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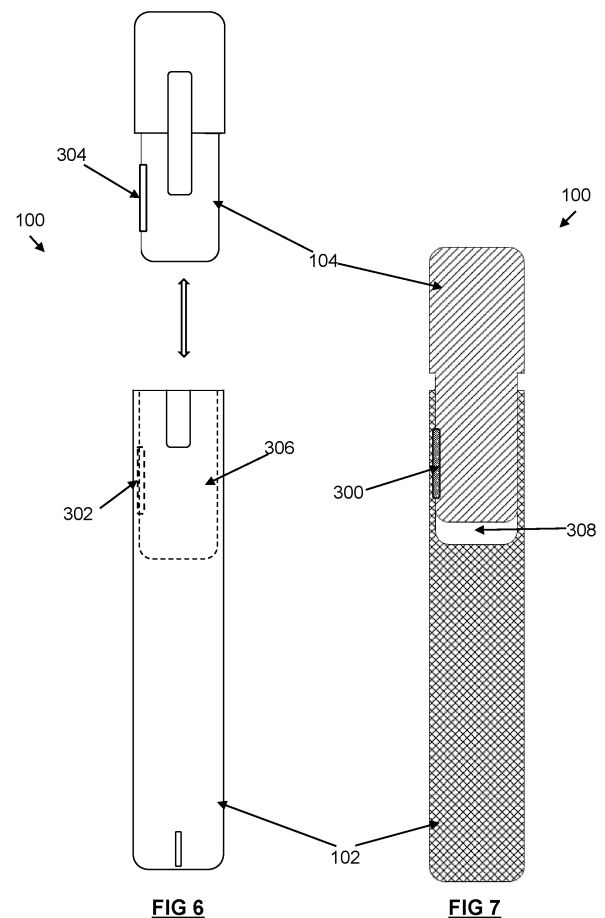
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(54) **AEROSOL GENERATING APPARATUS**

(57) The present disclosure relates to an aerosol generating apparatus (100) wherein a consumable (104) is engaged with a body (102) by pushing the consumable toward the body in a first direction, and wherein the consumable is disengaged from the body by subsequently pushing the consumable in the same first direction. Consequently, the consumable is fixed to the body by a mechanism (300) that enables a relative movement of the consumable and body in a first, push direction, to engage the mechanism, and a second relative movement of the consumable and body in the first, push direction to disengage the mechanism. Thus, in the exemplary embodiments, the consumable is engaged to the body by a push-push mechanism.



Description

Technical field

[0001] The present disclosure relates to an aerosol generating apparatus and an aerosol generating system such as a smoking substitute apparatus/system. In particular, the disclosure relates to an aerosol generating apparatus wherein a consumable is engaged relative to a body.

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] 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 in order to avoid the smoking of tobacco.

[0004] 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.

[0005] Smoking substitute systems, which may also be known as electronic nicotine delivery systems, may comprise electronic systems that permit a user to simulate the act of smoking by producing an aerosol, also referred to as a "vapour", which 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.

[0006] 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 tobacco products.

[0007] 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. Some smoking substitute systems are designed to resemble a traditional cigarette and are cylindrical in form with a mouthpiece at one end. Other smoking substitute systems do not generally resemble a cigarette (for example, the smoking substitute device may have a generally box-like form).

[0008] There are a number of different categories of smoking substitute systems, each utilising a different smoking substitute approach. A smoking substitute approach corresponds to the manner in which the substitute

system operates for a user.

[0009] One approach for a smoking substitute system is the so-called "vaping" approach, in which a vaporisable liquid, typically referred to (and referred to herein) as "e-liquid", is heated by a heater to produce an aerosol vapour which is inhaled by a user. An e-liquid typically includes a base liquid as well as nicotine and/or flavourings. The resulting vapour therefore typically contains nicotine and/or flavourings. The base liquid may include propylene glycol and/or vegetable glycerine.

[0010] Atypical vaping smoking substitute system includes a mouthpiece, a power source (typically a battery), a tank or liquid reservoir for containing e-liquid, as well as a heater. In use, electrical energy is supplied from the power source to the heater, which heats the e-liquid to produce an aerosol (or "vapour") which is inhaled by a user through the mouthpiece.

[0011] Vaping smoking substitute systems can be configured in a variety of ways. For example, there are "closed system" vaping smoking substitute systems which typically have a heater and a sealed tank which is pre-filled with e-liquid and is not intended to be refilled by an end user. One subset of closed system vaping smoking substitute systems include a device which includes the power source, wherein the device is configured to be physically and electrically coupled to a component including the tank and the heater. In this way, when the tank of a component has been emptied, the device can be reused by connecting it to a new component. Another subset of closed system vaping smoking substitute systems are completely disposable, and intended for one-use only.

[0012] There are also "open system" vaping smoking substitute systems which typically have a tank that is configured to be refilled by a user, so the system can be used multiple times.

[0013] An example vaping smoking substitute system is the myblu™ e-cigarette. The myblu™ e cigarette is a closed system which includes a device and a consumable component. The device and consumable component are physically and electrically coupled together by pushing the consumable component into the device. The device includes a rechargeable battery. The consumable component includes a mouthpiece, a sealed tank which contains e-liquid, as well as a vaporiser, which for this system is a heating filament coiled around a portion of a wick which is partially immersed in the e-liquid. The system is activated when a microprocessor on board the device detects a user inhaling through the mouthpiece. When the system is activated, electrical energy is supplied from the power source to the vaporiser, which heats e-liquid from the tank to produce a vapour which is inhaled by a user through the mouthpiece.

[0014] Another example vaping smoking substitute system is the blu PRO™ e-cigarette. The blu PRO™ e cigarette is an open system which includes a device, a (refillable) tank, and a mouthpiece. The device and tank are physically and electrically coupled together by screw-

ing one to the other. The mouthpiece and refillable tank are physically coupled together by screwing one into the other, and detaching the mouthpiece from the refillable tank allows the tank to be refilled with e-liquid. The system is activated by a button on the device. When the system is activated, electrical energy is supplied from the power source to a vaporiser, which heats e-liquid from the tank to produce a vapour which is inhaled by a user through the mouthpiece.

[0015] An alternative to the "vaping" approach 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. In the HT approach the intention is that the tobacco is heated but not burned, i.e. the tobacco does not undergo combustion.

[0016] The heating, as opposed to burning, of 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.

[0017] A typical HT smoking substitute system may include a device and a consumable component. The consumable component may include the tobacco material. The device and consumable component 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.

[0018] As the vapour passes through the consumable component (entrained in the airflow) from the location of vaporization to an outlet of the component (e.g. a mouthpiece), the vapour cools and condenses to form an aerosol for inhalation by the user. The aerosol may contain nicotine and/or flavour compounds.

[0019] As consumer devices that are handled and used by consumers in everyday environments, it is advantageous for smoking substitute systems to be user friendly and to provide users with features and functionality to compliment or ancillary to the primary function of generating an inhalable vapour.

[0020] Accordingly, there is a need for an improved aerosol delivery device/system which addresses at least some of the problems of the known devices and systems.

Summary

[0021] According to a first aspect, there is provided an aerosol generating apparatus (e.g. a smoking substitute

apparatus) wherein a consumable is engaged with a body by pushing the consumable toward the body in a first direction, and wherein the consumable is disengaged from the body by subsequently pushing the consumable in the same first direction. Consequently, the consumable is fixed to the body by a mechanism that enables a relative movement of the consumable and body in a first, push direction, to engage the mechanism, and a second relative movement of the consumable and body in the first, push direction to disengage the mechanism. Thus, in the exemplary embodiments, the consumable is engaged to the body by a push-push mechanism.

[0022] Providing an aerosol generating apparatus wherein a consumable is engaged with a body by the engagement of a push-push mechanism, allows the consumable to be pushed relative to the body to engage the body and pushed again relative to the body to disengage the consumable and body. Once disengaged, the consumable is separated from the body and can be removed, but whilst engaged, the consumable is restricted from being separated from the body.

[0023] Advantageously, engaging a consumable with a body using a push-push mechanism provides an improved user experience. For instance, the push-push mechanism provides an improved lock between the consumable and body, where the risk of accidental removal is reduced. That is, a secondary push action, followed by a reverse pull action to remove the consumable from the body has a reduced likelihood of being accidentally replicated. In addition, a push-push mechanism provides an enhanced user experience as the push-push mechanism can be repeatedly actioned without the step of withdrawing the consumable from the body, providing the user with a fiddle factor.

[0024] In exemplary embodiments, a push-push mechanism comprises a push-push insertion member and a push-push receiving member. Suitably, the push-push mechanism is configured so that the push-push insertion member is captured by the push-push receiving member when the push-push insertion member is pushed towards the push-push receiving member and released when the members are moved relatively to each other in the same direction.

[0025] Suitably, one of the push-push insertion member or push-push receiving member is fixed or attached to the body and the other fixed or attached to a second part. In one exemplary embodiment, the second member is the consumable. For instance, the consumable may be a capsule or pod (e.g. an E-liquid consumable) and the second part may be integral or fixed or otherwise connected to a housing of the consumable. Alternatively, the second member may be a carrier that receives and moves with the consumable. For instance, the consumable may be a stick or package (e.g. a heat not burn consumable) and the carrier receives the consumable to move with the consumable. Here, the second part is integral or fixed or otherwise connected to the carrier. In

the embodiments including a carrier, for instance where the consumable cannot be easily modified to include the push-push mechanism, the carrier suitably includes a gripping means. Here, the gripping means is configured to be actuable to grip the consumable. For instance, the gripping means may comprise a gripping member that is moved between a free position (wherein the consumable can be received in the carrier by relative movement) and a restricted position, wherein the gripping member grips the consumable to restrict relative movement between the consumable and carrier. For instance, in the restricted position, the gripping member may restrict a volume of the carrier in which the consumable is received, such that the restriction acts to grip the consumable in the carrier. In the exemplary embodiments including a gripping member, the push-push insertion member is further configured to actuate the gripping means between the free and restricted positions as the push-push mechanism is disengaged and engaged respectively.

[0026] According to an exemplary aspect, there is therefore provided an aerosol generating apparatus including a body and a consumable, wherein one of the body or second member includes a push-push insertion member and the other of the body or second member includes a push-push receiving member, wherein the push-push insertion member is receivable by the push-push receiving member to engage the consumable with the body.

[0027] According to a further exemplary aspect, there is therefore provided a consumable suitable for use with a body in forming an aerosol generating apparatus, wherein the consumable includes one of a push-push insertion member or a push-push receiving member, and the respective member is configured so that the push-push insertion member is receivable by the push-push receiving member to engage the consumable to the body.

[0028] According to a further exemplary aspect, there is therefore provided a body suitable for use with a consumable in forming an aerosol generating apparatus, wherein the body includes one of a push-push insertion member or a push-push receiving member, and the respective member is configured so that the push-push insertion member is receivable by the push-push receiving member to engage the consumable to the body.

