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(54) **Title:** FLAVOR CARTRIDGE FOR AEROSOL-GENERATING DEVICE

(57) **Abstract:** The invention relates to a replaceable flavor cartridge for an aerosol-generating device. The cartridge comprises a housing and a flavor substrate. The flavor substrate is arranged within the housing. The housing comprises a proximal aperture in a proximal end face of the housing. The housing comprises a distal aperture in a distal end face of the housing. The flavor substrate comprises a substrate aperture. The proximal aperture, the distal aperture and the substrate aperture are aligned with each other to form a cartridge airflow channel through the cartridge. The invention further relates to an aerosol-generating device.

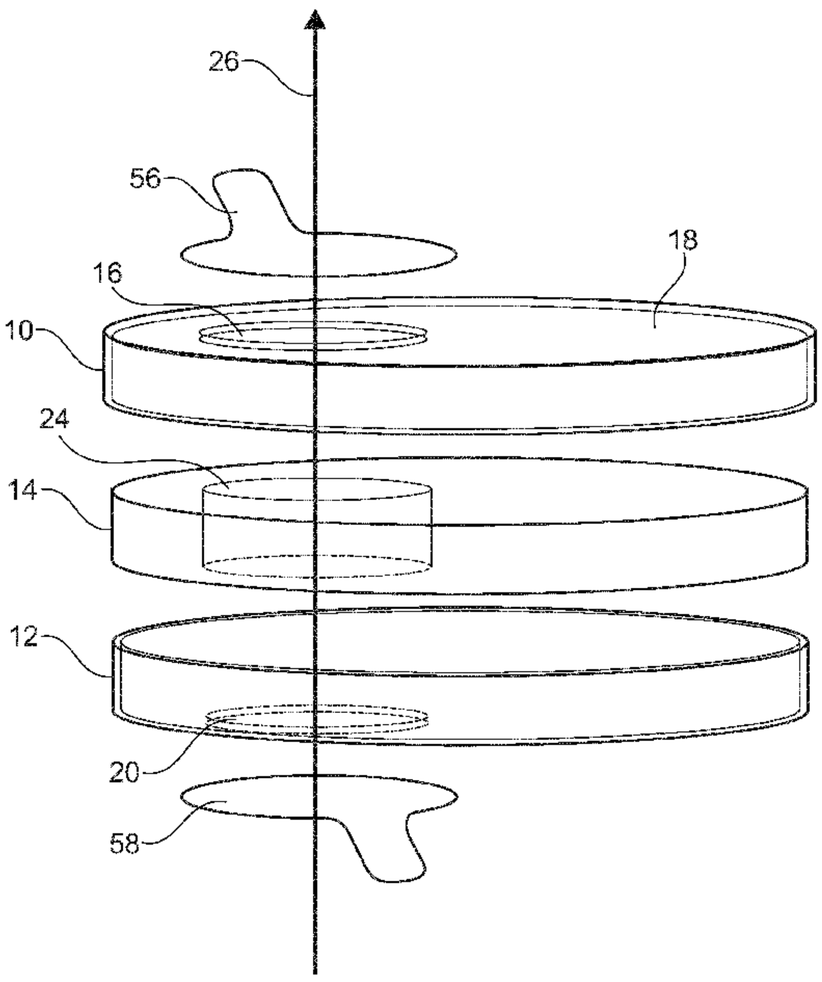


Fig. 1

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FLAVOR CARTRIDGE FOR AEROSOL-GENERATING DEVICE

The present invention relates to an aerosol-generating device.

Aerosol generation is known. One type of aerosol-generating system is an electronic cigarette. Electronic cigarettes typically use a liquid aerosol-forming substrate which is vaporized to form an aerosol. “Heat-not-burn” (HNB) devices may heat one or more solid aerosol-forming substrates to a temperature at which one or more components of the aerosol-forming substrate are volatilised without burning the solid aerosol-forming substrate. In addition, hybrid aerosol-generating devices, having both liquid aerosol-forming functionality and HNB functionality are known. All three of these devices, liquid aerosol-forming devices or electronic cigarettes, HNB devices and hybrid devices are aerosol-generating devices.

Typically, aerosol-generating devices comprise a top portion and a main body. Typically, the main body contains a power supply. Typically, the top portion, which may be replaceable, comprises a heater and a means for introducing the aerosol forming substrate to the heater.

The aerosol-generating substrate may be provided or may be inserted into a cavity, such as a heating chamber, in the top portion of the aerosol-generating device. A heating element may be arranged in or around the heating chamber for heating the aerosol-forming substrate once the aerosol-generating article is provided in the heating chamber of the aerosol-generating device.

It would be desirable to have an aerosol-generating device in which the flavor of the generated aerosol can be modified. It would be desirable to have an aerosol-generating device in which flavor modification of the generated aerosol can be controlled and modified by a user. It would be desirable to have an aerosol-generating device, in which user-based flavor modification of the generated aerosol is simple. It would be desirable to have an aerosol-generating device with flavor modification capabilities. It would be desirable to have an aerosol-generating device where flavor can be modified by providing a flavor cartridge that is separate from a solid or liquid aerosol-generating material.

According to an embodiment of the invention there is provided a replaceable flavor cartridge for an aerosol-generating device. The cartridge is insertable into the aerosol-generating device so that the air flow passes through the flavor cartridge, either before or after the air flow passes through the aerosol-generating portion of the aerosol-generator. This flavor cartridge can provide flavor upstream or downstream of the aerosol-generator.

In embodiments, the cartridge comprises a housing and a flavor substrate. The flavor substrate is arranged within the housing. The flavor substrate may be tobacco free. The flavor substrate may be nicotine free. The flavor substrate preferably comprises flavorant.

The housing comprises a proximal aperture in a proximal part of the housing. The proximal aperture is preferably provided in a proximal end face of the housing. The proximal end face is provided in the proximal part. The housing comprises a distal aperture in a distal part of the housing. The distal aperture is preferably provided in a distal end face of the housing. The distal end face is provided in the distal part. The flavor substrate comprises a substrate aperture. The proximal aperture, the distal aperture and the substrate aperture are aligned with each other to form a cartridge airflow channel through the flavor cartridge.

By providing the replaceable flavor cartridge, the flavor of the generated aerosol can be modified. Since the cartridge can be exchanged, a user can modify the flavor of the generated aerosol as desired.

The cartridge may be a non-heated cartridge. Flavorant from the flavor substrate may be entrained in the air flowing through the cartridge airflow channel. The flavor substrate preferably directly contacts the air flowing through the cartridge airflow channel. The direct contact between the flavor substrate and the cartridge airflow channel may facilitate entrainment of flavorant in the air flowing through the cartridge airflow channel.

The cartridge airflow channel may be straight. The airflow channel may directly run from the distal aperture through the substrate aperture to the proximal aperture. The distal aperture of the housing may directly abut the substrate aperture of the substrate portion. The substrate aperture of the substrate portion may directly abut the proximal aperture of the housing. The distal end face of the housing may directly abut the flavor substrate. The flavor substrate may directly abut the proximal end face of the housing. The flavor substrate may be sandwiched between the proximal end face of the housing and the distal end face of the housing. The cartridge airflow channel may be formed from the distal aperture, the substrate aperture and the proximal aperture. Preferably, the cartridge airflow channel runs parallel to a central axis through the cartridge airflow channel.

The cartridge may contain the flavor substrate only. The flavor substrate may be surrounded by the housing of the cartridge. A proximal end face of the flavor substrate may be covered by the proximal end face of the housing. A distal end face of the flavor substrate may be covered by the distal end face of the housing. A side face of the flavor substrate may be covered by a sidewall of the housing.

The cartridge may be disc-shaped. The proximal end face of the cartridge may be flat. The distal end face of the cartridge may be flat. The sidewall of the cartridge may be tubular. The cartridge is preferably cylindrical. The cross-section of the flavor cartridge may, for example, be substantially circular, elliptical, square or rectangular.

The cartridge may comprise a removable fluid impermeable proximal foil covering the proximal aperture. The removable fluid impermeable proximal foil may be peeled off by a user

before using the cartridge. The foil may be peeled off by a user before inserting the cartridge into an aerosol-generating device.

The cartridge may comprise a removable fluid impermeable distal foil covering the distal aperture. The removable fluid impermeable distal foil may be peeled off by a user before using the cartridge. The foil may be peeled off by a user before inserting the cartridge into an aerosol-generating device.

The housing may be porous. By providing a porous housing, the flavorant from the flavor substrate may soak into the housing. The flavorant from the flavor substrate may be wicked by the porous housing. The contact surface between the flavorant and the air flowing through the cartridge airflow channel may be increased by the porous housing. Particularly, flavorant from the flavor substrate may be wicked by the cartridge towards one or both of the proximal aperture and the distal aperture of the housing in fluid contact with the cartridge airflow channel. The whole housing may be porous. Alternatively, parts of the housing may be porous. Advantageously, the part of the housing forming one or both of the proximal aperture and the distal aperture may be porous.

The housing of the flavor cartridge may be a single integral element. However, preferably the housing of the flavor cartridge consists of at least two elements. The proximal part of the flavor cartridge may comprise the proximal aperture and the proximal end face of the housing. The distal part of the flavor cartridge may comprise the distal aperture and the distal end face. The sidewall of the flavor cartridge may be one or more of: part of the proximal part of the flavor cartridge, part of the distal part of the flavor cartridge and a separate element. The proximal part may be attachable to the distal part. The flavor substrate may be sandwiched between the proximal part and the distal part. The proximal part may be removably attachable to the distal part. The flavor substrate may be recycled after usage by detaching the proximal and distal parts.

