing and supplying a plurality of liquid compositions. For example, a multi-cartridge may include both a cartridge formed as a single structure in which a plurality of liquid compositions are stored and a cartridge system including a plurality of cartridges in which at least one liquid composition is stored.

Various examples of the multi-cartridge will be described below with reference to FIGS. 1 to 3.

[0037] Hereinafter, various embodiments of the present disclosure will be described in detail.

[0038] According to various embodiments of the present disclosure, a multi-cartridge having a function of storing and supplying a plurality of liquid compositions having different compositions (or aerosols formed therefrom) may be provided. Here, the liquid compositions having different compositions may not only include a case in which components are different but also include a case in which composition ratios are different. The multi-cartridge may be applied to liquid-type or hybrid-type aerosol generation devices (e.g., 100-1 to 100-3 of FIGS. 7 to 9) to enhance flavor expression and vapor production and provide a customized smoking experience to a user. This will be described below.

[0039] The above-described multi-cartridge may be implemented in various ways. For example, the multi-cartridge may be implemented in a form in which a plurality of liquid compositions are stored in a cartridge formed as a single structure or may be implemented in a form in which a plurality of cartridges are mounted on a cartridge holder (e.g., 33 of FIG. 3). Hereinafter, various examples of implementing the multi-cartridge will be described in detail with reference to the drawings, and for convenience of description, "liquid composition" will be shortened to "liquid."

[0040] FIG. 1 is an exemplary view for describing a multi-cartridge 10 according to some embodiments of the present disclosure.

[0041] As illustrated in FIG. 1, the multi-cartridge 10 according to the present embodiment may be formed as a structure in which a plurality of liquids L1 and L2 are vaporized together in a vaporization space.

[0042] Specifically, as illustrated, the multi-cartridge 10 may include a plurality of liquid reservoirs 11 and 12, a wicking element 14, a vaporizing element 15, and an airflow tube 13. However, only the components relating to the embodiment of the present disclosure are illustrated in FIG. 1. Therefore, those of ordinary skill in the art to which the present disclosure pertains should understand that the multi-cartridge 10 may further include general-purpose components other than the components illustrated in FIG. 1.

[0043] Also, not all of the components illustrated in FIG. 1 may be essential components of the multi-cartridge 10. For example, the multi-cartridge 10 may be implemented in a form in which some of the components illustrated in FIG. 1 are omitted. As a more specific example, the multi-cartridge 10 may be implemented in a form in which the wicking element 14, the vaporizing element 15, and the airflow tube 13 are omitted.

[0044] Also, although FIG. 1 illustrates an example in which the multi-cartridge 10 includes the two liquid reservoirs 11 and 12 (or two liquids), of course, the number of liquid reservoirs (or liquids) may be three or more. However, hereinafter, in order to provide convenience of un-

derstanding, description will be continued assuming that the number of liquid reservoirs (or liquids) is two unless mentioned otherwise. Hereinafter, each component of the multi-cartridge 10 will be described.

[0045] Among the plurality of liquid reservoirs 11 and 12, a first liquid reservoir 11 may store a first liquid L1, and a second liquid reservoir 12 may store a second liquid L2. In other words, the first liquid reservoir 11 and the second liquid reservoir 12 may have liquid storage spaces separated from each other and store different kinds of liquids L1 and L2. For example, the first liquid reservoir 11 and the second liquid reservoir 12 may be formed by a predetermined liquid storage space being divided by a partition. However, the scope of the present disclosure is not limited thereto.

[0046] As mentioned above, the first liquid L1 may have a different composition from the second liquid L2. However, a specific composition of each of the liquids L1 and L2 may vary according to embodiments.

[0047] In some embodiments, the first liquid L1 may include an aerosol-forming agent, and the second liquid L2 may include a flavoring agent. In this case, vapor production may be enhanced as the first liquid L1 is vaporized, and simultaneously, flavor expression may also be enhanced as the second liquid L2 is vaporized. In other words, since a proportion of the aerosol-forming agent can be increased through the first liquid L1, and separately, a proportion of the flavoring agent can also be increased through the second liquid L2, vapor production and flavor expression can be simultaneously enhanced.

[0048] Also, in some embodiments, the first liquid L1 may include a first flavoring agent, and the second liquid L2 may include a second flavoring agent different from the first flavoring agent. In this case, expression of the first flavoring agent may be enhanced as the first liquid L1 is vaporized, and simultaneously, expression of the second flavoring agent may also be enhanced as the second liquid L2 is vaporized. In other words, since a proportion of the first flavoring agent can be increased through the first liquid L1, and separately, a proportion of the second flavoring agent can also be increased through the second liquid L2, the expression of the first flavoring agent and the expression of the second flavoring agent can be simultaneously enhanced.

[0049] Also, in some embodiments, the first liquid L1 may include a flavoring agent and an aerosol-forming agent, and the second liquid L2 may also include a flavoring agent and an aerosol-forming agent. Here, the flavoring agent included in the first liquid L1 and the flavoring agent included in the second liquid L2 may be the same as or different from each other. Even in this case, vapor production and flavor expression can be simultaneously enhanced.

[0050] Next, the wicking element 14 may absorb the plurality of liquids L1 and L2 stored in the liquid reservoirs 11 and 12, respectively, and transfer the absorbed liquids L1 and L2 to the vaporizing element 15. For example, the wicking element 14 may be implemented using a ma-

terial that can easily absorb a liquid substance, such as cotton, silica, a bead assembly, and a porous body (e.g., a porous ceramic), but the scope of the present disclosure is not limited thereto. The wicking element 14 may be implemented using any other material (or form) as long as the wicking element 14 can absorb the liquids L1 and L2. The wicking element 14 may be substituted with another type of liquid transfer means known in the art.

[0051] Next, the vaporizing element 15 may vaporize the liquids L1 and L2, which are transferred thereto by the wicking element 14, to generate an aerosol. As illustrated, the vaporizing element 15 may be implemented as a heating element (e.g., a heating coil) configured to vaporize the liquids L1 and L2 by heating, but the scope of the present disclosure is not limited thereto. For example, the vaporizing element 15 may be implemented as a vibration element configured to vaporize a liquid through vibrations. However, hereinafter, in order to provide convenience of understanding, description will be continued assuming that the vaporizing element 15 is implemented as the heating element.

[0052] FIG. 1 illustrates an example in which the plurality of liquids L1 and L2 are vaporized together by a single vaporizing element 15, but the scope of the present disclosure is not limited thereto, and the vaporizing element 15 may consist of a first vaporizing element configured to vaporize the first liquid L1 and a second vaporizing element configured to vaporize the second liquid L2. For example, the vaporizing element 15 may consist of a first heating element configured to heat a portion at which the first liquid L1 is mostly absorbed and transferred by the wicking element 14 (e.g., a left side portion) and a second heating element configured to heat a portion at which the second liquid L2 is mostly absorbed and transferred by the wicking element 14 (e.g., a right side portion). In this case, a degree of vaporization (or a degree of supply) of the liquids L1 and L2 can be independently adjusted through power supplied to each vaporizing element.

[0053] Next, the airflow tube 13 may be a structure to which a gas such as air or an aerosol A formed (generated) by the vaporizing element 15 is transferred. FIG. 1 illustrates an example in which the airflow tube 13 is disposed at the center of the multi-cartridge 10, but the position of the airflow tube 13 may be changed in any way according to design of an airflow path.