[0029] In exemplary embodiments, the body comprises a recess for receiving the consumable. The recess suitably has an elongate axis parallel to an elongate axis of the body. Here, the respective push-push insertion or receiving member may be arranged within the recess. Suitably, the respective push-push insertion or receiving member is arranged on an internal side wall of the recess. It will be appreciated that when the consumable is engaged with the body, at least a portion of the consumable may be spaced from a distal, closed end of the cavity. The spacing enabling the portion of the consumable to move further into the recess during the second push action to disengage the push-push mechanism. It is envis-

aged the consumable may be an integral unit that moves as a single part, where the entire distal end of the consumable is spaced from the distal closed end of the recess in the engaged position. In an alternative embodiment, where the arrangement of, for instance the heating unit (or other components of the aerosol deliver system) are not configured to allow respective movement to accommodate the second push action, the consumable may include a sleeve or the like that moves relative to other parts of the consumable in order to accommodate the movement associated with the second push action, without requiring relative movement of the other components of the consumable with respective components of the body.

[0030] In exemplary embodiments, the push-push mechanism causes the consumable to be engaged and disengaged from the body. Here, when engaged, the push-push mechanism restricts relative movement between the consumable and body. The relative movement is restricted in at least a second direction opposed to the first direction (i.e. a pull direction). Thus, the consumable may be considered locked to the body. In some embodiments, the push-push mechanism also prevents rotational movement (i.e. rotation of the consumable relative to the body) and / or translational movement relative to the first direction (i.e. sideways movement of the consumable relative to the body). However, it is envisaged rotational movement and / or translational movement of the consumable relative to the body may also be restricted by abutment between the consumable and body. For instance, where the consumable is inserted into a recess in the body, abutment between the recess and consumable might provide the restriction to relative translational movement. Furthermore, the recess and consumable may have cooperating alignment features, wherein the cooperating alignment features may provide the restriction to rotational movement. Here, the cooperating alignment features may assist the connection of the push-push mechanism, for instance, where a specific angular alignment is required between the consumable and body to engage the parts of the push-push mechanism. In some exemplary embodiments, the cooperating alignment features are a face or protrusion or the like providing one or both of the body and consumable with a non-rotationally symmetric cross-section. For instance, the cooperating features may be a facet on the consumable and a corresponding facet on the body (e.g. on the inner side surface of the recess), where the corresponding facets allow insertion of the consumable into the recess in a restricted number of rotational respective alignments. Here, the respective members of the push-push mechanism may be arranged on the facets.

[0031] In exemplary embodiments, the push-push mechanism includes a biasing means to bias the consumable to move in the second direction (i.e. the pull direction that is opposed to the push direction). Thus, the consumable is pushed against the bias of the biasing means during both the first push action and also the sec-

ond push action. Advantageously, the biasing means assists in providing a secure engagement of the push-push mechanism. In some exemplary embodiments, the push-push mechanism comprises a push-push insertion member and a push-push receiving member. Here, the insertion member may comprise a follower. The follower being configured to enter and follow a track. Thus, the receiving member comprises a track for receiving and guiding the follower. The follower is moveably connected to a housing (the housing may be a separate part to the respective consumable or body or may be integral thereto). For instance, the follower may be formed on the end of an arm or the like wherein the arm is connected to the housing. The connection may be resilient so that when the arm is moved away from a natural position, it is biased back towards the natural position. Alternatively, the follower may be retained by the housing but otherwise free to move. Thus, in either instance, the follower is configured to move laterally relative to the push direction. Here, the track is configured to guide the follower at least partially in the first (push) direction and then to return the follower at least partially along the second (pull) direction in a different position, such that the follower is caused to abut or hook a part of the receiving member. That is, the track guides the follower along a first path during the initial push action of the consumable, and then guides the follower along a second path as the consumable withdraws (suitably under the presence of a biasing means) in the second, opposed (pull) direction. The first and second paths being different. The abutment between the follower and receiving member preventing further respective movement in the pull direction. Consequently, the insertion member is captured by the receiving member by guiding the follower from the first path to the second path. It will be appreciated that the track guides the follower to return along a different path to the path taken during the push action. As explained to release the follower from the receiving member, the follower is caused to move at least partially in the first (push) direction. Here, the track guides the follower to follow a third path (which may be the reverse of the second path), before returning down a fourth path during relative movement of the consumable and body in the opposed second (pull) direction. The fourth path may be the reverse of the first path. In the exemplary embodiments including a biasing means, the biasing means biases the follower to move along the second and fourth paths. The receiving member may include a projection of the like to guide the follower between the first and second paths and between the third and fourth paths. The projection may be in addition to or an alternative to any resiliency in the connection of the follower to the housing. For instance, the projection might be a diverting feature that diverts the follower to take a different path when moved past the diverting feature in one direction than the other.

[0032] In exemplary embodiments the aerosol generating apparatus includes a power supply, for supply of electrical energy. Suitably, the aerosol generating appa-

ratus includes an aerosol generating unit that is driven by the power supply. The power supply may include an electric power supply in the form of a battery and/or an electrical connection to an external power source. The aerosol generating apparatus includes precursor, which in use is aerosolised by the aerosol generating unit. The aerosol generating apparatus includes a delivery system for delivery of aerosolised precursor to a user. Electrical circuitry may be implemented to control the interoperability of the power supply and aerosol generating unit. In variant embodiments, the power supply may be omitted, e.g. an aerosol generating unit implemented as an atomiser with flow expansion may not require a power supply.

[0033] The consumable may comprise an electrical interface for interfacing with a corresponding electrical interface of the body. One or both of the electrical interfaces may include one or more electrical contacts (which may extend through the transverse plate of the lower portion of the insert). Thus, when the body is engaged with the consumable, the electrical interface may be configured to transfer electrical power from the power source to a heating element of the consumable. The electrical interface may also be used to identify the consumable from a list of known types. The electrical interface may additionally or alternatively be used to identify when the consumable is connected to the body. In exemplary embodiments, the electrical contacts are incorporated into the push-push mechanism. For instance, engagement of the push-push receiving member with the push-push insertion member also causes engagement of the electrical contacts.

[0034] The aerosol generating apparatus may suitably generate an aerosol from a liquid precursor. Here, the delivery system includes a flow path that transmits flow in operative proximity of a heating system of the aerosol generating unit. By operative proximity it is meant that the flow is transmitted to carry vaporised and/or aerosol precursor generated from aerosol generating unit to the outlet of the delivery system. The flow path includes an inlet, and an outlet, which may be arranged as a mouthpiece. The delivery system includes a precursor transmission system to transmit the precursor, typically in liquid form from a storage, to the aerosol generating unit. The precursor transmission system may be implemented as a wick, injector or other suitable device. In such embodiments, the precursor can be contained in a reservoir or other storage portion.

[0035] In variant embodiments, the precursor transmission system may be implemented by the aerosol generating unit, for example, as a porous heating component.

[0036] In some embodiments, the consumable is implemented as a capsule/pod. The capsule is separably connectable to the body. Suitably the body comprises a power supply. In some embodiments, the capsule includes the precursor, aerosol generating unit and mouthpiece. Here, suitably a storage portion, which is implemented as a reservoir, is arranged to carry the precursor.

[0037] In variant embodiments, one or both of the aerosol generating unit and mouthpiece, are arranged as part of the body, e.g. the mouthpiece is arranged as part of the body and the precursor and aerosol generating unit are arranged as a separable consumable (e.g. a car-tomizer).

[0038] In some embodiments, the aerosol generating apparatus may suitably generate an aerosol from a solid precursor. Here, a heating system of the aerosol generating unit interacts with the precursor to generate vapourised and/or aerosol precursor. The precursor is typically arranged as a solid and is arranged to receive thermal energy via conductive heat transfer from the aerosol generating unit, e.g. the heating system is arranged as a rod, which is inserted into the precursor or as a flat plate to abut a surface of the precursor. The delivery system includes a flow path that transmits flow from an inlet through (or in operative proximity to) the precursor to carry the vapour and/or aerosol to an outlet of the flow path.

[0039] In the embodiments generating aerosol from a solid precursor, a consumable is suitably implemented as a stick. Here, the stick is separably connectable to the body and the body comprises a power supply and an aerosol generating unit. Suitably, the stick includes, proximal the body, the precursor as a reconstituted tobacco formulation and, distal the body, a mouthpiece arranged as a filter. A storage portion, which is implemented as wrapping material may be arranged to carry the precursor.

[0040] The body suitably houses a source of power which may be a battery. The source of power may be a capacitor. The power source may be a rechargeable power source. The body may include a charging connection for connection to an external power supply for recharging of the power source within the body.

[0041] The body suitably comprises a body part for housing the power source and/or other electrical components. The body part may be an elongate body i.e. with a greater length than depth/width. It may have a greater width than depth.

[0042] The body part may have a length of between 5 and 30 cm e.g. between 10 and 20 cm such as between 10 and 13 cm. The maximum depth of the body part may be between 5 and 30 mm e.g. between 10 and 20 mm.

[0043] The body part may have a front surface that is curved in the transverse dimension. The body part may have a rear surface that is curved in the transverse dimension. The curvatures of the front surface and rear surface may be of the opposite sense to one another. Both front and rear surfaces may be convex in the transverse dimension. They may have an equal radius of curvature. The radius of curvature of the front surface may be between 10 and 50 mm, or between 10 and 40 mm, or between 10 and 30 mm, or between 10 and 20 mm, or between 10 and 15 mm, or substantially 13.5 mm.

[0044] The front and rear surfaces may meet at opposing transverse edges of the body. This leads to a mandorla-/lemon-/eye-shaped cross-sectional shape of the

body part. The transverse edges may have a radius of curvature that is significantly smaller than the radius of curvature of either the front or rear surface. This leads to the transverse edges being substantially "pointed" or "sharp". The transverse edges may have a radius of curvature in the transverse dimension of less than 10 mm, or less than 5 mm, or less than 2 mm, or less than 1 mm. The transverse edges may extend substantially the full longitudinal length of the body part. However, in some embodiments, the transverse edges may only extend along a longitudinal portion of the body part.

[0045] The body part may have a curved longitudinal axis i.e. curved in a direction between the front and rear faces.

[0046] The front and/or rear surface of the body may include at least one visual user feedback element, for example one or more lights e.g. one or more LEDs. In some embodiments, the body may include an illumination region configured to allow light provided by the visual user feedback element (e.g. one or more lights/LEDs) within the body to shine through.

[0047] The aerosol generating apparatus may comprise a movement detection unit (e.g. an accelerometer) for detecting a movement of the apparatus, and a haptic feedback generation unit (e.g. an electric motor and a weight mounted eccentrically on a shaft of the electric motor).

[0048] The body may include a controller. The controller may be configured to identify an operation of the aerosol generating apparatus; and control the one or more lights contained within the body, (e.g. to illuminate the illumination region) based on the operation of the apparatus identified. The controller may be configured to control the haptic feedback generation unit to generate the haptic feedback in response to the detection of movement of the apparatus by the movement detection unit.

[0049] A memory may be provided and may be operatively connected to the controller. The memory may include non-volatile memory. The memory may include instructions which, when implemented, cause the controller to perform certain tasks or steps of a method.

[0050] The aerosol generation apparatus may comprise a wireless interface, which may be configured to communicate wirelessly with an external device, for example a mobile device, e.g. via Bluetooth®. To this end, the wireless interface could include a Bluetooth® antenna. Other wireless communication interfaces, e.g. WiFi®, are also possible. The wireless interface may also be configured to communicate wirelessly with a remote server.

