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(54) **SMOKING SUBSTITUTE SYSTEM**

(57) Disclosed is a system having a smoking substitute device comprising a body (209), an elongate heating element projecting from the body along a longitudinal axis and a cap (210) engageable with the body for at least partly enclosing the heating element. The cap is movable along the longitudinal axis between a first position and a second position that is further from the body than the first

position. The cap is configured for engagement with an aerosol-forming article such that, when engaged, the article is moved along the longitudinal axis with the cap. A portion of the article remains in contact with the heating element when the cap is in each of the first and second positions.

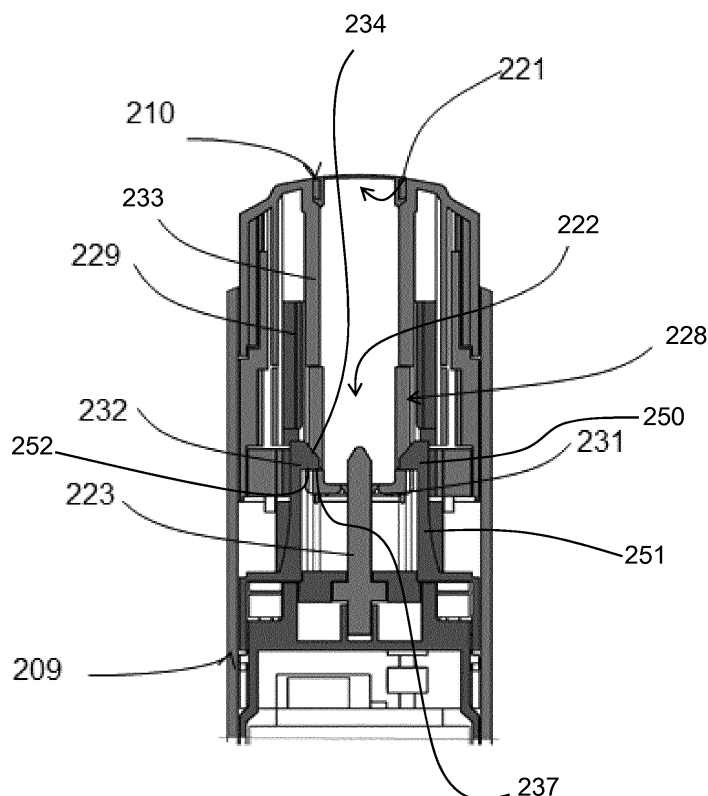


FIG 2H

Description

TECHNICAL FIELD

[0001] The present invention relates to a smoking substitute system and particularly, although not exclusively, to a smoking substitute system comprising a smoking substitute device for use with an aerosol-forming article.

BACKGROUND

[0002] The smoking of tobacco is generally considered to expose a smoker to potentially harmful substances. It is generally thought that a significant amount of the potentially harmful substances are generated through the heat caused by the burning and/or combustion of the tobacco and the constituents of the burnt tobacco in the tobacco smoke itself.

[0003] Conventional combustible smoking articles, such as cigarettes, typically comprise a cylindrical rod of tobacco comprising shreds of tobacco which is surrounded by a wrapper, and usually also a cylindrical filter axially aligned in an abutting relationship with the wrapped tobacco rod. The filter typically comprises a filtration material which is circumscribed by a plug wrap. The wrapped tobacco rod and the filter are joined together by a wrapped band of tipping paper that circumscribes the entire length of the filter and an adjacent portion of the wrapped tobacco rod. A conventional cigarette of this type is used by lighting the end opposite to the filter, and burning the tobacco rod. The smoker receives mainstream smoke into their mouth by drawing on the mouth end or filter end of the cigarette.

[0004] Combustion of organic material such as tobacco is known to produce tar and other potentially harmful by-products. There have been proposed various smoking substitute systems (or "substitute smoking systems") in order to avoid the smoking of tobacco.

[0005] Such smoking substitute systems can form part of nicotine replacement therapies aimed at people who wish to stop smoking and overcome a dependence on nicotine.

[0006] Smoking substitute systems include electronic systems that permit a user to simulate the act of smoking by producing an aerosol (also referred to as a "vapour") that is drawn into the lungs through the mouth (inhaled) and then exhaled. The inhaled aerosol typically bears nicotine and/or flavourings without, or with fewer of, the odour and health risks associated with traditional smoking.

[0007] In general, smoking substitute systems are intended to provide a substitute for the rituals of smoking, whilst providing the user with a similar experience and satisfaction to those experienced with traditional smoking and with combustible tobacco products. Some smoking substitute systems use smoking substitute articles (also referred to as a "consumables") that are designed to resemble a traditional cigarette and are cylindrical in form

with a mouthpiece at one end.

[0008] The popularity and use of smoking substitute systems has grown rapidly in the past few years. Although originally marketed as an aid to assist habitual smokers wishing to quit tobacco smoking, consumers are increasingly viewing smoking substitute systems as desirable lifestyle accessories.

[0009] There are a number of different categories of smoking substitute systems, each utilising a different smoking substitute approach.

[0010] One approach for a smoking substitute system is the so-called Heated Tobacco ("HT") approach in which tobacco (rather than an "e-liquid") is heated or warmed to release vapour. HT is also known as "heat not burn" ("HNB"). The tobacco may be leaf tobacco or reconstituted tobacco. The vapour may contain nicotine and/or flavourings. In the HT approach the intention is that the tobacco is heated but not burned, i.e. the tobacco does not undergo combustion.

[0011] A typical HT smoking substitute system may include a device and a consumable. The consumable may include the tobacco material. The device and consumable may be configured to be physically coupled together. In use, heat may be imparted to the tobacco material by a heating element of the device, wherein airflow through the tobacco material causes components in the tobacco material to be released as vapour. A vapour may also be formed from a carrier in the tobacco material (this carrier may for example include propylene glycol and/or vegetable glycerine) and additionally volatile compounds released from the tobacco. The released vapour may be entrained in the airflow drawn through the tobacco.

[0012] As the vapour passes through the consumable (entrained in the airflow) from the location of vaporisation to an outlet of the consumable (e.g. a mouthpiece), the vapour cools and condenses to form an aerosol for inhalation by the user. The aerosol will normally contain the volatile compounds.

[0013] In HT smoking substitute systems, heating as opposed to burning the tobacco material is believed to cause fewer, or smaller quantities, of the more harmful compounds ordinarily produced during smoking. Consequently, the HT approach may reduce the odour and/or health risks that can arise through the burning, combustion and pyrolytic degradation of tobacco.

[0014] In some smoking substitute systems, when the consumable is removed from the heater, parts of the consumable can remain on or around the heater (e.g. in a cavity containing the heater). This can be caused by those parts of the consumable adhering to the heater (e.g. due to the heat imparted by the heater) and/or can be due to portions of the consumable crumbling or breaking down.

[0015] Thus, there may be a need for improved design of smoking substitute systems, in particular HT smoking substitute systems, to enhance the user experience and improve the function of the HT smoking substitute system and provide the HT smoking substitute system with en-

hanced stability while removing the consumable from the device.

[0016] The present disclosure has been devised in the light of the above considerations.

SUMMARY OF THE INVENTION

[0017] At its most general, the present invention relates to smoking substitute device provided with increased stability of the consumable during removal.

[0018] According to a first aspect of the present invention, there is provided a smoking substitute device comprising: a body; an elongate heating element projecting from the body along a longitudinal axis; a cap engageable with the body for at least partly enclosing the heating element, the cap movable along the longitudinal axis between a first position and a second position that is further from the body than the first position; wherein the cap is configured for engagement with an aerosol-forming article such that, when engaged, the article is moved along the longitudinal axis with the cap, and wherein a portion of the article remains in contact with the heating element when the cap is in each of the first and second positions.

[0019] By maintaining contact of the consumable with the heating element in the first and second positions, the consumable may be supported by the heating element as it is removed from the device. This may, in some cases, help to improve the stability of the consumable as it is removed from the device.

[0020] Optional features will now be set out. These are applicable singly or in any combination with any aspect.

[0021] The portion of the article may remain in contact with the heating element while the cap is moved from the first position to the second position. That is, the portion of the article may remain in contact with the heating element throughout the movement.

[0022] In the second position, the heating element may remain in contact with article for a longitudinal length of between 1 mm and 5 mm, or e.g. between 2 mm and 4 mm, or about 3 mm. In the second position, the heating element may remain in contact with article for a longitudinal length that is between 5% and 30% of the longitudinal length of the heating element or e.g. between 10% and 20%, or about 15%. In the second position, the heating element may remain in contact with article for a longitudinal length that is between 2% and 10% of the longitudinal length of an aerosol-forming substrate of the article or e.g. between 4% and 8%, or about 6%.

[0023] When in the first position, the article (i.e. when engaged with the cap) may be in a position in which it is suitable for consumption (e.g. by operation of the device). That is, the first position may represent an operating position of the device. The second position may conversely represent a non-operating position. In the second position the article may be in a semi-released position.

[0024] The device may comprise a stop feature for restricting movement of the cap along the longitudinal axis beyond the second position. This may, for example, allow

a user to remove the consumable from the device in a subsequent movement (e.g. without the aid from movement of the cap). For example, once the cap is stopped in the second position a user may twist the article to fully remove it from contact with the heating element. Thus, movement of the cap from the first position to the second position may partially disengage the article and the subsequent movement by a user may fully disengage the consumable. Twisting the article when in the second position may avoid breakage of the article when being removed.

[0025] The stop feature may be in the form of a hook portion disposed on the cap or the body. The hook portion may engage with a corresponding aperture (or recess) of the other of the cap or the body. The hook portion may operate in the manner of a snap engagement mechanism. In that respect, the hook portion may snap engage in the aperture when the cap is engaged with the body. The aperture may extend longitudinally so as to allow (limited) longitudinal movement of the cap relative to the body (when the hook portion is engaged with the aperture). In this respect, the aperture may be in the form of a slot. The hook portion may engage an edge of the aperture or slot so as to prevent further movement of the cap relative to the body when in the second position. The hook portion may be connected to the cap or body via a flexible arm, which may flex to allow the hook portion to snap engage.