[0054] The multi-cartridge 10 according to some embodiments of the present disclosure has been described above with reference to FIG. 1. Hereinafter, a multi-cartridge 20 according to some other embodiments of the present disclosure will be described with reference to FIG. 2. However, for clarity of the present disclosure, description of content overlapping with the previous embodiment will be omitted.

[0055] As illustrated in FIG. 2, the multi-cartridge 20 according to the present embodiment may be formed to have a structure in which a plurality of liquids L1 and L2 are vaporized independently from each other to form aer-

osols and the formed aerosols are mixed.

[0056] Specifically, as illustrated, the multi-cartridge 20 may include a plurality of liquid reservoirs 21 and 22, a plurality of wicking elements 24 and 26, a plurality of vaporizing elements 25 and 27, and an airflow tube 23.

[0057] The liquid reservoirs 21 and 22 may correspond to the liquid reservoirs 11 and 12 of the previous embodiment. Therefore, description thereof will be omitted.

[0058] Next, among the plurality of wicking elements, a first wicking element 24 may absorb a first liquid L1 from a first liquid reservoir 21 and transfer the absorbed first liquid L1 to a first vaporizing element 25. Also, a second wicking element 26 may absorb a second liquid L2 from a second liquid reservoir 22 and transfer the absorbed second liquid L2 to a second vaporizing element 27.

[0059] Next, among the plurality of vaporizing elements 25 and 27, the first vaporizing element 25 may vaporize the first liquid L1 to generate a first aerosol, and the second vaporizing element 27 may vaporize the second liquid L2 to generate a second aerosol. The generated first aerosol and second aerosol may meet in a predetermined mixing space and be mixed therein, and the mixture may flow through the airflow tube 23. Alternatively, the first aerosol and the second aerosol may be mixed in the airflow tube 23.

[0060] Next, the airflow tube 23 may correspond to the airflow tube 13 of the previous embodiment. Therefore, description thereof will be omitted.

[0061] The multi-cartridge 20 according to some other embodiments of the present disclosure has been described above with reference to FIG. 2. Hereinafter, a multi-cartridge 30 according to still some other embodiments of the present disclosure will be described with reference to FIG. 3.

[0062] As illustrated in FIG. 3, the multi-cartridge 30 according to the present embodiment may be formed to have a structure in which a plurality of cartridges 31 and 32 are mounted. To this end, the multi-cartridge 30 may be configured to include the plurality of cartridges 31 and 32 and a cartridge holder 33.

[0063] Each of the cartridges 31 and 32 may correspond to a single cartridge or the above-described multi-cartridge (e.g., 10 or 20). Each of the cartridges 31 and 32 may only serve to store the liquids L1 and L2 or also serve to vaporize the liquids L1 and L2. Each of the cartridges 31 and 32 may be mounted on or detached from the cartridge holder 33. In order to avoid repeated description, further description of the cartridges 31 and 32 will be omitted.

[0064] Next, the cartridge holder 33 may be a structure on which the plurality of cartridges 31 and 32 are mounted. The cartridge holder 33 may only serve to allow the plurality of cartridges 31 and 32 to be mounted thereon or also serve to adjust a degree of supply or a degree of vaporization of the liquids L1 and L2 stored in the cartridges 31 and 32, respectively. Ways in which the degree of vaporization of the liquids L1 and L2 is adjusted will

be described in detail below with reference to FIGS. 4 and 5.

[0065] The multi-cartridge 30 according to still some other embodiments of the present disclosure has been described above with reference to FIG. 3. Hereinafter, various ways in which a degree of vaporization (or degree of supply) of a stored liquid (e.g., L1) is adjusted in the above-described multi-cartridges 10 to 30 will be described with reference to FIG. 4 and so on.

[0066] FIGS. 4 and 5 are exemplary views for describing ways in which a degree of vaporization is adjusted in a multi-cartridge 40 according to some embodiments of the present disclosure. In particular, in FIGS. 4 and 5, in order to provide convenience of understanding, illustrations of components such as a wicking element (e.g., 14), a vaporizing element (e.g., 15), and an airflow tube (e.g., 13) have been omitted. Also, the multi-cartridge 40 illustrated in FIGS. 4 and 5 may correspond to the multi-cartridges 10 to 30 described above with reference to FIGS. 1 to 3, and directions and thicknesses of arrows in FIGS. 4 and 5 indicate liquid transfer directions and amounts of transferred liquid. Also, FIGS. 4 and 5 illustrate a case in which the amount of transferred second liquid L2 is adjusted to be larger than the amount of transferred first liquid L1.

[0067] As illustrated in FIGS. 4 and 5, the first liquid L1 stored in a first liquid reservoir 41 may be transferred through a first transfer path 43, and the second liquid L2 stored in a second liquid reservoir 42 may be transferred through a second transfer path 44. For example, the first liquid L1 may be transferred to a wicking element (e.g., 14) or a vaporizing element (e.g., 15) through the first transfer path 43.

[0068] In such a case, the multi-cartridge 40 may adjust a degree of vaporization of the liquids L1 and L2 by using adjusting members 45 to 48 configured to adjust a degree of opening of the liquid transfer paths 43 and 44. Specifically, the multi-cartridge 40 may include first adjusting members 45 and 47 configured to adjust the degree of opening of the first transfer path 43 and second adjusting members 46 and 48 configured to adjust the degree of opening of the second transfer path 44. Also, as the degree of opening of each of the transfer paths 43 and 44 is adjusted by each of the adjusting members 45 to 48, a degree of supply (e.g., a supply speed, a supply amount) of the liquids L1 and L2 may be adjusted. Also, as a result, the degree of vaporization of each of the liquids L1 and L2 may be adjusted. For example, as the first adjusting member 45 closes the first transfer path 43, vaporization of the first liquid L1 may be stopped, and as the first adjusting member 45 completely opens the first transfer path 43, the vaporization of the first liquid L1 may be accelerated.

[0069] Meanwhile, the adjusting members 45 to 48 may be implemented in various ways.

[0070] As an example, as illustrated in FIG. 4, the adjusting members 45 and 46 may be implemented as structures that are disposed perpendicular to the liquid

transfer paths 43 and 44 to open or close the liquid transfer paths 43 and 44.

[0071] As another example, as illustrated in FIG. 5, the adjusting members 47 and 48 may be implemented as rotary plates in which a plurality of holes 481 and 482 of different sizes are formed. The rotary plate 48 may adjust a degree of supply of the liquids L1 and L2 through the plurality of holes 481 and 482. For example, as a first hole 481 having a relatively smaller size is located on a second liquid transfer path 44 due to rotation of the rotary plate 48, a supply amount of the second liquid L2 may be relatively decreased, and as a second hole 482 having a relatively larger size is located on the second liquid transfer path 44 due to rotation of the rotary plate 48, the supply amount of the second liquid L2 may be relatively increased. Of course, as a portion where a hole (e.g., 481 or 482) is not formed is located on the second liquid transfer path 44 due to rotation of the rotary plate 48, the supply of the second liquid L2 may be stopped.

[0072] However, the scope of the present disclosure is not limited by the above-described examples, and the adjusting members 45 to 48 may be implemented on the basis of various forms of valve structures known in the art.

