

US Patent & Trademark Office

Patent Public Search | Text View

United States Patent Application Publication

20250255341

Kind Code

A1

Publication Date

August 14, 2025

Inventor(s)

KIM; Tae Hun et al.

AEROSOL GENERATING DEVICE

Abstract

According to an exemplary embodiment, provided is an aerosol generating device including a body portion comprising a vaporizer configured to generate aerosol by heating a liquid composition; and one or more air flow paths configured to cause the generated aerosol to pass through a cigarette and be discharged to outside; and a cover coupled to the body portion and comprising a plurality of passages comprising a first passage and a second passage which are independent from each other and guide air to an entrance of the vaporizer along at least part of a surface of the body portion.

Inventors: KIM; Tae Hun (Yongin-si, KR), PARK; Jong Sun (Suwon-si, KR)

Applicant: KT&G CORPORATION (Daejeon, KR)

Family ID: 66331449

Assignee: KT&G CORPORATION (Daejeon, KR)

Appl. No.: 19/192813

Filed: April 29, 2025

Foreign Application Priority Data

KR 10-2017-0142578

Oct. 30, 2017

KR 10-2018-0062137

May. 30, 2018

Related U.S. Application Data

parent US continuation 16759441 20200427 parent-grant-document US 12317923 WO
continuation PCT/KR2018/012807 20181026 child US 19192813

Publication Classification

Int. Cl.: **A24F40/30** (20200101); **A24B15/167** (20200101); **A24D1/20** (20200101); **A24D3/17** (20200101); **A24F15/01** (20200101); **A24F40/10** (20200101); **A24F40/20** (20200101); **A24F40/40** (20200101); **A24F40/42** (20200101); **A24F40/44** (20200101); **A24F40/46** (20200101); **A24F40/485** (20200101); **A24F40/50** (20200101); **A24F40/51** (20200101); **A24F40/57** (20200101); **A24F40/60** (20200101); **A24F40/65** (20200101); **A24F40/90** (20200101); **A24F40/95** (20200101); **F21V3/00** (20150101); **F21V5/00** (20180101); **F21Y115/10** (20160101); **G02B19/00** (20060101); **H05B3/54** (20060101); **H05K1/02** (20060101); **H05K1/14** (20060101); **H05K1/18** (20060101)

U.S. Cl.:

CPC **A24F40/30** (20200101); **A24B15/167** (20161101); **A24D1/20** (20200101); **A24D3/17** (20200101); **A24F15/01** (20200101); **A24F40/40** (20200101); **A24F40/42** (20200101); **A24F40/44** (20200101); **A24F40/46** (20200101); **A24F40/485** (20200101); **A24F40/50** (20200101); **A24F40/57** (20200101); **A24F40/60** (20200101); **A24F40/65** (20200101); **A24F40/90** (20200101); **A24F40/95** (20200101); **F21V3/00** (20130101); **F21V5/00** (20130101); **G02B19/0009** (20130101); **G02B19/0061** (20130101); **H05B3/54** (20130101); **H05K1/0203** (20130101); **H05K1/0277** (20130101); **H05K1/148** (20130101); **H05K1/181** (20130101); **A24F40/10** (20200101); **A24F40/20** (20200101); **A24F40/51** (20200101); **F21Y2115/10** (20160801); **H05K2201/012** (20130101); **H05K2201/0154** (20130101); **H05K2201/10219** (20130101)

Background/Summary

CROSS REFERENCE TO RELATED APPLICATIONS [0001] This application is a continuation of U.S. application Ser. No. 16/759,441 filed Apr. 27, 2020, which is a National Stage of International Application No. PCT/KR2018/012807 filed Oct. 26, 2018, claiming priority based on Korean Patent Application No. 10-2017-0142578 filed Oct. 30, 2017 and Korean Patent Application No. 10-2018-0062137 filed May 30, 2018.

TECHNICAL FIELD

[0002] The present disclosure relates to an aerosol generating device, and more particularly, to an aerosol generating device capable of generating an aerosol having various flavors by passing an aerosol generated by a vaporizer through a cigarette.

BACKGROUND ART

[0003] Recently, the demand for alternative methods to overcome the shortcomings of general cigarettes has increased. For example, there is an increasing demand for a method of generating aerosol by heating an aerosol generating material in cigarettes, rather than by burning cigarettes. Accordingly, studies on a heating-type cigarette and a heating-type aerosol generating device have been actively conducted.

[0004] Meanwhile, to provide a user with an improved smoking experience, an aerosol generating device that uses a liquid composition as an aerosol generating source with a cigarette has been developed. For example, there has been developed an aerosol generating device which includes a vaporizer for heating a liquid composition to generate an aerosol and allows the aerosol generated by the vaporizer to pass through the cigarette and be delivered to the user. However, in such an aerosol generating device air introduced into the aerosol generating device needs to pass through not only the cigarette but also the vaporizer to be delivered to the user. As a result, the air flow path may increase or may be more complex as compared to the related art. In this case, if the number of air inlets is maintained to be the same as in the related art, the performance of the aerosol

generating device may be degraded because of unsmooth air flow in the aerosol generating device. Accordingly, technology for facilitating air flow in the aerosol generating device may be required.

DESCRIPTION OF EMBODIMENTS

Solution to Problem

[0005] Provided are an aerosol generating device. The technical solution of the present disclosure is not limited to the above-described technical problems, and other technical problems may be deduced from the following embodiments. For example, an aerosol generating device may include a body portion comprising a vaporizer configured to heat a liquid composition to generate an aerosol and one or more air flow paths for causing the generated aerosol to pass through a cigarette and discharged to the outside, and a cover coupled to the body portion and comprising a plurality of passages comprising a first passage and a second passage which are independent from each other and guide air to an entrance of the vaporizer along at least a part of the surface of the body portion.

