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(54) **FLAVOUR DELIVERY ARTICLE FOR SMOKING SUBSTITUTE APPARATUS**

(57) A flavour delivery article (120) for use with a smoking substitute apparatus (101) and method of delivering flavour to a user of a smoking substitute apparatus, the flavour delivery article comprising a flavourant,

wherein the flavour delivery article is arranged to deposit the flavourant on the smoking substitute apparatus when the flavour delivery article is applied to a surface of the smoking substitute apparatus.

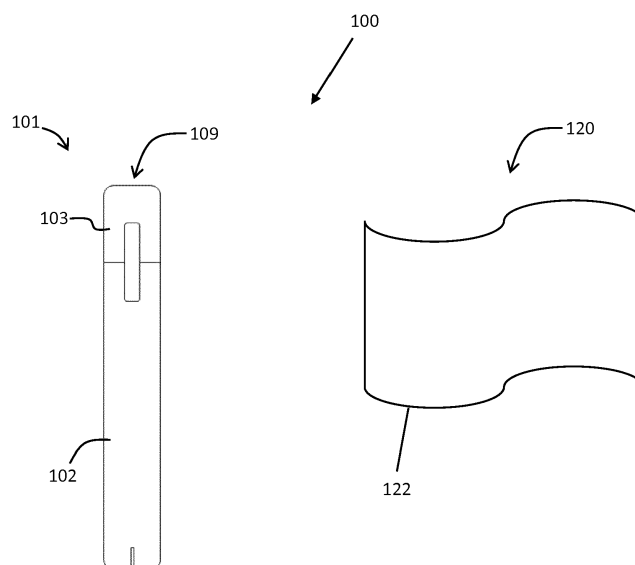


FIG 1A

Description

Field of the Invention

[0001] The present invention relates to a flavour delivery article for a smoking substitute apparatus and, in particular, to a flavour delivery article capable of depositing a flavourant on a surface of the smoking substitute apparatus.

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 byproducts. 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 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 a flavourant 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 with combustible 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. There are a number of different categories of smoking substitute systems, each utilising a different smoking substitute approach.

[0008] One approach 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 heating device (referred to herein as an electronic cigarette or "e-cigarette" device) to produce an aerosol vapour which is inhaled by a user. The e-liquid typically includes a base liquid as well as nicotine and/or a flavourant. The resulting vapour therefore also typically contains nicotine and/or a flavourant. The base liquid

may include propylene glycol and/or vegetable glycerine.

[0009] A typical e-cigarette device includes a mouthpiece, a power source (typically a battery), a tank for containing e-liquid, as well as a heating device. In use, electrical energy is supplied from the power source to the heating device, which heats the e-liquid to produce an aerosol (or "vapour") which is inhaled by a user through the mouthpiece.

[0010] E-cigarettes can be configured in a variety of ways. For example, there are "closed system" vaping smoking substitute systems, which typically have a sealed tank and heating element. The tank is prefilled 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 main body which includes the power source, wherein the main body is configured to be physically and electrically coupled to a consumable including the tank and the heating element. In this way, when the tank of a consumable has been emptied, that consumable is disposed of. The main body can be reused by connecting it to a new, replacement, consumable. Another subset of closed system vaping smoking substitute systems are completely disposable, and intended for one-use only.

[0011] There are also "open system" vaping smoking substitute systems which typically have a tank that is configured to be refilled by a user. In this way the entire device can be used multiple times.

[0012] An example vaping smoking substitute system is the myblu™ e-cigarette. The myblu™ e-cigarette is a closed system which includes a main body and a consumable. The main body and consumable are physically and electrically coupled together by pushing the consumable into the main body. The main body includes a rechargeable battery. The consumable includes a mouthpiece, a sealed tank which contains e-liquid, as well as a heater, which for this device is a heating filament coiled around a portion of a wick. The wick is partially immersed in the e-liquid, and conveys e-liquid from the tank to the heating filament. The device is activated when a micro-processor on board the main body detects a user inhaling through the mouthpiece. When the device is activated, electrical energy is supplied from the power source to the heating device, which heats e-liquid from the tank to produce a vapour which is inhaled by a user through the mouthpiece.

[0013] 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.

[0014] 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.

[0015] 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.

[0016] As the vapour passes through the consumable (entrained in the airflow) from the location of vapourisation 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 may contain nicotine and/or flavour compounds.

[0017] For a smoking substitute device it is desirable to deliver nicotine into the user's lungs, where it can be absorbed into the bloodstream. As explained above, in the so-called "vaping" approach, e-liquid is heated by a heating device to produce an aerosol vapour which is inhaled by a user. Many e-cigarettes also deliver flavour to the user to enhance the experience. In such e-cigarettes, flavour compounds are contained in the e-liquid that is heated. However, toxicology restrictions are placed on the amount of flavour that can be contained in the e-liquid, and this can result in some e-liquid flavours delivering a weak and underwhelming taste sensation to consumers in the pursuit of safety. Further, there is a view that providing a flavourant as part of the e-liquid, such that the flavourant is vaporised with the e-liquid, may be disadvantageous.

[0018] There may be a need for improved design of smoking substitute systems, in particular in regards to the delivery of flavour to a user.

[0019] The present disclosure has been devised in the light of the above considerations.

Summary of the Invention

[0020] At its most general, the present invention relates to a flavour delivery article for applying a flavourant to a surface of a smoking substitute apparatus. Thus, the flavour delivery article may be used to apply flavourant to a smoking substitute apparatus. This may then produce a flavour (e.g. scent and/or taste) for the user when using the smoking substitute apparatus.

[0021] In this manner, flavour may be delivered to a user via the flavour delivery article, rather than through a flavourant contained in an aerosol-former (e.g. e-liquid or tobacco material) of the of the smoking substitute apparatus. As a result, there may be no need to include any

flavourants in the aerosol-former of the smoking substitute apparatus.

[0022] The flavour delivery article may be applied to the smoking substitute apparatus when the user wishes to experience flavour. Flavour delivery articles having different flavours may be provided, so that the user may apply a flavour delivery article with a desired flavour to the smoking substitute apparatus, without having to otherwise modify the smoking substitute apparatus. This may improve a versatility of the smoking substitute apparatus, as the user may experience a wide range of flavours simply by applying a variety of flavour delivery articles with different flavours to the smoking substitute apparatus.