[0073] Meanwhile, according to some other embodiments of the present disclosure, the degree of vaporization of the liquids L1 and L2 may be adjusted through power supplied to the vaporizing elements (e.g., 25, 27). For example, a degree of vaporization of the first liquid L1 may be adjusted by adjusting power supplied to the first vaporizing element (e.g., 25) configured to vaporize the first liquid L1. This is because a vaporization amount (or vaporization speed) of the first liquid L1 will increase with an increase in the power supplied to the first vaporizing element (e.g., 25). The power supplied to the vaporizing elements (e.g., 25, 27) may be controlled by a controller (e.g., 120 of FIG. 7).

[0074] The ways in which the degree of vaporization of the liquids L1 and L2 is adjusted in the multi-cartridge 40 have been described above with reference to FIGS. 4 and 5. According to the above description, by adjusting the degree of opening of the liquid transfer paths 43 and 44 using the adjusting members 45 to 48 or adjusting the power supplied to the vaporizing elements (e.g., 25, 27), the degree of vaporization of the liquids L1 and L2 may be accurately and easily adjusted.

[0075] Hereinafter, a method of providing a customized smoking experience using the above-described multi-cartridge 40 will be described with reference to FIG. 6. In particular, FIG. 6 illustrates an example in which a multi-cartridge consists of three cartridges (or liquid reservoirs) 51 to 53 and the cartridges 51 to 53 store different liquids L1 to L3, respectively. Hereinafter, description will be given with reference to FIG. 6.

[0076] When a degree of vaporization of each of the liquids L1 to L3 is adjusted as described above, a customized smoking experience can be provided to a user. Specifically, when the degree of vaporization of each of the liquids L1 to L3 is implemented to be adjusted on the

basis of a user input, types and amounts of components included in aerosols (e.g., A1, A2) may be changed according to a user input, and thus a customized smoking experience can be provided to the user. In other words, a user may adjust the degree of vaporization of each of the liquids L1 to L3 according to his or her preferences, and thus a customized smoking experience can be provided to the user. For example, the controller (e.g., 120 of FIG. 7) may adjust the degree of vaporization of each of the liquids L1 to L3 on the basis of a received user input to generate customized aerosols (e.g., A1, A2). However, the scope of the present disclosure is not limited thereto.

[0077] As a specific example, as illustrated, a user may adjust a first liquid L1 and a second liquid L2 to be vaporized in equal proportions to generate a customized aerosol A1 in which components of the first liquid L1 and the second liquid L2 are uniformly combined. For example, a user may generate an aerosol in which components of a first flavoring agent and components of a second flavoring agent are uniformly combined.

[0078] Alternatively, a user may adjust a first liquid L1, a second liquid L2, and a third liquid L3 to be vaporized in different proportions to generate a customized aerosol A2 in which components of the first to third liquids L1 to L3 are combined in different proportions. For example, a user may generate an aerosol in which components of a first flavoring agent, a second flavoring agent, and a third flavoring agent are combined in different proportions.

[0079] In some embodiments, a multi-cartridge may be configured as illustrated in FIG. 3. In this case, a user may mount a cartridge containing a preferred liquid on a cartridge holder (e.g., 33) and receive a customized smoking experience by changing a degree of vaporization of the liquid. Also, the user may receive various smoking experiences by changing the cartridge mounted on the cartridge holder (e.g., 33).

[0080] Also, according to some embodiments of the present disclosure, the controller (e.g., 120 of FIG. 7) of an aerosol generation device (e.g., 100-1 of FIG. 7) to which the multi-cartridge is applied may provide various convenience functions for a customized smoking experience.

[0081] For example, the controller (e.g., 120 of FIG. 7) may provide a function of storing and loading combination information of a liquid. Here, the combination information may include information on the type of liquid and a degree of vaporization of the liquid. In this example, when an aerosol having preferred characteristics is formed, a user may store combination information including the type of liquid and a degree of vaporization of the liquid and may later load the stored information to be provided with the preferred aerosol again.

[0082] As another example, the controller (e.g., 120 of FIG. 7) may provide a function of storing a history of combination information of a liquid. Also, the controller may separately store or recommend to a user a liquid combi-

nation repeatedly used by the user or liquid combinations used in succession by the user.

[0083] As still another example, the controller (e.g., 120 of FIG. 7) may provide an automatic liquid combining function. As a more specific example, the controller may randomly combine a plurality of liquids (e.g., randomly determine and combine types of liquids and degrees of vaporization thereof) and provide the liquid combination to a user (e.g., randomly combine types of liquids and degrees of vaporization thereof upon each puff and provide the liquid combination to the user). Alternatively, when a user has designated a base liquid, the controller may randomly combine another liquid with the base liquid and provide the liquid combination to the user. Alternatively, the controller may determine a base liquid on the basis of a liquid combination history (e.g., determine a frequently-used liquid, a liquid with a short usage interval, a recently-used liquid, or the like as the base liquid), randomly combine another liquid with the determined base liquid, and provide the liquid combination to the user. Alternatively, the controller may, on the basis of a liquid combination history, combine liquids with a recipe not experienced by a user (e.g., combine liquids with proportions not present in the existing history) and provide the liquid combination to the user. Alternatively, the controller may change a combination of liquids on the basis of degrees of consumption of the liquids (e.g., reduce a degree of vaporization of a liquid that is consumed more or consumed at a high speed or increase a degree of vaporization of a liquid that is consumed less or consumed at a low speed) and provide the liquid combination to the user.

[0084] The method of providing a customized smoking experience by using the multi-cartridge (e.g., 40) according to some embodiments of the present disclosure has been described above with reference to FIG. 6. Hereinafter, various types of aerosol generation devices 100-1 to 100-3 to which the above-described multi-cartridges (e.g., 10 to 40) may be applied (or which include the above-described multi-cartridges) will be described with reference to FIGS. 7 to 9.

[0085] FIG. 7 is an exemplary view schematically illustrating the aerosol generation device 100-1 according to some embodiments of the present disclosure.

[0086] As illustrated in FIG. 7, the aerosol generation device 100-1 may include a housing, a mouthpiece 110, a vaporizer 1, a battery 130, and a controller 120. However, only the components relating to the embodiment of the present disclosure are illustrated in FIG. 7. Therefore, those of ordinary skill in the art to which the present disclosure pertains should understand that the aerosol generation device 100-1 may further include general-purpose components other than the components illustrated in FIG. 7. For example, the aerosol generation device 100-1 may further include an input module (e.g., a button, a touchable display, etc.) for receiving a command or the like from a user and an output module (e.g., a light emitting diode (LED), a display, or a vibration motor, etc.) for

outputting a state, smoking information, or the like of the aerosol generation device 100-1. Hereinafter, each component of the aerosol generation device 100-1 will be described.

[0087] The housing may form the overall exterior of the aerosol generation device 100-1. The housing may be implemented using a material that can protect components therein.

[0088] Next, the mouthpiece 110 may be disposed at one end of the aerosol generation device 100-1 and come into contact with the oral region of a user. By making a puff while holding the mouthpiece 110 in his or her mouth, the user may inhale an aerosol generated from the vaporizer 1.

[0089] Next, the vaporizer 1 may vaporize a liquid composition to generate an aerosol. The vaporizer 1 may be a component that corresponds to the above-described multi-cartridges (e.g., 10 to 40) or may be a component that includes the above-described multi-cartridges (e.g., 10 to 40). In order to avoid repeated description, further description of the vaporizer 1 will be omitted.