Advantageous Effects of Disclosure

[0006] The present disclosure may provide an aerosol generating device including a cover coupled to a body portion. Specifically, the aerosol generating device according to the present disclosure may include a body portion comprising a vaporizer for heating a liquid composition to generate an aerosol and one or more air flow paths for causing the generated aerosol to pass through a cigarette and discharged to the outside, and a cover coupled to the body portion and comprising a plurality of independent passages that guide air to an entrance of the vaporizer along at least a part of the surface of the body portion.

[0007] According to the present disclosure, the plurality of passages through which air is introduced into the vaporizer included in the aerosol generating device are formed, thereby achieving a smooth air flow in the aerosol generating device, and effectively preventing the performance degradation of the aerosol generating device.

Description

BRIEF DESCRIPTION OF DRAWINGS

[0008] FIGS. 1 and 2 are diagrams showing examples in which a cigarette is inserted into an aerosol generating device.

[0009] FIG. 3 is a drawing illustrating an example of a cigarette.

[0010] FIG. 4A is a perspective view of an aerosol generating device according to an exemplary embodiment, and FIG. 4B is a perspective view showing an operating state of the aerosol generating device shown in FIG. 4A.

[0011] FIG. 5 is a cross-sectional view taken along line V-V of FIG. 4B to show a configuration of the aerosol generating device according to an exemplary embodiment.

[0012] FIGS. 6A to 6D are bottom views of examples of an inner housing included in a cover for an aerosol generating device according to an exemplary embodiment.

[0013] FIGS. 7A to 7C are diagrams illustrating examples of an air inlet formed by a cover for an aerosol generating device according to an exemplary embodiment.

BEST MODE

[0014] According to an aspect of the present disclosure, an aerosol generating device may include a body portion comprising a vaporizer configured to generate aerosol by heating a liquid composition; and one or more air flow paths configured to cause the generated aerosol to pass through a cigarette and be discharged to outside; and a cover coupled to the body portion and comprising a plurality of passages comprising a first passage and a second passage which are independent from each other and guide air to an entrance of the vaporizer along at least part of a surface of the body portion.

[0015] The cover may include an outer housing comprising a first through hole through which the

cigarette penetrates and arranged to correspond to a receiving hole formed in the body portion into which the cigarette is inserted; a stopper configured to open or close the first through hole by sliding along an upper end of the outer housing; and an inner housing spaced apart from the outer housing to form a space such that the stopper slides inside the outer housing.

[0016] The inner housing may include a second through hole disposed coaxially with the first through hole, and the first passage may be formed between the inner housing and the body portion such that air that flows into a gap between the cigarette inserted into the receiving hole and the first through hole and passing through the second through hole flows along an upper surface of the body portion.

[0017] In an example, at least one of the outer housing and the inner housing may further include at least one support protrusion configured to maintain an interval between the inner housing and the body portion.

[0018] Meanwhile, the inner housing may further include a third through hole spaced apart from the second through hole, and the second passage may be formed between the outer housing and the inner housing to guide the air that flows into the gap between the cigarette inserted into the receiving hole and the first through hole to a side of the body portion.

[0019] A width of the first passage may be less than a width of the second passage.

[0020] The inner housing may further include a filter member disposed on the third through hole and configured to pass through air and filter foreign substances.

[0021] A cross-sectional shape of the third through hole may be at least one of a circle, a semicircle, an ellipse, and a polygon.

[0022] The third through hole may include a plurality of holes.

[0023] In an example the outer housing may further include an air inlet formed in a part where the outer housing and the body portion are connected when the outer housing is coupled to the body portion, and the cover may further include a third passage configured to guide air that flows into through the air inlet along at least a part of a surface of the body portion.

[0024] The air inlet may be formed to extend along at least a part of a circumference of the outer housing.

[0025] In another example, the outer housing may further include an air inlet formed to be spaced apart from a portion where the outer housing and the body portion are connected when the outer housing is coupled to the body portion, and the cover may further include a third passage configured to guide air that flows into through the air inlet along at least a part of a surface of the body portion.

[0026] Meanwhile, end portions of the plurality of passages may be connected to each other at an entrance of the vaporizer such that air that flows into through each of the plurality of passages is induced to the entrance of the vaporizer.

[0027] At least one of the outer housing and the inner housing may include a heat resistant material, and the heat resistant material may include a material capable of withstanding heat of 80° C. or more.

MODE OF DISCLOSURE

[0028] With respect to the terms in the various embodiments, the general terms which are currently and widely used are selected in consideration of functions of structural elements in the various embodiments of the present disclosure. However, meanings of the terms can be changed according to intention, a judicial precedence, the appearance of a new technology, and the like. In addition, in certain cases, a term which is not commonly used can be selected. In such a case, the meaning of the term will be described in detail at the corresponding portion in the description of the present disclosure. Therefore, the terms used in the various embodiments of the present disclosure should be defined based on the meanings of the terms and the descriptions provided herein.

[0029] In addition, unless explicitly described to the contrary, the word “comprise” and variations such as “comprises” or “comprising” will be understood to imply the inclusion of stated elements

but not the exclusion of any other elements. In addition, the terms “-er”, “-or”, and “module” described in the specification mean units for processing at least one function and operation and can be implemented by hardware components or software components and combinations thereof. [0030] Hereinafter, the present disclosure will now be described more fully with reference to the accompanying drawings, in which exemplary embodiments of the present disclosure are shown such that one of ordinary skill in the art may easily work the present disclosure. The disclosure can, however, be embodied in many different forms and should not be construed as being limited to the embodiments set forth herein.