[0051] The aerosol generation apparatus may comprise an airflow (i.e. puff) sensor that is configured to detect a puff (i.e. inhalation from a user). The airflow sensor may be operatively connected to the controller so as to be able to provide a signal to the controller that is indicative of a puff state (i.e. puffing or not puffing). The airflow sensor may, for example, be in the form of a pressure sensor or an acoustic sensor.

[0052] The controller may control power supply to a heating element in response to airflow detection by the sensor. The control may be in the form of activation of the heating element in response to a detected airflow.

[0053] When implemented with an e-liquid consumable having the aerosol generation unit on the consumable, the body may comprise an electrical connection (e.g. one or more contact pins) for connection of the power source to the aerosol generating unit (i.e. the heating element).

[0054] The body may comprise a chassis within a body part and one or more of any electrical components of the body (e.g. one or more of the power source, charging connection, visual feedback element, movement detection unit, haptic feedback generation unit, controller, memory, wireless interface, puff sensor and/or electrical connection) may be mounted on or affixed to the chassis.

[0055] In a further aspect, there is provided an aerosol delivery system comprising an aerosol generating apparatus according to exemplary aspects and an external device.

[0056] The present disclosure provides a use of the aerosol generating apparatus, which may implement the features of any preceding embodiment, or another embodiment disclosed herein, for generating an aerosol for delivery to a user.

[0057] The present disclosure therefore provides a method of generating an aerosol, which may implement the features of any preceding embodiment, or another embodiment disclosed herein. In a further aspect there is provided a method comprising engaging the consumable with an aerosol-generating apparatus (e.g. smoking substitute apparatus) (as described above) having a power source so as to electrically connect the power source to the consumable (i.e. to the vaporiser of the consumable).

[0058] According to a further exemplary aspect, there is therefore provided a method of connecting and disconnecting a consumable with a body to form an aerosol generating apparatus, the method comprising: moving the consumable and body together in a first direction to cause a push-push insertion member to be received by a push-push receiving member to engage the consumable with the body; and subsequently moving the consumable and body together in the first direction to release the push-push insertion member from the receiving member to disengage the consumable from the body.

[0059] In the exemplary embodiments, the consumable is inserted into a recess of the body. Suitably, the method comprises inserting the consumable into the recess prior to the step of moving the consumable and body together in a first direction to cause a push-push insertion member to be received by a push-push receiving member. Here, the respective movement of the consumable and body to insert the consumable into the recess may also be in the first direction. Suitably, the method also comprises withdrawing the consumable from the recess after the step of subsequently moving the consumable

body together in the first direction to disengage the consumable from the body. Here, the consumable may be withdrawn from the recess in a second direction, opposed to the first. In some exemplary embodiments, the method may comprises repeating the movement to cause the push-push insertion member to be received by the push-push receiving member and repeating the movement to cause the push-push insertion member to be released from the push-push receiving member a plurality of times before the subsequent movement to withdraw the consumable from the recess.

[0060] The present disclosure provides electrical circuitry, and/or a computer program configured to cause an aerosol generating system to perform said method, and a computer readable medium comprising the computer program.

[0061] The preceding summary is provided for purposes of summarizing some embodiments to provide a basic understanding of aspects of the subject matter described herein. Accordingly, the above-described features are merely examples and should not be construed to narrow the scope or spirit of the subject matter described herein in anyway. Moreover, the above and/or proceeding embodiments may be combined in any suitable combination to provide further embodiments. Other features, aspects, and advantages of the subject matter described herein will become apparent from the following Detailed Description, Figures, and Claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0062] Aspects, features and advantages of embodiments of the present disclosure will become apparent from the following description of embodiments in reference to the appended drawings in which like numerals denote like elements, and in which:

- Fig. 1A is a front schematic view of a smoking substitute apparatus;
- Fig. 1B is a front schematic view of a body of the apparatus;
- Fig. 1C is a front schematic view of a consumable of the apparatus;
- Fig. 2A is a schematic of the electrical components of the body;
- Fig. 2B is a schematic of the parts of the consumable;
- Fig. 3 is a section view of the component;
- Fig. 4 is a perspective view of an embodiment of the apparatus;
- Fig. 5 is a schematic transverse cross-section view of the body of Figure 4;
- Fig. 6 is a front schematic view of an aerosol generating apparatus showing a consumable ready for connection with a body;
- Fig. 7 is a schematic cross-section view showing the aerosol generating apparatus of Fig. 6 with the consumable and body connected;
- Fig. 8. is a front schematic view of an aerosol gen-

erating apparatus showing a consumable connected with a body; and

- Fig. 9 is a schematic cross-section view showing the aerosol generating apparatus of Fig. 8 with the consumable and body connected.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0063] Before describing several embodiments of aerosol generating system and apparatus, it is to be understood that the system and apparatus is not limited to the details of construction or process steps set forth in the following description. It will be apparent to those skilled in the art having the benefit of the present disclosure that the systems, apparatuses and/or methods described herein could be embodied differently and/or be practiced or carried out in various ways.

[0064] Unless otherwise defined herein, scientific and technical terms used in connection with the presently disclosed inventive concept(s) shall have the meanings that are commonly understood by those of ordinary skill in the art, and known techniques and procedures may be performed according to conventional methods well known in the art and as described in various general and more specific references that may be cited and discussed in the present specification.

[0065] All of the systems, apparatus, and/or methods disclosed herein can be made and executed without undue experimentation in light of the present disclosure. While they have been described in terms of particular embodiments, it will be apparent to those of skill in the art that variations may be applied to the systems, apparatus, and/or methods and in the steps or in the sequence of steps of the methods described herein without departing from the concept, spirit, and scope of the inventive concept(s). All such similar substitutions and modifications apparent to those skilled in the art are deemed to be within the spirit, scope, and concept of the inventive concept(s) as defined by the appended claims.

[0066] The use of the term "a" or "an" in the present disclosure (including the claims) may mean "one," as well as "one or more," "at least one," and "one or more than one." As such, the terms "a," "an," and "the," as well as all singular terms, include plural referents unless the context clearly indicates otherwise. Likewise, plural terms shall include the singular unless otherwise required by context.

[0067] The use of the term "or" in the present disclosure (including the claims) is used to mean an inclusive "and/or" unless explicitly indicated to refer to alternatives only or unless the alternatives are mutually exclusive. For example, a condition "A or B" is satisfied by any of the following: A is true (or present) and B is false (or not present), A is false (or not present) and B is true (or present), and both A and B are true (or present).

[0068] As used in the present disclosure (including the claims), the words "comprising", "having", "including", or "containing" (and any forms thereof, such as "comprise"

and "comprises", "have" and "has", "includes" and "include", or "contains" and "contain", respectively) are inclusive or open-ended and do not exclude additional, unrecited elements or method steps.

[0069] Unless otherwise explicitly stated as incompatible, or the physics or otherwise of the embodiments, example, or claims prevent such a combination, the features of the foregoing embodiments and examples, and of the following claims may be integrated together in any suitable arrangement, especially ones where there is a beneficial effect in doing so. This is not limited to only any specified benefit, and instead may arise from an "ex post facto" benefit. This is to say that the combination of features is not limited by the described forms, particularly the form (e.g. numbering) of the example(s), embodiment(s), or dependency of the claim(s). Moreover, this also applies to the phrase "in one embodiment," "according to an embodiment," and the like, which are merely a stylistic form of wording and are not to be construed as limiting the following features to a separate embodiment to all other instances of the same or similar wording. This is to say, a reference to 'an,' 'one,' or 'some' embodiment(s) may be a reference to any one or more, and/or all embodiments, or combination(s) thereof, disclosed. Also, similarly, the reference to "the" embodiment may not be limited to the immediately preceding embodiment. Further, all references to one or more embodiments or examples are to be construed as non-limiting to the claims.

[0070] The present disclosure may be better understood in view of the following explanations, wherein the terms used that are separated by "or" may be used interchangeably:

As used herein, the term "aerosol generating apparatus" or "aerosol delivery apparatus" or "apparatus" or "electronic(e)-cigarette" may include apparatus to deliver an aerosol to a user for inhalation. The apparatus may also be referred to as a "smoking substitute apparatus", which may refer to apparatus intended to be used instead of a conventional combustible smoking article. As used herein a "smoking article" may refer to a cigarette, cigar, pipe or other article, that produces smoke (an aerosol comprising solid particulates and gas) via heating above the thermal decomposition temperature (typically by combustion and/or pyrolysis). The apparatus may include an aerosol generating unit that may generate a vapour that may subsequently condense into the aerosol before delivery to an outlet, which may be arranged as a mouthpiece. The apparatus may be configured to deliver an aerosol for inhalation, which may comprise an aerosol with particle sizes of 0.2 - 7 microns, or less than 10 microns, or less than 7 microns. This particle size may be achieved by control of one or more of: heater temperature; cooling rate as the vapour condenses to an aerosol; flow properties including turbulence and velocity. The apparatus may be portable. As used herein, the term "Portable" may refer to the apparatus being for use when held by a user. The apparatus may be adapted to gen-

erate a variable amount of aerosol, e.g. by activating an aerosol generating unit of the apparatus for a variable amount of time, (as opposed to a metered dose of aerosol), which may be controlled by an input device. The input device may be configured to be user activated, and may for example include or take the form of a vaping button and/or inhalation sensor. Each occurrence of the aerosol generating apparatus being caused to generate aerosol for a period of time (which may be variable, see above) may be referred to as an "activation" of the aerosol generating apparatus. The aerosol generating apparatus may be arranged to vary an amount of aerosol delivered to a user based on the strength/duration of a draw of a user through a flow path of the apparatus (to replicate an effect of smoking a conventional combustible smoking article).

[0071] As used herein, the term "aerosol generating system" or "aerosol delivery system" or "system" may include the aerosol generating apparatus and optionally other circuitry/componentry associated with the function of the apparatus, e.g. an external device and/or an external component (here "external" is intended to mean external to the aerosol generating apparatus). As used herein, the terms "external device" and "external component" may include one or more of a: a mobile device (which may be connected to the aerosol generating apparatus, e.g. via a wireless or wired connection); a networked-based computer (e.g. a remote server); a cloud-based computer; any other server system.

[0072] As used herein, the term "aerosol" may include a suspension of precursor, including as one or more of: solid particles; liquid droplets; gas. Said suspension may be in a gas including air. Aerosol herein may generally refer to/include a vapour. Aerosol may include one or more components of the precursor.

[0073] As used herein, the term "aerosol-forming precursor" or "precursor" or "aerosol-forming substance" or "aerosol-forming substrate" may refer to one or more of a: liquid; solid; gel; loose leaf material; other substance. The precursor may be configured to be processed by an aerosol generating unit of the apparatus to form an aerosol. The precursor may include one or more of: an active component; a carrier; a flavouring. The active component may include one or more of nicotine; caffeine; a cannabinoid oil; a non-pharmaceutical formulation, e.g. a formulation which is not for treatment of a disease or physiological malfunction of the human body. The active component may be carried by the carrier, which may be a liquid, including propylene glycol and/or glycerine. The term "flavouring" may refer to a component that provides a taste and/or a smell to the user. The flavouring may include one or more of: Ethylvanillin (vanilla); menthol, Isoamyl acetate (banana oil); or other. The precursor may include a substrate, e.g. reconstituted tobacco to carry one or more of the active component; a carrier; a flavouring.