[0090] Next, the battery 130 may supply power used to operate the aerosol generation device 100-1. For example, the battery 130 may supply power to allow the vaporizer 1 to generate an aerosol and may supply power required for the operation of the controller 120.

[0091] Also, the battery 130 may supply power required to operate electrical components such as a display (not illustrated), a sensor (not illustrated), and a motor (not illustrated) which are installed in the aerosol generation device 100-1.

[0092] Next, the controller 120 may control the overall operation of the aerosol generation device 100-1. For example, the controller 120 may control the operation of the vaporizer 1 and the battery 130 and may also control the operation of other components included in the aerosol generation device 100-1. The controller 120 may control the power supplied by the battery 130, a vaporization speed of the vaporizer 1, and the like. Also, the controller 120 may check a state of each of the components of the aerosol generation device 100-1 and determine whether the aerosol generation device 100-1 is in an operable state.

[0093] The controller 120 may be implemented with at least one controller (processor). The controller may also be implemented with an array of a plurality of logic gates or implemented with a combination of a general-purpose microcontroller and a memory which stores a program that may be executed by the microcontroller. Also, those of ordinary skill in the art to which the present disclosure pertains should understand that the controller 120 may also be implemented with other forms of hardware.

[0094] Hereinafter, other types of aerosol generation devices 100-2 and 100-3 will be described with reference to FIGS. 8 and 9. However, for clarity of the present disclosure, description of content overlapping with the previous embodiment will be omitted.

[0095] FIGS. 8 and 9 are views for describing the aer-

osol generation devices 100-2 and 100-3 according to some other embodiments of the present disclosure. In particular, FIG. 8 and so on illustrate examples in which an aerosol-generating article 150 is accommodated (inserted) in the devices 100-2 and 100-3.

[0096] As illustrated in FIGS. 8 and 9, the aerosol generation devices 100-2 and 100-3 according to the present embodiment may further include a heater part 140 configured to heat the aerosol-generating article 150. Also, the aerosol generation devices 100-2 and 100-3 may have an airflow path formed to allow an aerosol generated in the vaporizer 1 to pass through the aerosol-generating article 150 and be delivered to the user.

[0097] FIG. 8 illustrates a case in which the heater part 140 (or the aerosol-generating article 150) and the vaporizer 1 are disposed in parallel, and FIG. 9 illustrates a case in which the heater part 140 (or the aerosol-generating article 150) and the vaporizer 1 are disposed in series. However, an internal structure of the aerosol generation devices 100-2 and 100-3 is not limited to the examples of FIGS. 8 and 9, and the arrangement of the components may be changed in any way.

[0098] The heater part 140 may heat the aerosol-generating article 150 accommodated in an accommodation space. The accommodation space may be formed by housings of the aerosol generation devices 100-2 and 100-3. Specifically, when the aerosol-generating article 150 is accommodated in the accommodation spaces of the aerosol generation devices 100-2 and 100-3, the heater part 140 may heat the aerosol-generating article 150 using power supplied from the battery 130.

[0099] An operation method and/or an implementation form of the heater part 140 may vary.

[0100] For example, the heater part 140 may operate using a resistive heating method. For example, the heater part 140 may include an electrically insulating substrate (e.g., a substrate formed of polyimide) and an electrically conductive track and may include an electrically-resistive heating element configured to generate heat as current flows in the electrically conductive track.

[0101] As another example, the heater part 140 may operate using an induction heating method. For example, the heater part 140 may include an induction coil and a heating element (that is, a susceptor) inductively heated by the induction coil. The susceptor may be disposed outside the aerosol-generating article 150 or inside the aerosol-generating article 150.

[0102] However, the scope of the present disclosure is not limited to the above examples, and the heater part 140 may operate using any other method as long as the heater part 140 can heat the aerosol-generating article 150 to a desired temperature. Here, the desired temperature may be preset in the aerosol generation devices 100-2 and 100-3 (e.g., a temperature profile may be prestored therein) or may be set by the user.

[0103] The aerosol-generating article 150 may have a structure similar to that of a general combustion-type cigarette. For example, the aerosol-generating article 150

may be divided into an aerosol-forming substrate part which includes an aerosol-forming substrate (e.g., an aerosol-forming agent, a nicotine-generating substrate, etc.) and a filter part which includes a filter material. At least a portion of the aerosol-forming substrate part may be inserted into the aerosol generation devices 100-2 and 100-3, and the filter part may be exposed to the outside, but the present disclosure is not limited thereto. The user may smoke while holding the filter part in his or her mouth.

[0104] Various types of aerosol generation devices 100-1 to 100-3 to which the multi-cartridges (e.g., 10 to 40) according to some embodiments of the present disclosure may be applied have been described above with reference to FIGS. 7 to 9.

[0105] All the components constituting the embodiments of the present disclosure have been described above as being combined into one body or being operated in combination, but the technical spirit of the present disclosure is not necessarily limited to the embodiments. That is, any one or more of the components may be selectively operated in combination within the intended scope of the present disclosure.

[0106] The embodiments of the present disclosure have been described above with reference to the accompanying drawings, but those of ordinary skill in the art to which the present disclosure pertains should understand that the present disclosure may be embodied in other specific forms without changing the technical spirit or essential features thereof. Therefore, the embodiments described above should be understood as being illustrative, instead of limiting, in all aspects. The scope of the present disclosure should be interpreted according to the claims below, and any technical spirit within the scope equivalent to the claims should be interpreted as falling within the scope of the technical spirit defined by the present disclosure.

Claims

1. An aerosol generation device comprising:

a first liquid reservoir in which a first liquid composition is stored;
a second liquid reservoir in which a second liquid composition different from the first liquid composition is stored; and
a vaporizing element configured to vaporize at least one of the first liquid composition and the second liquid composition to generate an aerosol.

2. The aerosol generation device of claim 1, further comprising a housing configured to form an accommodation space for accommodating an aerosol-generating article,

- wherein an airflow path is formed to allow the generated aerosol to pass through the aerosol-generating article accommodated in the accommodation space,
the first liquid composition includes an aerosol-forming agent, and
the second liquid composition includes a flavoring agent.
3. The aerosol generation device of claim 1, wherein:
- the first liquid composition includes a flavoring agent and an aerosol-forming agent; and
the second liquid composition also includes a flavoring agent and an aerosol-forming agent.
4. The aerosol generation device of claim 1, wherein the vaporizing element vaporizes the first liquid composition and the second liquid composition together in a vaporization space.
5. The aerosol generation device of claim 1, wherein:
- the vaporizing element includes a first vaporizing element configured to vaporize the first liquid composition to generate a first aerosol and a second vaporizing element configured to vaporize the second liquid composition to generate a second aerosol; and
an airflow path is formed so that the first aerosol and the second aerosol are mixed.
6. The aerosol generation device of claim 1, wherein:
- the first liquid reservoir is included in a first cartridge;
the second liquid reservoir is included in a second cartridge; and
the aerosol generation device further comprises a cartridge holder on which the first cartridge and the second cartridge are mounted.
7. The aerosol generation device of claim 1, wherein a degree of vaporization of the first liquid composition and the second liquid composition is adjusted on the basis of a user input.
8. The aerosol generation device of claim 1, wherein:
- the vaporizing element includes a first vaporizing element configured to vaporize the first liquid composition to generate a first aerosol and a second vaporizing element configured to vaporize the second liquid composition to generate a second aerosol; and
the aerosol generation device further comprises a controller configured to control power supplied to the first vaporizing element and the second
- vaporizing element to adjust a degree of vaporization of the first liquid composition and the second liquid composition.
9. The aerosol generation device of claim 1, wherein:
- the first liquid composition is transferred to the vaporizing element through a first transfer path; and
a degree of vaporization of the first liquid composition is adjusted by a degree of opening of the first transfer path.
10. The aerosol generation device of claim 9, further comprising a rotary plate which is disposed on the first transfer path and has a plurality of holes of different sizes formed therein, wherein the rotary plate is configured to, by rotation, cause at least one of the plurality of holes to be placed on the first transfer path to adjust the degree of opening of the first transfer path.
11. A multi-cartridge comprising:
- a first liquid reservoir in which a first liquid composition is stored;
a second liquid reservoir in which a second liquid composition different from the first liquid composition is stored; and
a vaporizing element configured to vaporize at least one of the first liquid composition and the second liquid composition.