[0031] Hereinafter, embodiments of the present disclosure will be described in detail with reference to the drawings.

[0032] FIGS. **1** and **2** are diagrams showing examples in which a cigarette is inserted into an aerosol generating device.

[0033] Referring to FIGS. **1** and **2**, an aerosol generating device **10000** includes a battery **11000**, a controller **12000**, a heater **13000**, and a vaporizer **14000**. Also, a cigarette **20000** may be inserted into an inner space of the aerosol generating device **10000**.

[0034] FIGS. **1** and **2** only illustrate components of the aerosol generating device **10000**, which are related to the present embodiment. Therefore, it will be understood by one of ordinary skill in the art that other general-purpose components may be further included in the aerosol generating device **10000**, in addition to the components illustrated in FIG. **1**.

[0035] Also, FIGS. **1** and **2** illustrate that the aerosol generating device **10000** includes the heater **13000**. However, as necessary, the heater **13000** may be omitted.

[0036] FIG. **1** illustrates that the battery **11000**, the controller **12000**, the vaporizer **14000**, and the heater **13000** are arranged in series. On the other hand, FIG. **2** illustrates that the vaporizer **14000** and the heater **13000** are arranged in parallel. However, the internal structure of the aerosol generating device **10000** is not limited to the structures illustrated in FIG. **1** or FIG. **2**. In other words, according to the design of the aerosol generating device **10000**, the battery **11000**, the controller **12000**, the vaporizer **14000**, and the heater **13000** may be differently arranged.

[0037] When the cigarette **20000** is inserted into the aerosol generating device **10000**, the aerosol generating device **10000** may operate the vaporizer **14000** to generate aerosol. The aerosol generated by the vaporizer **14000** is delivered to the user by passing through the cigarette **20000**. The vaporizer **14000** will be described in more detail later.

[0038] The battery **11000** may supply power to be used for the aerosol generating device **10000** to operate. For example, the battery **11000** may supply power to heat the heater **13000** or the vaporizer **14000** and may supply power for operating the controller **12000**. Also, the battery **11000** may supply power for operations of a display, a sensor, a motor, etc. mounted in the aerosol generating device **10000**.

[0039] The controller **12000** may generally control operations of the aerosol generating device **10000**. In detail, the controller **12000** may control not only operations of the battery **11000**, the heater **13000**, and the vaporizer **14000**, but also operations of other components included in the aerosol generating device **10000**. Also, the controller **12000** may check a state of each of the components of the aerosol generating device **10000** to determine whether or not the aerosol generating device **10000** is in an operable state.

[0040] The controller **12000** may include at least one processor. A processor can be implemented as an array of a plurality of logic gates or can be implemented as a combination of a general-purpose microprocessor and a memory in which a program executable in the microprocessor is stored. It will be understood by one of ordinary skill in the art that the processor can be implemented in other forms of hardware.

[0041] The heater **13000** may be heated by the power supplied from the battery **11000**. For example, when the cigarette **20000** is inserted into the aerosol generating device **10000**, the heater **13000** may be located outside the cigarette **20000** and increase a temperature of an aerosol

generating material in the cigarette **20000**.

[0042] The heater **13000** may include an electro-resistive heater. For example, the heater **13000** may include an electrically conductive track, and the heater **13000** may be heated when currents flow through the electrically conductive track. However, the heater **13000** is not limited to the example described above and may include any other heaters which may be heated to a desired temperature. Here, the desired temperature may be pre-set in the aerosol generating device **10000** or may be set by a user.

[0043] As another example, the heater **13000** may include an induction heater. In detail, the heater **13000** may include an electrically conductive coil for heating a cigarette in an induction heating method, and the cigarette may include a susceptor which may be heated by the induction heater.

[0044] FIGS. **1** and **2** illustrate that the heater **13000** is positioned outside the cigarette **20000**, but the position of the heater **13000** is not limited thereto. For example, the heater **13000** may include a tube-type heating element, a plate-type heating element, a needle-type heating element, or a rod-type heating element, and may heat the inside or the outside of the cigarette **20000**, according to the shape of the heating element.

[0045] Also, the aerosol generating device **10000** may include a plurality of heaters **13000**. Here, the plurality of heaters **13000** may be inserted into the cigarette **20000** or may be arranged outside the cigarette **20000**. Also, some of the plurality of heaters **13000** may be inserted into the cigarette **20000**, and the others may be arranged outside the cigarette **20000**. In addition, the shape of the heater **13000** is not limited to the shapes illustrated in FIGS. **1** and **2** and may include various shapes.

[0046] The vaporizer **14000** may generate aerosol by heating a liquid composition and the generated aerosol may pass through the cigarette **20000** to be delivered to a user. In other words, the aerosol generated by the vaporizer **14000** may move along an air flow passage of the aerosol generating device **10000**. The air flow passage may be configured such that the aerosol generated by the vaporizer **14000** passes through the cigarette **20000** to be delivered to the user.

[0047] For example, the vaporizer **14000** may include a liquid storage, a liquid delivery element, and a heating element, but it is not limited thereto. For example, the liquid storage, the liquid delivery element, and the heating element may be included in the aerosol generating device **10000** as independent modules.

[0048] The liquid storage may store a liquid composition. For example, the liquid composition may be a liquid including a tobacco-containing material having a volatile tobacco flavor component, or a liquid including a non-tobacco material. The liquid storage may be formed to be attachable/detachable to/from the vaporizer **14000** or may be formed integrally with the vaporizer **14000**.