[0026] As may be appreciated, the stop feature may take other forms and may, for example, be a protrusion or projection, or a lip (for engagement with the aperture). Similarly, the stop feature may engage with a feature other than an edge of an aperture. For example, the stop feature may engage with a lip or a rib, etc. The device may comprise multiple stop features.

[0027] The stop feature may be releasable to permit movement of the cap along the longitudinal axis beyond the second position. Release of the stop feature may permit (i.e. full) disengagement of the cap from the body. Thus, a user may only be able to disengage the cap from the body by release of the stop feature. Full disengagement of the cap from the body may expose the heating element of the device and could thus present safety risk. Thus, preventing such disengagement without a further release step may improve the safety of the device. In this respect, the stop feature may (e.g. only) be releasable by interaction with a user handheld tool.

[0028] The device and/or cap may comprise a guide portion for guiding the cap along the longitudinal axis. The guide portion may be a protrusion received in a slot (extending parallel to the longitudinal axis). The guide portion and stop feature may be the same part of the device and/or cap. That is, the guide portion may act as a stop feature.

[0029] Where the stop feature is in the form of a snap engagement portion, a tool may be inserted into a cavity defined by the cap and may e.g. move a hook of the snap engagement portion out of engagement with a corre-

sponding aperture. This may subsequently allow full release of the cap from the body.

[0030] The device may comprise a retainer for retaining the cap in the first and/or second positions. For example, the device may comprise a retainer for retaining the cap in the second position. That is, the retainer may maintain the position of the cap, without further force from a user, in the first and/or second position. The retainer may comprise a magnetic arrangement configured to provide magnetic interaction between the cap and the body so as to retain the cap in the first and/or second positions. For example, a magnet may be disposed on the cap or body and a ferromagnetic element may be disposed on the other of the cap or the body. The magnet and ferromagnetic element may align when the cap is in the first or second position and, when aligned, the magnetic interaction between the magnet and the ferromagnetic element may retain the cap in that position. The magnetic interaction may be such that it increases the force to move the cap away from the first or second position, but may still allow a user to move the cap from those positions by hand (i.e. without the use of a further tool). The retainer may otherwise be in the form of a detent feature formed on the cap or body. Similarly, the retainer may be in the form of a snap engagement mechanism.

[0031] The cap may comprise a cavity into which the article is received for engagement. The heating element may project into the cavity. The cavity may be generally elongate along the longitudinal axis. Thus, one or more sidewalls defining the cavity may be parallel to one or more outer surfaces of the heating element. The cavity may be configured so as to form a friction fit with the article when received therein. The cap may be rotatably relative to the body such that the article, when received in the cavity, may be rotated by rotation of the cap.

[0032] The heating element may be configured for insertion into the article. A portion of the heating element may be received in the article in each of the first and second positions. A distal end of the heating element (i.e. distal from a base of the heating element where it is mounted to the device) may comprise a tapered portion, which may facilitate insertion of the heating element into the aerosol-forming article. The heating element may fully penetrate the aerosol-forming article when the aerosol-forming article is received in the cavity and the cap is in the first position. That is, the entire length, or substantially the entire length, of the heating element may be received in the aerosol-forming article when the cap is in the first position. A distal portion of the heating element may be received in the aerosol-forming article when the cap is in the second position.

[0033] The cap may comprises a base portion defining a base of the cavity. The base portion may comprise an aperture through which the heating element projects. When an article is received in the cavity and the cap is moved along the longitudinal axis the base portion may engage and move the article (i.e. along the longitudinal

axis). In this respect, the cap may pull the article along the heating element. The aperture may be sized and shaped so as to correspond to a transverse cross section of the heating element. In that respect there may be a close fit of the heating element in the aperture. Thus, there may be minimal gap (e.g. for debris from the article) between the heating element and the base portion.

[0034] The cap may be slidably engagable with the body for movement along the longitudinal axis. Alternatively or additionally, the cap may be rotatably engagable with the body. The cap may be engagable with the body via a threaded engagement. In this respect, the cap may be moved from the first position to the second position by rotation of the cap relative to the body.

[0035] The longitudinal distance between first and second positions may be shorter than the longitudinal length of the heating element projecting within the body.

[0036] A gap (e.g. a circumferential gap) may be formed between cap and the body when the cap is moved from the first position to the second position. A portion of the heating element (e.g. the portion of the heating element that is not in contact with the article) may be exposed in this gap. This may facilitate cleaning of the heating element.

[0037] The cap may be configured such that when an aerosol-forming article is engaged with the device (e.g. received in the cavity), only a portion of the aerosol-forming article is received in the cavity. That is, a portion of the aerosol-forming article (not received in the cavity) may protrude from (i.e. extend beyond) the opening. This (protruding) portion of the aerosol-forming article may be a terminal (e.g. mouth) end of the aerosol-forming article, which may be received in a user's mouth for the purpose of inhaling aerosol formed by the device.

[0038] The body of the device may be elongate. An end of the elongate body may be configured for engagement with the aerosol-forming article. The body may be configured for engagement with a heated tobacco (HT) consumable (or heat-not-burn (HNB) consumable). That is, the aerosol-forming article may be a HNB consumable. The terms "heated tobacco" and "heat-not-burn" are used interchangeably herein to describe a consumable that is of the type that is heated rather than combusted (or are used interchangeably to describe a device for use with such a consumable). The aerosol-forming article may be of the type that comprises an aerosol former (e.g. carried by an aerosol-forming substrate).

[0039] The heating element may be in the form of a rod that extends from the body of the device. The heating element may form part of a heater. The heater (and thus the heating element) may be rigidly mounted to the body. The heating element may have a transverse profile (i.e. transverse to a longitudinal axis of the heating element) that is substantially circular (i.e. the heating element may be generally cylindrical). Alternatively, the heating element may have a transverse profile that is rectangular (i.e. the heater may be a "blade heater"). The heating element may alternatively be in the shape of a tube (i.e.

the heater may be a "tube heater"). The heating element may take other forms (e.g. the heating element may have an elliptical transverse profile). The shape and/or size (e.g. diameter) of the transverse profile of the heating element may be generally consistent for the entire length (or substantially the entire length) of the heating element.

[0040] The heating element may be between 15 mm and 25 mm long, e.g. between 18 mm and 20 mm long, e.g. around 19 mm long. Thus, the longitudinal distance between the first and second positions may be less than 15 mm to 25 mm e.g. less than 18 mm to 20 mm, e.g. less than 19 mm. The heating element may have a diameter of between 1.5 mm and 2.5 mm, e.g. a diameter between 2 mm and 2.3 mm, e.g. a diameter of around 2.15 mm.

[0041] The heating element may be formed of ceramic. The heating element may comprise a core (e.g. a ceramic core) comprising Al₂O₃. The core of the heating element may have a diameter of 1.8 mm to 2.1 mm, e.g. between 1.9 mm and 2 mm. The heating element may comprise an outer layer (e.g. an outer ceramic layer) comprising Al₂O₃. The thickness of the outer layer may be between 160 μ m and 220 μ m, e.g. between 170 μ m and 190 μ m, e.g. around 180 μ m. The heating element may comprise a heating track, which may extend longitudinally along the heating element. The heating track may be sandwiched between the outer layer and the core of the heating element. The heating track may comprise tungsten and/or rhenium. The heating track may have a thickness of around 20 μ m.

[0042] The heating element may be located in a cavity (defined by the device), and may extend (e.g. along the longitudinal axis) from an internal base of the cavity towards an opening of the cavity. A portion of the cap may be received in this cavity (and the heating element may be received through an aperture in the base of the portion of the cap. The length of the heating element (i.e. along the longitudinal axis of the heater) may be less than the depth of the cavity. Hence, the heating element may extend for only a portion of the length of the cavity. That is, the heating element may not extend through (or beyond) the opening of the cavity.

[0043] The heating element may have a length that is less than, or substantially the same as, an axial length of an aerosol-forming substrate forming part of an aerosol-forming article (e.g. a HT consumable). Thus, when such an aerosol-forming article is engaged with the device (and the cap is in the first position), the heating element may only penetrate the aerosol-forming substrate, rather than other components of the aerosol-forming article. When the cap is in the first position, the heating element may penetrate the aerosol-forming substrate for substantially the entire axial length of the aerosol-forming substrate of the aerosol-forming article. Thus, heat may be transferred from (e.g. an outer circumferential surface of) the heating element to the surrounding aerosol-forming substrate, when penetrated by the heating element. That is, heat may be transferred radially out-

wardly (in the case of a cylindrical heating element) or e.g. radially inwardly (in the case of a tube heater).

[0044] Where the heater is a tube heater, the heating element of the tube heater may surround at least a portion of the cavity. When the portion of the aerosol-forming article is received in the cavity and the cap is in the first position, the heating element may surround a portion of the aerosol-forming article (i.e. so as to heat that portion of the aerosol-forming article). In particular, the heating element may surround an aerosol-forming substrate of the aerosol-forming article. That is, when an aerosol-forming article is engaged with the device, the aerosol-forming substrate of the aerosol-forming article may be located adjacent an inner surface of the (tubular) heating element. When the heating element is activated, heat may be transferred radially inwardly from the inner surface of the heating element to heat the aerosol-forming substrate.

[0045] The cavity may comprise a (e.g. circumferential) wall (or walls) and the (tubular) heating element may extend around at least a portion of the wall(s). In this way, the wall may be located between the inner surface of the heating element and an outer surface of the aerosol-forming article. The wall (or walls) of the cavity may be formed from a thermally conductive material (e.g. a metal) to allow heat conduction from the heating element to the aerosol-forming article. Thus, heat may be conducted from the heating element, through the cavity wall (or walls), to the aerosol-forming substrate of an aerosol-forming article received in the cavity.

[0046] The cap may define at least a portion of the cavity of the device. That is, the cavity may be fully defined by the cap, or each of the cap and body may define a portion of the cavity. Where the cap fully defines the cavity, the cap may comprise an aperture for receipt of the heating element into the cavity (when the cap is in the closed position). The cap may comprise an opening to the cavity. The opening may be configured for receipt of at least a portion of an aerosol-forming article. That is, an aerosol-forming article may be inserted through the opening and into the cavity (so as to be engaged with the device).