FIG. 1

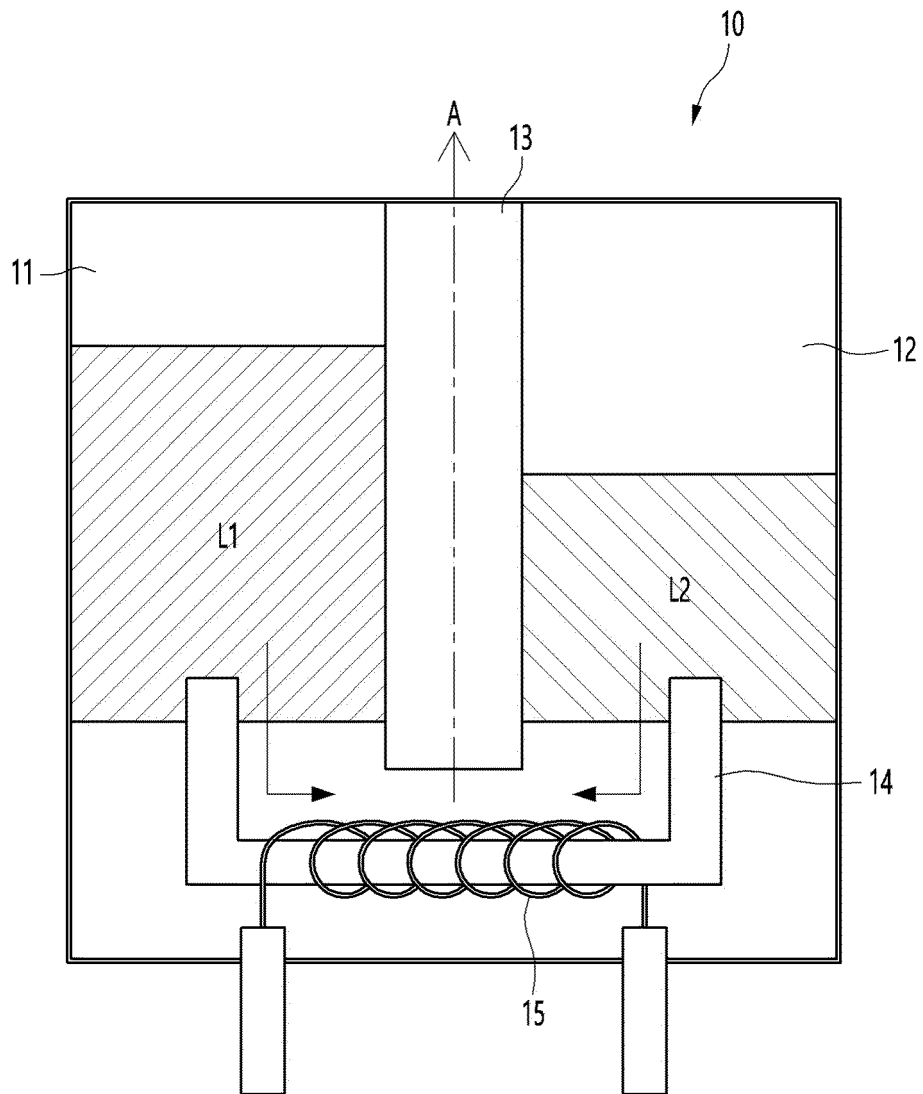


FIG. 2

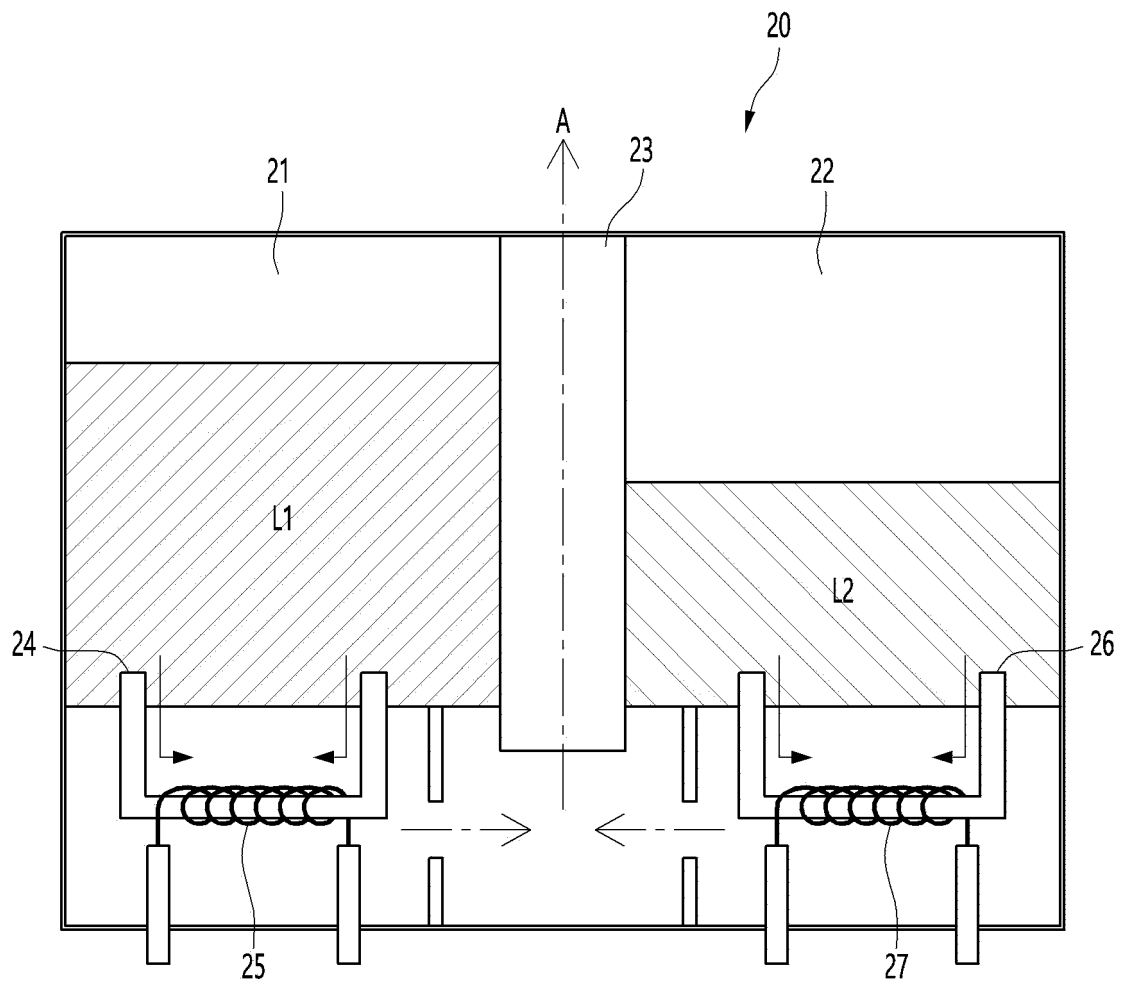


FIG. 3

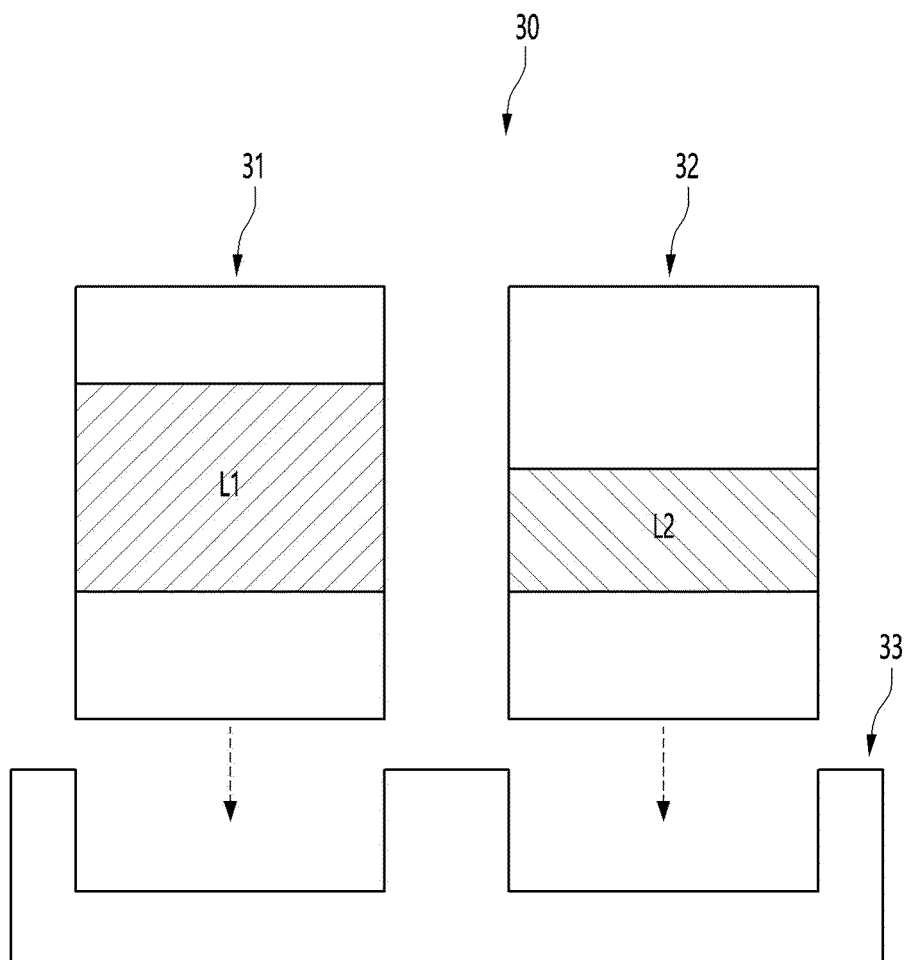


FIG. 4

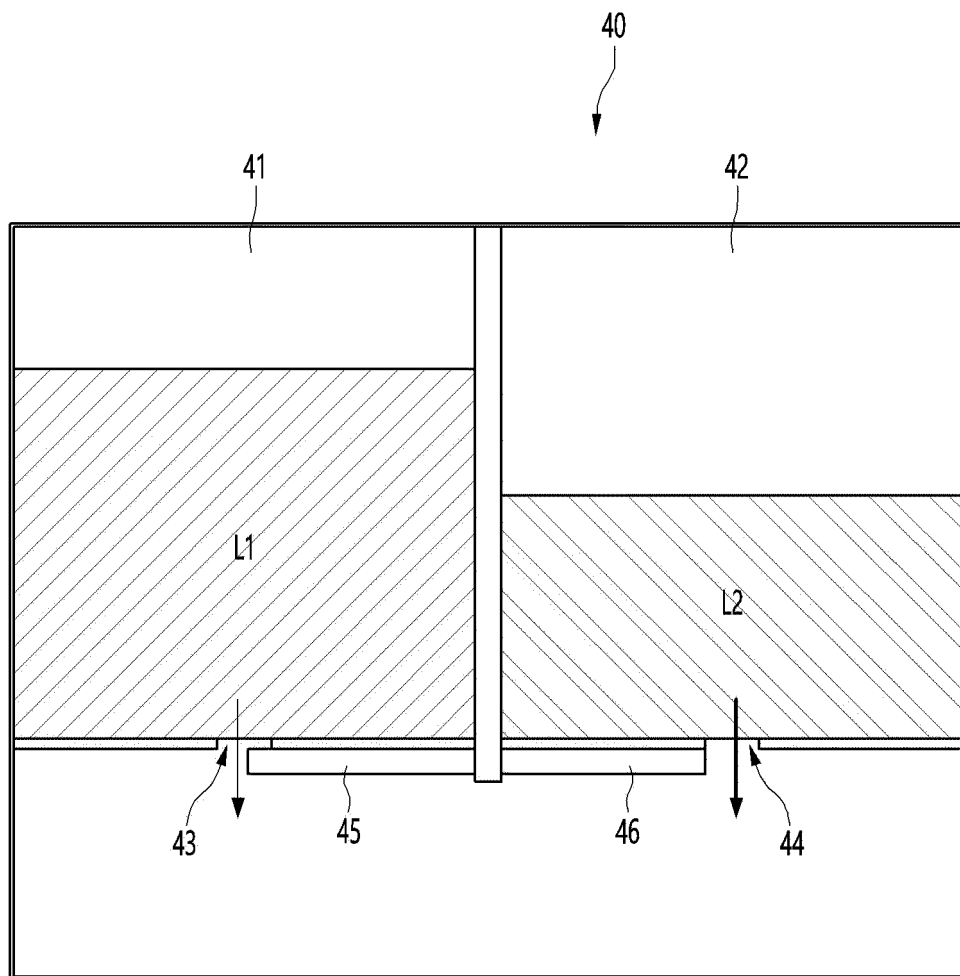


FIG. 5

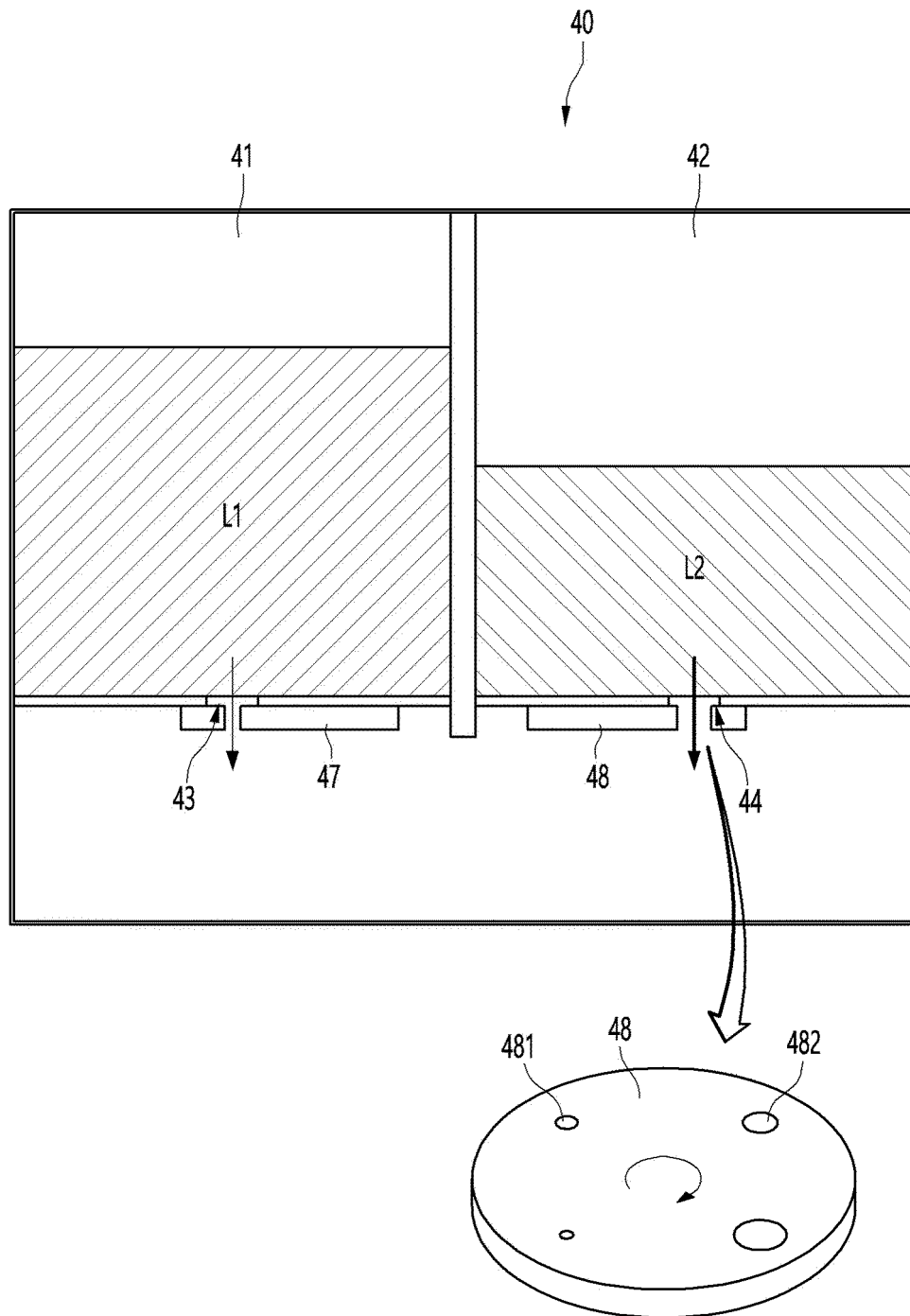


FIG. 6

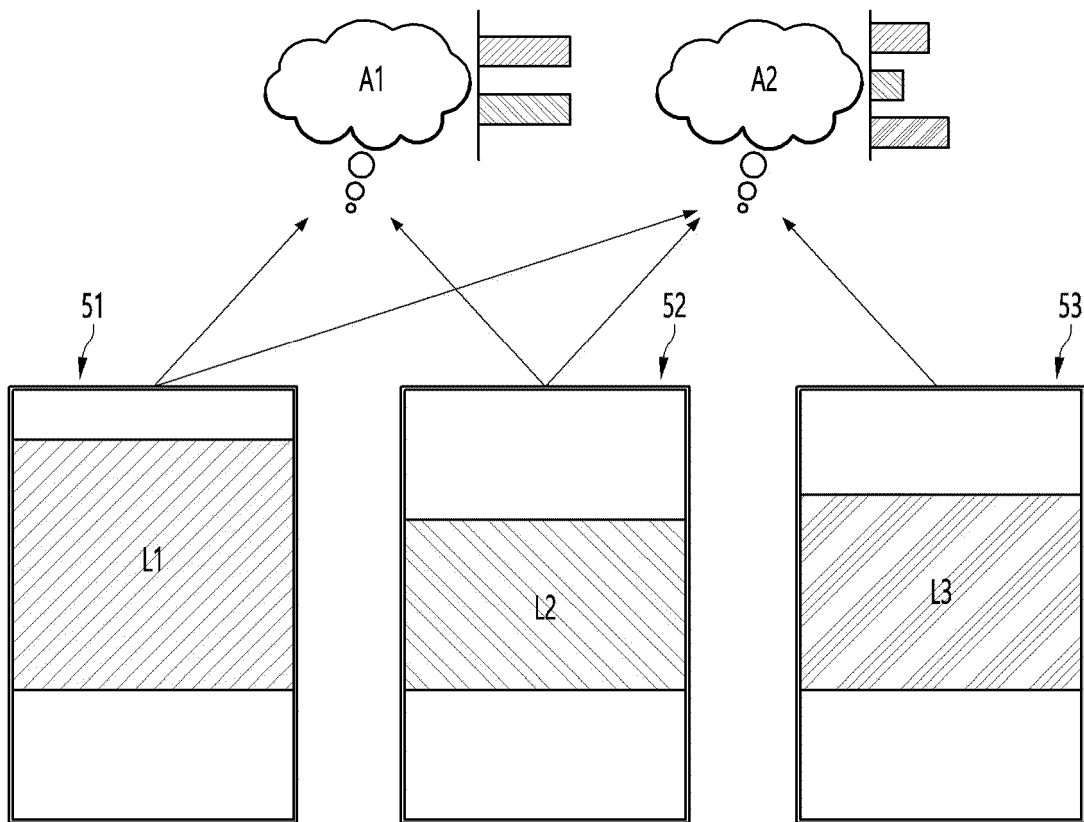


FIG. 7

100-1

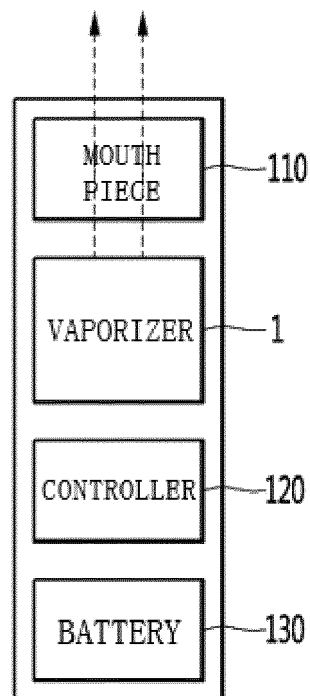
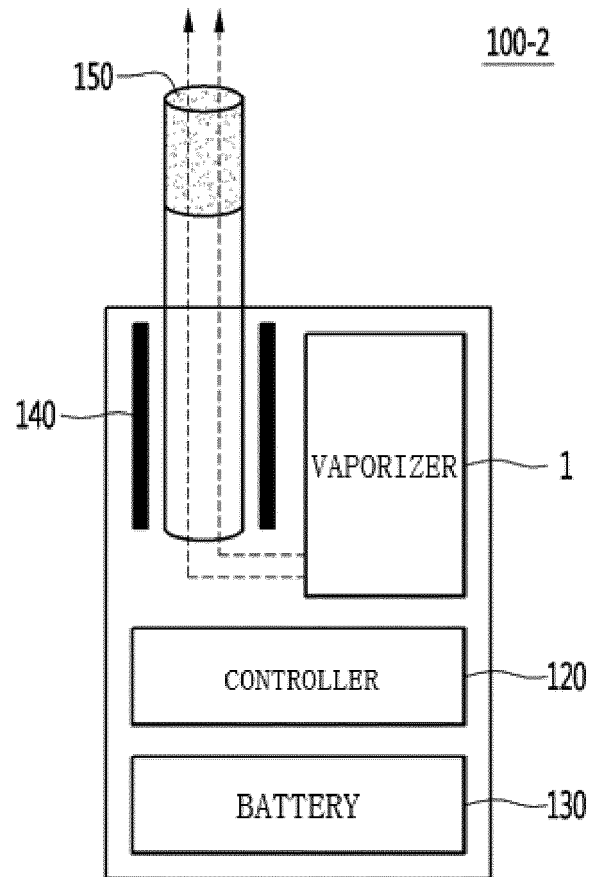
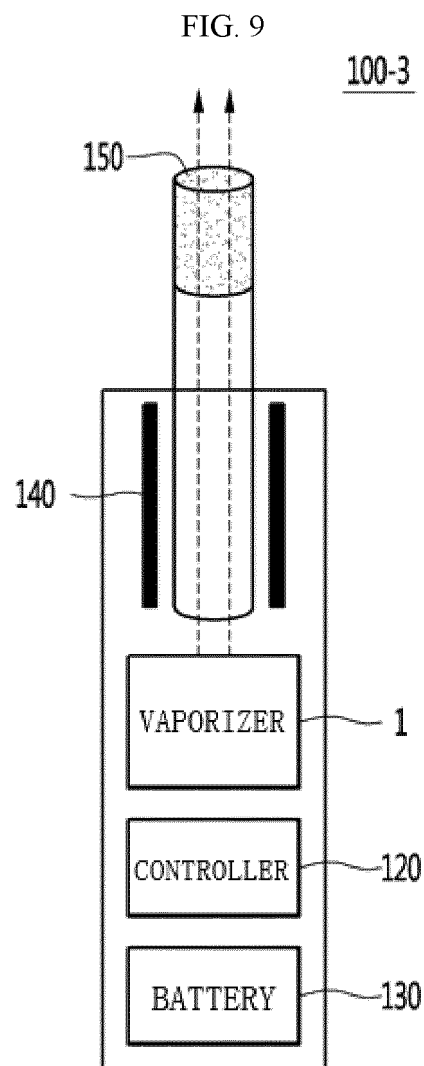


FIG. 8





INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2022/004203

A. CLASSIFICATION OF SUBJECT MATTER

A24F 40/30(2020.01)i; A24F 40/42(2020.01)i; A24F 40/10(2020.01)i; A24F 40/485(2020.01)i; A24B 15/167(2020.01)i;
A24F 40/60(2020.01)i; A24F 40/50(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 40/30(2020.01); A24B 15/167(2020.01); A24F 40/05(2020.01); A24F 40/40(2020.01); A24F 47/00(2006.01);