[0049] For example, the liquid composition may include water, a solvent, ethanol, plant extract, spices, flavorings, or a vitamin mixture. The spices may include menthol, peppermint, spearmint oil, and various fruit-flavored ingredients, but are not limited thereto. The flavorings may include ingredients capable of providing various flavors or tastes to a user. Vitamin mixtures may be a mixture of at least one of vitamin A, vitamin B, vitamin C, and vitamin E, but are not limited thereto. Also, the liquid composition may include an aerosol forming substance, such as glycerin and propylene glycol.

[0050] The liquid delivery element may deliver the liquid composition of the liquid storage to the heating element. For example, the liquid delivery element may be a wick such as cotton fiber, ceramic fiber, glass fiber, or porous ceramic, but is not limited thereto.

[0051] The heating element is an element for heating the liquid composition delivered by the liquid delivery element. For example, the heating element may be a metal heating wire, a metal hot plate, a ceramic heater, or the like, but is not limited thereto. In addition, the heating element may include a conductive filament such as nichrome wire and may be wound around the liquid delivery element. The heating element may be heated by electrical current and may transfer heat to the

liquid composition in contact with the heating element, thereby heating the liquid composition. As a result, aerosol may be generated.

[0052] For example, the vaporizer **14000** may be referred to as a cartomizer or an atomizer, but it is not limited thereto.

[0053] The aerosol generating device **10000** may further include general-purpose components in addition to the battery **11000**, the controller **12000**, and the heater **13000**. For example, the aerosol generating device **10000** may include a display capable of outputting visual information and/or a motor for outputting haptic information. Also, the aerosol generating device **10000** may include at least one sensor (a puff detecting sensor, a temperature detecting sensor, a cigarette insertion detecting sensor, etc.). Also, the aerosol generating device **10000** may be formed as a structure where, even when the cigarette **20000** is inserted into the aerosol generating device **10000**, external air may be introduced or internal air may be discharged.

[0054] Although not illustrated in FIGS. **1** and **2**, a cradle may be used with the aerosol generating device **10000** to form a system. For example, the cradle may be used to charge the battery **11000** of the aerosol generating device **10000**. Alternatively, the heater **13000** may be heated when the cradle and the aerosol generating device **10000** are coupled to each other.

[0055] The cigarette **20000** may be similar to a general combustive cigarette. For example, the cigarette **20000** may be divided into a first portion including an aerosol generating material and a second portion including a filter, etc. Alternatively, the second portion of the cigarette **20000** may also include an aerosol generating material. For example, an aerosol generating material made in the form of granules or capsules may be inserted into the second portion.

[0056] The entire first portion may be inserted into the aerosol generating device **10000**, and the second portion may be exposed to the outside. Alternatively, the first portion may be partially inserted into the aerosol generating device **10000**. Otherwise, the first portion and a part of the second portion may be inserted into the aerosol generating device **10000**. The user may puff aerosol while holding the second portion by the mouth of the user. In this case, the aerosol is generated by the external air passing through the first portion, and the generated aerosol passes through the second portion and is delivered to the user's mouth.

[0057] For example, the external air may flow into at least one air passage formed in the aerosol generating device **10000**. For example, opening and closing of the air passage and/or a size of the air passage may be adjusted by the user. Accordingly, the amount of smoke and a smoking impression may be adjusted by the user. As another example, the external air may flow into the cigarette **20000** through at least one hole formed in a surface of the cigarette **20000**.

[0058] Hereinafter, an example of the cigarette **20000** will be described with reference to FIG. **3**.

[0059] FIG. **3** is a drawing illustrating an example of a cigarette.

[0060] Referring to FIG. **3**, the cigarette **20000** may include a tobacco rod **21000** and a filter rod **22000**. The first portion described above with reference to FIGS. **1** and **2** may include the tobacco rod **21000**, and the second portion may include the filter rod **22000**.

[0061] FIG. **3** illustrates that the filter rod **22000** includes a single segment. However, the filter rod **22000** is not limited thereto. In other words, the filter rod **22000** may include a plurality of segments. For example, the filter rod **22000** may include a first segment configured to cool aerosol and a second segment configured to filter a certain component included in the aerosol. Also, as necessary, the filter rod **22000** may further include at least one segment configured to perform other functions.

[0062] The cigarette **20000** may be packaged using at least one wrapper **24000**. The wrapper **24000** may have at least one hole through which external air may be introduced or internal air may be discharged. For example, the cigarette **20000** may be packaged using one wrapper **24000**. As another example, the cigarette **20000** may be doubly packaged using at least two wrappers **24000**. For example, the tobacco rod **21000** may be packaged using a first wrapper, and the filter rod **22000** may be packaged using a second wrapper. Also, the tobacco rod **21000** and the filter rod

22000, which are respectively packaged via separate wrappers, may be combined and packaged together using a third wrapper. When each of the tobacco rod **21000** and the filter rod **22000** includes a plurality of segments, each segment may be packaged using a separate wrapper. Also, the entire cigarette **20000** including the plurality of segments, which are respectively packaged using the separate wrappers and coupled to each other, may be re-packaged using another wrapper. [0063] The tobacco rod **21000** may include an aerosol generating material. For example, the aerosol generating material may include at least one of glycerin, propylene glycol, ethylene glycol, dipropylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, and oleyl alcohol, but it is not limited thereto. Also, the tobacco rod **21000** may include other additives, such as flavors, a wetting agent, and/or organic acid. Also, the tobacco rod **21000** may include a flavored liquid, such as menthol or a moisturizer, which is injected to the tobacco rod **21000**.