[0047] The device may comprise a power source or may be connectable to a power source (e.g. a power source separate to the device). The power source may be electrically connectable to the heater. In that respect, altering (e.g. toggling) the electrical connection of the power source to the heater may affect a state of the heater. For example, toggling the electrical connection of the power source to the heater may toggle the heater between an on state and an off state. The power source may be a power store. For example, the power source may be a battery or rechargeable battery (e.g. a lithium ion battery).

[0048] The device may comprise an input connection (e.g. a USB port, Micro USB port, USB-C port, etc.). The input connection may be configured for connection to an external source of electrical power, such as a mains elec-

trical supply outlet. The input connection may, in some cases, be used as a substitute for an internal power source (e.g. battery or rechargeable battery). That is, the input connection may be electrically connectable to the heater (for providing power to the heater). Hence, in some forms, the input connection may form at least part of the power source of the device.

[0049] Where the power source comprises a rechargeable power source (such as a rechargeable battery), the input connection may be used to charge and recharge the power source.

[0050] The device may comprise a user interface (UI). In some embodiments the UI may include input means to receive operative commands from the user. The input means of the UI may allow the user to control at least one aspect of the operation of the device. In some embodiments the input means may comprise a power button to switch the device between an on state and an off state.

[0051] In some embodiments the UI may additionally or alternatively comprise output means to convey information to the user. In some embodiments the output means may comprise a light to indicate a condition of the device (and/or the aerosol-forming article) to the user. The condition of the device (and/or aerosol-forming article) indicated to the user may comprise a condition indicative of the operation of the heater. For example, the condition may comprise whether the heater is in an off state or an on state. In some embodiments, the UI unit may comprise at least one of a button, a display, a touch-screen, a switch, a light, and the like. For example, the output means may comprise one or more (e.g. two, three, four, etc.) light-emitting diodes ("LEDs") that may be located on the body of the device.

[0052] The device may further comprise a puff sensor (e.g. airflow sensor), which form part of the input means of the UI. The puff sensor may be configured to detect a user drawing on an end (i.e. a terminal (mouth) end) of the aerosol-forming article. The puff sensor may, for example, be a pressure sensor or a microphone. The puff sensor may be configured to produce a signal indicative of a puff state. The signal may be indicative of the user drawing (an aerosol from the aerosol-forming article) such that it is e.g. in the form of a binary signal. Alternatively or additionally, the signal may be indicative of a characteristic of the draw (e.g. a flow rate of the draw, length of time of the draw, etc).

[0053] The device may comprise a cap position sensor for detecting a position of the cap. For example, the cap position sensor may be configured to detect if the device is in the first position. The cap position sensor may, for example, be in the form of a Hall effect sensor and the cap may comprise a magnet that is arranged to be detected by the Hall effect sensor when the cap is in the first position.

[0054] The device may comprise a controller, or may be connectable to a controller that may be configured to control at least one function of the device. The controller may comprise a microcontroller that may e.g. be mounted

on a printed circuit board (PCB). The controller may also comprise a memory, e.g. non-volatile memory. The memory may include instructions, which, when implemented, may cause the controller to perform certain tasks or steps of a method. Where the device comprises an input connection, the controller may be connected to the input connection. The controller may be configured to prevent activation of the heater when the cap position sensor detects that the cap is not in the first position.

[0055] The controller may be configured to control the operation of the heater (and e.g. the heating element). Thus, the controller may be configured to control vaporisation of an aerosol forming part of an aerosol-forming article engaged with the device. The controller may be configured to control the voltage applied by power source to the heater. For example, the controller may be configured to toggle between applying a full output voltage (of the power source) to the heater and applying no voltage to the heater. Alternatively or additionally, the control unit may implement a more complex heater control protocol.

[0056] The device may further comprise a voltage regulator to regulate the output voltage supplied by the power source to form a regulated voltage. The regulated voltage may subsequently be applied to the heater.

[0057] In some embodiments, where the device comprises a UI, the controller may be operatively connected to one or more components of the UI. The controller may be configured to receive command signals from an input means of the UI. The controller may be configured to control the heater in response to the command signals. For example, the controller may be configured to receive "on" and "off command signals from the UI and, in response, may control the heater so as to be in a corresponding on or off state.

[0058] The controller may be configured to send output signals to a component of the UI. The UI may be configured to convey information to a user, via an output means, in response to such output signals (received from the controller). For example, where the device comprises one or more LEDs, the LEDs may be operatively connected to the controller. Hence, the controller may be configured to control the illumination of the LEDs (e.g. in response to an output signal). For example, the controller may be configured to control the illumination of the LEDs according to (e.g. an on or off) state of the heater.

[0059] Where the device comprises a sensor (e.g. a puff/airflow sensor), the controller may be operatively connected to the sensor. The controller may be configured to receive a signal from the sensor (e.g. indicative of a condition of the device and/or engaged aerosol-forming article). The controller may be configured to control the heater, or an aspect of the output means, based on the signal from the sensor.

[0060] The device may comprise a wireless interface configured to communicate wirelessly (e.g. via Bluetooth (e.g. a Bluetooth low-energy connection) or WiFi) with an external device. Similarly, the input connection may be configured for wired connection to an external device

so as to provide communication between the device and the external device.

[0061] The external device may be a mobile device. For example, the external device may be a smart phone, tablet, smart watch, or smart car. An application (e.g. app) may be installed on the external device (e.g. mobile device). The application may facilitate communication between the device and the external device via the wired or wireless connection.

[0062] The wireless or wired interface may be configured to transfer signals between the external device and the controller of the device. In this respect, the controller may control an aspect of the device in response to a signal received from an external device. Alternatively or additionally, an external device may respond to a signal received from the device (e.g. from the controller of the device).

[0063] According to a second aspect of the present invention, there is provided a smoking substitute device comprising a body; an elongate heating element projecting from the body along a longitudinal axis from a base end at the body to an opposing distal end; and a cap engagable with the body so as to be movable along the longitudinal axis between a first position and a second position that is further away from the body than the first position, the cap comprising an engagement portion for engaging a consumable and moving the consumable with the cap and wherein the longitudinal distance between the first and second positions is less than the longitudinal distance between the base and distal ends of the heating element.

[0064] The device of the second aspect may otherwise be as described with respect to the first aspect above.

[0065] In a third aspect, there is provided a system (e.g. a smoking substitute system) comprising a device as described above with respect to the first or second aspect and an aerosol-forming article for engagement with the cap of the device. The aerosol-forming article may comprise an aerosol-forming substrate at an upstream end of the aerosol-forming article. When the article is engaged with the cap of the device, the aerosol-forming substrate may remain in contact with the heating element of the device in both the first and second positions. The article may be in the form of a smoking substitute article, e.g. heated tobacco (HT) consumable (also known as a heat-not-burn (HNB) consumable).

[0066] As used herein, the terms "upstream" and "downstream" are intended to refer to the flow direction of the vapour/aerosol i.e. with the downstream end of the article/consumable being the mouth end or outlet where the aerosol exits the consumable for inhalation by the user. The upstream end of the article/consumable is the opposing end to the downstream end.

[0067] The aerosol-forming substrate is capable of being heated to release at least one volatile compound that can form an aerosol. The aerosol-forming substrate may be located at the upstream end of the article/consumable.

[0068] In order to generate an aerosol, the aerosol-

forming substrate comprises at least one volatile compound that is intended to be vaporised/aerosolised and that may provide the user with a recreational and/or medicinal effect when inhaled. Suitable chemical and/or physiologically active volatile compounds include the group consisting of: nicotine, cocaine, caffeine, opiates and opioids, cathine and cathinone, kavalactones, mescaline, beta-carboline alkaloids, salvinorin A together with any combinations, functional equivalents to, and/or synthetic alternatives of the foregoing.

[0069] The aerosol-forming substrate may comprise plant material. The plant material may comprise least one plant material selected from the list including *Amaranthus dubius*, *Arctostaphylos uva-ursi* (Bearberry), *Argemone mexicana*, *Amica*, *Artemisia vulgaris*, Yellow Tees, *Galea zacatechichi*, *Canavalia maritima* (Baybean), *Cecropia mexicana* (Guamara), *Cestrum nocturnum*, *Cynoglossum virginianum* (wild comfrey), *Cytisus scoparius*, *Damiana*, *Entada rheedii*, *Eschscholzia californica* (California Poppy), *Fittonia albivenis*, *Hippobroma longiflora*, *Humulus japonica* (Japanese Hops), *Humulus lupulus* (Hops), *Lactuca virosa* (Lettuce Opium), *Lagdera alata*, *Leonotis leonurus*, *Leonurus cardiaca* (Motherwort), *Leonurus sibiricus* (Honeyweed), *Lobelia cardinalis*, *Lobelia inflata* (Indian-tobacco), *Lobelia siphilitica*, *Nepeta cataria* (Catnip), *Nicotiana species* (Tobacco), *Nymphaea alba* (White Lily), *Nymphaea caerulea* (Blue Lily), Opium poppy, *Passiflora incarnata* (Passionflower), *Pedicularis densiflora* (Indian Warrior), *Pedicularis groenlandica* (Elephant's Head), *Salvia divinorum*, *Salvia dorrii* (Tobacco Sage), *Salvia species* (Sage), *Scutellaria galericulata*, *Scutellaria lateriflora*, *Scutellaria nana*, *Scutellaria species* (Skullcap), *Sida acuta* (Wireweed), *Sida rhombifolia*, *Silene capensis*, *Syzygium aromaticum* (Clove), *Tagetes lucida* (Mexican Tarragon), *Tarhonanthus camphoratus*, *Tumera diffusa* (Damiana), *Verbascum* (Mullein), *Zamia latifolia* (Maconha Brava) together with any combinations, functional equivalents to, and/or synthetic alternatives of the foregoing.