[0023] According to a first aspect there is provided a flavour delivery article for use with a smoking substitute apparatus, the flavour delivery article comprising a flavourant, wherein the flavour delivery article is arranged to deposit the flavourant on the smoking substitute apparatus when the flavour delivery article is applied to a surface of the smoking substitute apparatus. Thus, a user may apply the flavour delivery article to the smoking substitute apparatus (e.g. a mouthpiece of the smoking substitute apparatus), to deposit flavourant on the smoking substitute apparatus. Then, when the user uses the smoking substitute apparatus (e.g. when they inhale an aerosol from the smoking substitute apparatus), they may experience a flavour due to the presence of flavourant on the smoking substitute apparatus. The flavour delivery article may be used to deposit flavourant on a mouthpiece of the smoking substitute apparatus. In use, the mouthpiece may be located near the user's mouth and nose, so that the flavourant may produce a flavour perceived by the user.

[0024] The flavour delivery article may comprise a substrate which carries the flavourant. As an example, the flavour delivery article may be provided as a wipe. Then, flavourant may be deposited on the surface of the smoking substitute apparatus by wiping the smoking substitute apparatus with the wipe.

[0025] The term "flavourant" is used to describe a compound or combination of compounds that provide flavour and/or aroma. For example, the flavourant may be configured to interact with a sensory receptor of a user (such as an olfactory or taste receptor). The flavourant may include one or more volatile substances.

[0026] The flavourant may be provided in solid or liquid form. The flavourant may be natural or synthetic. For example, the flavourant 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 across the flavour delivery article, or it may be provided in isolated locations and/or varying concentrations.

[0027] The flavour delivery article may be single-use, e.g. it may be disposed after it has been used to deposit flavourant onto a smoking substitute apparatus. Alternatively, the flavour delivery article may be intended for mul-

multiple uses, e.g. it may contain enough flavourant so that it may be used to deposit flavourant on the smoking substitute article multiple times.

[0028] The flavour delivery article may include a porous material in which the flavourant is contained. In other words, the substrate of the flavour delivery article which carries the flavourant may be a porous material. In this manner, a larger quantity of flavourant may be carried by the flavour delivery article. For example, the porous material may be a cloth material, a fabric material, a paper material, a sponge material, or the like. The porous material may be an absorbent material for the flavourant.

[0029] The flavourant may be a liquid flavourant, and the porous material may be imbued with the liquid flavourant. Thus, the flavour delivery article may be in the form of a "wet wipe", which is arranged to deposit the liquid flavourant on the smoking substitute article when the flavour delivery article is applied to a surface of the smoking substitute article. Such a flavour delivery article may be stored in a sealed package, to prevent evaporation of the liquid flavourant prior to use.

[0030] The flavourant may be encapsulated within a plurality of microcapsules, the microcapsules being arranged to disintegrate in the presence of the aerosol generated by the smoking substitute apparatus. The microcapsules encapsulating the flavourant may be carried by the flavour delivery article, and deposited on the smoking substitute apparatus when the flavour delivery article is applied to the smoking substitute apparatus. When the user puts a mouthpiece of the smoking substitute apparatus in their mouth to use the apparatus, some of the microcapsules may enter the user's mouth. Then, when the user inhales an aerosol from the smoking substitute apparatus, aerosol may come into contact with the microcapsules, causing them to disintegrate and release flavourant into the user's mouth. Thus, release of the flavourant may be activated by the aerosol, such that flavourant may only be released when the user uses the smoking substitute. The flavourant may be in solid and/or liquid form inside the microcapsules.

[0031] As an example, the microcapsules may include a membrane made of a hydrogel material containing Chitosan. Chitosan is substantially stable around pH 7.5. Thus, when a microcapsule enters the user's mouth, the Chitosan, and hence the microcapsule's membrane, may be stable and retain its integrity for a period of time. When the user inhales an aerosol having a more alkaline pH (e.g. an aerosol produced from an e-liquid having a pH around 7.8), the change in pH in the user's mouth may cause the Chitosan, and hence microcapsule's membrane, to rapidly break down and release the flavourant contained within.

[0032] The flavourant carried by the flavour delivery article may be a freeze-dried flavourant. In this manner, the flavourant may be activated by moisture in the user's mouth. Thus, the flavourant may not produce a flavour until it reaches the user's mouth.

[0033] According to a second aspect of the invention,

there is provided a smoking substitute apparatus having a mouthpiece, the mouthpiece comprising an outlet for conveying an aerosol generated by the smoking substitute apparatus to a user, wherein the mouthpiece is configured to absorb a flavourant deposited on the mouthpiece with a flavour delivery article. The smoking substitute apparatus of the second aspect of the invention may be used together with the flavour delivery article of the first aspect of the invention. In particular, the flavour delivery article of the first aspect of the invention may be used to deposit flavourant onto the mouthpiece of the smoking substitute apparatus of the second aspect of the invention.

[0034] As the mouthpiece of the smoking substitute apparatus is configured to absorb flavourant deposited thereon, it may efficiently retain flavourant deposited thereon (e.g. with a flavour delivery article). This may enhance flavour delivery to the user.

[0035] In use, the user may insert the mouthpiece into their mouth to inhale the aerosol generated by the smoking substitute apparatus. Thus, flavourant absorbed by the mouthpiece may come into direct contact with the user's mouth (e.g. tongue), and be in close proximity to the user's nose. This may result in effective flavour delivery to the user.

[0036] The mouthpiece may include a textured surface for absorbing the flavourant deposited on the mouthpiece. For example, the textured surface may include a series of features arranged to absorb and retain flavourant therein. The textured surface may be formed through a moulding process of the mouthpiece. Alternatively, the textured surface may be formed by sanding and/or etching a surface of the mouthpiece, to produce a rough surface on the mouthpiece. Increasing a surface roughness of the mouthpiece may facilitate retaining flavourant on the mouthpiece.

[0037] The textured surface may include a plurality of channels for receiving the flavourant deposited on the mouthpiece. Where the flavourant is a liquid flavourant, the channels may be arranged to retain the flavourant via capillary action of the liquid flavourant in the channels. The channels may also serve to distribute the flavourant across the textured surface (e.g. via capillary action), e.g. to provide an even distribution of the flavourant over the textured surface.