[0064] The tobacco rod **21000** may be manufactured in various forms. For example, the tobacco rod **21000** may be formed as a sheet or a strand. Also, the tobacco rod **21000** may be formed as a pipe tobacco, which is formed of tiny bits cut from a tobacco sheet. Also, the tobacco rod **21000** may be surrounded by a heat conductive material. For example, the heat conductive material may be, but is not limited to, a metal foil such as aluminum foil. For example, the heat conductive material surrounding the tobacco rod **21000** may uniformly distribute heat transmitted to the tobacco rod **21000**, and thus, the heat conductivity applied to the tobacco rod may be increased and taste of the tobacco may be improved.

[0065] The filter rod **22000** may include a cellulose acetate filter. Shapes of the filter rod **22000** are not limited. For example, the filter rod **22000** may include a cylinder-type rod or a tube-type rod having a hollow inside. Also, the filter rod **22000** may include a recess-type rod. When the filter rod **22000** includes a plurality of segments, at least one of the plurality of segments may have a different shape.

[0066] The filter rod **22000** may be formed to generate flavors. For example, a flavoring liquid may be injected onto the filter rod **22000**, or an additional fiber coated with a flavoring liquid may be inserted into the filter rod **22000**.

[0067] Also, the filter rod **22000** may include at least one capsule **23000**. Here, the capsule **23000** may generate a flavor or aerosol. For example, the capsule **23000** may have a structure in which a liquid containing a flavoring material is wrapped with a film. For example, the capsule **23000** may have a spherical or cylindrical shape, but is not limited thereto.

[0068] When the filter rod **22000** includes a segment configured to cool the aerosol, the cooling segment may include a polymer material or a biodegradable polymer material. For example, the cooling segment may include pure polylactic acid alone, but the material for forming the cooling segment is not limited thereto. In an exemplary embodiment, the cooling segment may include a cellulose acetate filter having a plurality of holes. However, the cooling segment is not limited to the above-described example and any other cooling segment that cools the aerosol may be used.

[0069] Although not illustrated in FIG. 3, the cigarette **20000** according to an exemplary embodiment may further include a front-end filter. The front-end filter may be located on a front side of the tobacco rod **21000**, the side away from the filter rod **22000**. The front-end filter may prevent the tobacco rod **21000** from being detached and prevent liquefied aerosol from flowing into the aerosol generating device **10000** (FIGS. 1 and 2) from the tobacco rod **21000**, during smoking.

[0070] FIG. 4A is a perspective view of an aerosol generating device according to an exemplary embodiment, and FIG. 4B is a perspective view showing an operating state of the aerosol generating device shown in FIG. 4A.

[0071] Referring to FIGS. 4A and 4B, the aerosol generating device **10000** includes a body portion **410** into which a cigarette **20000** may be inserted. A cover **420** is coupled to the upper portion of the body portion **410**. The cover **420** is coupled to the body portion **410** in a detachable manner. A stopper **430** is installed on the upper surface of the cover **420** in a slidable manner. However, the structure of the aerosol generating device **10000** shown in FIGS. 4A and 4B is only one example,

and is not limited thereto. For example, the body portion **410** and the cover **420** may be an integral structure and not detachable from each other.

[0072] The upper surface of the cover **420** is provided with a rail extending along the sliding movement direction of the stopper **430**, and a first through hole **440** into which the cigarette **20000** is inserted. The rail may expose the inside of the cover **420**. However, the present disclosure is not limited thereto, and the rail may have a closed structure such that the outside and the inside of the cover **420** are not connected. In addition, the upper surface of the cover **420** may include any suitable structure, instead of the rail, that allows the sliding movement of the stopper **430**.

[0073] The stopper **430** may open and close the first through hole **440** by sliding along the upper end of the cover **420**. For example, when the stopper **430** moves along the rail formed on the upper surface of the cover **420** to a position shown in FIG. **4B**, the first through hole **440** is exposed to the outside so that at least a part of the cigarette **20000** may be inserted into the first through hole **440**.

[0074] Meanwhile, a method of coupling the stopper **430** to the cover **420** is not limited to the configuration of the exemplary embodiment shown in FIGS. **4A** and **4B**. For example, the stopper **430** may be coupled to the cover **420** by using a hinge coupling method such that the stopper **430** may open or close the cover **420**.

[0075] The body portion **410** may include a vaporizer **14000** for heating a liquid composition to generate aerosol as described with reference to FIGS. **1** and **2**, and may include one or more air flows for causing the generated aerosol to pass through the cigarette **20000** and discharged to the outside.

[0076] The cover **420** may be coupled to the body portion **410** and may include a plurality of independent passages that guide air to an entrance of the vaporizer **14000** along at least a part of the surface of the body portion **410**. Hereinafter, the plurality of passages provided in the cover **420** will be described in detail with reference to FIG. **5**.

[0077] FIG. **5** is a cross-sectional view taken along the line V-V of FIG. **4B** to show a configuration of an aerosol generating device according to an exemplary embodiment.

[0078] Referring to FIG. **5**, an example of a state in which the cover **420** of the aerosol generating device **10000** is coupled to the body portion **410** is illustrated. Meanwhile, FIG. **5** only shows elements of the aerosol generating device **10000** related to the present embodiment. Accordingly, it will be understood by those skilled in the art that the general purpose elements other than the elements shown in FIG. **5** may be further included in the aerosol generating device **10000**.

[0079] The cover **420** may include an outer housing **510**, a stopper **430**, and an inner housing **520**. At least one of the outer housing **510**, the stopper **430**, and the inner housing **520** may include a heat resistant material, and the heat resistant material may include a material capable of withstanding heat of 80° C. or more. Being capable of withstanding heat of 80° C. or more means that the melting point T_m of the heat resistant material is above 80° C.

[0080] Meanwhile, the heat resistant material may be a heat resistant synthetic resin. When the heat resistant material is the heat resistant synthetic resin, at least one of the melting point and a glass transition temperature T_g of the heat resistant material may be 80° C. or more.