The proximal part of the flavor cartridge may be configured removably attachable to one of the sidewall and the distal part of the flavor cartridge. The distal part of the flavor cartridge may be configured removably attachable to one of the sidewall and the proximal part of the flavor cartridge. For example, the proximal part of the flavor cartridge may comprise a male connection element and the distal part of the flavor cartridge may comprise a female connection element or vice versa. The sidewall may comprise corresponding male and female connection elements to be attached between the proximal part and the distal part. Alternatively, the proximal part of the flavor cartridge may be directly removably attached to the distal part of the flavor cartridge. The removable attachment may be facilitated by a screw connection. The removable attachment may be facilitated by a snap fit connection. The removable attachment may be facilitated by a friction fit connection.

The proximal part of the housing and the distal part of the housing may be connected with a Luer connector. One or more of the proximal aperture, the distal aperture and the substrate aperture may be configured as a Luer connector. One or both of the proximal part of the housing of the flavor cartridge and the distal part of the housing of the flavor cartridge may comprise a Luer connector. A reliable attachment between one or more of the proximal aperture, the distal aperture and the substrate aperture is achievable by providing one or more of these components as a Luer connector.

In additional embodiments, one or more of the proximal aperture, the distal aperture and the substrate aperture may comprise a connector. The connector may be configured to connect one or more of the proximal aperture, the distal aperture and the substrate aperture. Preferably, the connector is configured to securely hold components of the flavor cartridge together by enabling a removable attachment between the components of the flavor cartridge. Preferably, the connector enables a removable attachment between the proximal part of the flavor cartridge and the distal part of the flavor cartridge. The connector can be any connector known in the art that creates an air-tight and/or liquid-tight seal that is releasable. For example, the connector can be a screw connection or a snap fit connection.

The flavor substrate may comprise one or more of a flavor liquid, a high retention material impregnated with a flavor liquid, a flavor gel, particles impregnated with a flavoring liquid and gel capsules comprising a flavor liquid or a flavor gel. If the flavor substrate comprises a flavor gel, the flavor gel may be configured as a viscous flavor gel. If the flavor substrate comprises particles or gel capsules, the particles or gel capsules may be embedded in a carrier. The flavor substrate is preferably configured dimensionally stable such that the substrate aperture can be provided in the flavor substrate.

Particularly by providing the flavor substrate as a high retention material impregnated with a flavor liquid, a flavor liquid can be wicked by the high retention material. During use of the cartridge, the flavor liquid may be entrained in the air flowing through the cartridge airflow channel. Consequently, the part of the flavor substrate adjacent the cartridge airflow channel may be depleted. Flavor liquid from other non-depleted parts of the flavor substrate may be wicked towards the part of the flavor substrate adjacent the cartridge airflow channel so that flavor liquid from other parts of the flavor substrate are gradually entrained in the air flowing through the cartridge airflow channel.

The flavor substrate may be comprise an ambient temperature atomizable flavor substrate. The ambient temperature atomizable flavor substrate may become airborne at standard conditions of pressure and temperature. Consequently, the ambient temperature atomizable flavor substrate may aerosolize at the contact surface between the flavor substrate and the air flowing through the cartridge airflow channel. The aerosolized ambient temperature atomizable flavor substrate may be entrained by the air flowing through the cartridge airflow

channel. As a consequence of the ambient temperature atomizable flavor substrate, it is not necessary to heat the cartridge to aerosolize the flavor substrate. The cartridge is therefore preferably configured as a non-heated cartridge.

The flavor substrate may comprise at least one aerosol-former. An aerosol-former is any suitable known compound or mixture of compounds that, in use, facilitates formation of a dense and stable aerosol and that is substantially resistant to thermal degradation at the temperature of operation of the system. Suitable aerosol-formers are well known in the art and include, but are not limited to: polyhydric alcohols, such as triethylene glycol, 1,3-butanediol and glycerine; esters of polyhydric alcohols, such as glycerol mono-, di- or triacetate; and aliphatic esters of mono-, di- or polycarboxylic acids, such as dimethyl dodecanedioate and dimethyl tetradecanedioate. Aerosol formers may be polyhydric alcohols or mixtures thereof, such as triethylene glycol, 1,3-butanediol and glycerine. The aerosol-former may be propylene glycol. The aerosol former may comprise both glycerine and propylene glycol.

In embodiments, the flavour substrate is a high retention material that can be shaped to provide a substrate aperture. For example, the flavor substrate may be a material that is wetted or soaked or impregnated with a liquid or gel that is a flavorant. The flavorant may comprise water, solvents, ethanol, plant extracts and natural or artificial flavours. The liquid may comprise nicotine. The liquid may have a nicotine concentration of between about 0.5% and about 10%, for example about 2%.

The housing of the flavor cartridge may be a rigid housing. As used herein, the term 'rigid housing' is used to mean a housing that is self-supporting. The rigid housing of the flavor cartridge may provide mechanical support to the flavor cartridge. The housing of the flavor cartridge may comprise any suitable material. The housing of the flavor cartridge may comprise substantially fluid impermeable material. The housing of the flavor cartridge may comprise a transparent or a translucent portion, such that the substrate portion stored in the flavor cartridge may be visible to a user through the housing. The flavor cartridge may be configured such that aerosol-forming substrate stored in the flavor cartridge is protected from light. This may reduce the risk of degradation of the substrate and may maintain a high level of hygiene.

The flavor cartridge may comprise one or more inlets which can be one-way inlets. This may enable ambient air to enter the flavor cartridge. The one or more one-way inlets may be semi-permeable membranes or one-way valves, permeable to allow ambient air into the flavor cartridge and impermeable to substantially prevent air and liquid inside the flavor cartridge from leaving the flavor cartridge. The one or more semi-open inlets may enable air to pass into the flavor cartridge under specific conditions. The flavor cartridge may be refillable. Alternatively, the flavor cartridge may be configured as a replaceable flavor cartridge. The flavor cartridge may be part of or configured as a replaceable cartridge.

The term 'ambient air' refers to air drawn into the aerosol-generating device from the outside of the aerosol-generating device. In other words, the term 'ambient air' refers to the air surrounding the aerosol-generating device.

The invention further relates to an aerosol-generating device comprising a top portion, a replaceable flavor cartridge as described herein and a main body. The cartridge may be configured removably attachable between the top portion and the main body.

The user can easily modify the flavor of the aerosol generated by the aerosol-generating device by inserting a desired flavor cartridge containing a desired flavor into the aerosol-generating device. Due to the flavor cartridge being replaceable, the user can modify the flavor of the generated aerosol by changing the flavor cartridge to a different desired flavor.

The flavor cartridge may be modular. A multitude of different flavor cartridges may be used in conjunction with a single aerosol-generating device.

The top portion of the aerosol generating device may be configured as a mouth-end portion. The top portion may be configured as a mouthpiece. Or, the top portion may have a cavity for inserting a solid aerosol generating substrate. In conventional aerosol-generating devices, an air inlet, an airflow channel and an air outlet are provided. In the present invention, preferably the flavor cartridge is provided in the common airflow channel so that the aerosol-generating device does not need an additional air inlet or airflow channel. In other words, the flavor cartridge can be sandwiched between the top portion and the main body in a modular way and utilize the same comment airflow channel. In embodiments, the flavour cartridge can be refillable.

An air flow pathway may allow a user to draw air through the heated substrate. The top portion may comprise a top portion airflow channel. The main body may comprise a main body airflow channel. The main body airflow channel, the cartridge airflow channel and the top portion airflow channel may be fluidly connected to form a common airflow channel through the aerosol-generating device.

Preferably, the aerosol-generating device can be used without the cartridge. In this case, the top portion is attached to the main body so that the top portion airflow channel is in fluid communication with the main portion airflow channel. These two airflow channels form the common airflow channel. If the user desires to modify the flavor of the generated aerosol, the user can insert the flavor cartridge as described herein between the top portion and the main body to modify the flavor of the desired. This insertion of the flavor cartridge will utilize the same top portion airflow channel and the main portion airflow channel by aligning the cartridge airflow channel with these two airflow channels. The resulting common airflow channel is therefore the combination of the previous airflow channels (aerosol-generating device without flavor cartridge) with the cartridge airflow channel of the flavor cartridge.

The top portion may comprise a cavity configured to receive an aerosol-generating article comprising aerosol-forming substrate. The top portion may comprise a heating element arranged in or around the cavity. The heating element may be configured to heat the aerosol-forming substrate of the aerosol-generating article.

The heating element may be arranged distanced from the replaceable flavor cartridge such that the flavor substrate may be substantially thermally insulated from the heating element. The heating element may be configured to heat the aerosol-forming substrate of the aerosol-generating article. At the same time, the heating element may be configured to not heat the flavor cartridge. As described herein, the flavor cartridge may be a non-heated flavor cartridge. Consequently, the aerosol-generating device does not need an additional heating element to modify the flavor of the aerosol. In an alternative embodiment, the heating element is configured to also heat the flavor cartridge or the aerosol-generating device may comprise a further heating element for heating the flavor cartridge, when the flavor cartridge is received by the aerosol-generating device.