[0038] The mouthpiece may include an absorbent material for absorbing the flavourant deposited on the mouthpiece. The absorbent material may be a porous material, e.g. a porous plastic. Using an absorbent material in the mouthpiece may increase the amount of flavourant that may be absorbed by the mouthpiece, which may enhance flavour delivery to the user.

[0039] The smoking substitute apparatus may be in the form of a consumable. The consumable may be configured for engagement with a main body (i.e. so as to form a closed smoking substitute system). For example, the consumable may comprise components of the system that are disposable, and the main body may comprise

non-disposable or non-consumable components (e.g. power supply, controller, sensor, etc.) that facilitate the delivery of aerosol by the consumable. In such an embodiment, the aerosol former (e.g. e-liquid) may be replenished by replacing a used consumable with an unused consumable.

[0040] Alternatively, the smoking substitute apparatus may be a non-consumable apparatus (e.g. that is in the form of an open smoking substitute system). In such embodiments an aerosol former (e.g. e-liquid) of the system may be replenished by re-filling e.g. a reservoir of the smoking substitute apparatus with the aerosol former (rather than replacing a consumable component of the apparatus).

[0041] In light of this, it should be appreciated that some of the features described herein as being part of the smoking substitute apparatus may alternatively form part of a main body for engagement with the smoking substitute apparatus (i.e. when the smoking substitute apparatus is in the form of a consumable).

[0042] Where the smoking substitute apparatus is in the form of a consumable, the main body and the consumable may be configured to be physically coupled together. For example, the consumable may be at least partially received in a recess of the main body, such that there is an interference fit between the main body and the consumable. Alternatively, the main body and the consumable may be physically coupled together by screwing one onto the other, or through a bayonet fitting.

[0043] Thus, the smoking substitute apparatus may comprise one or more engagement portions for engaging with a main body. In this way, one end of the smoking substitute apparatus may be coupled with the main body, whilst an opposing end of the smoking substitute apparatus may define a mouthpiece of the smoking substitute system.

[0044] The smoking substitute apparatus may comprise a reservoir configured to store an aerosol former, such as an e-liquid. The e-liquid may, for example, comprise a base liquid and e.g. nicotine. The base liquid may include propylene glycol and/or vegetable glycerine. The e-liquid may be flavourless. That is, the e-liquid may not contain any flavourants and may consist solely of a base liquid of propylene glycol and/or vegetable glycerine and nicotine.

[0045] The reservoir may be in the form of a tank. At least a portion of the tank may be translucent. For example, the tank may comprise a window to allow a user to visually assess the quantity of e-liquid in the tank. A housing of the smoking substitute apparatus may comprise a corresponding aperture (or slot) or window that may be aligned with a translucent portion (e.g. window) of the tank. The reservoir may be referred to as a "clearomizer" if it includes a window, or a "cartomizer" if it does not.

[0046] The smoking substitute apparatus may comprise a passage for fluid flow therethrough. The passage may extend through (at least a portion of) the smoking substitute apparatus, between openings that may define

an inlet and an outlet of the passage. The outlet may be at a mouthpiece of the smoking substitute apparatus. In this respect, a user may draw fluid (e.g. air) into and through the passage by inhaling at the outlet (i.e. using the mouthpiece). The passage may be at least partially defined by the tank. The tank may substantially (or fully) define the passage. In this respect, the tank may surround the passage.

[0047] The smoking substitute apparatus may comprise an aerosol-generator. The aerosol generator may comprise a wick. The aerosol generator may further comprise a heater. The wick may comprise a porous material. A portion of the wick may be exposed to fluid flow in the passage. The wick may also comprise one or more portions in contact with liquid stored in the reservoir. For example, opposing ends of the wick may protrude into the reservoir and a central portion (between the ends) may extend across the passage so as to be exposed to fluid flow in the passage. Thus, fluid may be drawn (e.g. by capillary action) along the wick, from the reservoir to the exposed portion of the wick.

[0048] The heater may comprise a heating element, which may be in the form of a filament wound about the wick (e.g. the filament may extend helically about the wick). The filament may be wound about the exposed portion of the wick. The heating element may be electrically connected (or connectable) to a power source. Thus, in operation, the power source may supply electricity to (i.e. apply a voltage across) the heating element so as to heat the heating element. This may cause liquid stored in the wick (i.e. drawn from the tank) to be heated so as to form a vapour and become entrained in fluid flowing through the passage. This vapour may subsequently cool to form an aerosol in the passage.

[0049] The smoking substitute apparatus (or main body engaged with the smoking substitute apparatus) may comprise a power source. The power source may be electrically connected (or connectable) to a heater of the smoking substitute apparatus (e.g. when engaged with the main body). The power source may be a battery (e.g. a rechargeable battery). A connector in the form of e.g. a USB port may be provided for recharging this battery.

[0050] When the smoking substitute apparatus is in the form of a consumable, the smoking substitute apparatus may comprise an electrical interface for interfacing with a corresponding electrical interface of the main body. One or both of the electrical interfaces may include one or more electrical contacts. Thus, when the main body is engaged with the consumable, the electrical interface may be configured to transfer electrical power from the power source to a heater of the consumable.

[0051] The electrical interface may also be used to identify the smoking substitute apparatus (in the form of a consumable) from a list of known types. For example, the consumable may have a certain concentration of nicotine and the electrical interface may be used to identify this. The electrical interface may additionally or alterna-

tively be used to identify when a consumable is connected to the main body.

[0052] Again, where the smoking substitute apparatus is in the form of a consumable, the main body may comprise an interface, which may, for example, be in the form of an RFID reader, a barcode or QR code reader. This interface may be able to identify a characteristic (e.g. a type) of a consumable engaged with the main body. In this respect, the consumable may 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 interface.

[0053] The smoking substitute apparatus or main body may comprise a controller, which may include a micro-processor. The controller may be configured to control the supply of power from the power source to the heater of the smoking substitute apparatus (e.g. via the electrical contacts). 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.

[0054] The main body or smoking substitute apparatus may comprise a wireless interface, which may be configured to communicate wirelessly with another 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.