[0074] As used herein, the term "electrical circuitry" or "electric circuitry" or "circuitry" or "control circuitry" may

refer to one or more of the suitable hardware or software components, examples of which may include: an Application Specific Integrated Circuit (ASIC); electronic/electrical componentry (which may include combinations of transistors, resistors, capacitors, inductors etc); one or more processors; a non-transitory memory (e.g. implemented by one or more memory devices), that may store one or more software or firmware programs; a combinational logic circuit; interconnection of the aforesaid. The electrical circuitry may be located entirely at the apparatus, or distributed between the apparatus and/or on one or more external devices in communication with the apparatus, e.g. as part of the system [Note that if we refer to operations of the electrical circuitry, they are not limited to being executed onboard the apparatus].

[0075] As used herein, the term "processor" or "processing resource" may refer to one or more units for processing, examples of which include an ASIC, microcontroller, FPGA, microprocessor, digital signal processor (DSP) capability, state machine or other suitable component. A processor may be configured to execute a computer program, e.g. which may take the form of machine readable instructions, which may be stored on a non-transitory memory and/or programmable logic. The processor may have various arrangements corresponding to those discussed for the circuitry, e.g. on-board and/or off board the apparatus as part of the system. As used herein, any machine executable instructions, or computer readable media, may be configured to cause a disclosed method to be carried out, e.g. by a aerosol generating apparatus or system as disclosed herein, and may therefore be used synonymously with the term method, or each other.

[0076] As used herein, the term "external device" or "external electronic device" or "electronic user device" or "peripheral device" may include electronic components external to the apparatus, e.g. those arranged at the same location as the apparatus or those remote from the apparatus. The external electronic device may comprise electronic computer devices including: a smartphone; a PDA; a video game controller; a tablet; a laptop; or other like device.

[0077] As used herein, the term "computer readable medium/media" or "data storage" may include any medium capable of storing a computer program, and may take the form of any conventional non-transitory memory, for example one or more of: random access memory (RAM); a CD; a hard drive; a solid state drive; a memory card; a DVD. The memory may have various arrangements corresponding to those discussed for the circuitry /processor.

[0078] As used herein, the term "information carrying medium" may include one or more arrangements for storage of information on any suitable medium. Examples include: computer readable medium/media or data storage as defined herein; a Radio Frequency Identification (RFID) transponder; codes encoding information, such as optical (e.g. a bar code or QR code) or mechanically

read codes (e.g. a configuration of the absence or presents of cut-outs to encode a bit, through which pins or a reader may be inserted).

[0079] As used herein, the term "communication resources" or "communication interface" may refer to hardware and/or firmware for electronic information transfer. The communication resources/interface may be configured for wired communication ("wired communication resources/interface") or wireless communication ("wireless communication resources/interface"). Wireless communication resources may include hardware to transmit and receive signals by radio and may include various protocol implementations e.g. the 802.11 standard described in the Institute of Electronics Engineers (IEEE) and Bluetooth™ from the Bluetooth Special Interest Group of Kirkland Wash. Wired communication resources may include; Universal Serial Bus (USB); High-Definition Multimedia Interface (HDMI) or other protocol implementations. The apparatus may include communication resources for wired or wireless communication with an external device.

[0080] As used herein, the term "network" or "computer network" may refer to a system for electronic information transfer between a plurality of apparatuses/devices. The network may, for example, include one or more networks of any type, which may include: a Public Land Mobile Network (PLMN); a telephone network (e.g. a Public Switched Telephone Network (PSTN) and/or a wireless network); a local area network (LAN); a metropolitan area network (MAN); a wide area network (WAN); an Internet Protocol Multimedia Subsystem (IMS) network; a private network; the Internet; an intranet.

[0081] It will be appreciated that any of the disclosed methods (or corresponding apparatuses, programs, data carriers, etc.) may be carried out by either a host or client, depending on the specific implementation (i.e. the disclosed methods/apparatuses are a form of communication(s), and as such, may be carried out from either 'point of view', i.e. in corresponding to each other fashion). Furthermore, it will be understood that the terms "receiving" and "transmitting" encompass "inputting" and "outputting" and are not limited to an RF context of transmitting and receiving electromagnetic (e.g. radio) waves. Therefore, for example, a chip or other device or component for realizing embodiments could generate data for output to another chip, device or component, or have as an input data from another chip, device, or component, and such an output or input could be referred to as "transmit" and "receive" including gerund forms, that is, "transmitting" and "receiving," as well as such "transmitting" and "receiving" within an RF context.

[0082] As used herein, the term "storage portion" may refer to a portion of the apparatus adapted to store the precursor, it may be implemented as fluid holding reservoir or carrier for solid material depending on the implementation of the precursor as defined above.

[0083] As used herein, the term "flow path" may refer to a path or enclosed passageway through the apparatus,

through which the user may inhale for delivery of the aerosol. The flow path may be arranged to receive aerosol from an aerosol generating unit. When referring to the flow path, upstream and downstream may be defined in respect of a direction of flow in the flow path, e.g. the outlet is downstream of the inlet.

[0084] As used herein, the term "delivery system" may refer to a system operative to deliver an aerosol to a user. The delivery system may include a mouthpiece/a mouthpiece assembly and the flow path.

[0085] As used herein, the term "flow" may refer to a flow in the flow path. The flow may include aerosol generated from the precursor. The flow may include air, which may be induced into the flow path via a puff.

[0086] As used herein, the term "inhale" or "puff" or "draw" may refer to a user expansion of the lungs and/or oral cavity to create a pressure reduction that induces flow through the flow path.

[0087] As used herein, the term "heating system" may refer to an arrangement of one or more heating elements, which are operable to aerosolise the precursor once heated. The heating elements may be electrically resistive to produce heat from electrical current therethrough. The heating elements may be arranged as susceptors to produce heat when penetrated by an alternating magnetic field. The heating system may heat the precursor to below 300 or 350 degrees C, including without combustion.

[0088] As used herein, the term "consumable" may refer to a unit that includes or consists of the precursor. The consumable may include the aerosol generating unit, e.g. it is arranged as a cartomizer. The consumable may include the mouthpiece. The consumable may include the information carrying medium. With liquid or gel implementations of the precursor, e.g. an E-liquid, the consumable may be referred to as a "capsule" or a "pod" or "E-liquid consumable". The capsule may include the storage portion, e.g. a reservoir, for storage of the precursor. With solid material implementations of the precursor, e.g. tobacco or reconstituted tobacco formulation, the consumable may be referred to as a "stick" or "package" or "heat not burn consumable". In a heat not burn consumable the mouthpiece may be implemented as a filter and the consumable may be arranged to carry the precursor. The consumable may be implemented as a dosage or pre-portioned amount of material, including a loose-leaf product.

[0089] As used herein the term "heat not burn" or "heated precursor" may refer to the heating of a precursor, typically tobacco, without combustion, or without substantial combustion (i.e. localised combustion may be experienced of limited portions of the precursor, including of less than 5% of the total volume).

[0090] Referring to the Figures and according to exemplary embodiments, there is provided an aerosol generating apparatus 100 comprising a consumable 104 that is engaged with a body 102 by a push-push connection 300 (see figure 6 and 7). The push-push connection 300

is a connection between first and second parts wherein the first and second parts can be engaged by relative movement in a first linear direction (e.g. by pushing the two parts together, herein an initial push action). Once engaged, the push-push connection prevents the parts from being disconnected by relative movement in a second linear direction where the second direction is opposed to the first direction (e.g. the two parts are prevented from being pulled apart). Rather, to disconnect the two parts, a second relative movement in the first direction is required to disengage the push-push connection 300 (e.g. by pushing the parts together, herein a secondary push action). After the secondary push action, the push-push connection 300 is disengaged, which allows the two parts to be separated by movement in the second direction. Advantageously, incorporating a push-push connection into an aerosol generating apparatus 100, provides an enhanced user experience. For instance, the user experience is enhanced because the consumable is locked to the body after the initial push, providing increased protection to accidental removal of the consumable. Furthermore, the secondary push followed by a change to a pull movement to separate the consumable and body means the movement action is less likely to be replicated in normal use (i.e. when carried in a user's bag or pocket or the like). Yet further, the push-push connection provides an increased user experience as the repeated push action to engage and disengage the consumable (without the pull action to separate the two) provides a fiddle factor to the apparatus.

[0091] It is envisaged that the push-push connection 300 could be applied to any type of aerosol generating apparatus. For instance, both an aerosol generating apparatus that generates an aerosol from a liquid percussor, and an aerosol generating apparatus that generates an aerosol from a solid percussor.

[0092] The aerosol generating apparatus including a consumable 104, body 102 and push-push connection 300 to releasably engage the consumable to the body will first be described in relation to Figures 1 to 7 that shows an example of an aerosol generating apparatus for generating an aerosol from a liquid percussor. Here, Fig. 1A shows a first embodiment of a smoking substitute system 100 (e.g. an aerosol generating apparatus). In this example, the smoking substitute system 100 includes a body 102 and a consumable 104. The consumable 104 may alternatively be referred to as a "pod", "cartridge" or "cartomizer". It should be appreciated that in other examples (i.e. open systems), the body may be integral with the consumable. In such apparatuses, a tank of the aerosol delivery apparatus may be accessible for refilling the apparatus.

[0093] In this example, the smoking substitute apparatus 100 is a closed system vaping apparatus, wherein the consumable 104 includes a sealed tank 106 and is intended for single-use only. The consumable 104 is removably engageable with the body 102 (i.e. for removal and replacement). Fig. 1A shows the smoking substitute

apparatus 100 with the body 102 physically coupled to the consumable 104, Fig. 1B shows the body 102 of the smoking substitute apparatus 100 without the consumable 104, and Fig. 1C shows the consumable 104 of the smoking substitute apparatus 100 without the body 102.

[0094] The body 102 and the consumable 104 are configured to be physically coupled together by pushing the consumable 104 into a cavity (i.e. a recess) at an upper end 108 of the body 102, such that there is an interference fit between the body 102 and the consumable 104.

[0095] The consumable 104 includes a mouthpiece portion at an upper end 109 of the consumable 104, and one or more air inlets (not shown) in fluid communication with the mouthpiece portion such that air can be drawn into and through the consumable 104 when a user inhales through the mouthpiece portion. The tank 106 containing e-liquid is located at the lower end 111 of the consumable 104.

[0096] The tank 106 includes a window 112, which allows the amount of e-liquid in the tank 106 to be visually assessed. The body 102 includes a slot 114 so that the window 112 of the consumable 104 can be seen whilst the rest of the tank 106 is obscured from view when the consumable 104 is inserted into the cavity at the upper end 108 of the body 102.

[0097] The lower end 110 of the body 102 also includes a light 116 (e.g. an LED) located behind a small translucent cover. The light 116 may be configured to illuminate when the smoking substitute system 100 is activated. Whilst not shown, the consumable 104 may identify itself to the body 102, via an electrical interface, RFID chip, or barcode.