[0070] The plant material may be tobacco. Any type of tobacco may be used. This includes, but is not limited to, flue-cured tobacco, burley tobacco, Maryland Tobacco, dark-air cured tobacco, oriental tobacco, dark-fired tobacco, perique tobacco and rustica tobacco. This also includes blends of the above mentioned tobaccos.

[0071] The tobacco may comprise one or more of leaf tobacco, stem tobacco, tobacco powder, tobacco dust, tobacco derivatives, expanded tobacco, homogenised tobacco, shredded tobacco, extruded tobacco, cut rag tobacco and/or reconstituted tobacco (e.g. slurry recon or paper recon).

[0072] The aerosol-forming substrate may comprise a gathered sheet of homogenised (e.g. paper/slurry recon) tobacco or gathered shreds/strips formed from such a sheet.

[0073] The aerosol-forming substrate may comprise one or more additives selected from humectants, flavourants, fillers, aqueous/non-aqueous solvents and binders.

[0074] The flavourant may be provided in solid or liquid form. It may include menthol, liquorice, chocolate, fruit flavour (including e.g. citrus, cherry etc.), vanilla, spice (e.g. ginger, cinnamon) and tobacco flavour. The flavourant may be evenly dispersed throughout the aerosol-forming substrate or may be provided in isolated locations and/or varying concentrations throughout the aerosol-forming substrate.

[0075] The aerosol-forming substrate may be formed in a substantially cylindrical shape such that the article/consumable resembles a conventional cigarette. It may have a diameter of between 5 and 10mm e.g. between 6 and 9mm or 6 and 8mm e.g. around 7 mm. It may have an axial length of between 10 and 15mm e.g. between 11 and 14mm such as around 12 or 13mm.

[0076] The article/consumable may comprise at least one filter element. There may be a terminal filter element at the downstream/mouth end of the article/consumable.

[0077] The or at least one of the filter element(s) (e.g. the terminal filter element) may be comprised of cellulose acetate or polypropylene tow. The at least one filter element (e.g. the terminal filter element) may be comprised of activated charcoal. The at least one filter element (e.g. the terminal element) may be comprised of paper. The or each filter element may be at least partly (e.g. entirely) circumscribed with a plug wrap e.g. a paper plug wrap.

[0078] The terminal filter element (at the downstream end of the article/consumable) may be joined to the upstream elements forming the article/consumable by a circumscribing tipping layer e.g. a tipping paper layer. The tipping paper may have an axial length longer than the axial length of the terminal filter element such that the tipping paper completely circumscribes the terminal filter element plus the wrapping layer surrounding any adjacent upstream element.

[0079] In some embodiments, the article/consumable may comprise an aerosol-cooling element which is adapted to cool the aerosol generated from the aerosol-forming substrate (by heat exchange) before being inhaled by the user.

[0080] The article/consumable may comprise a spacer element that defines a space or cavity between the aerosol-forming substrate and the downstream end of the consumable. The spacer element may comprise a cardboard tube. The spacer element may be circumscribed by the (paper) wrapping layer.

[0081] According to a fourth aspect of the present invention, there is provided a method of using the system according to the third aspect, the method comprising inserting the aerosol-forming article into the device; and heating the article using the heater of the device.

[0082] In some embodiments the method may comprise inserting the article into a cavity within a body of the device and penetrating the article with the heating element of the device upon insertion of the article. The method may comprise moving the cap of the device from the first position to the second position so as to move the article along the heating element of the device, whereby

the article remains in contact with the heating element in the first and second positions (and therebetween).

[0083] The invention includes the combination of the aspects and preferred features described except where such a combination is clearly impermissible or expressly avoided.

[0084] The skilled person will appreciate that except where mutually exclusive, a feature or parameter described in relation to any one of the above aspects may be applied to any other aspect. Furthermore, except where mutually exclusive, any feature or parameter described herein may be applied to any aspect and/or combined with any other feature or parameter described herein.

SUMMARY OF THE FIGURES

[0085] So that the invention may be understood, and so that further aspects and features thereof may be appreciated, embodiments illustrating the principles of the invention will now be discussed in further detail with reference to the accompanying figures, in which:

Figure 1 is a schematic of a smoking substitute system;

Figure 2A is a front view of a first embodiment of a smoking substitute system with the consumable engaged with the device;

Figure 2B is a front view of the first embodiment of the smoking substitute system with the consumable disengaged from the device;

Figure 2C is a section view of the consumable of the first embodiment of the smoking substitute system;

Figure 2D is a detailed view of an end of the device of the first embodiment of the smoking substitute system;

Figure 2E is a section view of the first embodiment of the substitute smoking system;

Figure 2F is a detail section view of a portion of the first embodiment, showing a cap of the device in the first position;

Figure 2G is a perspective view of the first embodiment showing the cap in the second position; and

Figure 2H is a detail section view of the first embodiment, showing the cap in the second position.

DESCRIPTION OF THE INVENTION

[0086] Aspects and embodiments of the present invention will now be discussed with reference to the accom-

panying figures. Further aspects and embodiments will be apparent to those skilled in the art. All documents mentioned in this text are incorporated herein by reference.

[0087] Figure 1 is a schematic providing a general overview of a smoking substitute system 100. The system 100 includes a substitute smoking device 101 and an aerosol-forming article in the form of a consumable 102, which comprises an aerosol former 103. The system is configured to vaporise the aerosol former by heating the aerosol former 103 (so as to form a vapour/aerosol for inhalation by a user).

[0088] The heater 104 forms part of the device 101 and is configured to heat the aerosol former 103. The heater 104 is electrically connected to a power source 105. Heat from the heater 104 vaporises the aerosol former 103 to produce a vapour. The vapour subsequently condenses to form an aerosol, which is ultimately inhaled by the user.

[0089] As above, the system 100 comprises a power source 105 that forms part of the device 101. In other embodiments the power source 105 may be external to (but connectable to) the device 101. The power source 105 is electrically connected to the heater 104 such that it is able to supply power to the heater 104 (i.e. for the purpose of heating the aerosol former 103). Thus, control of the electrical connection of the power source 105 to the heater 104 provides control of the state of the heater 104. The power source 105 may be a power store, for example a battery or rechargeable battery (e.g. a lithium ion battery).

[0090] The system 100 further comprises an I/O module comprising a connector 106 (e.g. in the form of a USB port, Micro USB port, USB-C port, etc.). The connector 106 is configured for connection to an external source of electrical power, e.g. a mains electrical supply outlet. The connector 106 may be used in substitution for the power source 105. That is, the connector 106 may be electrically connectable to the heater 104 so as to supply electricity to the heater 104. In such embodiments, the device may not include a power source, and the power source of the system may instead comprise the connector 106 and an external source of electrical power (to which the connector 106 provides electrical connection).

[0091] In some embodiments, the connector 106 may be used to charge and recharge the power source 105 where the power source 105 includes a rechargeable battery.

[0092] The system 100 also comprises a user interface (UI) 107. Although not shown, the UI 107 may include input means to receive commands from a user. The input means of the UI 107 allows the user to control at least one aspect of the operation of the system 100. The input means may, for example, be in the form of a button, touch-screen, switch, microphone, etc.

[0093] The UI 107 also comprises output means to convey information to the user. The output means may, for example, comprise lights (e.g. LEDs), a display screen, speaker, vibration generator, etc.

[0094] The system 100 further comprises a controller 108 that is configured to control at least one function of the device 101. In the illustrated embodiment, the controller 108 is a component of the device 101, but in other embodiments may be separate from (but connectable to) the device 101. The controller 108 is configured to control the operation of the heater 104 and, for example, may be configured to control the voltage applied from the power source 105 to the heater 104. The controller 108 may be configured to toggle the supply of power to the heater 104 between an on state, in which the full output voltage of the power source 105 is applied to the heater 104, and an off state, in which the no voltage is applied to the heater 104.

[0095] Although not shown, the system 100 may also comprise a voltage regulator to regulate the output voltage from the power source 105 to form a regulated voltage. The regulated voltage may then be applied to the heater 104.

[0096] In addition to being connected to the heater 104, the controller 108 is operatively connected to the UI 107. Thus, the controller 108 may receive an input signal from the input means of the UI 107. Similarly, the controller 108 may transmit output signals to the UI 107. In response, the output means of the UI 107 may convey information, based on the output signals, to a user. The controller also comprises a memory 109, which is a non-volatile memory. The memory 109 includes instructions, which, when implemented, cause the controller to perform certain tasks or steps of a method.

[0097] Figures 2A and 2B illustrate a heated-tobacco (HT) smoking substitute system 200. The system 200 is an example of the system 100 described in relation to Figure 1. System 200 includes an HT device 201 and an HT consumable 202. The description of Figure 1 above is applicable to the system 200 of Figures 2A and 2B, and will thus not be repeated.

[0098] The device 201 and the consumable 202 are configured such that the consumable 202 can be engaged with the device 201. Figure 2A shows the device 201 and the consumable 202 in an engaged state, whilst Figure 2B shows the device 201 and the consumable 202 in a disengaged state.

[0099] The device 201 comprises a body 209 and cap 210. In use the cap 210 is engaged at an end of the body 209. Although not apparent from the figures, the cap 210 is moveable relative to the body 209. In particular, the cap 210 is slideable and can slide along a longitudinal axis of the body 209 between first and second positions by a sliding mechanism.

[0100] The device 201 comprises an output means (forming part of the UI of the device 201) in the form of a plurality of light-emitting diodes (LEDs) 211 arranged linearly along the longitudinal axis of the device 201 and on an outer surface of the body 209 of the device 201. A button 212 is also arranged on an outer surface of the body 209 of the device 201 and is axially spaced (i.e. along the longitudinal axis) from the plurality of LEDs 211.

[0101] Figure 2C show a detailed section view of the consumable of 202 of the system 200. The consumable 202 generally resembles a cigarette. In that respect, the consumable 202 has a generally cylindrical form with a diameter of 7 mm and an axial length of 70 mm. The consumable 202 comprises an aerosol forming substrate 213, a terminal filter element 214, an upstream filter element 215 and a spacer element 216. In other embodiments, the consumable may further comprise a cooling element. A cooling element may exchange heat with vapour that is formed by the aerosol-forming substrate 213 in order to cool the vapour so as to facilitate condensation of the vapour.