[0055] A puff sensor may be provided that is configured to detect a puff (i.e. inhalation from a user). The puff 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 puff sensor may, for example, be in the form of a pressure sensor or an acoustic sensor. That is, the controller may control power supply to the heater of the consumable in response to a puff detection by the sensor. The control may be in the form of activation of the heater in response to a detected puff. That is, the smoking substitute apparatus may be configured to be activated when a puff is detected by the puff sensor. When the smoking substitute apparatus is in the form of a consumable, the puff sensor may form part of the consumable or the main body.

[0056] According to a third aspect of the invention, there is provided a smoking substitute kit comprising: a flavour delivery article according to the first aspect of the invention; and a smoking substitute apparatus according to the second aspect of the invention; wherein the flavour delivery article is arranged to deposit flavourant on the smoking substitute apparatus when the flavour delivery article is applied to a surface of the smoking substitute apparatus.

[0057] In this manner, as discussed above, a user may apply flavourant to the smoking substitute apparatus using the flavour delivery article, so that they receive a fla-

vour when using the smoking substitute apparatus.

[0058] The kit may comprise a pack containing a plurality of flavour delivery articles, each of the plurality of flavour delivery articles being a flavour delivery article according to the first aspect of the invention. In this manner, the user may conveniently carry with them a plurality of flavour delivery articles, so that they may apply flavourant to the smoking substitute apparatus when required.

[0059] The pack may be sealable to prevent flavourant from escaping, e.g. to prevent the flavourant from evaporating where the flavourant is a volatile liquid.

[0060] The pack may be arranged to individually dispense the plurality of flavour delivery articles contained therein. In this manner, the user may conveniently retrieve an individual flavour delivery article from the pack for use with the smoking substitute apparatus, whilst keeping the remaining flavour delivery articles in the pack.

[0061] According to a fourth aspect of the invention, there is provided a method of delivering flavour to a user of a smoking substitute apparatus, the method comprising: applying a flavour delivery article to a surface of the smoking substitute apparatus to deposit flavourant from the flavour delivery article on the smoking substitute apparatus; and using, by the user, the smoking substitute apparatus. The method of the fourth aspect of the invention may be used with the flavour delivery article of the first aspect of the invention, the smoking substitute apparatus of the second aspect of the invention, and/or the kit of the third aspect of the invention.

[0062] Similar to the discussion above in relation to the previous aspects of the invention, the method may enable flavour delivery to a user of the smoking substitute apparatus via flavourant deposited thereon with the flavour delivery article. When using the smoking substitute apparatus, the user may place a mouthpiece of the smoking substitute apparatus in their mouth. Using the smoking substitute apparatus may include inhaling an aerosol generated by the smoking substitute apparatus.

[0063] The invention includes the combination of the aspects and preferred features described except where such a combination is clearly impermissible or expressly avoided.

Summary of the Figures

[0064] 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 1A is schematic diagram of a smoking substitute kit according to an embodiment of the invention;

Figure 1B is a front view of a smoking substitute system of the smoking substitute kit of Figure 1A, where

the smoking substitute system is in a disengaged position;

Figure 1C is a schematic cross-sectional view of a consumable of the smoking substitute system of Figure 1B; and

Figure 2 is a schematic cross-sectional view of a flavourant-containing microcapsule that may be used with a flavour delivery article that is an embodiment of the invention.

Detailed Description of the Invention

[0065] Aspects and embodiments of the present invention will now be discussed with reference to the accompanying 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.

[0066] Fig. 1A illustrates a smoking substitute kit 100 that is an embodiment of the invention. The smoking substitute kit 100 includes a smoking substitute system in the form of an e-cigarette system 101, and a flavour delivery article in the form of a wipe 120. The wipe 120 on its own may be considered as an embodiment of the invention.

[0067] The system 101 comprises an e-cigarette device defining a main body 102 of the system 101, and a smoking substitute apparatus in the form of an e-cigarette consumable (or "pod") 103. In the illustrated embodiment the consumable 103 (smoking substitute apparatus) is removable from the main body (e-cigarette device), so as to be a replaceable component of the system 101. In other words, the e-cigarette system 101 is a closed system. The consumable 103 is illustrated in more detail in Fig. 1C.

[0068] The consumable 103 is configured to engage the main body 102. In Fig. 1A, the consumable 103 is engaged with the main body 102, whilst Fig. 1B shows the main body 102 and the consumable 103 in a disengaged state. When engaged, a portion of the consumable 103 is received in a cavity of the main body 102 and is retained in the engaged position by way of a snap-engagement mechanism. In other embodiments, the main body 102 and consumable 103 may be engaged by screwing one into (or onto) the other, through a bayonet fitting, or by way of an interference fit.

[0069] The system 101 is configured to vaporise an aerosol-former, which in the illustrated embodiment, is in the form of a nicotine-based e-liquid 104. The e-liquid 104 comprises nicotine and a base liquid including propylene glycol and/or vegetable glycerine. In the present embodiment, the e-liquid 104 is flavourless (and does not include any added flavourant). That is, if the e-liquid 104 were to be inhaled (i.e. in aerosol form) by a user, it would not have a particularly perceptible flavour or taste.

[0070] As is more apparent from Figure 1C, this e-liquid

104 is stored within a reservoir in the form of a tank 105 that forms part of the consumable 103. In the illustrated embodiment, the consumable 103 is a "single-use" consumable 103. That is, upon exhausting the e-liquid 104 in the tank 105, the intention is that the user disposes of the entire consumable 103. In other embodiments, the e-liquid (i.e. aerosol former) may be the only part of the system that is truly "single-use". That is, the tank may be refillable with e-liquid or the e-liquid may be stored in a non-consumable component of the system. For example, the e-liquid may be stored in a tank located in the main body or stored in another component that is itself not single-use (e.g. a refillable cartomizer).

[0071] The tank 105 surrounds, and thus defines a portion of, a passage 106 that extends between an inlet 107 and an outlet 108 at opposing ends of the consumable 103. In this respect, the passage comprises an upstream end at the end of the consumable 103 that engages with the main body 102, and a downstream end at an opposing end of the consumable 103 that comprises a mouthpiece 109 of the system 101. When the consumable 103 is engaged with the main body 102, a user can inhale (i.e. take a puff) via the mouthpiece 109 so as to draw air through the passage 106, and so as to form an airflow (indicated by arrows) in a direction from the inlet 107 to the outlet 108 of the passage 106. Although not illustrated, the passage 106 may be partially defined by a tube (e.g. a metal tube) extending through the consumable 103. The passage 106 is in fluid communication with a gap defined between the consumable 103 and the main body 102 (when engaged) such that air outside of the system 101 is drawn into the passage 106 (during an inhale).