The replaceable flavor cartridge may be configured attachable between the top portion and the main body. Preferably, the attachment is configured as a removable attachment. The top portion of the aerosol-generating device may be configured removably attachable with the proximal part of the flavor cartridge. The main portion of the aerosol-generating device may be configured removably attachable with the distal part of the flavor cartridge. The removable attachment between the aerosol-generating device at the flavor cartridge may be facilitated by any known attachment means. For example, the top portion of the aerosol-generating device may comprise a male connection element and the proximal part of the flavor cartridge may comprise a female connection element or vice versa. The main portion of the aerosol-generating device may comprise a male connection element at the distal part of the flavor cartridge may comprise a female connection element or vice versa. The removal attachment between one or both of the top portion and the main body of the aerosol-generating device and one or both of the proximal part and the distal part of the flavor cartridge may be configured as a screw connection, a snap fit connection or a friction fit connection.

The replaceable flavor cartridge may be configured attachable between the top portion and the main body by placing the cartridge between the top portion and the main body and by rotating the cartridge. Attachment of the replaceable flavor cartridge between the top portion and the main body may be facilitated by a swivel connection, a bayonet mount or a Luer connection or any other rapid reversible connection known in the art.

The removable attachment of the flavor cartridge to the aerosol-generating device may depend upon the chosen connection. If the connection is facilitated by a screw connection, a user may screw on the proximal part of the flavor cartridge to the top portion of the aerosol-generating device. Alternatively, the user may screw on the top portion of the aerosol-

generating device to the proximal part of the flavor cartridge. Subsequently, the user may screw are not the distal part of the flavor cartridge to the main body of the aerosol-generating device. Alternatively, the user may subsequently screw on the main body of the aerosol-generating device to move the distal part of the flavor cartridge. As a further alternative, the user may initially screw the distal part of the flavor cartridge to the main body of the aerosol-generating device and subsequently screw the flavor cartridge to the top portion of the aerosol-generating device.

If the connection is facilitated as a snap fit connection or friction fit connection, the user may initially press the proximal part of the flavor cartridge against the top portion of the aerosol-generating device to establish a snap fit connection or friction fit connection between the proximal part and the top portion. Subsequently, the user may press the distal part of the flavor cartridge against the main body of the aerosol-generating device to establish a snap fit connection or friction fit connection between the distal part and the main body. Alternatively, the user may initially press the distal part of the flavor cartridge against the main body and subsequently press the proximal part against the top portion.

If the connection is facilitated as a swivel connection or a bayonet mount, a user may place of the flavor cartridge between the top portion of the aerosol-generating device and the main body of the aerosol-generating device. Optionally, a protrusion of the flavor cartridge may be placed in a recess of the aerosol-generating device or a recess of the flavor cartridge intrusion of the aerosol-generating device to facilitate correct alignment of the flavor cartridge between the top portion and the main body. Subsequently, a user may rotate the flavor cartridge with respect to the aerosol-generating device to facilitate engagement of the swivel connection or the bayonet mount of the flavor cartridge with the corresponding elements of the aerosol-generating device.

The flavor cartridge may be securely held between the top portion and the main body of the aerosol-generating device by any of the above discussed connection means. Further, any of the above discussed connection means may enable detaching the flavor cartridge from the aerosol-generating device, if the flavor cartridge is depleted. A fresh flavor cartridge may then be removably attached to the aerosol-generating device. Alternatively or additionally to replacing the depleted flavor cartridge with a fresh flavor cartridge, the flavor substrate of the depleted flavor cartridge may be refilled.

For refilling the depleted flavor cartridge, the flavor cartridge may comprise a refilling aperture. The refilling aperture may be configured as a membrane or one-way valve. In an embodiment, the refilling aperture may be arranged in the housing of the flavor cartridge such as to be accessible, when the flavor cartridge is rotated with respect to the further components of the aerosol-generating device. This embodiment is particularly beneficial, if the connection between the flavor cartridge and the aerosol-generating device is facilitated by means of the

swivel connection or the bayonet mount. When the flavor cartridge in this embodiment is rotated to an operating position, the refilling aperture is preferably not accessible to prevent spilling of flavor substrate.

As used herein, an 'aerosol-generating device' relates to a device that interacts with an aerosol-forming substrate to generate an aerosol. The aerosol-forming substrate may be part of an aerosol-generating article, for example part of a smoking article. An aerosol-generating device may be a smoking device that interacts with an aerosol-forming substrate of an aerosol-generating article to generate an aerosol that is directly inhalable into a user's lungs thorough the user's mouth. An aerosol-generating device may be a holder. The device may be an electrically heated smoking device. The aerosol-generating device may comprise a housing, electric circuitry, a power supply, a heating chamber and a heating element.

The aerosol-generating device may comprise a cavity for receiving the aerosol-generating article comprising aerosol-forming substrate. The cavity of the aerosol-generating device may have an open end into which the aerosol-generating article is inserted. The open end may be a proximal end. The cavity may have a closed end opposite the open end. The closed end may be the base of the cavity. The closed end may be closed except for the provision of air apertures arranged in the base. The base of the cavity may be flat. The base of the cavity may be circular. The base of the cavity may be arranged upstream of the cavity. The open end may be arranged downstream of the cavity. The cavity may have an elongate extension. The cavity may have a longitudinal central axis. A longitudinal direction may be the direction extending between the open and closed ends along the longitudinal central axis. The longitudinal central axis of the cavity may be parallel to the longitudinal axis of the aerosol-generating device.

The cavity may be configured as a heating chamber. The cavity may have a cylindrical shape. The cavity may have a hollow cylindrical shape. The cavity may have a shape corresponding to the shape of the aerosol-generating article to be received in the cavity. The cavity may have a circular cross-section. The cavity may have an elliptical or rectangular cross-section. The cavity may have an inner diameter corresponding to the outer diameter of the aerosol-generating article.

The top portion airflow channel may run through the cavity. Ambient air may be drawn into the aerosol-generating device, into the cavity and towards the user through the top portion airflow channel. Downstream of the cavity, a mouthpiece may be arranged or a user may directly draw on the aerosol-generating article. The airflow channel may extend through the mouthpiece. Upstream of the cavity, the flavor cartridge may be arranged.

As used herein, the terms 'upstream', 'downstream', 'proximal' and 'distal' are used to describe the relative positions of components, or portions of components, of the aerosol-

generating device in relation to the direction in which a user draws on the aerosol-generating device during use thereof.

The aerosol-generating device may comprise heating element. The heating element may comprise an electrically resistive material. Suitable electrically resistive materials include but are not limited to: semiconductors such as doped ceramics, electrically "conductive" ceramics (such as, for example, molybdenum disilicide), carbon, graphite, metals, metal alloys and composite materials made of a ceramic material and a metallic material. Such composite materials may comprise doped or undoped ceramics. Examples of suitable doped ceramics include doped silicon carbides. Examples of suitable metals include titanium, zirconium, tantalum platinum, gold and silver. Examples of suitable metal alloys include stainless steel, nickel-, cobalt-, chromium-, aluminium- titanium- zirconium-, hafnium-, niobium-, molybdenum-, tantalum-, tungsten-, tin-, gallium-, manganese-, gold- and iron-containing alloys, and super-alloys based on nickel, iron, cobalt, stainless steel, Timetal® and iron-manganese-aluminium based alloys. In composite materials, the electrically resistive material may optionally be embedded in, encapsulated or coated with an insulating material or vice-versa, depending on the kinetics of energy transfer and the external physicochemical properties required.

The aerosol-generating device may comprise an internal heating element or an external heating element, or both internal and external heating elements, where "internal" and "external" refer to the aerosol-forming substrate. An internal heating element may take any suitable form. For example, an internal heating element may take the form of a heating blade. Alternatively, the internal heater may take the form of a casing or substrate having different electro-conductive portions, or an electrically resistive metallic tube. Alternatively, the internal heating element may be one or more heating needles or rods that run through the center of the aerosol-forming substrate. Other alternatives include a heating wire or filament, for example a Ni-Cr (Nickel-Chromium), platinum, tungsten or alloy wire or a heating plate. Optionally, the internal heating element may be deposited in or on a rigid carrier material. In one such embodiment, the electrically resistive heating element may be formed using a metal having a defined relationship between temperature and resistivity. In such an exemplary device, the metal may be formed as a track on a suitable insulating material, such as ceramic material, and then sandwiched in another insulating material, such as a glass. Heaters formed in this manner may be used to both heat and monitor the temperature of the heating elements during operation.

An external heating element may take any suitable form. For example, an external heating element may take the form of one or more flexible heating foils on a dielectric substrate, such as polyimide. The flexible heating foils can be shaped to conform to the perimeter of the cavity. Alternatively, an external heating element may take the form of a metallic grid or grids, a flexible printed circuit board, a molded interconnect device (MID),

ceramic heater, flexible carbon fibre heater or may be formed using a coating technique, such as plasma vapor deposition, on a suitable shaped substrate. An external heating element may also be formed using a metal having a defined relationship between temperature and resistivity. In such an exemplary device, the metal may be formed as a track between two layers of suitable insulating materials. An external heating element formed in this manner may be used to both heat and monitor the temperature of the external heating element during operation.

The internal or external heating element may comprise a heat sink, or heat reservoir comprising a material capable of absorbing and storing heat and subsequently releasing the heat over time to the aerosol-forming substrate. The heat sink may be formed of any suitable material, such as a suitable metal or ceramic material. In one embodiment, the material has a high heat capacity (sensible heat storage material), or is a material capable of absorbing and subsequently releasing heat via a reversible process, such as a high temperature phase change. Suitable sensible heat storage materials include silica gel, alumina, carbon, glass mat, glass fibre, minerals, a metal or alloy such as aluminium, silver or lead, and a cellulose material such as paper. Other suitable materials which release heat via a reversible phase change include paraffin, sodium acetate, naphthalene, wax, polyethylene oxide, a metal, metal salt, a mixture of eutectic salts or an alloy. The heat sink or heat reservoir may be arranged such that it is directly in contact with the aerosol-forming substrate and can transfer the stored heat directly to the substrate. Alternatively, the heat stored in the heat sink or heat reservoir may be transferred to the aerosol-forming substrate by means of a heat conductor, such as a metallic tube.