[0102] The aerosol-forming substrate 213 is substantially cylindrical and is located at an upstream end 217 of the consumable 202, and comprises the aerosol former of the system 200. In that respect, the aerosol forming substrate 213 is configured to be heated by the device 201 to release a vapour. The released vapour is subsequently entrained in an airflow flowing through the aerosol-forming substrate 213. The airflow is produced by the action of the user drawing on a downstream 218 (i.e. terminal or mouth) end of the consumable 202.

[0103] In the present embodiment, the aerosol forming substrate 213 comprises tobacco material that may, for example, include any suitable parts of the tobacco plant (e.g. leaves, stems, roots, bark, seeds and flowers). The tobacco may comprise one or more of leaf tobacco, stem tobacco, tobacco powder, tobacco dust, tobacco derivatives, expanded tobacco, homogenised tobacco, shredded tobacco, extruded tobacco, cut rag tobacco and/or reconstituted tobacco (e.g. slurry recon or paper recon). For example, the aerosol-forming substrate 213 may comprise a gathered sheet of homogenised (e.g. paper/slurry recon) tobacco or gathered shreds/strips formed from such a sheet.

[0104] In order to generate an aerosol, the aerosol forming substrate 213 comprises at least one volatile compound that is intended to be vaporised/aerosolised and that may provide the user with a recreational and/or medicinal effect when inhaled. The aerosol-forming substrate 213 may further comprise one or more additives. For example, such additives may be in the form of humectants (e.g. propylene glycol and/or vegetable glycerine), flavourants, fillers, aqueous/non-aqueous solvents and/or binders.

[0105] The terminal filter element 214 is also substantially cylindrical, and is located downstream of the aerosol forming substrate 213 at the downstream end 218 of the consumable 202. The terminal filter element 214 is in the form of a hollow bore filter element having a bore 219 (e.g. for airflow) formed therethrough. The diameter of the bore 219 is 2 mm. The terminal filter element 214 is formed of a porous (e.g. monoacetate) filter material. As set forth above, the downstream end 218 of the consumable 202 (i.e. where the terminal filter 214 is located) forms a mouthpiece portion of the consumable 202 upon which the user draws. Airflow is drawn from the upstream

end 217, through the components of the consumable 202, and out of the downstream end 218. The airflow is driven by the user drawing on the downstream end 218 (i.e. the mouthpiece portion) of the consumable 202.

[0106] The upstream filter element 215 is located axially adjacent to the aerosol-forming substrate 213, between the aerosol-forming substrate 213 and the terminal filter element 214. Like the terminal filter 214, the upstream filter element 215 is in the form of a hollow bore filter element, such that it has a bore 220 extending axially therethrough. In this way, the upstream filter 215 may act as an airflow restrictor. The upstream filter element 215 is formed of a porous (e.g. monoacetate) filter material. The bore 220 of the upstream filter element 215 has a larger diameter (3 mm) than the terminal filter element 214.

[0107] The spacer 216 is in the form of a cardboard tube, which defines a cavity or chamber between the upstream filter element 215 and the terminal filter element 214. The spacer 216 acts to allow both cooling and mixing of the vapour/aerosol from the aerosol-forming substrate 213. The spacer has an external diameter of 7 mm and an axial length of 14mm.

[0108] Although not apparent from the figure, the aerosol-forming substrate 213, upstream filter 215 and spacer 216 are circumscribed by a paper wrapping layer. The terminal filter 214 is circumscribed by a tipping layer that also circumscribes a portion of the paper wrapping layer (so as to connect the terminal filter 214 to the remaining components of the consumable 202). The upstream filter 215 and terminal filter 214 are circumscribed by further wrapping layers in the form of plug wraps.

[0109] Returning now to the device 201, Figure 2D illustrates a detailed view of the end of the device 201 that is configured to engage with the consumable 202. The cap 210 of the device 201 includes an opening 221 to an internal cavity 222 (more apparent from Figure 2D) defined by the cap 210. The opening 221 and the cavity 222 are formed so as to receive at least a portion of the consumable 202. During engagement of the consumable 202 with the device 201, a portion of the consumable 202 is received through the opening 221 and into the cavity 222. After engagement (see Figure 2B), the downstream end 218 of the consumable 202 protrudes from the opening 221 and thus also protrudes from the device 201. The opening 221 includes laterally disposed notches 226. When a consumable 202 is received in the opening 221, these notches 226 remain open and could, for example, be used for retaining a cover in order to cover the end of the device 201.

[0110] Figure 2E shows a cross section through a central longitudinal plane through the device 201. The device 201 is shown with the consumable 202 engaged therewith.

[0111] The device 201 comprises a heater 204 comprising heating element 223. The heater 204 forms part of the body 209 of the device 201 and is rigidly mounted to the body 209. In the illustrated embodiment, the heater

204 is a rod heater with a heating element 223 having a circular transverse profile. In other embodiments the heater may be in the form of a blade heater (e.g. heating element with a rectangular transverse profile) or a tube heater (e.g. heating element with a tubular form).

[0112] The heating element 223 of the heater 204 projects from an internal base of the cavity 222 along a longitudinal axis towards the opening 221. As is apparent from the figure, the length (i.e. along the longitudinal axis) of the heating element is less than a depth of the cavity 222. In this way, the heating element 223 does not protrude from or extend beyond the opening 221.

[0113] When the consumable 202 is received in the cavity 222 (as is shown in Figure 2E), the heating element 223 penetrates the aerosol-forming substrate 213 of the consumable 202. In particular, the heating element 223 extends for nearly the entire axial length of the aerosol-forming substrate 213 when inserted therein. Thus, when the heater 204 is activated, heat is transferred radially from an outer circumferential surface the heating element 223 to the aerosol-forming substrate 213.

[0114] The device 201 further comprises an electronics cavity 224. A power source, in the form of a rechargeable battery 205 (a lithium ion battery), is located in electronics cavity 224.

[0115] The device 201 includes a connector (i.e. forming part of an IO module of the device 201) in the form of a USB port 206. The connector may alternatively be, for example, a micro-USB port or a USB-C port for examples. The USB port 206 may be used to recharge the rechargeable battery 205.

[0116] The device 201 includes a controller 208 located in the electronics cavity 224. The controller comprises a microcontroller mounted on a printed circuit board (PCB). The USB port 206 is also connected to the controller 208 (i.e. connected to the PCB and microcontroller).

[0117] The controller 208 is configured to control at least one function of the device 202. For example, the controller 208 is configured to control the operation of the heater 204. Such control of the operation of the heater 204 may be accomplished by the controller toggling the electrical connection of the rechargeable battery 205 to the heater 204. For example, the controller 208 is configured to control the heater 204 in response to a user depressing the button 212. Depressing the button 212 may cause the controller to allow a voltage (from the rechargeable battery 205) to be applied to the heater 204 (so as to cause the heating element 223 to be heated).

[0118] The controller is also configured to control the LEDs 211 in response to (e.g. a detected) a condition of the device 201 or the consumable 202. For example, the controller may control the LEDs to indicate whether the device 201 is in an on state or an off state (e.g. one or more of the LEDs may be illuminated by the controller when the device is in an on state).

[0119] The device 201 comprises a further input means (i.e. in addition to the button 212) in the form of a puff

sensor 225. The puff sensor 225 is configured to detect a user drawing (i.e. inhaling) at the downstream end 218 of the consumable 202. The puff sensor 225 may, for example, be in the form of a pressure sensor, flowmeter or a microphone. The puff sensor 225 is operatively connected to the controller 208 in the electronics cavity 224, such that a signal from the puff sensor 225, indicative of a puff state (i.e. drawing or not drawing), forms an input to the controller 208 (and can thus be responded to by the controller 208).

[0120] As is set forth above, the cap 210 is slidable between first and second positions. This is best illustrated by figures 2F, 2G and 2H. Figure 2F shows the cap 210 in the first position. In this position, a central portion 233 of the cap 210 is received in a cavity defined by a tubular portion 229 of the device body 209. A base portion 231 of the cap 210 abuts a base of the cavity (of the body 209) and the heating element 223 projects longitudinally through an aperture 235 formed in the base portion 231.

[0121] The body 209 comprises two stop features in the form of spaced opposing elongate engagement members 250 that extend longitudinally. The engagement members 250 each comprise a flexible arm 251 and an inwardly protruding hook portion 232 disposed at a distal end of the flexible arm 251. Each hook portion 232 comprises an engagement surface 252 (defining an underside of the hook portion 232) and an opposing ramp surface 234 (which defines a distal leading surface of the hook portion 232). The elongate engagement members 250 are configured to flex such that their respective hook portions 232 move laterally (with respect to the longitudinal axis) between an engaged position and a disengaged position. In this respect, the hook portions 232 each define a free end of their respective engagement member 250.

[0122] When the cap 210 is received in the tubular portion 229 of the body 209, the hook portions 232 are moved outwards by contact of a leading edge of the cap 210 with the ramp surfaces 234, and then subsequently snap into longitudinally extending apertures 228 formed in the cap 210. The elongate nature of these apertures 228 allows the cap 210 to move longitudinally with respect to the body 209 (whilst engaged) between the first and second positions. In this respect, the apertures 228 into which the hook portions 232 act as guides that guide the cap 210 along a longitudinal axis.

[0123] As discussed above, in Figure 2F the cap 210 is shown in the first position. Conversely, in figures 2G and 2H, the cap 210 is shown in the second position in which the cap 210 has been slid in a longitudinal direction away from the body 209. When in this second position, a gap 253 is formed between the cap 210 and the body 209 for accessing the heating element 223 (See Figure 2G).

[0124] In the second position, the engagement surfaces 252 of the hook portions 232 abut (i.e. so as to engage with) respective lower edges 237 of the apertures 228 formed in cap 210. This interaction between the lower

edges 237 and the engagement surfaces 252 prevents further longitudinal movement of the cap 210 away from the body 209. The cap 210 may be partially retained in the first and second positions by detents such as bump features (e.g. protrusions interacting with the hook portions 232) or an arrangement of magnets.