[0072] The smoking substitute system 101 is configured to vaporise the e-liquid 104 for inhalation by a user. To provide this, the consumable 103 comprises a heater having of a porous wick 110 and a resistive heating element in the form of a heating filament 111 that is helically wound around a portion of the porous wick 110. The porous wick 110 extends across the passage 106 (i.e. transverse to a longitudinal axis of the passage 106) and opposing ends of the wick 110 extend into the tank 105 (so as to be submerged in the e-liquid 104). In this way, e-liquid 104 contained in the tank 105 is conveyed from the opposing ends of the porous wick 110 to a central portion of the porous wick 110 so as to be exposed to the airflow in the passage 106 (i.e. caused by a user inhaling).

[0073] The helical filament 111 is wound about this exposed central portion of the porous wick 110 and is electrically connected to an electrical interface in the form of electrical contacts 112 mounted at the end of the consumable that is proximate the main body 102 (when engaged). When the consumable 103 is engaged with the main body 102, the electrical contacts 112 contact corresponding electrical contacts (not shown) of the main body 102. The main body electrical contacts are electrically connected to a power source (not shown) of the main body 102, such that (in the engaged position) the

filament 111 is electrically connected to the power source. In this way, power can be supplied by the main body 102 to the filament 111 in order to heat the filament 111. This heat is transferred from the filament 111 to the porous wick 110 which causes e-liquid 104 conveyed by the porous wick 110 to increase in temperature to a point at which it vaporises. The vaporised e-liquid becomes entrained in the airflow and, between the vaporisation point at the filament 111 and the outlet 108 of the passage 106, condenses to form an aerosol. This aerosol is then inhaled, via the mouthpiece 109, by a user of the system 101.

[0074] The power source of the main body 102 may be in the form of a battery (e.g. a rechargeable battery). The main body 102 may comprise a connector in the form of e.g. a USB port for recharging this battery. The main body 102 may also comprise a controller that controls the supply of power from the power source to the main body electrical contacts (and thus to the filament 111). That, is the controller may be configured to control a voltage applied across the main body electrical contacts, and thus the voltage applied across the filament 111. In this way, the filament 111 may only be heated under certain conditions (e.g. during a puff and/or only when the system is in an active state). In this respect, the main body 102 may include a puff sensor (not shown) that is configured to detect a puff (i.e. inhalation). The puff sensor may be operatively connected to the controller so as to be able to provide a signal, to the controller, which is indicative of a puff state (i.e. puffing or not puffing). The puff sensor may, for example, be in the form of a pressure sensor or an acoustic sensor.

[0075] Although not shown, the main body 102 and consumable 103 may comprise a further interface which may, for example, be in the form of an RFID reader, a barcode or QR code reader. This interface may be able to identify a characteristic (e.g. a type) of a consumable 103 engaged with the main body 102. In this respect, the consumable 103 may 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 interface.

[0076] The wipe 120 is made of a cloth substrate 122 which carries a flavourant. The wipe 120 may be applied to a surface of the system 101 to deposit flavourant on the system 101. This may then produce a scent and/or taste for a user when using the system 101. In particular, the wipe 120 may be applied to the mouthpiece 109 of the consumable, so that flavourant is deposited on the mouthpiece 109. In this manner, when the user puts the mouthpiece 109 in their mouth to use the system 101 (e.g. to inhale an aerosol), the user may experience a flavour produced by the flavourant. Thus, the kit 100 may enable flavour delivery to a user of the smoking substitute system 101.

[0077] The flavourant may be a liquid flavourant. For example, the cloth substrate 122 of the wipe 120 may be imbued with the liquid flavourant. In some cases, the fla-

vourant may encapsulated within a plurality of microcapsules, the microcapsules being arranged to disintegrate in the presence of the aerosol generated by the smoking substitute apparatus. In this manner, flavourant may only be delivered to the user when they inhale an aerosol from the system 101. Such a scenario is discussed in more detail below in relation to Fig. 2.

[0078] To facilitate depositing of flavourant on the mouthpiece 109 with the wipe 120, the mouthpiece 109 is arranged to absorb flavourant deposited thereon. In particular, as shown in Fig. 1C, the mouthpiece 109 includes an absorbent material 124 disposed adjacent to the outlet 108. The absorbent material 124 may be a porous material, such as a porous plastic. In this manner, when the wipe 120 is brought into contact with the mouthpiece 109, the absorbent material 124 of the mouthpiece 109 may absorb flavourant from the wipe 120. This may enable a larger amount of flavourant to be held on the mouthpiece, so that flavourant may be delivered to the user for longer periods without having to reapply the wipe 120. Alternatively or in addition to the absorbent material 124, the mouthpiece 109 may include a plurality of channels defined thereon, the channels being arranged to receive flavourant from the wipe 120. The channels may be arranged to retain liquid flavourant from the wipe 120 via capillary action of the liquid flavourant in the channels. The channels may, for example, be formed during a moulding of the mouthpiece (e.g. where the mouthpiece is a moulded piece of plastic).

[0079] Fig. 2 shows a schematic cross-sectional view of a microcapsule 202 containing a flavourant 204. The microcapsule 202 is arranged to disintegrate in the presence of an aerosol generated by a smoking substitute system (e.g. system 101), to release the flavourant 204 contained therein. A plurality of such microcapsules 202 containing flavourant may be carried by a flavour delivery article of the invention (e.g. wipe 120).

[0080] The microcapsule 202 may include an outer membrane 206 made of a hydrogel composite which contains Chitosan. Chitosan is substantially stable around pH 7.5. Thus, when the microcapsule 202 is placed in a user's mouth, the Chitosan, and hence the outer membrane 206, may be stable and retain its integrity for a period of time. In this manner, the flavourant 204 contained in the microcapsule 202 is not released and so does not produce a flavour in the user's mouth.