The heating element advantageously heats the aerosol-forming substrate by means of conduction. The heating element may be at least partially in contact with the substrate, or the carrier on which the substrate is deposited. Alternatively, the heat from either an internal or external heating element may be conducted to the substrate by means of a heat conductive element.

During operation, the aerosol-forming substrate may be completely contained within the aerosol-generating device. In that case, a user may puff on a mouthpiece of the aerosol-generating device. Alternatively, during operation a smoking article containing the aerosol-forming substrate may be partially contained within the aerosol-generating device. In that case, the user may puff directly on the smoking article.

As an alternative to an electrically resistive heating element, the heating element may be configured as an induction heating element. The induction heating element may comprise an induction coil and a susceptor. In general, the susceptor is a material that is capable of absorbing electromagnetic energy and converting it to heat. When located in an alternating electromagnetic field, typically eddy currents are induced and hysteresis losses occur in the

susceptor causing heating of the susceptor. Changing electromagnetic fields generated by one or several induction coils heat the susceptor, which then transfers the heat to the aerosol-generating article, such that an aerosol is formed. The heat transfer may be mainly by conduction of heat. Such a transfer of heat is best, if the susceptor is in close thermal contact with the aerosol-generating article.

The susceptor may be formed from any material that can be inductively heated to a temperature sufficient to generate an aerosol from the aerosol-forming substrate. A preferred susceptor may comprise or consist of a ferromagnetic material, for example a ferromagnetic alloy, ferritic iron, or a ferromagnetic steel or stainless steel. A suitable susceptor may be, or comprise, aluminium. Preferred susceptors may be heated to a temperature in excess of 250 degrees Celsius.

Preferred susceptors are metal susceptors, for example stainless steel. However, susceptor materials may also comprise or be made of graphite, molybdenum, silicon carbide, aluminum, niobium, Inconel alloys (austenite nickel-chromium-based superalloys), metallized films, ceramics such as for example zirconia, transition metals such as for example iron, cobalt, nickel, or metalloids components such as for example boron, carbon, silicon, phosphorus, aluminium.

Preferably, the susceptor material is a metallic susceptor material. The susceptor may also be a multi-material susceptor and may comprise a first susceptor material and a second susceptor material. In some embodiments, the first susceptor material may be disposed in intimate physical contact with the second susceptor material. The second susceptor material preferably has a Curie temperature that is below the ignition point of the aerosol-forming substrate. The first susceptor material is preferably used primarily to heat the susceptor when the susceptor is placed in a fluctuating electromagnetic field. Any suitable material may be used. For example, the first susceptor material may be aluminium, or may be a ferrous material such as a stainless steel. The second susceptor material is preferably used primarily to indicate when the susceptor has reached a specific temperature, that temperature being the Curie temperature of the second susceptor material. The Curie temperature of the second susceptor material can be used to regulate the temperature of the entire susceptor during operation. Suitable materials for the second susceptor material may include nickel and certain nickel alloys.

By providing a susceptor having at least a first and a second susceptor material, the heating of the aerosol-forming substrate and the temperature control of the heating may be separated. Preferably the second susceptor material is a magnetic material having a second Curie temperature that is substantially the same as a desired maximum heating temperature. That is, it is preferable that the second Curie temperature is approximately the same as the

temperature that the susceptor should be heated to in order to generate an aerosol from the aerosol-forming substrate.

When an induction heating element is employed, the induction heating element may be configured as an internal heating element as described herein or as an external heater as described herein. If the induction heating element is configured as an internal heating element, the susceptor element is preferably configured as a pin or blade for penetrating the aerosol-generating article. If the induction heating element is configured as an external heating element, the susceptor element is preferably configured as a cylindrical susceptor at least partly surrounding the cavity or forming the sidewall of the cavity.

The aerosol-generating device may comprise electric circuitry. The electric circuitry may comprise a microprocessor, which may be a programmable microprocessor. The microprocessor may be part of a controller. The electric circuitry may comprise further electronic components. The electric circuitry may be configured to regulate a supply of power to the heating element. Power may be supplied to the heating element continuously following activation of the aerosol-generating device or may be supplied intermittently, such as on a puff-by-puff basis. The power may be supplied to the heating element in the form of pulses of electrical current. The electric circuitry may be configured to monitor the electrical resistance of the heating element, and preferably to control the supply of power to the heating element dependent on the electrical resistance of the heating element.

The aerosol-generating device may comprise a power supply, typically a battery, within a main body of the aerosol-generating device. In one embodiment, the power supply is a Lithium-ion battery. Alternatively, the power supply may be a Nickel-metal hydride battery, a Nickel cadmium battery, or a Lithium based battery, for example a Lithium-Cobalt, a Lithium-Iron-Phosphate, Lithium Titanate or a Lithium-Polymer battery. As an alternative, the power supply may be another form of charge storage device such as a capacitor. The power supply may require recharging and may have a capacity that enables to store enough energy for one or more usage experiences; for example, the power supply may have sufficient capacity to continuously generate aerosol for a period of around six minutes or for a period of a multiple of six minutes. In another example, the power supply may have sufficient capacity to provide a predetermined number of puffs or discrete activations of the heating element.

As used herein, the term ‘aerosol-generating article’ refers to an article comprising an aerosol-forming substrate that is capable of releasing volatile compounds that can form an aerosol. For example, an aerosol-generating article may be a smoking article that generates an aerosol that is directly inhalable into a user’s lungs through the user's mouth. An aerosol-generating article may be disposable. As described herein, the aerosol-generating article may be provided in addition to the flavor cartridge. While the aerosol-generating article is preferably received by the cavity of the top portion of the aerosol-generating device, the flavor cartridge

is preferably arranged upstream of the cavity between the top portion and the main body of the aerosol-generating device.

The aerosol-generating article may be substantially cylindrical in shape. The aerosol-generating article may be substantially elongate. The aerosol-generating article may have a length and a circumference substantially perpendicular to the length. The aerosol-generating article may be substantially rod shaped. The aerosol-forming substrate may be substantially cylindrical in shape. The aerosol-forming substrate may be substantially elongate. The aerosol-forming substrate may also have a length and a circumference substantially perpendicular to the length. The aerosol-forming substrate may be substantially rod shaped.

The aerosol-generating substrate may comprise an aerosol-former. The aerosol-generating substrate preferably comprises homogenised tobacco material, an aerosol-former and water. Providing homogenised tobacco material may improve aerosol generation, the nicotine content and the flavour profile of the aerosol generated during heating of the aerosol-generating article. Specifically, the process of making homogenised tobacco involves grinding tobacco leaf, which more effectively enables the release of nicotine and flavours upon heating.

The homogenised tobacco material is preferably provided in sheets which are one of folded, crimped, or cut into strips. In a particularly preferred embodiment, the sheets are cut into strips having a width of between about 0.2 millimetres and about 2 millimetres, more preferably between about 0.4 millimetres and about 1.2 millimetres. In one embodiment, the width of the strips is about 0.9 millimetres.

Alternatively, the homogenised tobacco material may be formed into spheres using spheronisation. The mean diameter of the spheres is preferably between about 0.5 millimetres and about 4 millimetres, more preferably between about 0.8 millimetres and about 3 millimetres.

The aerosol-generating substrate preferably comprises: homogenised tobacco material between about 55 percent and about 75 percent by weight; aerosol-former between about 15 percent and about 25 percent by weight; and water between about 10 percent and about 20 percent by weight.

Before measuring the samples of aerosol-generating substrate they are equilibrated for 48 hours at 50 percent relative humidity at 22 degrees Celsius. The Karl Fischer technique is used to determine the water content of the homogenised tobacco material.

Sheets of homogenised tobacco material for use in aerosol-generating articles comprising a capsule may be formed by agglomerating particulate tobacco obtained by grinding or otherwise comminuting one or both of tobacco leaf lamina and tobacco leaf stems.

Sheets of homogenised tobacco material for use in aerosol-generating articles comprising a capsule may comprise one or more intrinsic binders that is a tobacco endogenous binder, one or more extrinsic binders that is a tobacco exogenous binder, or a combination

thereof to help agglomerate the particulate tobacco. Alternatively, or in addition, sheets of homogenised tobacco material may comprise other additives including, but not limited to, tobacco and non-tobacco fibres, flavourants, fillers, aqueous and non-aqueous solvents and combinations thereof.

Suitable extrinsic binders for inclusion in sheets of homogenised tobacco material for use in aerosol-generating articles comprising a capsule are known in the art and include, but are not limited to: gums such as, for example, guar gum, xanthan gum, arabic gum and locust bean gum; cellulosic binders such as, for example, hydroxypropyl cellulose, carboxymethyl cellulose, hydroxyethyl cellulose, methyl cellulose and ethyl cellulose; polysaccharides such as, for example, starches, organic acids, such as alginic acid, conjugate base salts of organic acids, such as sodium-alginate, agar and 30 pectins; and combinations thereof.

A number of reconstitution processes for producing sheets of homogenised tobacco materials are known in the art. These include, but are not limited to: paper-making processes of the type described in, for example, US-A-3,860,012; casting or 'cast leaf' processes of the type described in, for example, US-A-5,724,998; dough reconstitution processes of the type described in, for example, US-A-3,894,544; and extrusion processes of the type described in, for example, in GB-A-983,928. Typically, the densities of sheets of homogenised tobacco material produced by extrusion processes and dough reconstitution processes are greater than the densities of sheets of homogenised tobacco materials produced by casting processes.