[0098] The lower end 110 of the body 102 also includes a charging connection 115, which is usable to charge a battery within the body 102. The charging connection 115 can also be used to transfer data to and from the body, for example to update firmware thereon.

[0099] Figs. 2A and 2B are schematic drawings of the body 102 and consumable 104. As is apparent from Fig. 2A, the body 102 includes a power source 118, a controller 120, a memory 122, a wireless interface 124, an electrical interface 126, and, optionally, one or more additional components 128.

[0100] The power source 118 is preferably a battery, more preferably a rechargeable battery. The controller 120 may include a microprocessor, for example. The memory 122 preferably includes non-volatile memory. The memory may include instructions which, when implemented, cause the controller 120 to perform certain tasks or steps of a method.

[0101] The wireless interface 124 is preferably configured to communicate wirelessly with another device, for example a mobile device, e.g. via Bluetooth®. To this end, the wireless interface 124 could include a Bluetooth® antenna. Other wireless communication interfaces, e.g. WiFi®, are also possible. The wireless interface 124 may also be configured to communicate wirelessly with a remote server.

[0102] The electrical interface 126 of the body 102 may include one or more electrical contacts. The electrical interface 126 may be located in a base of the aperture in the upper end 108 of the body 102. When the body 102 is physically coupled to the consumable 104, the electrical interface 126 is configured to transfer electrical power from the power source 118 to the consumable 104 (i.e. upon activation of the smoking substitute system 100).

[0103] The electrical interface 126 may also be used to identify the consumable 104 from a list of known components. For example, the consumable 104 may be a particular flavour and/or have a certain concentration of nicotine (which may be identified by the electrical interface 126). This can be indicated to the controller 120 of the body 102 when the consumable 104 is connected to the body 102. Additionally, or alternatively, there may be a separate communication interface provided in the body 102 and a corresponding communication interface in the consumable 104 such that, when connected, the consumable 104 can identify itself to the body 102.

[0104] The additional components 128 of the body 102 may comprise the light 116 discussed above.

[0105] The additional components 128 of the body 102 also comprises the charging connection 115 configured to receive power from the charging station (i.e. when the power source 118 is a rechargeable battery). This may be located at the lower end 110 of the body 102.

[0106] The additional components 128 of the body 102 may, if the power source 118 is a rechargeable battery, include a battery charging control circuit, for controlling the charging of the rechargeable battery. However, a battery charging control circuit could equally be located in a charging station (if present).

[0107] The additional components 128 of the body 102 may include a sensor, such as an airflow (i.e. puff) sensor for detecting airflow in the smoking substitute system 100, e.g. caused by a user inhaling through a mouthpiece portion 136 of the consumable 104. The smoking substitute system 100 may be configured to be activated when airflow is detected by the airflow sensor. This sensor could alternatively be included in the consumable 104. The airflow sensor can be used to determine, for example, how heavily a user draws on the mouthpiece or how many times a user draws on the mouthpiece in a particular time period.

[0108] The additional components 128 of the body 102 may include a user input, e.g. a button. The smoking substitute system 100 may be configured to be activated when a user interacts with the user input (e.g. presses the button). This provides an alternative to the airflow sensor as a mechanism for activating the smoking substitute system 100.

[0109] As shown in Fig. 2B, the consumable 104 includes the tank 106, an electrical interface 130, a vaporiser 132, one or more air inlets 134, a mouthpiece portion 136, and one or more additional components 138.

[0110] The electrical interface 130 of the consumable

104 may include one or more electrical contacts. The electrical interface 126 of the body 102 and an electrical interface 130 of the consumable 104 are configured to contact each other and thereby electrically couple the body 102 to the consumable 104 when the lower end 111 of the consumable 104 is inserted into the upper end 108 of the body 102 (as shown in Fig. 1A). In this way, electrical energy (e.g. in the form of an electrical current) is able to be supplied from the power source 118 in the body 102 to the vaporiser 132 in the consumable 104.

[0111] The vaporiser 132 is configured to heat and vaporise e-liquid contained in the tank 106 using electrical energy supplied from the power source 118. As will be described further below, the vaporiser 132 includes a heating filament and a wick. The wick draws e-liquid from the tank 106 and the heating filament heats the e-liquid to vaporise the e-liquid.

[0112] The one or more air inlets 134 are preferably configured to allow air to be drawn into the smoking substitute system 100, when a user inhales through the mouthpiece portion 136. When the consumable 104 is physically coupled to the body 102, the air inlets 134 receive air, which flows to the air inlets 134 along a gap between the body 102 and the lower end 111 of the consumable 104.

[0113] In operation, a user activates the smoking substitute system 100, e.g. through interaction with a user input forming part of the body 102 or by inhaling through the mouthpiece portion 136 as described above. Upon activation, the controller 120 may supply electrical energy from the power source 118 to the vaporiser 132 (via electrical interfaces 126, 130), which may cause the vaporiser 132 to heat e-liquid drawn from the tank 106 to produce a vapour which is inhaled by a user through the mouthpiece portion 136.

[0114] An example of one of the one or more additional components 138 of the consumable 104 is an interface for obtaining an identifier of the consumable 104. As discussed above, this interface may be, for example, an RFID reader, a barcode, a QR code reader, or an electronic interface which is able to identify the consumable. The consumable 104 may, therefore include any one or more of an RFID chip, a barcode or QR code, or memory within which is an identifier and which can be interrogated via the electronic interface in the body 102.

[0115] It should be appreciated that the smoking substitute system 100 shown in figures 1A to 2B is just one exemplary implementation of a smoking substitute system. For example, the system could otherwise be in the form of an entirely disposable (single-use) system or an open system in which the tank is refillable (rather than replaceable).

[0116] Fig. 3 is a section view of an example of the consumable 104 described above. The consumable 104 comprises a tank 106 for storing e-liquid, a mouthpiece portion 136 and a conduit 140 extending along a longitudinal axis of the consumable 104. In the illustrated embodiment the conduit 140 is in the form of a tube having

a substantially circular transverse cross-section (i.e. transverse to the longitudinal axis). The tank 106 surrounds the conduit 140, such that the conduit 140 extends centrally through the tank 106.

[0117] A tank housing 142 of the tank 106 defines an outer casing of the consumable 104, whilst a conduit wall 144 defines the conduit 140. The tank housing 142 extends from the lower end 111 of the consumable 104 to the mouthpiece portion 136 at the upper end 109 of the consumable 104. At the junction between the mouthpiece portion 136 and the tank housing 142, the mouthpiece portion 136 is wider than the tank housing 142, so as to define a lip 146 that overhangs the tank housing 142. This lip 146 acts as a stop feature when the consumable 104 is inserted into the body 102 (i.e. by contact with an upper edge of the body 102).

[0118] The tank 106, the conduit 140 and the mouthpiece portion 136 are integrally formed with each other so as to form a single unitary component and may e.g. be formed by way of an injection moulding process. Such a component may be formed of a thermoplastic material such as polypropylene.

[0119] The mouthpiece portion 136 comprises a mouthpiece aperture 148 defining an outlet of the conduit 140. The vaporiser 132 is fluidly connected to the mouthpiece aperture 148 and is located in a vaporising chamber 156 of the consumable 104. The vaporising chamber 156 is downstream of the inlet 134 of the consumable 104 and is fluidly connected to the mouthpiece aperture 148 (i.e. outlet) by the conduit 140.

[0120] The vaporiser 132 comprises a porous wick 150 and a heater filament 152 coiled around the porous wick 150. The wick 150 extends transversely across the chamber vaporising 156 between sidewalls of the chamber 156 which form part of an inner sleeve 154 of an insert 158 that defines the lower end 111 of the consumable 104 that connects with the body 102. The insert 158 is inserted into an open lower end of the tank 106 so as to seal against the tank housing 142.

[0121] In this way, the inner sleeve 154 projects into the tank 106 and seals with the conduit 140 (around the conduit wall 144) so as to separate the vaporising chamber 156 from the e-liquid in the tank 106. Ends of the wick 150 project through apertures in the inner sleeve 154 and into the tank 106 so as to be in contact with the e-liquid in the tank 106. In this way, e-liquid is transported along the wick 150 (e.g. by capillary action) to a central portion of the wick 150 that is exposed to airflow through the vaporising chamber 156. The transported e-liquid is heated by the heater filament 152 (when activated e.g. by detection of inhalation), which causes the e-liquid to be vaporised and to be entrained in air flowing past the wick 150. This vaporised liquid may cool to form an aerosol in the conduit 140, which may then be inhaled by a user.

[0122] Fig. 4 shows a perspective view of an embodiment of the body 102 engaged with the consumable 104 at the upper end 108. The body 102 includes a charging connection 115 at the lower end 110.

[0123] The front surface 201 of the body 102 is curved in the transverse dimension. The rear surface 202 of the body 102 is curved in the transverse dimension. The curvatures of the front surface 201 and rear surface 202 are of the opposite sense to one another. Both front and rear surfaces 201, 202 are convex in the transverse dimension. This leads to a mandorla-/lemon-/eye-shaped cross sectional shape of the body 102.

[0124] The front surface 201 and rear surface 202 meet at two transverse edges 205. The transverse edges 205 have a radius of curvature that is significantly smaller than the radius of curvature of either the front 201 or rear surface 202. This leads to the transverse edges being substantially "pointed" or "sharp". The transverse edges may have a radius of curvature in the transverse dimension of less than 1 millimetre.

[0125] As illustrated in Fig. 4, the transverse edges 205 extend substantially the full longitudinal length of the body 102.

[0126] The front surface 201 of the body 102 may include an illumination region through which at least one light source may be visible.

[0127] Fig. 5 illustrates a schematic transverse cross section through the body 102 of Fig. 4, in accordance with an embodiment. The front surface 201 and rear surface 202 are shown meeting at the transverse edges 205 on either side of the body 102. The radius of curvature in the transverse dimension of the front surface 201 is equal to the radius of curvature in the transverse dimension of the rear surface 202.

[0128] The push-push connection 300 is shown in more detail in Figure 6-9. In the exemplary embodiments, the push-push connection comprises a means to enable the consumable to be pushed relative to the body to engage the body and pushed again relative to the body to disengage the consumable and body. For instance, the push-push connection is shown as a push-push mechanism 300. As shown in Figure 6, the push-push mechanism comprises a receiving member 302 and an insertion member 304. The insertion member is shown as being arranged on the consumable 104 and the receiving member 302 connected to the body 102. However, it will be appreciated that the members may be reversed. In the exemplary embodiment of the body, the body comprises a recess 306 in which the consumable is inserted. Here, the receiving member is shown as being connected to an inside side surface of the recess 306. The consumable is inserted into the recess. For instance, by relative movement in an axial direction of the body. Suitably, when the consumable is partially inserted into the recess, the inserting member is engaged with the receiving member. As shown in Figure 7, when the push-push mechanism is engaged, a space is reserved between the consumable and body, in which the consumable is able to move to complete the second push action to disengage the push-push mechanism.