[0081] A nicotine-containing e-liquid may produce an aerosol which has a pH around 7.8. Thus, when a user inhales such an aerosol, a pH in the user's mouth may increase above pH 7.5, which may cause rapid breakdown of the Chitosan in the outer membrane 206, resulting in disintegration of the microcapsule's membrane and release of the flavourant 204.

[0082] The flavourant 204 in the microcapsule 202 may be in solid or liquid form. Preferably, the flavourant 204 may be a freeze-dried flavourant. In other words, during manufacture the flavourant 204 may have been freeze-dried to remove moisture from the flavourant 204. This

may reduce the risk of flavourant 204 escaping from the microcapsule 202 prior to use. When the flavourant 204 is released from the microcapsule 202 due to disintegration of the outer membrane 206 in the user's mouth, the flavourant 204 may be activated by moisture in the user's mouth (e.g. the flavourant 204 may dissolve in the user's saliva), to produce a flavour in the user's mouth.

[0083] The outer membrane 206 may include Chitosan having a Deacetylation (DDT) of 75% - 99%. The hydrogel composite forming the outer membrane may, for example, include 0.1% w/w up to 20% w/w of Chitosan. The hydrogel composite may further include excipients such as Xanthan Gum, water, propylene glycol and/or vegetable glycerine.

[0084] Any of the following compounds may also break down upon contacting the aerosol, and so may be included in the hydrogel composite (instead of, or in addition to, Chitosan): Hyaluronic Acid, Dextran, Poly-Acrylamide, Polyacrylic Acid, Guar Gum Succinate, Kappa-Carrageenan, Poly(vinyl Alcohol).

[0085] The microcapsule 202 may be manufactured by first freeze-drying a flavourant to remove any moisture from the flavourant and produce a flavourant cake. The flavourant cake may be moulded into a desired shape (e.g. a ball) using a mould. Chitosan, together with excipients forming the hydrogel may be then be mixed together to produce the hydrogel composite. The hydrogel composite may be layered in a mould, into which the flavourant cake is inserted. The hydrogel composite may then be rolled to form an outer membrane around the flavourant cake.

[0086] A flavour delivery article of the invention (e.g. wipe 120), may contain a plurality of microcapsules 202. When the flavour delivery article is applied to a smoking substitute system, microcapsules may be deposited on a surface of the system (e.g. on mouthpiece 109). Then, when the user uses the smoking substitute system, some of the microcapsules 202 may enter the user's mouth. When the user inhales an aerosol from the smoking substitute system, the outer membrane 206 of the microcapsules 202 may disintegrate, to release the flavourant 204 into the user's mouth.

[0087] 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.

[0088] 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.

[0089] 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.

[0090] Any section headings used herein are for organizational purposes only and are not to be construed as limiting the subject matter described.

[0091] 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.

[0092] 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%.

[0093] 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 flavour delivery article for use with a smoking substitute apparatus, the flavour delivery article comprising a flavourant, wherein the flavour delivery article is arranged to deposit the flavourant on the smoking substitute apparatus when the flavour delivery article is applied to a surface of the smoking substitute apparatus.
2. A flavour delivery article according to claim 1, wherein the flavour delivery article includes a porous material in which the flavourant is contained.
3. A flavour delivery article according to claim 2, wherein the flavourant is a liquid flavourant, and wherein

the porous material is imbued with the liquid flavourant.

4. A flavour delivery article according to any preceding claim, wherein the flavourant is encapsulated within a plurality of microcapsules, the microcapsules being arranged to disintegrate in the presence of the aerosol generated by the smoking substitute apparatus. 5
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5. A flavour delivery article according to any preceding claim, wherein the flavourant is a freeze-dried flavourant.
6. A smoking substitute apparatus having a mouthpiece, the mouthpiece comprising an outlet for conveying an aerosol generated by the smoking substitute apparatus to a user, wherein the mouthpiece is configured to absorb a flavourant deposited on the mouthpiece with a flavour delivery article. 15
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7. A smoking substitute apparatus according to claim 6, wherein the mouthpiece includes a textured surface for absorbing the flavourant deposited on the mouthpiece. 25
8. A smoking substitute apparatus according to claim 7, wherein the textured surface includes a plurality of channels for receiving the flavourant deposited on the mouthpiece. 30
9. A smoking substitute apparatus according to one of claims 6 to 8, wherein the mouthpiece includes an absorbent material for absorbing the flavourant deposited on the mouthpiece. 35
10. A smoking substitute kit comprising:
 - a flavour delivery article according to one of claims 1 to 5; and 40
 - a smoking substitute apparatus according to one of claims 6 to 9;
 - wherein the flavour delivery article is arranged to deposit flavourant on the smoking substitute apparatus when the flavour delivery article is applied to a surface of the smoking substitute apparatus. 45
11. A smoking substitute kit according to claim 10, further comprising a pack containing a plurality of flavour delivery articles, each of the plurality of flavour delivery articles being a flavour delivery article according to one of claims 1 to 5. 50
12. A smoking substitute kit according to claim 11, wherein the pack is arranged to individually dispense the plurality of flavour delivery articles contained therein. 55

13. A method of delivering flavour to a user of a smoking substitute apparatus, the method comprising:

applying a flavour delivery article to a surface of the smoking substitute apparatus to deposit flavourant from the flavour delivery article on the smoking substitute apparatus; and
using, by the user, the smoking substitute apparatus.