Sheets of homogenised tobacco material for use in aerosol-generating articles comprising a capsule are preferably formed by a casting process of the type generally comprising casting a slurry comprising particulate tobacco and one or more binders onto a conveyor belt or other support surface, drying the cast slurry to form a sheet of homogenised tobacco material and removing the sheet of homogenised tobacco material from the support surface.

The homogenised tobacco sheet material may be produced using different types of tobacco. For example, tobacco sheet material may be formed using tobaccos from a number of different varieties of tobacco, or tobacco from different regions of the tobacco plant, such as leaves or stem. After processing, the sheet has consistent properties and a homogenised flavour. A single sheet of homogenised tobacco material may be produced to have a specific flavour. To produce a product having a different flavour, a different tobacco sheet material needs to be produced. Some flavours that are produced by blending a large number of different shredded tobaccos in a conventional cigarette may be difficult to replicate in a single homogenised tobacco sheet. For example, Virginia tobaccos and Burley tobaccos may need to be processed in different ways to optimise their individual flavours. It may not be possible to replicate a particular blend of Virginia and Burley tobaccos in a single sheet of homogenised tobacco material. As such, the aerosol-generating substrate may comprise a first homogenised

tobacco material and a second homogenised tobacco material. By combining two different sheets of tobacco material in a single aerosol-generating substrate, new blends may be created that could not be produced by a single sheet of homogenised tobacco.

The aerosol-former preferably comprises at least one polyhydric alcohol. In a preferred embodiment, the aerosol-former comprises at least one of: triethylene glycol; 1,3-butanediol; propylene glycol; and glycerine.

The aerosol-forming substrate of the aerosol-generating article is preferably flavorant free. The flavorant, if any is desired, is preferably provided by the flavor cartridge arranged upstream of the cavity between the top portion and the main body of the aerosol-generating device.

As an alternative or additionally to providing an aerosol-generating article comprising a solid aerosol-forming substrate, the aerosol-generating device may be operated with a liquid aerosol-forming substrate. The liquid aerosol-forming substrate may be held in a liquid storage portion. The liquid storage portion may be arranged in the top portion of the aerosol-generating device. The liquid storage portion may be arranged downstream of the flavor cartridge. The liquid aerosol-forming substrate may comprise a liquid aerosol former. The liquid aerosol-forming substrate may comprise a flavorant, exemplarily tobacco flavor or menthol flavor. The liquid aerosol-forming substrate may comprise nicotine. The liquid aerosol-forming substrate contained in the liquid storage portion is preferably provided in addition to the flavor cartridge. The liquid aerosol-forming substrate from the liquid storage portion is heated and vaporized by the heating element.

Below, there is provided a non-exhaustive list of non-limiting examples. Any one or more of the features of these examples may be combined with any one or more features of another example, embodiment, or aspect described herein.

Example A: Replaceable flavor cartridge for an aerosol-generating device, wherein the cartridge comprises:

a housing; and

a flavor substrate, wherein the flavor substrate is arranged within the housing,

wherein the housing comprises a proximal aperture in a proximal part of the housing, wherein the housing comprises a distal aperture in a distal part of the housing, wherein the flavor substrate comprises a substrate aperture, and wherein the proximal aperture, the distal aperture and the substrate aperture are aligned with each other to form a cartridge airflow channel through the cartridge.

Example B: Cartridge according to example B, wherein the cartridge airflow channel is straight.

Example C: Cartridge according to any of the preceding examples, wherein the cartridge comprises a removable fluid impermeable proximal foil covering the proximal aperture.

Example D: Cartridge according to any of the preceding examples, wherein the cartridge comprises a removable fluid impermeable distal foil covering the distal aperture.

Example E: Cartridge according to any of the preceding examples, wherein the flavor substrate is tobacco free.

Example F: Cartridge according to any of the preceding examples, wherein the flavor substrate is nicotine free.

Example G: Cartridge according to any of the preceding examples, wherein the housing is porous.

Example H: Cartridge according to any of the preceding examples, wherein the proximal part of the housing and the distal part of the housing are connected with a Luer connector.

Example I: Cartridge according to any of the preceding examples, wherein the flavor substrate comprises a high retention material impregnated with a flavoring liquid or a flavoring gel.

Example J: Cartridge according to any of the preceding examples, wherein the flavor substrate comprises an ambient temperature atomizable flavor substrate.

Example K: Aerosol-generating device comprising:

a top portion;

a replaceable flavor cartridge according to any of the preceding examples; and

a main body,

wherein the cartridge is configured removably attachable between the top portion and the main body.

Example L: Aerosol-generating device according to example K, wherein the top portion comprises a top portion airflow channel, wherein the main body comprises a main body airflow channel, and wherein the main body airflow channel, the cartridge airflow channel and the top

portion airflow channel are fluidly connected to form a common airflow channel through the aerosol-generating device, when the cartridge is attached between the top portion and the main body.

Example M: Aerosol-generating device according to example K or L, wherein the top portion comprises a cavity configured to receive an aerosol-generating article comprising aerosol-forming substrate, wherein the top portion comprises a heating element arranged in or around the cavity, and wherein the heating element is configured to heat the aerosol-forming substrate of the aerosol-generating article.

Example N: Aerosol-generating device according to example M, wherein the heating element is arranged distanced from the replaceable flavor cartridge such that the flavor substrate is substantially thermally insulated from the heating element.

Example O: Aerosol-generating device according to any of examples K to N, wherein the replaceable flavor cartridge is configured attachable between the top portion and the main body by placing the cartridge between the top portion and the main body and by rotating the cartridge.

Features described in relation to one embodiment may equally be applied to other embodiments of the invention.

The invention will be further described, by way of example only, with reference to the accompanying drawings in which:

Fig. 1 shows an exploded view of a flavor cartridge;

Fig. 2A shows a cross-sectional view of the flavor cartridge in a disassembled state;

Fig. 2B shows a cross-sectional view of the flavor cartridge in an assembled state;

Fig. 3 shows an illustrative view of an aerosol-generating device;

Fig. 4 shows an illustration of attachment of the flavor cartridge to the aerosol-generating device; and

Fig. 5 shows a cross-sectional view of a further embodiment of the aerosol-generating device.

Figure 1 shows a flavor cartridge configured to be used for an aerosol-generating device. The aerosol-generating device and the usage of the flavor cartridge in the aerosol-generating device will be described below in conjunction with Figures 3 and 4. The flavor cartridge comprises a proximal part 10, a distal part 12 and a flavor substrate 14. The flavor substrate 14 is arranged between the proximal part 10 and the distal part 12. The proximal part

10 and the distal part 12 together form a housing of the flavor cartridge. The flavor substrate 14 is sandwiched between the proximal part 10 at the distal part 12.

The proximal part 10 comprises a proximal aperture 16. The proximal aperture 16 is arranged in a proximal end face 18 of the proximal part 10. The distal part 12 comprises a distal aperture 20. The distal aperture 20 is arranged in a distal end face 22 of the distal part 12. The flavor substrate 14 comprises a substrate aperture 24. The proximal aperture 16, the substrate aperture 24 and the distal aperture 20 are aligned with each other. A cartridge airflow channel 26 runs through the proximal aperture 16, the substrate aperture 24 and the distal aperture 20.

Before usage of the flavor cartridge, the flavor cartridge is sealed to prevent evaporation of flavorant during storage. For sealing the flavor cartridge, a removable fluid impermeable proximal foil 56 may be provided over the proximal aperture 16. Further, a removable fluid impermeable distal foil 58 may be provided over the distal aperture 20. A user may remove the removable fluid impermeable proximal foil 56 and the removable fluid impermeable distal foil 58 before usage of the flavor cartridge. After removal, the cartridge airflow channel 26 is established and air may flow through the flavor cartridge.

When air flows through the flavor cartridge, the air contacts the flavor substrate 14. Flavorant contained in the flavor substrate 14 may be entrained in the air. To increase the contact surface between the air flowing through the cartridge airflow channel 26 and the flavorant, one or both of the proximal part 10 and the distal part 12 may be configured porous or comprise porous areas. The flavorant may then be wicked into one or both of the proximal part 10 and the distal part 12 or the porous areas of these elements.

Figure 2A shows a state of the flavor cartridge before assembly of the flavor cartridge. It can be seen that the cartridge airflow channel 26 runs parallel to the central axis 28 of the flavor cartridge. In the area of the proximal aperture 16, the flavor cartridge comprises a female connection element 30. In the area of the distal aperture 20, the flavor cartridge comprises a male connection element 32. Of course, it is also an option that the female connection element 30 is arranged in the area of the proximal aperture 16 and that the male connection element 32 is arranged in the area of the distal aperture 20. The male connection element 32 and the female connection element 30 are configured to enable attachment of the flavor cartridge to the aerosol-generating device.