A61M 11/04(2006.01); A61M 15/06(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 발생 장치(aerosol-generating apparatus), 복수의 액상 저장조(multiple liquid storage tanks), 기화 요소(vaporizing element), 기화 조절 가능 경로(vaporizing-adjustable path), 회전판(rotating plate)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2018-0123701 A (PHILIP MORRIS PRODUCTS S.A.) 19 November 2018 (2018-11-19) See paragraphs [0007]-[0011], [0022]-[0040] and [0056]-[0072]; claim 1; and figures 1c and 4.	1-8,11
Y		9-10
Y	KR 10-2019-0087638 A (RAI STRATEGIC HOLDINGS, INC.) 24 July 2019 (2019-07-24) See claims 1 and 18.	9-10
X	KR 10-2021-0017296 A (KT & G CORPORATION) 17 February 2021 (2021-02-17) See paragraphs [0038] and [0086]-[0090]; claims 1 and 13; and figure 4.	1-4,6,11
A	US 2020-0107572 A1 (PHILIP MORRIS PRODUCTS S.A.) 09 April 2020 (2020-04-09) See entire document.	1-11

☒ 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

“E” earlier application or patent but published on or after the international filing date

“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

27 June 2022

Date of mailing of the international search report

27 June 2022

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon Building 4, 189 Cheongsang-ro, Seo-gu, Daejeon 35208

Facsimile No. +82-42-481-8578

Authorized officer

Telephone No.

Form PCT/ISA/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2022/004203

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2019-0039411 A (RAI STRATEGIC HOLDINGS, INC.) 11 April 2019 (2019-04-11) See entire document.	1-11
E	KR 10-2022-0064664 A (KT & G CORPORATION) 19 May 2022 (2022-05-19) See paragraphs [0028]-[0037] and [0059]-[0066]; and figures 1-3.	1-4,6-7,11

Form PCT/ISA/210 (second sheet) (July 2019)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2022/004203

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
KR 10-2018-0123701 A	19 November 2018	JP 2019-513362 A	30 May 2019
		JP 6862469 B2	21 April 2021
		US 10617152 B2	14 April 2020
		US 2017-0280778 A1	05 October 2017
		US 2020-0221770 A1	16 July 2020