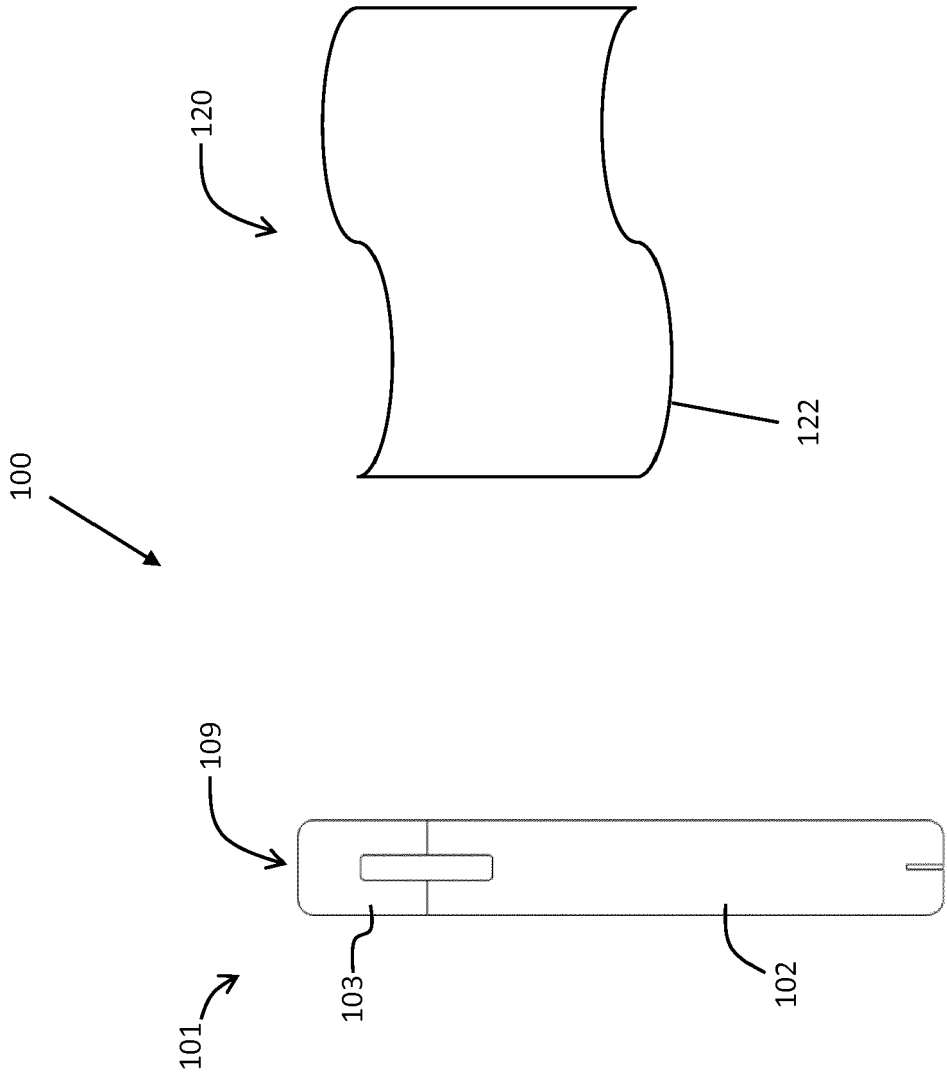
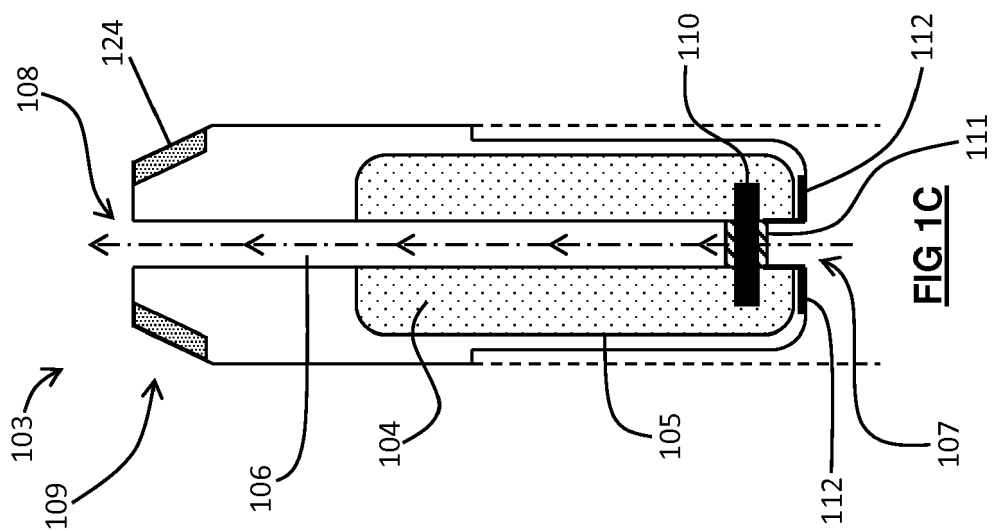
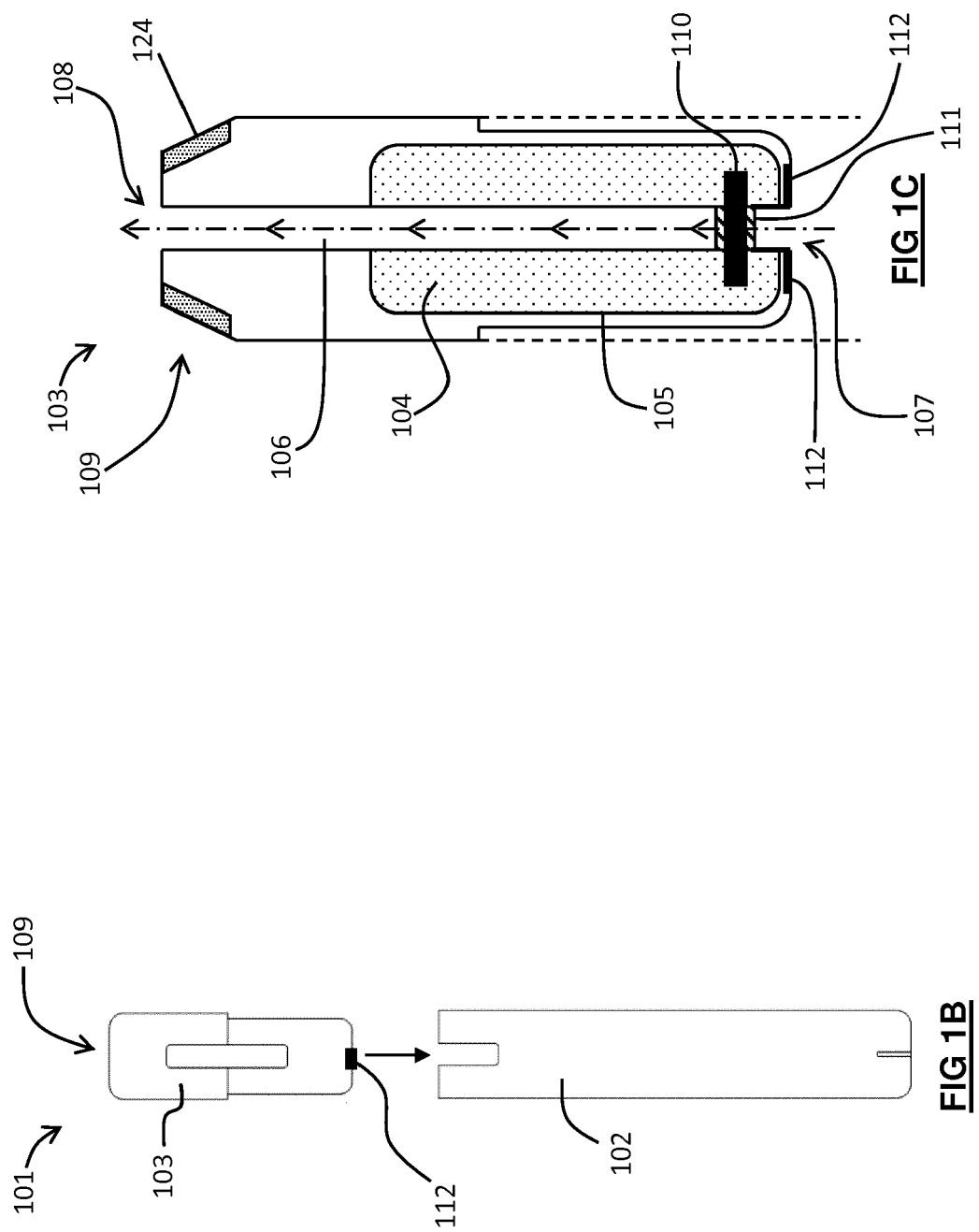