Figure 3 shows an embodiment of the aerosol-generating device. The aerosol-generating device comprises a top portion 34. The top portion 34 is configured as a mouthpiece. A user may inhale the aerosol generated in the aerosol-generating device through the top portion 34. The top portion 34 is arranged at a proximal end or downstream end of the aerosol-generating device. The aerosol-generating device further comprises a main body 36. The main body 36 may comprise further components such as a power supply 46 in the form

of a battery and a controller 48. These components are shown in more detail in Figure 5. The aerosol-generating device may further comprise a heating element 38 (the heating element 38 is not depicted in the embodiment shown in Figures 3 and 4, but is depicted in the embodiment shown in Figure 5). The flavor cartridge is also depicted in Figure 3. The flavor cartridge is sandwiched between the top portion 34 and the main body 36. Ambient air is drawn into the aerosol-generating device through an air inlet 50 (shown in the embodiment of Figure 5), when a user draws on the top portion 34. The air is drawn through an airflow channel (shown in the embodiment of Figure 5) and heated by the heating element 38 together with aerosol-forming substrate and an aerosol is generated by the aerosol-generating device. The aerosol may subsequently be inhaled by the user. In the airflow channel, the flavor cartridge is arranged. The flavor cartridge ads flavorant to the air such that the flavor of the generated aerosol can be modified by the user.

The attachment of the flavor cartridge to the aerosol-generating device is depicted in Figure 4. The male connection element 32 of the flavor cartridge in the embodiment shown in Figure 4 is inserted into a corresponding female part 40 of the main body 36 of the aerosol-generating device. After insertion of the male connection element 32, the flavor cartridge may be rotated to secure the flavor cartridge with the main body 36. Subsequently, the top portion 34 may be attached to the flavor cartridge, exemplarily by attachment of the top portion 34 to the female connection element 30 of the flavor cartridge.

Figure 5 shows a further embodiment of the aerosol-generating device. The main elements are similar to the aerosol-generating device shown in Figures 3 and 4. In the following, the differences will be highlighted. The top portion 34 of the aerosol-generating device shown in Figure 5 comprises a cavity 42 for receiving an aerosol-generating article 44 comprising aerosol-forming substrate. The heating element 38 is arranged downstream of the flavor cartridge in the top portion 34. The heating element 38 is configured as an induction heating element 38. The heating element 38 at least partly surrounds the cavity 42. The heating element 38 is configured to heat the aerosol-forming substrate of the aerosol-generating article 44.

The flavor cartridge is sandwiched between the top portion 34 and the main body 36.

The main body 36 comprises a power supply 46 and a controller 48. The controller 48 is configured to control the supply of electrical energy from the power supply 46 to the heating element 38. The power supply 46 is preferably a battery. The main body 36 comprises an air inlet 50. The air inlet 50 is fluidly connected with a main body airflow channel 52. The main body airflow channel 52 of the main body 36 is fluidly connected with the cartridge airflow channel 26, when the flavor cartridge is arranged between the main body 36 and the top portion 34. The cartridge airflow channel 26 is fluidly connected with a top portion airflow channel 54. The top portion airflow channel 54 is arranged in the top portion 34. The top portion airflow

channel 54 is fluidly connected with the cavity 42. As shown in Figure 5, the main portion airflow channel, the cartridge airflow channel 26 and the top portion airflow channel 54 form a common airflow channel. During use, a user draws on the aerosol-generating article 44 thereby drawing ambient air to the air inlet 50, through the main body airflow channel 52, through the cartridge airflow channel 26, through the top portion airflow channel 54 and into the cavity 42. In the cavity 42, the air flows through the aerosol-forming substrate of the aerosol-generating article 44. Due to the heating action of the heating element 38, the air and the aerosol-forming substrate is heated and an aerosol is generated. During drawing of the ambient air through the cartridge airflow channel 26, the air is enriched with flavorant from the flavor substrate 14 of the flavor cartridge. The flavor of the aerosol exiting the system comprising the aerosol-generating device and the aerosol-generating article 44 is therefore adjustable by an appropriate flavor cartridge.

CLAIMS

1. An aerosol-generating device comprising:

a top portion and a main body, and

a replaceable flavor cartridge, wherein the cartridge comprises:

a housing; and

a flavor substrate, wherein the flavor substrate is arranged within the housing,

wherein the housing comprises a proximal aperture in a proximal part of the housing, wherein the housing comprises a distal aperture in a distal part of the housing, wherein the flavor substrate comprises a substrate aperture, and wherein the proximal aperture, the distal aperture and the substrate aperture are aligned with each other to form a cartridge airflow channel through the cartridge, wherein the cartridge is removably attachable between the top portion and the main body.

2. Aerosol-generating device according to claim 1, wherein the cartridge airflow channel is straight.

3. Aerosol-generating device according to any of the preceding claims, wherein the cartridge comprises a removable fluid impermeable proximal foil covering the proximal aperture.

4. Aerosol-generating device according to any of the preceding claims, wherein the cartridge comprises a removable fluid impermeable distal foil covering the distal aperture.

5. Aerosol-generating device according to any of the preceding claims, wherein the flavor substrate is tobacco free.

6. Aerosol-generating device according to any of the preceding claims, wherein the flavor substrate is nicotine free.

7. Aerosol-generating device according to any of the preceding claims, wherein the housing is porous.

8. Aerosol-generating device according to any of the preceding claims, wherein the proximal part of the housing and the distal part of the housing are connected with a Luer connector.

9. Aerosol-generating device according to any of the preceding claims, wherein the flavor substrate comprises a high retention material impregnated with a flavoring liquid or a flavoring gel.

10. Aerosol-generating device according to any of the preceding claims, wherein the flavor substrate comprises an ambient temperature atomizable flavor substrate.

11. Aerosol-generating device according to any of the preceding claims, wherein the top portion comprises a top portion airflow channel, wherein the main body comprises a main body airflow channel, and wherein the main body airflow channel, the cartridge airflow channel and the top portion airflow channel are fluidly connected to form a common airflow channel through the aerosol-generating device, when the cartridge is attached between the top portion and the main body.

12. Aerosol-generating device according to any of the preceding claims, wherein the top portion comprises a cavity configured to receive an aerosol-generating article comprising aerosol-forming substrate, wherein the top portion comprises a heating element arranged in or around the cavity, and wherein the heating element is configured to heat the aerosol-forming substrate of the aerosol-generating article.

13. Aerosol-generating device according to claim 12, wherein the heating element is arranged distanced from the replaceable flavor cartridge such that the flavor substrate is substantially thermally insulated from the heating element.

14. Aerosol-generating device according to any of the preceding claims, wherein the replaceable flavor cartridge is configured attachable between the top portion and the main body by placing the cartridge between the top portion and the main body and by rotating the cartridge.