[0081] For example, the heat resistant material may include at least one of, for example, polypropylene, polyether ether ketone (PEEK), polyethylene, polypropylene, polyethylene terephthalate, polycyclohexylenedimethylene terephthalate, polyimide, sulfone resin, fluorine resin, and aramid. The sulfone resin may include a resin such as polyethylsulfone and polyphenylene sulfide, and the fluorine resin may include polytetrafluoroethylene (teflon).

[0082] However, the present disclosure is not limited thereto, and for example, the heat resistant material may be any suitable material capable of withstanding heat of 40° C. or more, and the heat resistant material may be any suitable material capable of withstanding heat of 100° C. or more. Further, for example, the heat resistant material may be any suitable material capable of withstanding heat of 130° C. or more, for example, the heat resistant material may be any suitable material capable of withstanding heat of 200° C. or more, for example, the heat resistant material

may be any suitable material capable of withstanding heat of 300° C. or more, and for example, the heat resistant material may be any suitable material capable of withstanding heat of 400° C. or more.

[0083] In addition, the aerosol generating device **10000** may include a heat insulating portion on at least one of the inner and outer surfaces of the outer housing **510** and the inner housing **520**. The heat insulating portion may include at least one heat insulating material. For example, the heat insulating portion may include any suitable material that blocks the movement of heat through the heat insulating portion. For example, the heat insulating portion may include at least one of a porous material, graphite, and ceramics, but is not limited thereto. The ceramic may be a porous ceramic.

[0084] The outer housing **510** may refer to a case forming an appearance of the cover **420**. The outer housing **510** may include the first through hole **440** arranged to correspond to a receiving hole **530** that is formed in the body portion **410** so that the cigarette **20000** is inserted. The first through hole **440** may be disposed coaxially with the receiving hole **530**.

[0085] The inner housing **520** may refer to a case forming the inner structure of the cover **420**. The inner housing **520** may be spaced apart from the outer housing **510** to form a space so that the stopper **430** slides inside the outer housing **510**. At least a part of the stopper **430** may be covered by the inner housing **520** when viewed from the bottom of the outer housing **510**.

[0086] The inner housing **520** may include a second through hole **540** that may be coaxially disposed with the first through hole **440**. The second through hole **540** may be disposed to correspond to each other with the first through hole **440** and the receiving hole **530** and penetrated by the cigarette **20000**. When the cigarette **20000** is inserted into the aerosol generating device **10000**, the cigarette **20000** may pass through the first through hole **440**, the second through hole **540**, and the receiving hole **530** sequentially.

[0087] Each of the first through hole **440**, the second through hole **540**, and the receiving hole **530** may have a shape corresponding to the shape of the cigarette **20000**. For example, when the cigarette **20000** is cylindrical, the shape of each of the first through hole **440**, the second through hole **540**, and the receiving hole **530** may be circular. However, the present disclosure is not limited thereto, and the shape of each of the first through hole **440**, the second through hole **540**, and the receiving hole **530** may be at least one of a circle, a semicircle, an ellipse, and a polygon. Meanwhile, the diameter of the first through hole **440** may be greater than the diameter of the cigarette **20000** such that a gap through which air passes is formed between the cigarette **20000** and the first through hole **440** when the cigarette **20000** is inserted into the receiving hole **530**.

[0088] Among the plurality of passages that guide air to the entrance of the vaporizer **14000** along at least a part of the surface of the body portion **410**, a first passage **545** may be formed between the inner housing **520** and the body portion **410** such that air flowing into the gap between the cigarette **20000** inserted into the receiving hole **530** and the first through hole **440** and passing through a second through hole **540** flows along the upper surface of the body portion **410**. Meanwhile, the diameter of the second through hole **540** may be greater than the diameter of the cigarette **20000** such that a gap through which air flows is formed between the cigarette **20000** and the second through hole **540** when the cigarette **20000** is inserted into the receiving hole **530**.

[0089] In an example, at least one of the outer housing **510** and the inner housing **520** may further include at least one support protrusion (not shown) to maintain an interval between the inner housing **520** and the body portion **410**. A space may be formed between the inner housing **520** and the body portion **410** by the at least one support protrusion.

[0090] Meanwhile, the inner housing **520** may further include a third through hole **550** spaced apart from the second through hole **540**. Among the plurality of passages that guide the air to the entrance of the vaporizer **14000** along at least a part of the surface of the body portion **410**, the second passage **555** may be formed between the outer housing **510** and the inner housing **520** in order to guide the air that flows into the gap between the cigarette **20000** inserted into the receiving

hole **530** and the first through hole **440** to the side of the body portion **410**.

[0091] When the cigarette **20000** is inserted into the receiving hole **530**, the air that flows into the gap between the cigarette **20000** and the first through hole **440** may flow along at least one of the first passage **545** extending to the entrance of the vaporizer **14000** through the second through hole **540** and the second passage **555** extending to the entrance of the vaporizer **14000** through the third through hole **550**.

[0092] Because the inner housing **520** of the cover **420** further includes the third through hole **550** spaced apart from the second through hole **540**, the second passage **555** may be further added besides the first passage **545**, and accordingly, the flow of air flowing into the vaporizer **14000** included in the aerosol generating device **10000** may be smooth. In an example, the width of the first passage **545** may be smaller than the width of the second passage **555**, and accordingly, the influence of the flow change in the air caused by the addition of the second passage **555** may increase. However, the present disclosure is not limited thereto. Hereinafter, an example of the inner housing **520** including the second through hole **540** and the third through hole **550** will be described in detail with reference to FIGS. **6A** to **6D**.