[0129] As mentioned, in some embodiments the consumable is required to be electrically connected to the

body to power a heater on the consumable. In addition, the body may include a number of active electronic components that interrogate passive components on the consumable, each also requiring further electrical connection. As the number of electrical connections required increases, it becomes more difficult to provide the electrical connections with established connections such as pogo pins etc. Thus, in some exemplary embodiments, the push-push mechanism is configured to also provide the electrical interface between the consumable and body. By combining the push-push mechanism with the electrical connection it is envisaged more connections can be reliably made between the consumable and body.

[0130] Push-push mechanisms are known in remote technical fields such as the connection of sim cards to mobile telephones. A variety of push-push mechanism are therefore suitable. But in one exemplary embodiment, the push-push mechanism includes a biasing member, such as a spring or other resilient element to bias the insertion member away from the receiving member in the second direction, opposed to the first (i.e. in a pull direction). The first push action therefore urges the insertion member into the receiving member against the bias of the spring. When the insertion member of other part reaches a stop, the pushing force is released from the consumable and the insertion member urged in the second direction by the bias and to hook or catch the insertion member to the receiving member. The consumable can then be urged back against the bias by the second push action, which moves the insertion member relative to the receiving member in the first direction, before again reaching a stop. Releasing the push force on the consumable, allows the insertion member to move back in the second direction and to be released from the receiving member.

[0131] In the exemplary embodiment, the insertion member travels along a first path as the insertion member enters the receiving member and travels relatively in the first direction. Here the receiving member guides the insertion member along a first path. For instance, the insertion member is guided by a first track. When reaching the stop, the insertion member is guided to follow a second path when moving in the second direction. For instance, the follower may be moveably connected to a body of the insertion member, and the follower is moved or bent to follow the second path. The second path is different to the first path. That is, it is not the reverse of the first path. Thus, rather than leading to an exit from the receiving member, the second path leads the follower to a catch or hook so that the follower is retained in the receiving member. Thus, the follower is prevented from further moving in the second direction and consequently, the follower prevents withdrawal of the consumable from the recess.

[0132] From the captured or retained position, the second push action moves the follower away from the catch in the first direction and along a third path. The third path may be different to the second path (i.e. the follower is

moved again to not follow the reverse of the second path) or the third path may be the reverse of the second path. When reaching the stop, the insertion member is guided to follow a fourth path when moving in the second direction. The fourth path leads to an exit from the receiving member (i.e. an exit from the guide track). The fourth path may be different to the first path, for instance by causing the follower to move laterally, or the fourth path may be the reverse of the first path.

[0133] As an alternative embodiment, figures 8 and 9 show an example of an aerosol generating apparatus for generating an aerosol from a solid percussor. Here, the consumable comprises a stick. Although the stick could be adapted to include a push-push connection member as with the liquid percussor embodiment, where it is desirable to not adapt the stick, a carrier 310 may be arranged within the recess of the body. Here, the push-push mechanism is configured between the carrier and the body. Unlike the consumable in the liquid percussor embodiment, the carrier 310 may not be separable from the body when the follower is at the start of the first path or the end of the fourth path. But the carrier 310 is moveable relative to the body in a push-push configuration to capture and release an insertion member into a receiving member as herein described. In addition, the carrier member comprises a gripping means such as an actuable restriction 309. Here, the push-push connection is configured to actuate the restriction (i.e. move the restriction) when the insertion member is captured by the receiving member so that a restriction is applied to the consumable. And the push-push connection is configured to remove the restriction when the insertion member is released.

[0134] As will be appreciated the embodiments described herein provide an aerosol generating apparatus wherein a consumable is engaged with a body via a push-push mechanism. Adapting a push-push mechanism for an aerosol generating apparatus provides an improved user experience by providing an improved connection between the consumable and body and also a fiddle factor to the apparatus to be enjoyed by the user.

Claims

1. An aerosol generating apparatus including a body and a consumable, wherein one of the body or a second member includes a push-push insertion member and the other of the body or second member includes a push-push receiving member, wherein the push-push insertion member is receivable by the push-push receiving member to engage the consumable with the body.
2. The aerosol generating apparatus of Claim 1, wherein the second member is the consumable.
3. The aerosol generating apparatus of Claim 1, where-

- in the second member is a carrier member that receives and moves with the consumable, and wherein the consumable includes a gripping means, the gripping means being configured to grip the consumable when the insertion member is received by the receiving member.
4. The aerosol generating apparatus of any of Claims 1 to 3, wherein the body comprises a recess for receiving the consumable and the push-push receiving member and push-push insertion member are configured to engage after the consumable is partially inserted into the recess.
 5. The aerosol generating apparatus of any of Claims 1 to 4, wherein the body comprises a recess for receiving the consumable and the respective push-push receiving member or push-push insertion member is arranged inside the recess.
 6. The aerosol generating apparatus of any of Claims 1 to 5, wherein the body comprises a recess for receiving the consumable and the recess and consumable have cooperating alignment features.
 7. The aerosol generating apparatus of any of Claims 1 to 6, wherein a biasing means is arranged to bias the push-push insertion member against movement relative to the push-push receiving member in a push direction.
 8. The aerosol generating apparatus of any of Claims 1 to 7, wherein the insertion member comprises a follower, the follower being configured to move relative to the receiving member to move along a first path, a second path, a third path, and a fourth path, the first path being arranged at least partially in a first direction, the second path being arranged at least partially in a second direction that is opposed to the first direction, the first and second paths being different, the third path being arranged at least partially in the first direction, the fourth path being arranged at least partially in the second direction, the third and fourth paths being different, such that at an end of the second path, the follower is prevented from moving further in the second direction, and at the end of the fourth path, the follower is released from the receiving member.
 9. The aerosol generating apparatus of any of Claims 1 to 8, wherein the body houses a power supply.
 10. The aerosol generating apparatus of any of Claims 1 to 9, wherein the consumable is electrically connected to the body when the consumable is engaged with the body, wherein the receiving member and insertion member comprise cooperating electrical contacts.
 11. A consumable suitable for use with a body in forming an aerosol generating apparatus, wherein the consumable includes one of a push-push insertion member or a push-push receiving member, and the respective member is configured so that the push-push insertion member is receivable by the push-push receiving member to engage the consumable to the body.
 12. A body suitable for use with a consumable in forming an aerosol generating apparatus, wherein the body includes one of a push-push insertion member or a push-push receiving member, and the respective member is configured so that the push-push insertion member is receivable by the push-push receiving member to engage the consumable to the body.
 13. A method of connecting and disconnecting a consumable with a body to form an aerosol generating apparatus, the method comprising:
 - moving the consumable and body together in a first direction to cause a push-push insertion member to be received by a push-push receiving member to engage the consumable with the body; and
 - subsequently moving the consumable and body together in the first direction to release the push-push insertion member from the receiving member to disengage the consumable from the body.
 14. The method of Claim 13, wherein the method comprises:
 - inserting the consumable into a recess of the body prior to the step of moving the consumable and body together in a first direction to cause a push-push insertion member to be received by a push-push receiving member; and
 - withdrawing the consumable from the recess after the step of subsequently moving the consumable and body together in the first direction to release the push-push insertion member from the receiving member.
 15. The method of Claim 14, wherein the step of moving the consumable and body together in a first direction to cause a push-push insertion member to be received by a push-push receiving member and the step of subsequently moving the consumable and body together in the first direction to release the push-push insertion member from the receiving member are repeated a number of times before the step of withdrawing the consumable from the recess.