		WO 2017-167511 A1	05 October 2017
KR 10-2019-0087638 A	24 July 2019	JP 2020-501557 A	23 January 2020
		US 10092039 B2	09 October 2018
		US 10285451 B2	14 May 2019
		US 10512287 B2	24 December 2019
		US 10842188 B2	24 November 2020
		US 2018-0160732 A1	14 June 2018
		US 2018-0352869 A1	13 December 2018
		US 2019-0230994 A1	01 August 2019
		US 2020-0113232 A1	16 April 2020
		WO 2018-109696 A1	21 June 2018
KR 10-2021-0017296 A	17 February 2021	KR 10-2330305 B1	24 November 2021
US 2020-0107572 A1	09 April 2020	JP 2020-522274 A	30 July 2020
		KR 10-2020-0016223 A	14 February 2020
		WO 2018-224677 A2	13 December 2018
		WO 2018-224677 A3	07 February 2019
KR 10-2019-0039411 A	11 April 2019	JP 2019-524108 A	05 September 2019
		US 10617151 B2	14 April 2020
		US 2018-0020722 A1	25 January 2018
		US 2020-214348 A1	09 July 2020
		WO 2018-015910 A2	25 January 2018
		WO 2018-015910 A3	07 June 2018
KR 10-2022-0064664 A	19 May 2022	None	

Form PCT/ISA/210 (patent family annex) (July 2019)