[0125] The cap 210 can only be fully disengaged (or released) from the body 209 by moving the hook portions 232 outwardly. This may be performed through the use of a tool (not shown) inserted into the cavity 222 of the cap 210 so as to force the hook portions 232 outwards.

[0126] For clarity, the consumable 202 is not shown in figures 2F, 2G and 2H. However, it should be appreciated that when a consumable 202 is engaged with the device 201, it substantially fills the cavity 222 (as shown in Figure 2E). Thus, in the first position, substantially the entire length of the heating element 223 is received in the consumable 202. When the cap 210 is moved longitudinally towards the second position, the base portion 231 of the cap 210 engages an upstream end of the consumable 202 and moves the consumable 202 longitudinally along the heating element 223 (to the second position). At this point, the engagement of the hook portions 232 with the edges 237 of the apertures 228 prevents further longitudinal movement of the cap 210. In the second position, a distal end of the heating element 223 projects into the cavity 222, such that when a consumable is received in the cavity 222, that portion of the heating element 223 projects into the consumable 202. Thus, a portion at the distal end of the heating element 223 is received in the consumable 202 in both of the first and second positions, and during movement between the first and second positions. This is at least partly a result of the longitudinal length of the heating element 223 being larger than the distance the cap 210 moves between the first and second positions.

[0127] Whilst not shown, a portion (e.g. outer surface) of the cap 210 may comprise a gripping region (e.g. a tactile finish), to facilitate gripping of the cap 210 by a user during movement of the cap 210 between the first position and the second position. Further, the device 201 may be configured to prevent the use of heater when the cap 210 is in second position by means of a sensor which can detect position of the cap 210. The sensor may form part of the body 209 of the device 201 to detect the position of the cap 210.

[0128] The features disclosed in the foregoing description, or in the following claims, or in the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for obtaining the disclosed results, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

[0129] While the invention has been described in conjunction with the exemplary embodiments described above, many equivalent modifications and variations will be apparent to those skilled in the art when given this

disclosure. Accordingly, the exemplary embodiments of the invention set forth above are considered to be illustrative and not limiting. Various changes to the described embodiments may be made without departing from the spirit and scope of the invention.

[0130] For the avoidance of any doubt, any theoretical explanations provided herein are provided for the purposes of improving the understanding of a reader. The inventors do not wish to be bound by any of these theoretical explanations.

[0131] Any section headings used herein are for organizational purposes only and are not to be construed as limiting the subject matter described.

[0132] Throughout this specification, including the claims which follow, unless the context requires otherwise, the words "have", "comprise", and "include", and variations such as "having", "comprises", "comprising", and "including" will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

[0133] It must be noted that, as used in the specification and the appended claims, the singular forms "a," "an," and "the" include plural referents unless the context clearly dictates otherwise. Ranges may be expressed herein as from "about" one particular value, and/or to "about" another particular value. When such a range is expressed, another embodiment includes from the one particular value and/or to the other particular value. Similarly, when values are expressed as approximations, by the use of the antecedent "about," it will be understood that the particular value forms another embodiment. The term "about" in relation to a numerical value is optional and means, for example, +/- 10%.

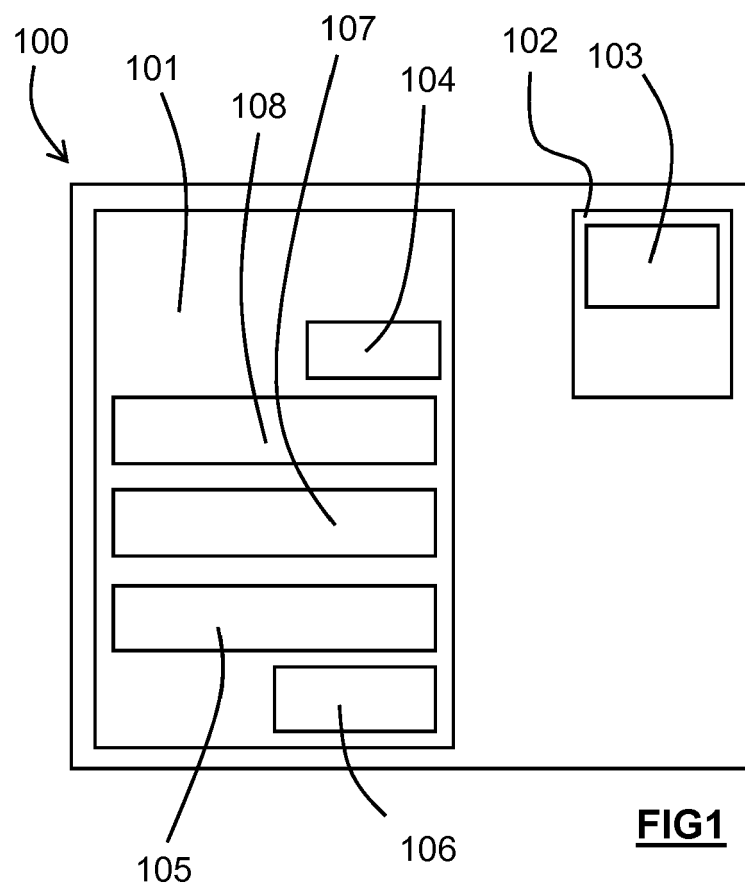
[0134] The words "preferred" and "preferably" are used herein refer to embodiments of the invention that may provide certain benefits under some circumstances. It is to be appreciated, however, that other embodiments may also be preferred under the same or different circumstances. The recitation of one or more preferred embodiments therefore does not mean or imply that other embodiments are not useful, and is not intended to exclude other embodiments from the scope of the disclosure, or from the scope of the claims.

Claims

1. A smoking substitute device comprising:

a body;
an elongate heating element projecting from the body along a longitudinal axis;
a cap engageable with the body for at least partly enclosing the heating element, the cap movable along the longitudinal axis between a first position and a second position that is further from the body than the first position;

- wherein the cap is configured for engagement with an aerosol-forming article such that, when engaged, the article is moved along the longitudinal axis with the cap, and wherein a portion of the article remains in contact with the heating element when the cap is in each of the first and second positions.
2. A smoking substitute device according to claim 1 comprising a stop feature for restricting movement of the cap along the longitudinal axis beyond the second position.
 3. A smoking substitute device according to claim 2 wherein the stop feature is releasable to permit movement of the cap along the longitudinal axis beyond the second position.
 4. A smoking substitute device according to claim 3 wherein release of the stop feature permits disengagement of the cap from the body.
 5. A smoking substitute device according to claim 3 or 4 wherein the stop feature is releasable by interaction with a user handheld tool.
 6. A smoking substitute device according to any one of the preceding claims comprising a retainer for retaining the cap in the first and/or second position.
 7. A smoking substitute device according to claim 6 wherein the retainer comprises a magnetic arrangement configured to provide magnetic interaction between the cap and the body so as to retain the cap in the first and/or second positions.
 8. A smoking substitute device according to any one of the preceding claims wherein when the cap comprises a cavity into which the article is received for engagement, the heating element projecting into the cavity.
 9. A smoking substitute device according to claim 8 wherein the heating element is configured for insertion into the article, a portion of the heating element being received in the article in each of the first and second positions.
 10. A smoking substitute device according to claim 9 wherein the cap comprises a base portion defining a base of the cavity, the base portion comprising an aperture through which the heating element projects, and wherein when an article is received in the cavity and the cap is moved along the longitudinal axis the base portion engages and moves the article.
 11. A smoking substitute device according to any one of the preceding claims wherein the cap is slidably en-
- gagable with the body for movement along the longitudinal axis.
12. A smoking substitute device according to any of the preceding claims, wherein the longitudinal distance between first and second positions is shorter than the longitudinal length of the heating element projecting within the body.
 13. A smoking substitute device according to any one of the preceding claims that is a heat-not-burn device.
 14. A smoking substitute system comprising:
 - a smoking substitute device according to any one of the preceding claims; and
 - an aerosol-forming article for engagement with the cap of the device.
 15. A smoking substitute system according to claim 14 wherein the article is a heat-not-burn consumable.