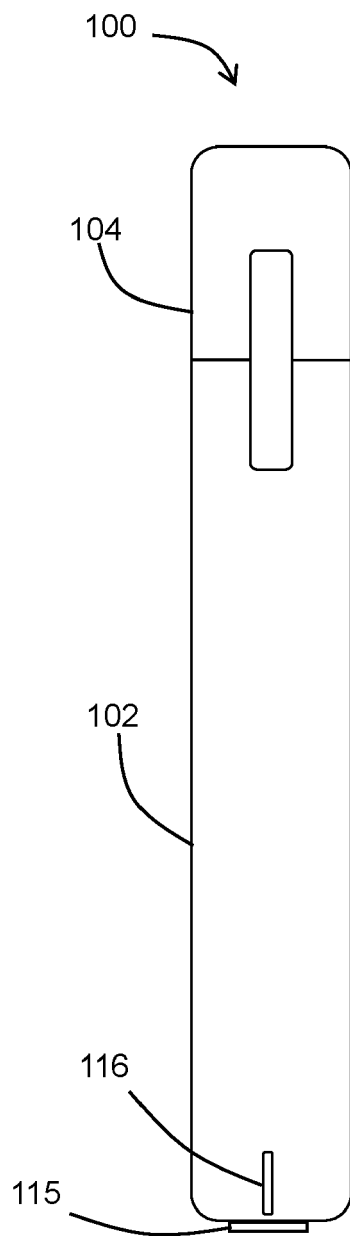


FIG 1A

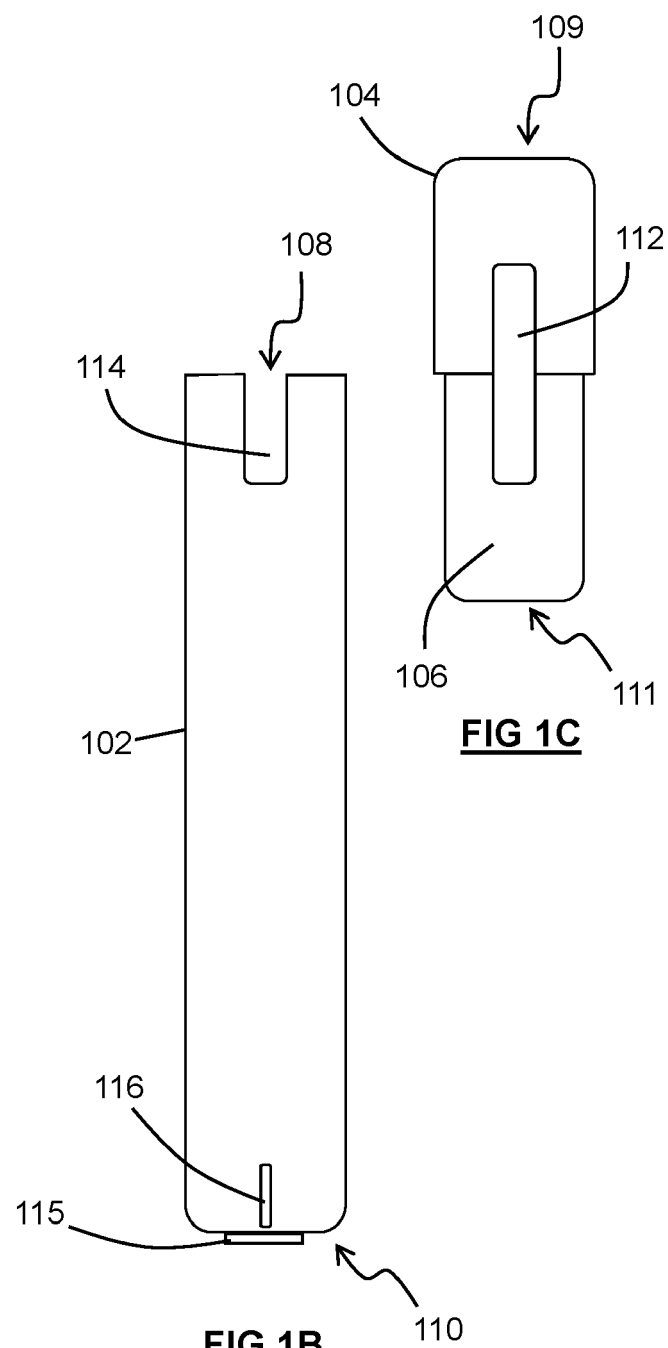


FIG 1C

FIG 1B

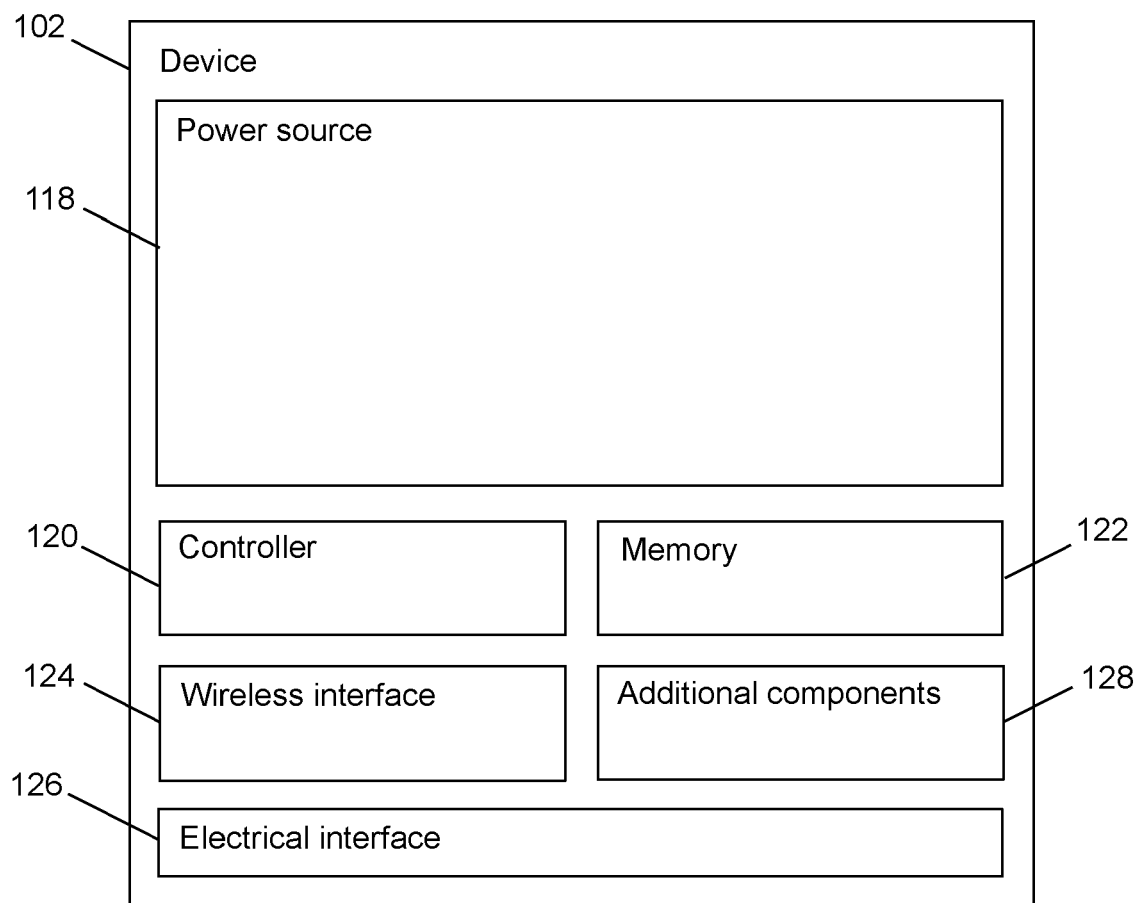


FIG 2A

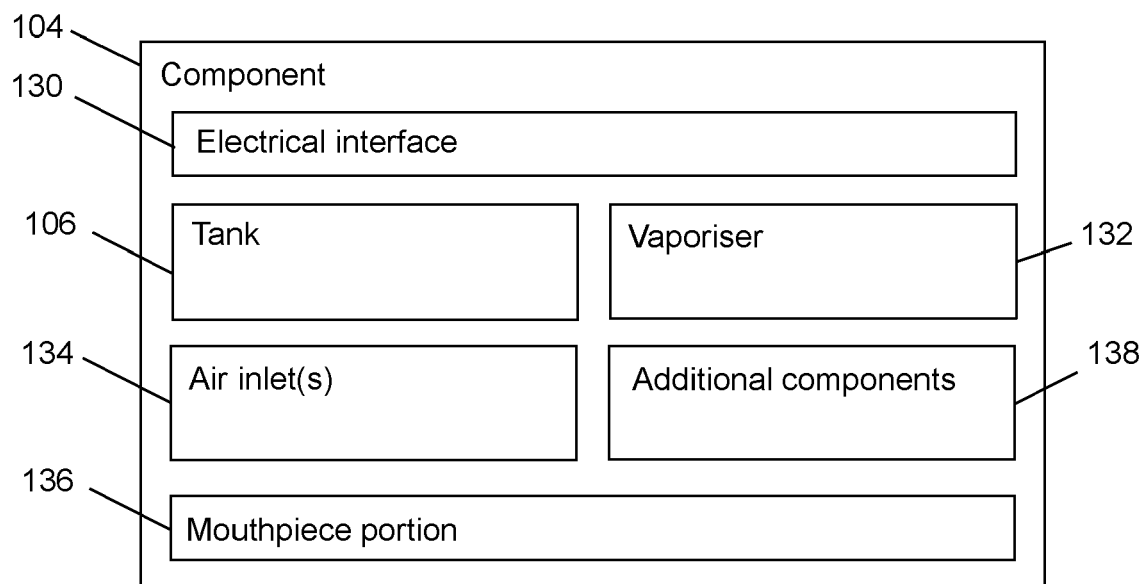


FIG 2B

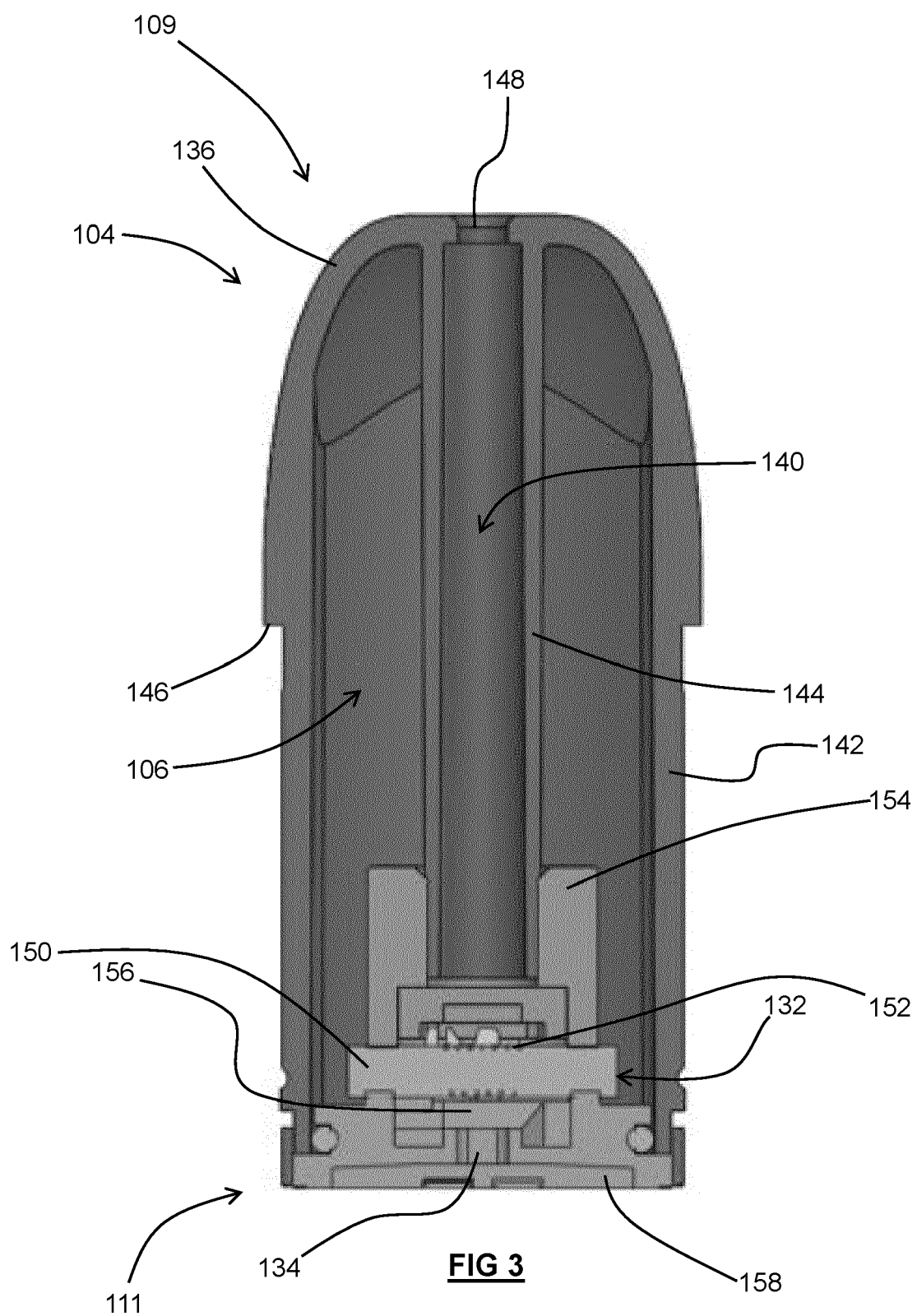
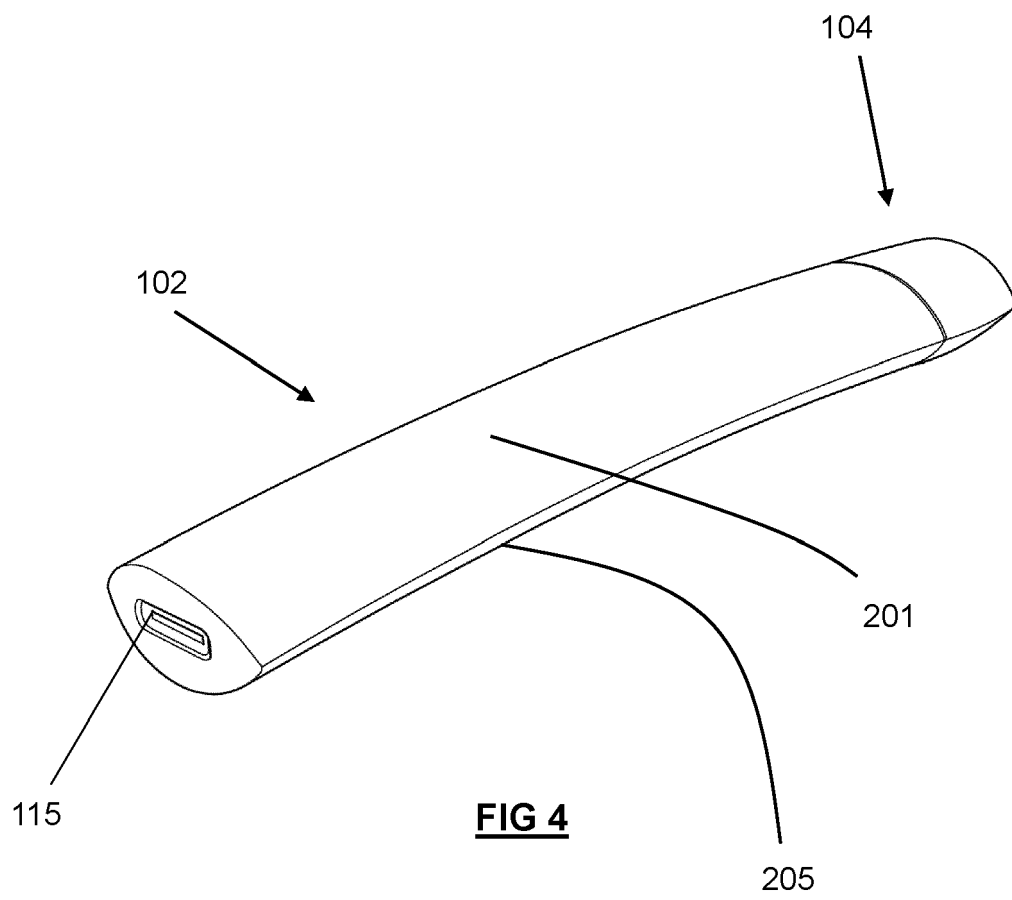