FIG 1A



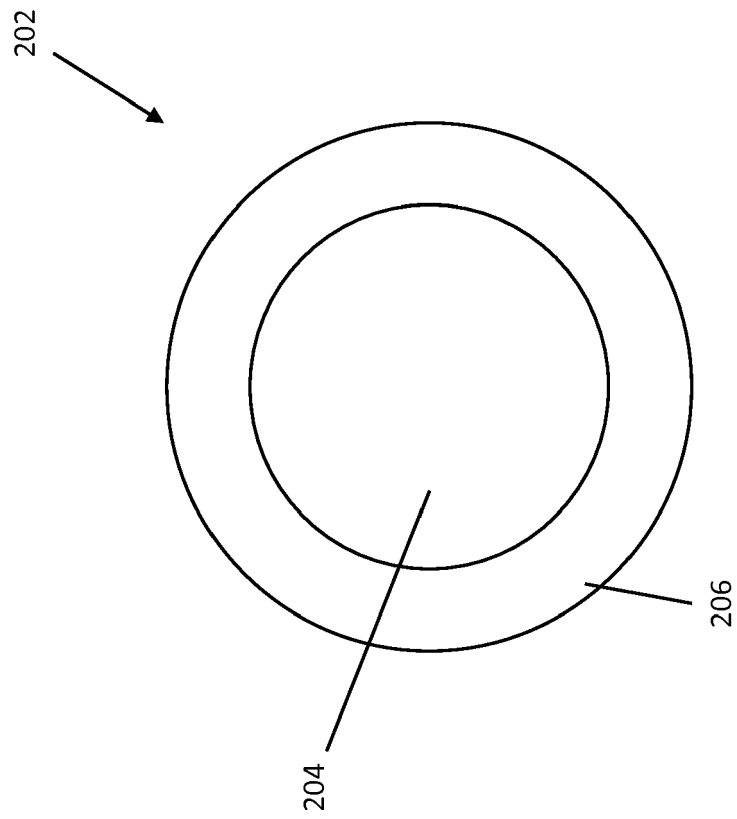


FIG 2



EUROPEAN SEARCH REPORT

 Application Number
 EP 19 15 5940

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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	EP 0 365 160 A2 (SCOTT PAPER CO [US]) 25 April 1990 (1990-04-25)	1-4, 10-12	INV. A24D3/18 A61K8/02
Y	* page 2, lines 16-20 * * page 2, line 42 - page 3, line 5 *	5	
X	US 2002/142690 A1 (WILSON MICHAEL DAVID [US]) 3 October 2002 (2002-10-03)	1-3, 10-12	ADD. A24C5/60 A24D1/00
Y	* paragraphs [0009], [0012], [0019]; figure 1 *	4,5	
X	US 2002/164910 A1 (MURRAY SIMON JOHN [GB]) 7 November 2002 (2002-11-07)	1-3, 10-12	
Y	* abstract *	4,5	
Y	GB 1 473 315 A (SMITH W) 11 May 1977 (1977-05-11) * the whole document *	5	
			TECHNICAL FIELDS SEARCHED (IPC)
			A24D A61Q A24C A61K
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		1 August 2019	Kock, Søren
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 03.02 (P04C01)



Application Number

EP 19 15 5940

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-5(completely); 10-12(partially)

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

**LACK OF UNITY OF INVENTION
SHEET B**

Application Number

EP 19 15 5940

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-5(completely); 10-12(partially)

Flavour deliver article comprising a flavourant. Intended for use in applying flavourant to a smoking substitute apparatus.

2. claims: 6-9, 13(completely); 10-12(partially)

A smoking substitute apparatus having a mouthpiece. The mouthpiece is configured to absorb a flavourant deposited on the mouthpiece with a flavour delivery article.

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

EP 19 15 5940

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

01-08-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0365160 A2	25-04-1990	AU 612100 B2	27-06-1991
		CA 1325560 C	28-12-1993
		DE 68919991 D1	26-01-1995
		DE 68919991 T2	18-05-1995
		DK 514589 A	19-04-1990
		EP 0365160 A2	25-04-1990
		ES 2065392 T3	16-02-1995
		HK 103995 A	07-07-1995
		JP 2557987 B2	27-11-1996
		JP H02157217 A	18-06-1990
		KR 900005920 A	07-05-1990
		NO 173764 B	25-10-1993
		US 4904524 A	27-02-1990

US 2002142690 A1	03-10-2002	NONE	

US 2002164910 A1	07-11-2002	GB 2376245 A	11-12-2002
		US 2002164910 A1	07-11-2002

GB 1473315 A	11-05-1977	NONE	