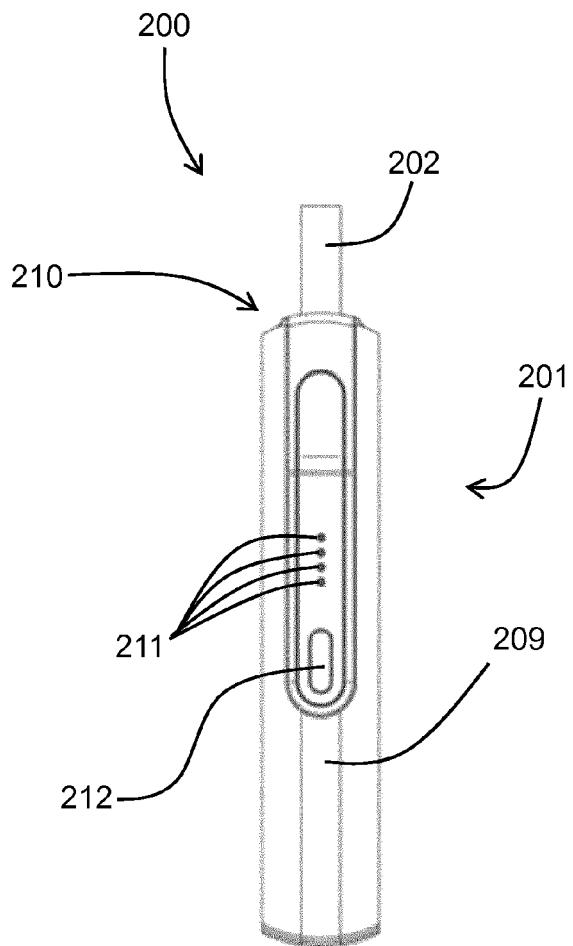


FIG 2A

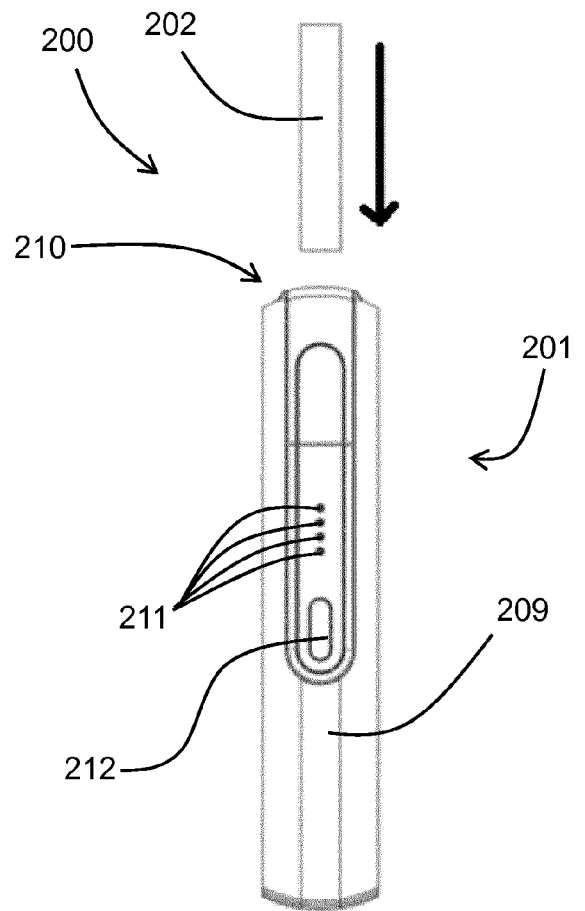
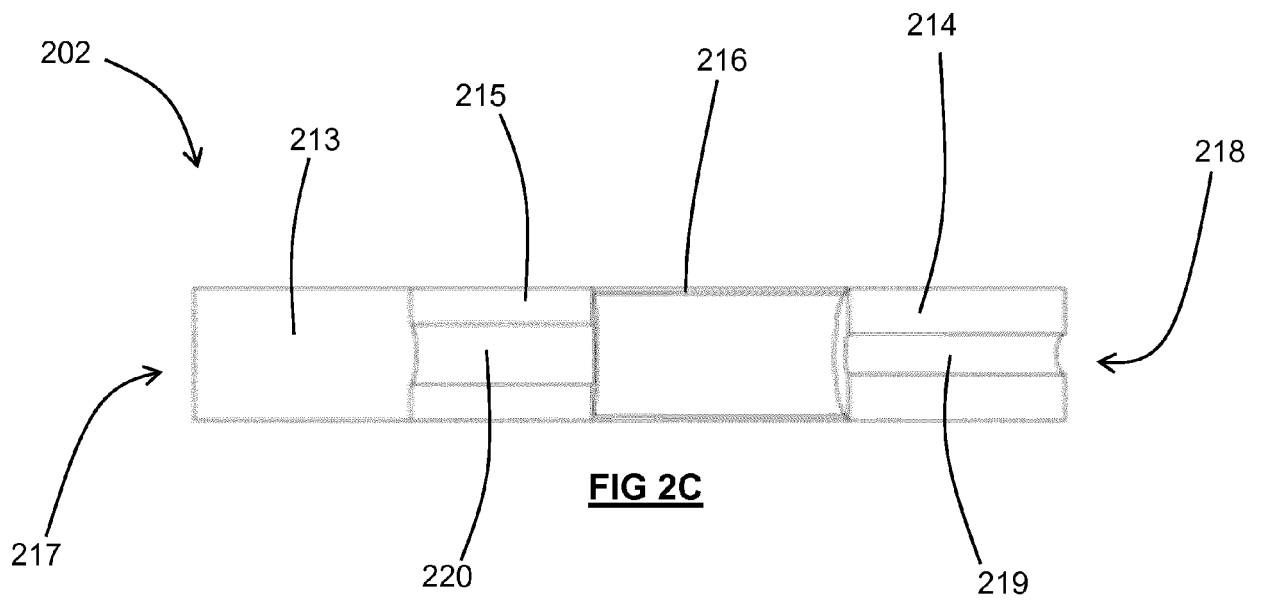
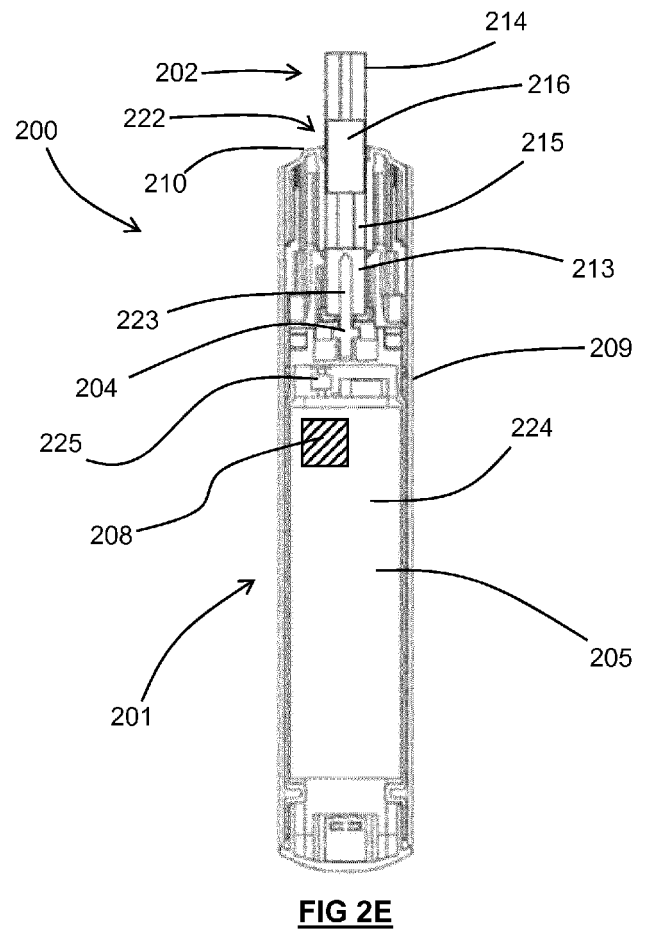
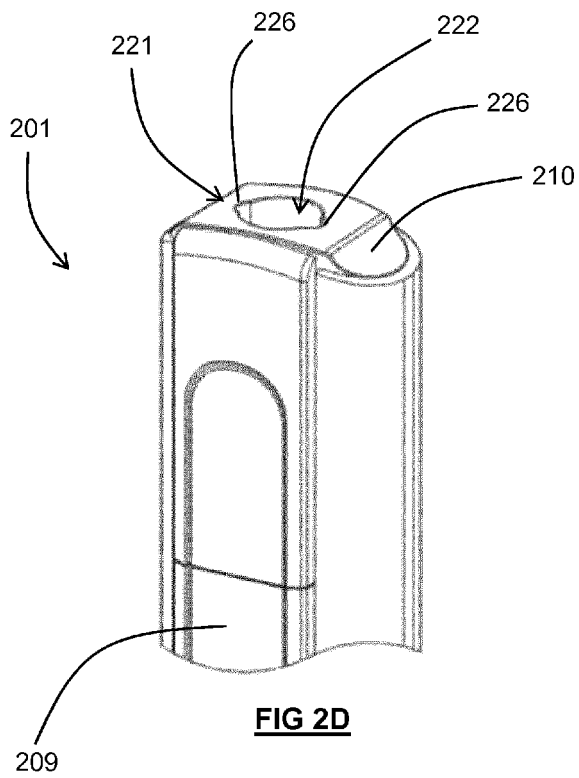