FIG 3



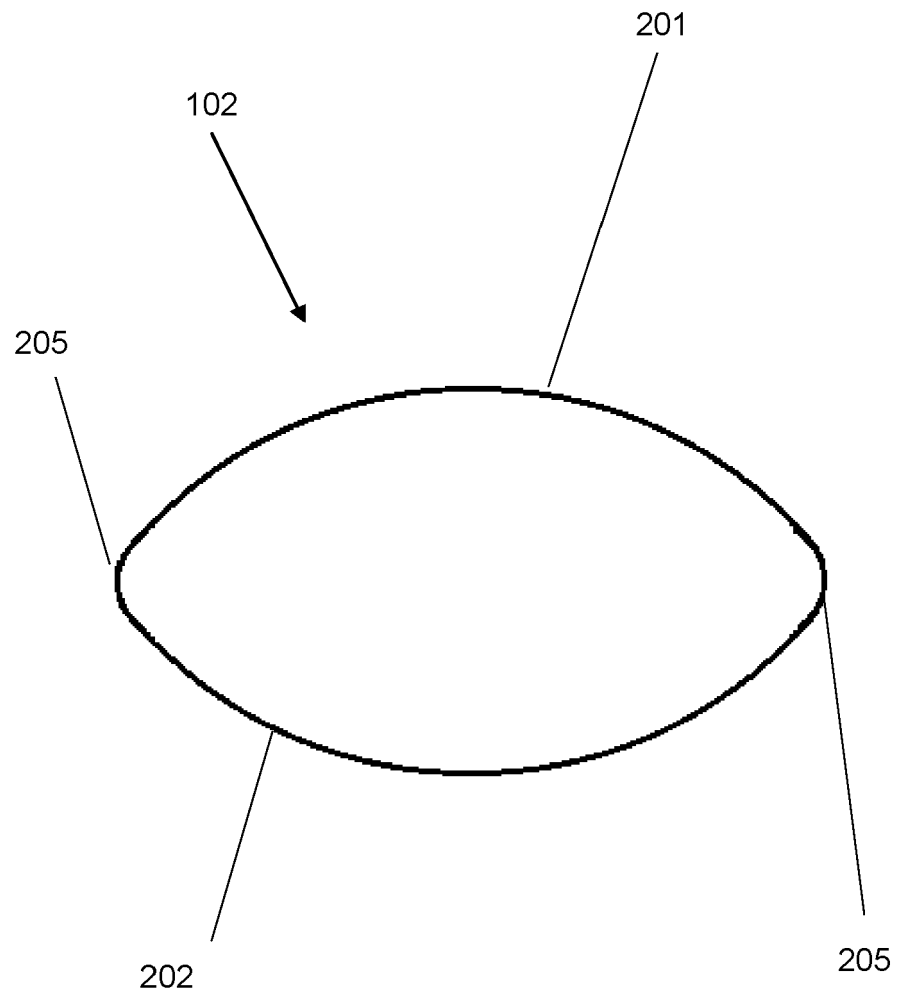
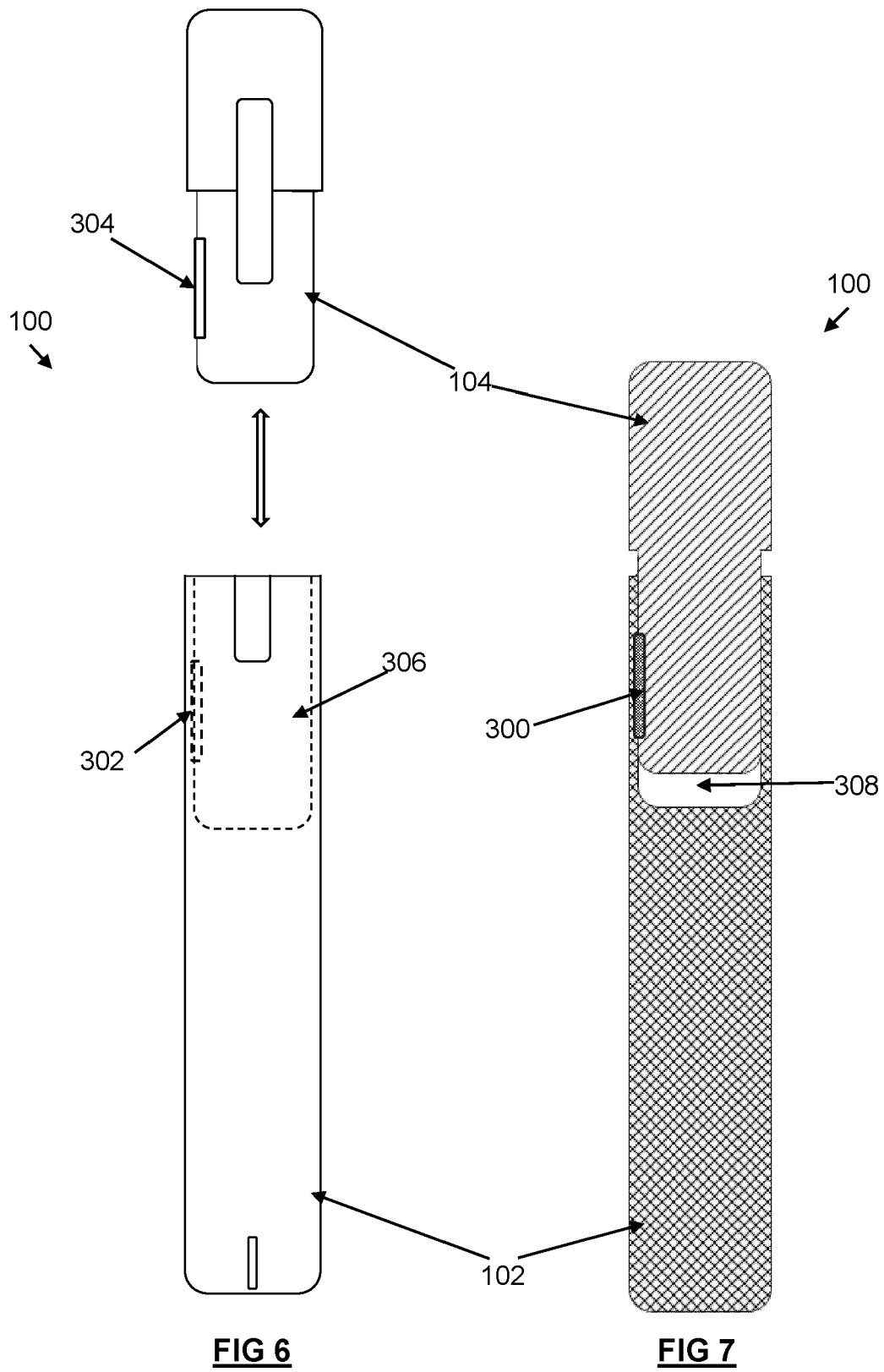


FIG 5



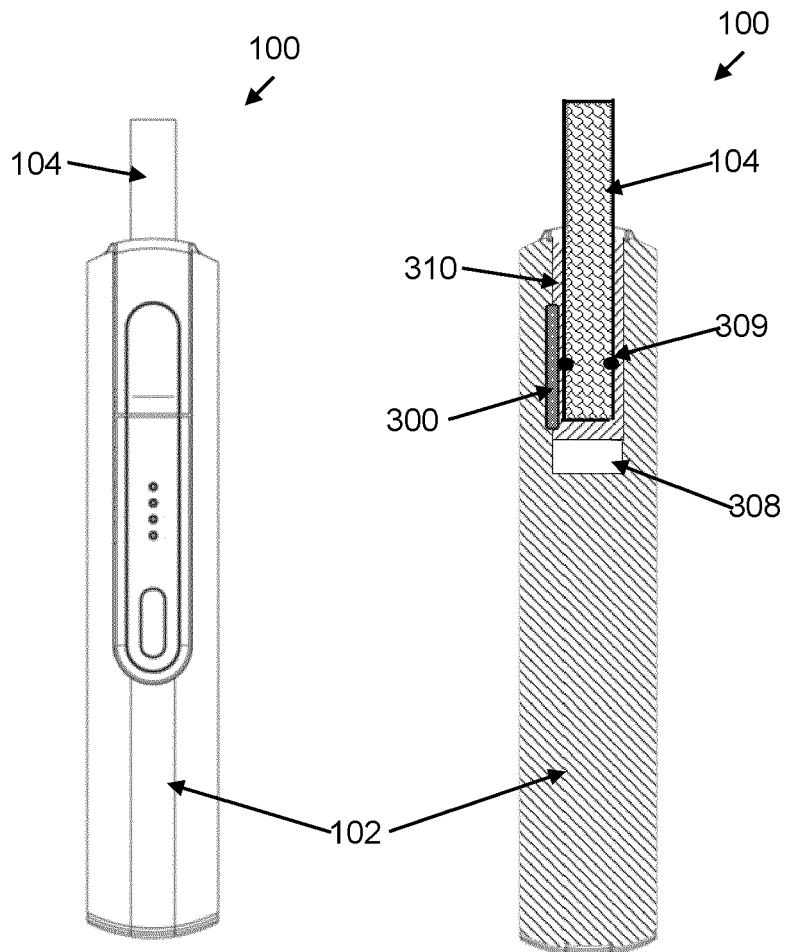


FIG 8

FIG 9



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A	* paragraph [0037] - paragraph [0046]; figures 1-13 *	3	ADD. A24F40/10 A24F40/20
X	WO 2021/152035 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 5 August 2021 (2021-08-05)	1, 3-9, 12-15	
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Place of search Munich		Date of completion of the search 22 February 2022	Examiner Espla, Alexandre
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