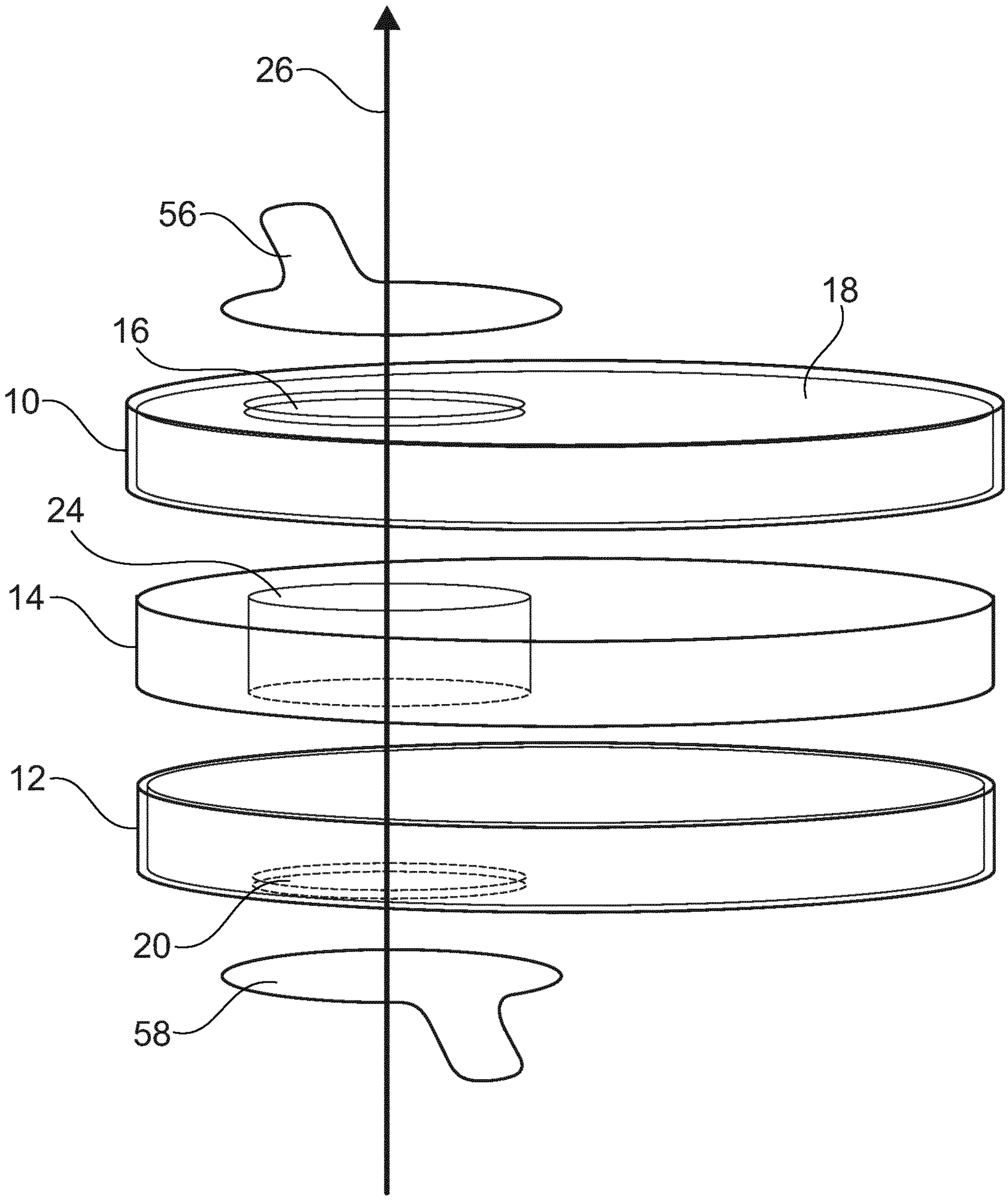


Fig. 1

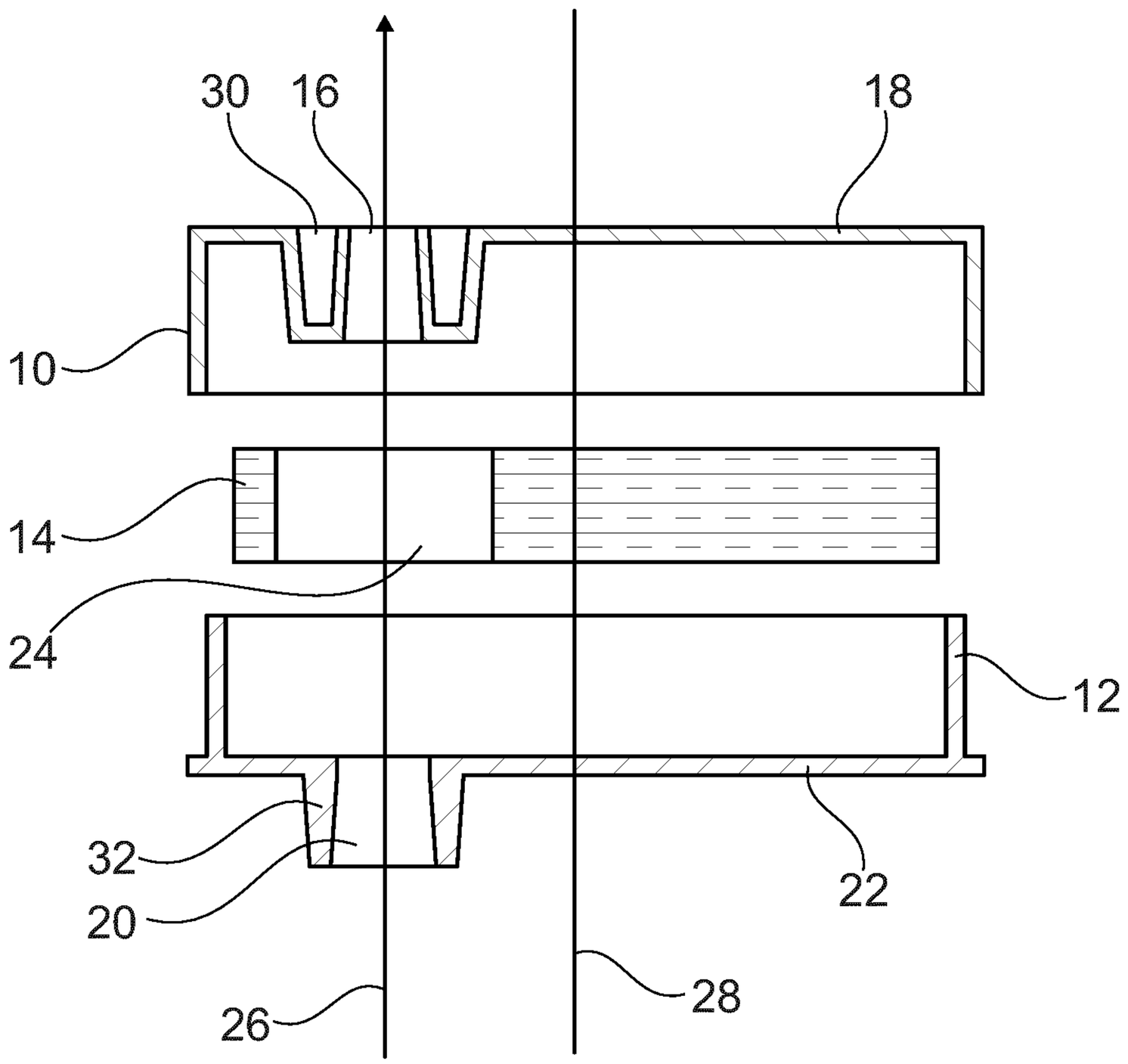


Fig. 2A

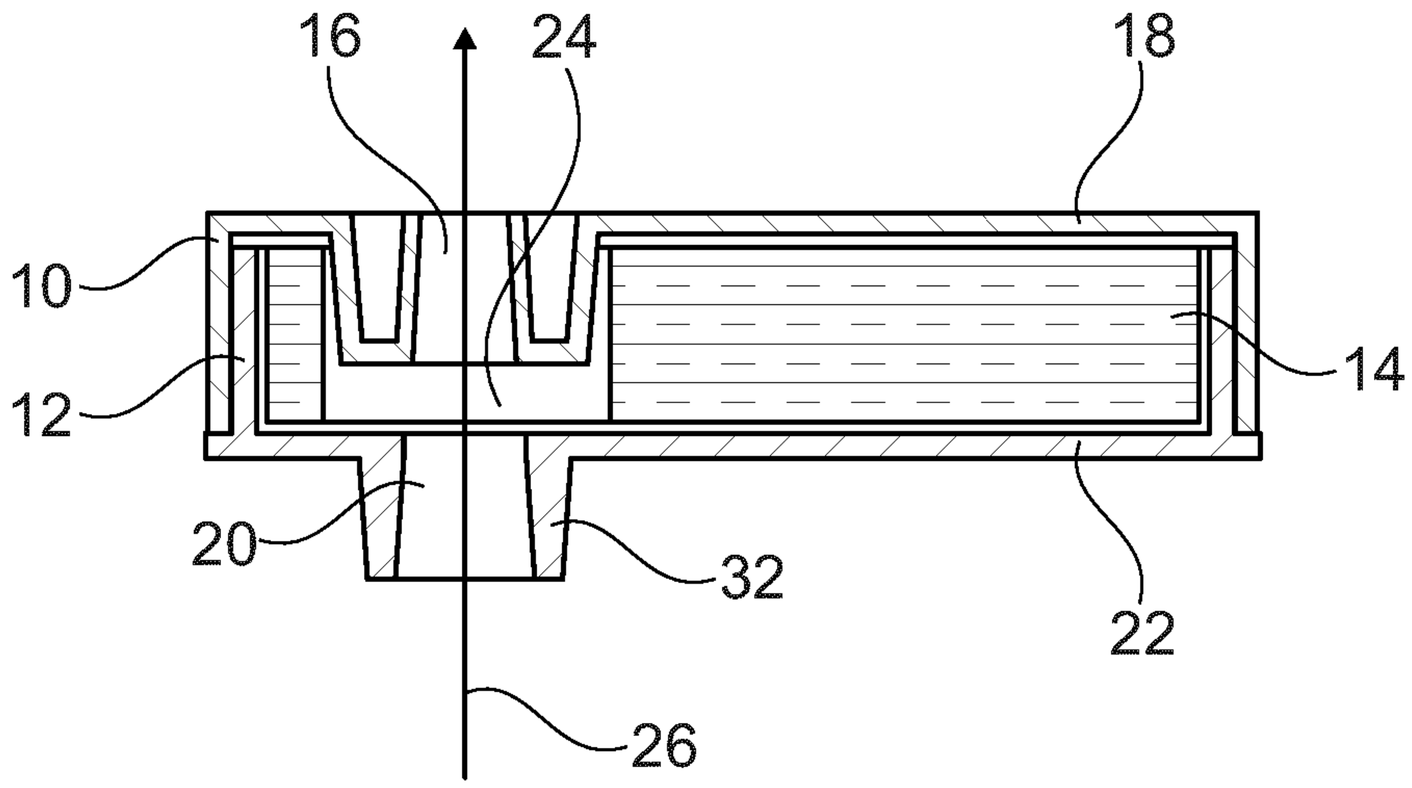


Fig. 2B

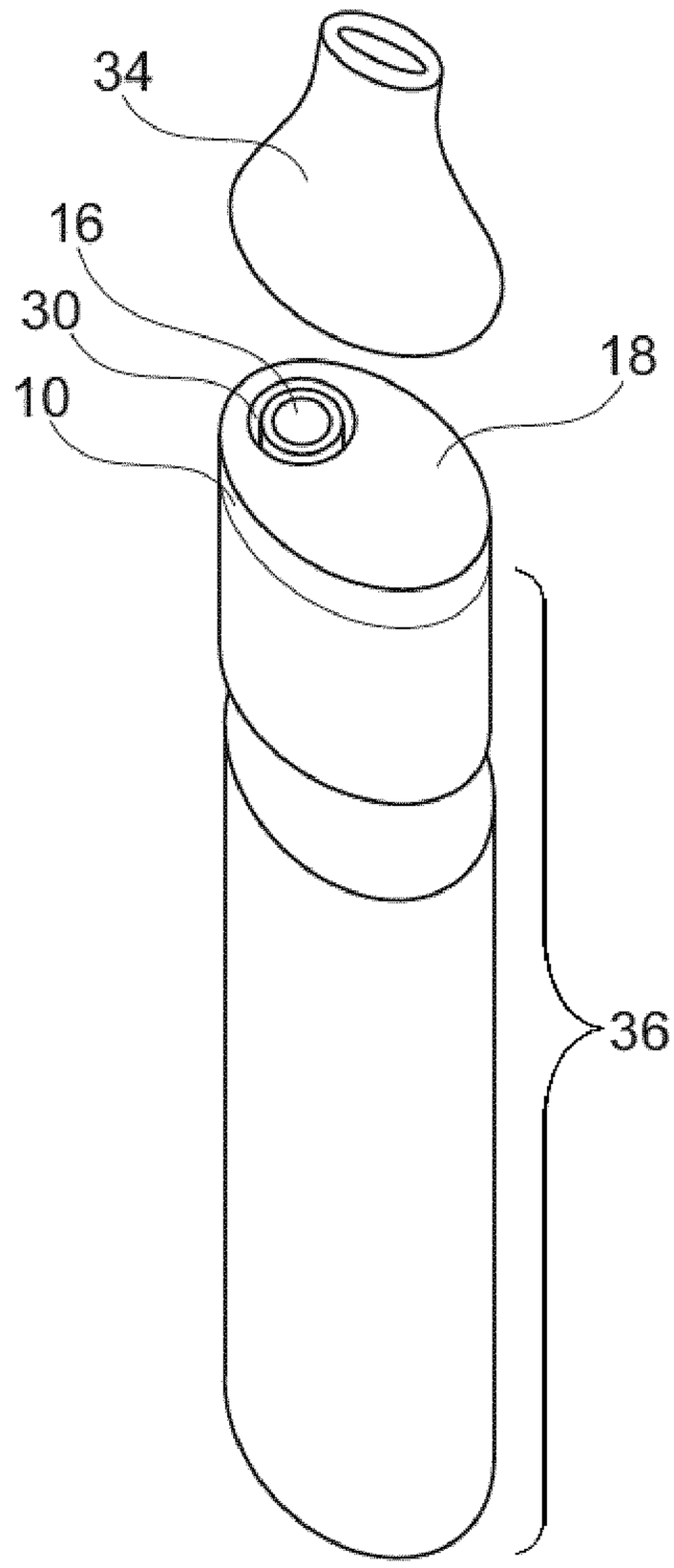


Fig. 3

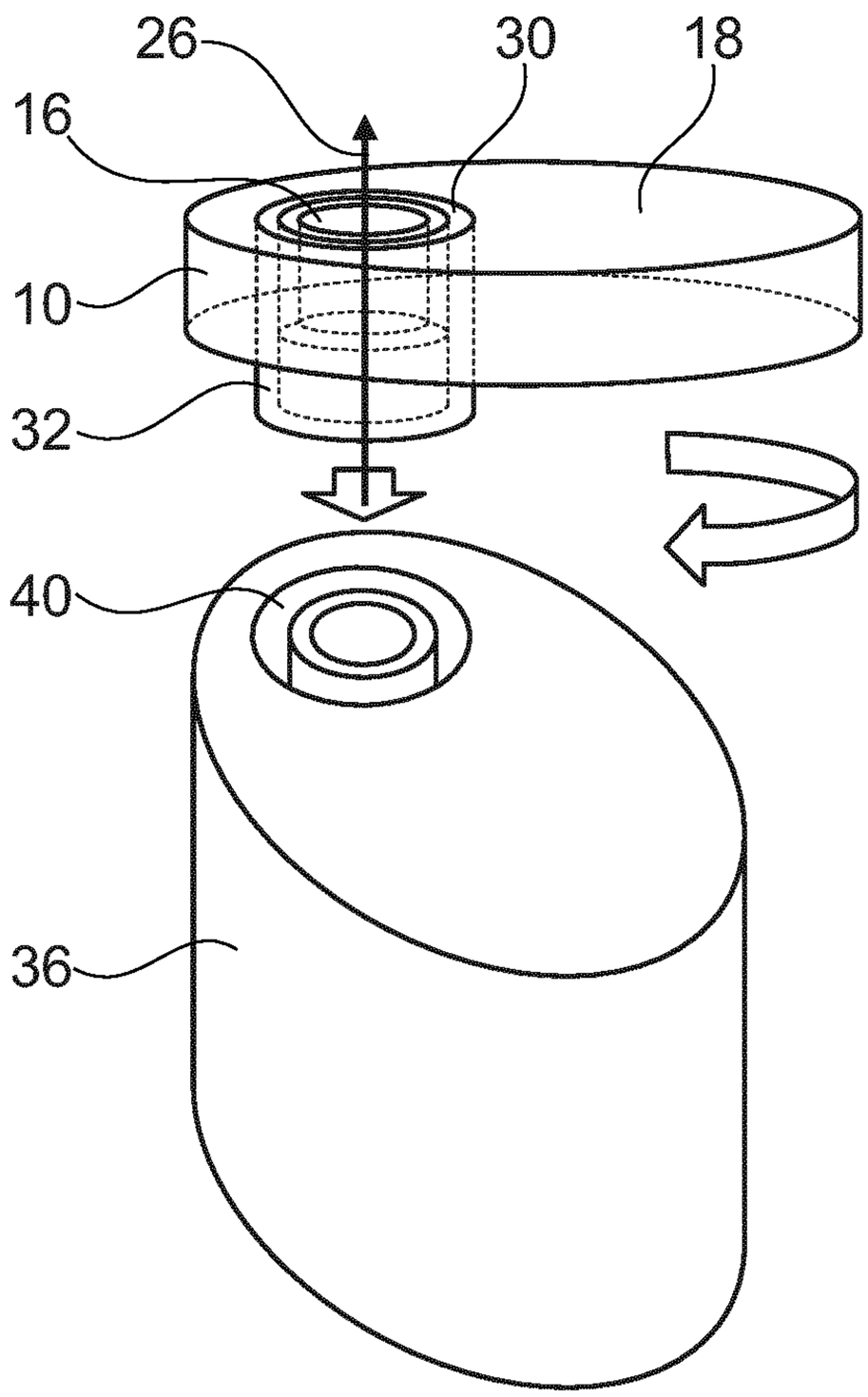


Fig. 4

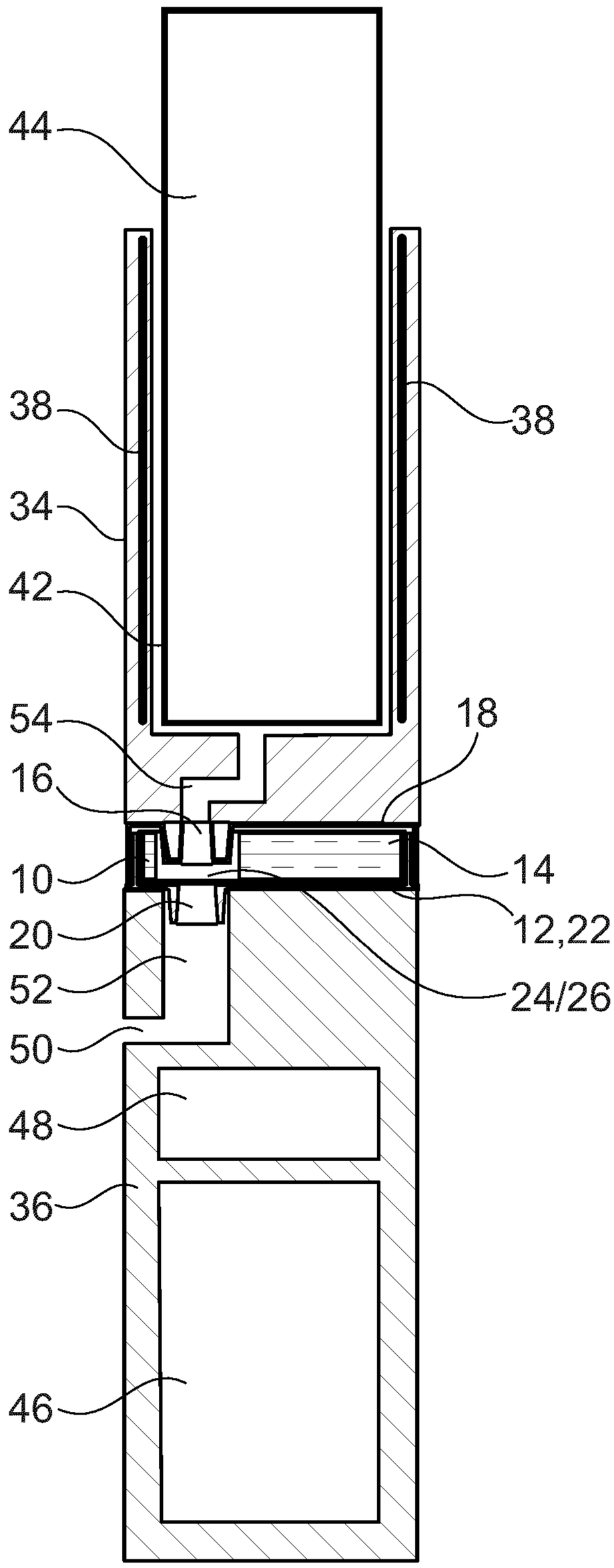


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2021/050627

A. CLASSIFICATION OF SUBJECT MATTER
INV. A24F40/42
ADD.

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 A61M

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2019/183177 A1 (HUBBARD SAWYER [US] ET AL) 20 June 2019 (2019-06-20) paragraph [0037] - paragraph [0081]; figures 1-11	1-14
X	US 2019/289909 A1 (HEJAZI VAHID [US]) 26 September 2019 (2019-09-26) paragraph [0069] - paragraph [0101]; figures 1-9	1-14
A	KR 2013 0052119 A (KT & G CORP [KR]) 22 May 2013 (2013-05-22) paragraph [0030] - paragraph [0051]; figures 1-5	1-14

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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"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

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
31 March 2021	12/04/2021
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Klintebäck, Daniel

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2021/050627

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