FIG 2B





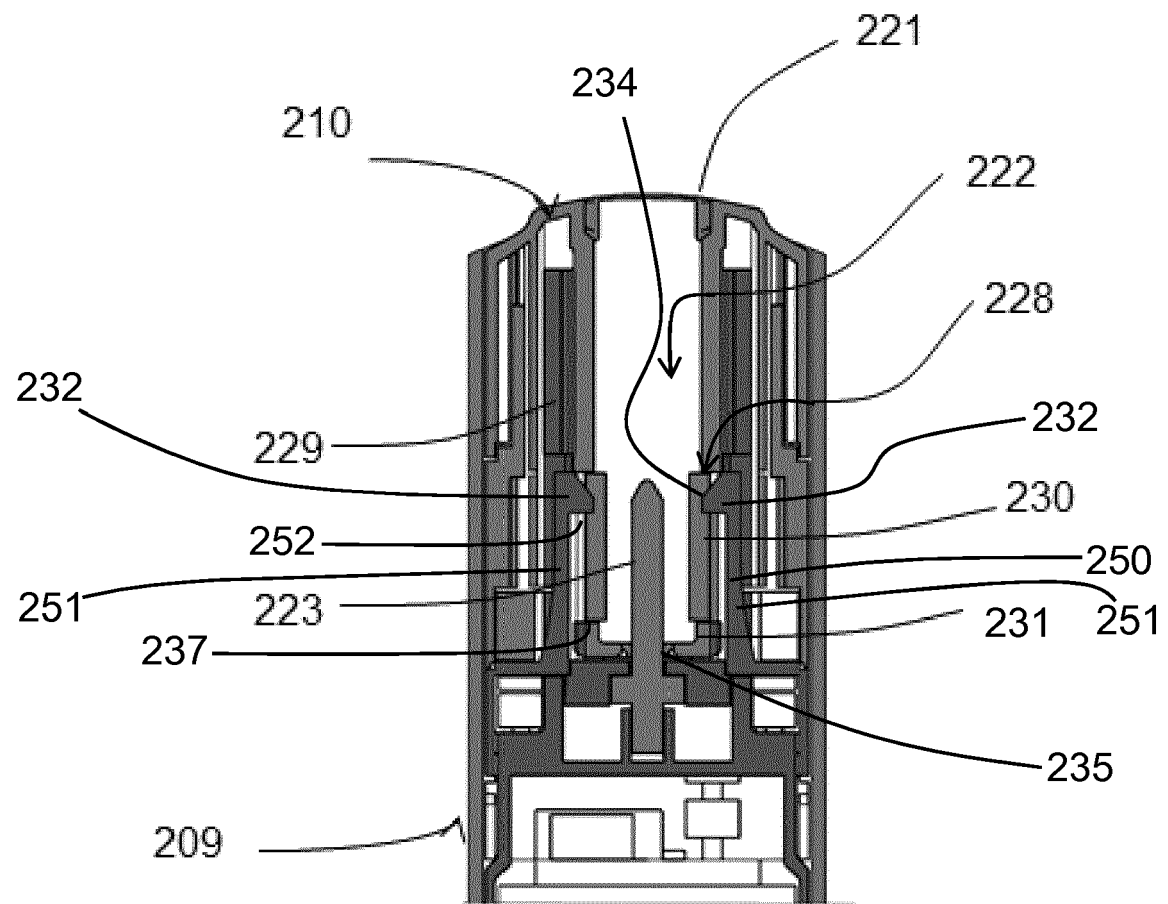


FIG 2F

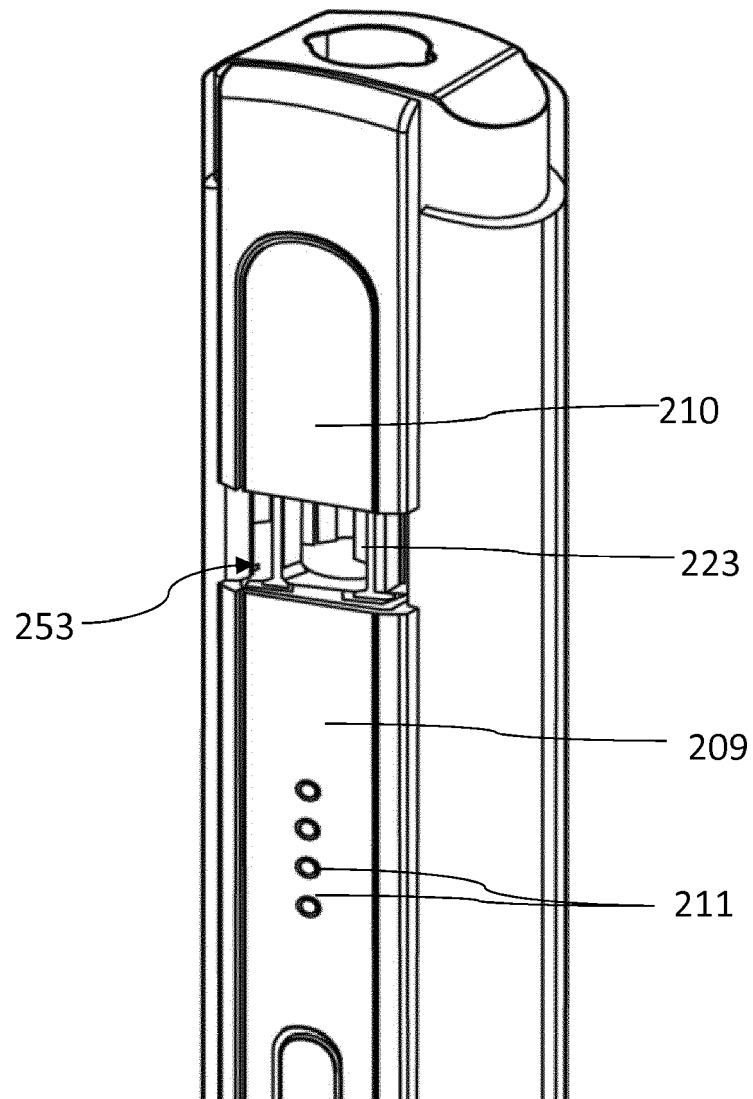


FIG 2G

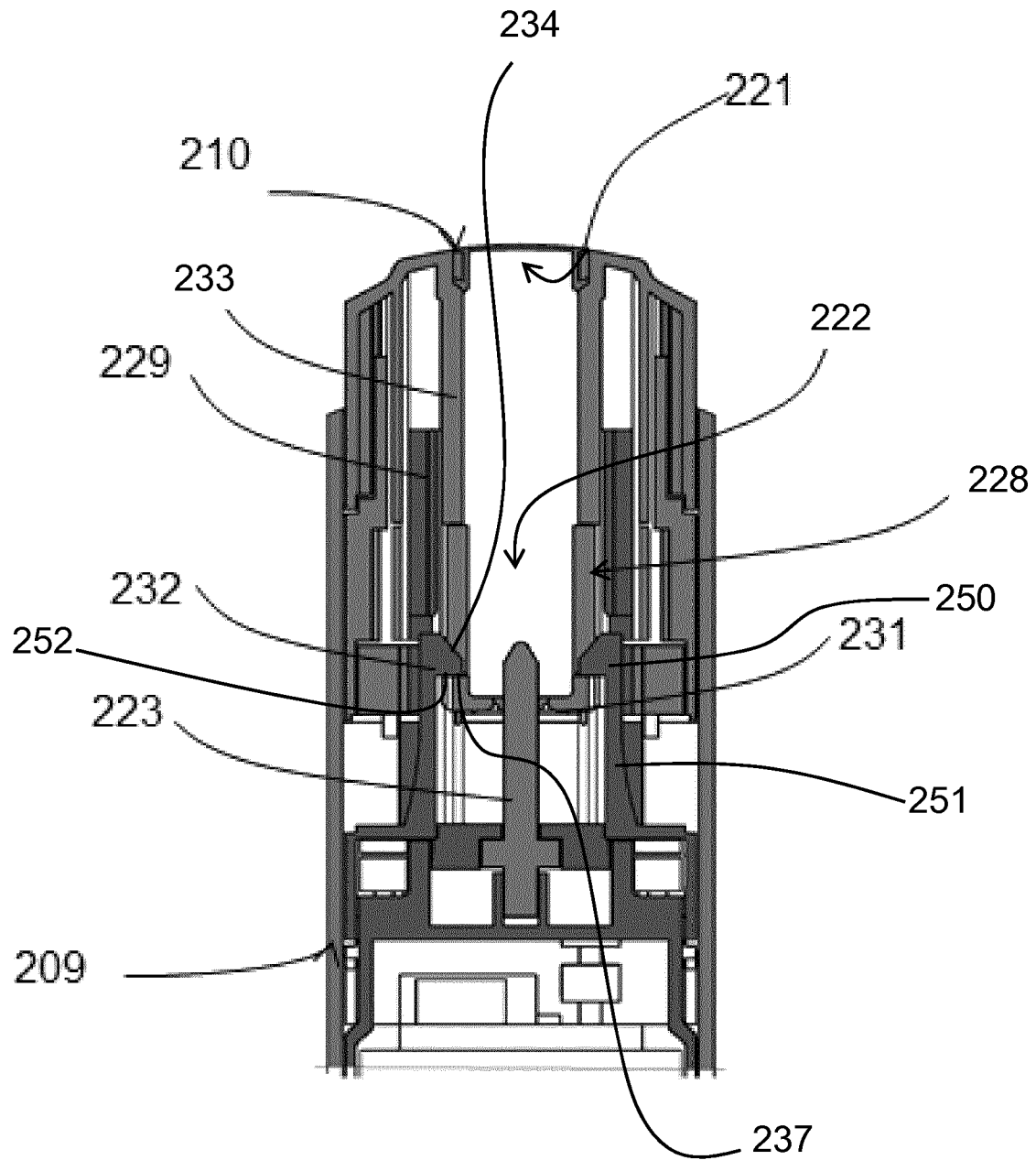


FIG 2H



EUROPEAN SEARCH REPORT

Application Number
EP 19 02 0201

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 108 618 205 A (LYUYAN IND SHENZHEN CO LTD) 9 October 2018 (2018-10-09)	1,2,6-15	INV. A24F47/00
Y	* paragraph [0057] - paragraph [0094] *	3-5	
X	CN 108 669 658 A (CHONGQING CHINA TOBACCO IND CO LTD) 19 October 2018 (2018-10-19)	1-15	
X	CN 208 096 008 U (WEITAO ELECTRONIC TECH SHENZHEN CO LTD) 16 November 2018 (2018-11-16)	1,6-15	
Y	* paragraph [0033] - paragraph [0048] *	2-5	
X	CN 108 402 526 A (CHINA TOBACCO YUNNAN IND CO LTD) 17 August 2018 (2018-08-17)	1,2,6, 8-15	
X	US 2015/013696 A1 (PLOJOUX JULIEN [CH] ET AL) 15 January 2015 (2015-01-15)	1,6,8-15	
Y	* paragraph [0122] - paragraph [0131];	2-5	
A	figures 10-13 *	7	
			A24F A61M
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 1 October 2019	Examiner Koob, Michael
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 19 02 0201

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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01-10-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 108618205 A	09-10-2018	NONE	
CN 108669658 A	19-10-2018	NONE	
CN 208096008 U	16-11-2018	NONE	
CN 108402526 A	17-08-2018	NONE	
US 2015013696 A1	15-01-2015	AU 2012342570 A1 BR 112014012065 A2 CA 2856321 A1 CN 103997922 A DK 2782463 T3 EP 2782463 A2 ES 2589260 T3 HK 1197865 A1 HU E030095 T2 JP 6050826 B2 JP 2014533513 A KR 20140093694 A MX 353367 B MY 168320 A NZ 624969 A PH 12014501025 A1 PL 2782463 T3 PT 2782463 T RU 2014125232 A SG 11201402506U A TW 201328616 A US 2015013696 A1 WO 2013076098 A2 ZA 201403335 B	03-07-2014 13-06-2017 30-05-2013 20-08-2014 12-09-2016 01-10-2014 11-11-2016 07-04-2017 28-04-2017 21-12-2016 15-12-2014 28-07-2014 10-01-2018 30-10-2018 29-07-2016 04-08-2014 30-12-2016 02-08-2016 27-12-2015 30-10-2014 16-07-2013 15-01-2015 30-05-2013 29-07-2015

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82