[0093] FIGS. **6A** to **6D** are bottom views of examples of an inner housing included in a cover for an aerosol generating device according to an exemplary embodiment.

[0094] Referring to FIGS. **6A** to **6D**, the inner housing **520** further includes the third through hole **550** spaced apart from the circular second through hole **540** corresponding to the shape of the cigarette **20000**. The third through hole **550** may have various shapes and sizes. For example, referring to FIG. **6A**, the third through hole **550** having a circular cross section is shown, referring to FIG. **6B**, the third through hole **550** having a rectangular cross section is shown, and referring to FIG. **6C**, the third through hole **550** having an elliptical cross section is shown. Meanwhile, the cross-sectional shape of the third through hole **550** is not limited to the configuration of the embodiment in FIGS. **6A** to **6C**, and may be any suitable shape. For example, the shape of the third through hole **550** may be at least one of a circle, a semicircle, an ellipse, and a polygon.

[0095] Meanwhile, the third through hole **550** may include one or more holes. For example, the third through hole **550** includes one hole in the exemplary embodiments shown in FIGS. **6A** and **6B**, and the third through hole **550** includes three holes in the exemplary embodiment shown in FIG. **6C**. In the above embodiments, the number one or three is merely an example, and the third through hole **550** may include any suitable number of holes.

[0096] Meanwhile, referring to FIG. **6D**, the inner housing **520** may further include a filter member **610** disposed in the third through hole **550** in addition to the second through hole **540** and the third through hole **550**. The filter member **610** allows air to pass through a plurality of holes, and may filter foreign substances, thereby preventing droplets formed when an aerosol generated by the vaporizer **14000** is liquefied again from leaking out through the third through hole **550**.

[0097] The filter member **610** may include a mesh material in which a plurality of holes are closely drilled like a mesh. Each of the plurality of holes included in the filter member **610** may have various sizes and various shapes. For example, first group of holes included in the filter member **610** may have the same size that is different from the size of a second group of. In addition, the shape of each of the plurality of holes included in the filter member **610** may be at least one of a square, a rectangle, a parallelogram, and a rhombus.

[0098] The filter member **610** may be a film or sheet shape structure such as a nonwoven fabric, and may include a polymer resin such as polyethylene, polypropylene, polyvinyl chloride resin, polyethylene terephthalate, nylon, epoxy, polyimide, polyester, urethane, acrylic, polycarbonate, urea, melanin, rubber chloride, polyvinyl alcohol, polyvinyl ester, vinylidene fluoride-hexafluoropropylene copolymer (PVDF-co-HFP), polyvinylidene fluoride (PVDF), polytetrafluoroethylene (PTFE), styrenebutadiene rubber (SBR), or ethylene-propylene-diene copolymer (EPDM).

[0099] Referring back to FIG. **5**, the outer housing **510** may further include an air inlet **560** formed

at a part where the outer housing **510** and the body portion **410** are connected when the outer housing **510** is coupled to the body portion **410**. The air inlet **560** may be formed along at least a part of the circumference of the outer housing **510**. For example, the air inlet **560** may be formed along the entire circumference of the outer housing **510**, or may be formed only along a part of the circumference of the outer housing **510**. Hereinafter, examples of the air inlet **560** formed by the outer housing **510** will be described in detail with reference to FIGS. 7A to 7C.

[0100] FIGS. 7A to 7C are diagrams illustrating examples of an air inlet formed by a cover for an aerosol generating device according to an exemplary embodiment.

[0101] Referring to FIG. 7A, the air inlet **560** may refer to a gap formed between the lower end of the outer housing **510** and the body portion **410** when the outer housing **510** and the body portion **410** are coupled. At this time, the air inlet **560** is formed along the entire circumference of the outer housing **510**. Therefore, the outside air may flow into the aerosol generating device **10000** through the air inlet **560** along the entire circumference of the outer housing **510**.

[0102] Referring to FIG. 7B, the air inlet **560** may mean a gap formed by a groove provided in the lower end of the outer housing **510** at a portion where the outer housing **510** and the body portion **410** are connected when the outer housing **510** is coupled to the body portion **410**. At this time, the air inlet **560** is formed along a part of the circumference of the outer housing **510**. In FIG. 7B, a rectangular groove is provided in the lower end of the outer housing **510**, but is not limited thereto. A groove of any suitable shape may be provided in the lower end of the outer housing **510** to form the air inlet **560**.

[0103] Meanwhile, as shown in FIG. 7C, the air inlet **560** may refer to a through hole formed spaced apart from the position where the outer housing **510** and the body portion **410** are connected to each other. In FIG. 7C, the cross section of the air inlet **560** has a rectangular shape, but is not limited thereto. The air inlet **560** may be a through hole having any suitable cross sectional shape. For example, the cross-sectional shape of the air inlet **560** may include at least one of a circle, a semicircle, an ellipse, and a polygon.

[0104] Meanwhile, although only one air inlet **560** is shown in FIGS. 7B and 7C, it will be readily understood by those skilled in the art that a plurality of air inlets **560** may be formed spaced apart along the outer circumference of the outer housing **510**. In addition, it will be readily understood by those skilled in the art that the air inlets **560** shown in FIGS. 7A to 7C may be combined and included in the aerosol generating device **10000**.

[0105] Referring back to FIG. 5, the cover **420** may further include a third passage **565** for guiding air that flows into through the air inlet **560** along at least a part of the surface of the body portion **410**. For example, air inhaled through the air inlet **560** may flow along the third passage **565** extending from the air inlet **560** to the vaporizer **14000**. Because the cover **420** further includes the air inlet **560** in addition to the second through hole **540** and the third through hole **550**, the third passage **565** may be added besides the first passage **545** and the second passage **555**, and accordingly, the flow of air flowing into the entrance of the vaporizer **14000** included in the aerosol generating device **10000** may be smooth.

[0106] End portions of a plurality of passages may be connected to each other at the entrance of the vaporizer **14000** such that air that flows into through each of the plurality of passages is induced to the entrance of the vaporizer **14000**. Accordingly, air flowing through the first passage **545**, air flowing through the second passage **555**, and air flowing through the third passage **565** may all be combined at the entrance of the vaporizer **14000**. The air combined at the entrance of the vaporizer **14000** may be delivered to a user through the cigarette **20000** along with the aerosol generated by the vaporizer **14000**.

[0107] According to the structure of the cover **420** for the aerosol generating device **10000** according to the present disclosure, the plurality of passages for inducing air to the entrance of the vaporizer **14000** included in the aerosol generating device **10000** are formed, and thus the air flow in the aerosol generating device **10000** may be smooth, and the performance degradation of the

aerosol generating device **10000** may be effectively prevented.

[0108] For example, Table 1 below is a table showing a degree of ease of inhalation of the user according to the combination of the first passage **545**, the second passage **555** and the third passage **565**. In Table 1, when 100 users perform a test of smoking cigarettes using an aerosol generating device **10000** including the combination of the first, second, and third passages **545**, **555** and **565**, © indicates that more than 85 users have determined that inhalation was easy, and ° indicates that 50 to 80 users have determined that inhalation was easy, and X indicates that less than 50 users have determined that inhalation was easy.

TABLE-US-00001 TABLE 1 Including Including Including all Including first first of first, Combination only passage passage second, of first and second and third and third passageways passage passage passage passages Ease of X ○ ○ © Inhalation

[0109] Table 1 shows that at least two or more passages should be formed by the cover **420** of the aerosol generating device **10000** such that the air flow in the aerosol generating device **10000** may be smooth, and the performance degradation of the aerosol generating device **10000** may be effectively prevented.

[0110] It will be understood by one of ordinary skill in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims. Therefore, the disclosed methods should be considered from an illustrative point of view, not from a restrictive point of view. The scope of the present disclosure is defined by the appended claims rather than by the foregoing description, and all differences within the scope of equivalents thereof should be construed as being included in the present disclosure.

Claims

1. An aerosol generating device comprising: a body portion comprising: a vaporizer configured to generate aerosol by heating a liquid composition; and one or more air flow paths configured to cause the generated aerosol to pass through a cigarette and be discharged to outside; and a cover detachably coupled to the body portion and comprising a plurality of passages comprising a first passage and a second passage which are independent from each other and guide air to an entrance of the vaporizer along at least part of a surface of the body portion, wherein the cover comprises an inner housing and an outer housing, wherein the first passage is formed between the inner housing and the body portion, and wherein the second passage is formed between the outer housing and the inner housing.
2. The aerosol generating device of claim 1, wherein the outer housing comprises a first through hole through which the cigarette penetrates and arranged to correspond to a receiving hole formed in the body portion into which the cigarette is inserted, wherein the cover further comprises a stopper configured to open or close the first through hole by sliding along an upper end of the outer housing, and wherein the inner housing is spaced apart from the outer housing to form a space such that the stopper slides inside the outer housing.
3. The aerosol generating device of claim 2, wherein the inner housing comprises a second through hole disposed coaxially with the first through hole, and wherein the first passage is formed between the inner housing and the body portion such that air flowing into a gap between the cigarette inserted into the receiving hole and the first through hole and passing through the second through hole flows along an upper surface of the body portion.
4. The aerosol generating device of claim 3, wherein at least one of the outer housing and the inner housing further comprises at least one support protrusion configured to maintain an interval between the inner housing and the body portion.
5. The aerosol generating device of claim 3, wherein the inner housing further includes a third through hole spaced apart from the second through hole, and wherein the second passage is formed

between the outer housing and the inner housing to guide the air that flows into the gap between the cigarette and the first through hole to a side of the body portion.

6. The aerosol generating device of claim 5, wherein a width of the first passage is less than a width of the second passage.

7. The aerosol generating device of claim 5, wherein a cross-sectional shape of the third through hole is at least one of a circle, a semicircle, an ellipse, and a polygon.

8. The aerosol generating device of claim 5, wherein the third through hole comprises a plurality of holes.

9. The aerosol generating device of claim 5, wherein the inner housing further comprises a filter member disposed on the third through hole and configured to filter foreign substances from air passing through the filter member.

10. The aerosol generating device of claim 2, wherein the outer housing further comprises an air inlet formed in a portion where the outer housing and the body portion are connected when the outer housing is coupled to the body portion, and wherein the cover further comprises a third passage configured to guide air that flows in through the air inlet along at least part of a surface of the body portion.

11. The aerosol generating device of claim 10, wherein the air inlet extends along at least part of a circumference of the outer housing.

12. The aerosol generating device of claim 2, wherein the outer housing further includes an air inlet formed to be spaced apart from a portion where the outer housing and the body portion are connected when the outer housing is coupled to the body portion, and wherein the cover further comprises a third passage configured to guide air that flows in through the air inlet along at least part of a surface of the body portion.

13. The aerosol generating device of claim 1, wherein end portions of the plurality of passages are connected to each other at an entrance of the vaporizer such that air that flows in through each of the plurality of passages is directed to the entrance of the vaporizer.

14. The aerosol generating device of claim 2, wherein at least one of the outer housing and the inner housing comprises a heat-resistant material.

15. The aerosol generating device of claim 14, wherein the heat-resistant material comprises a material capable of withstanding heat of 80° C. or more.
