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(54) **CLEANING CONSUMABLE FOR A SMOKING SUBSTITUTE**

(57) Disclosed is a cleaning consumable for cleaning a heating element of a smoking substitute device. The consumable comprises a substrate formed of a cellulose monoacetate and has an elongate bore extending longitudinally therethrough for receipt of the heating element. Also disclosed is a system comprising a cleaning consumable and a smoking substitute device having an elongate heating element. The cleaning consumable configured for receipt of the heating element for cleaning the heating element.

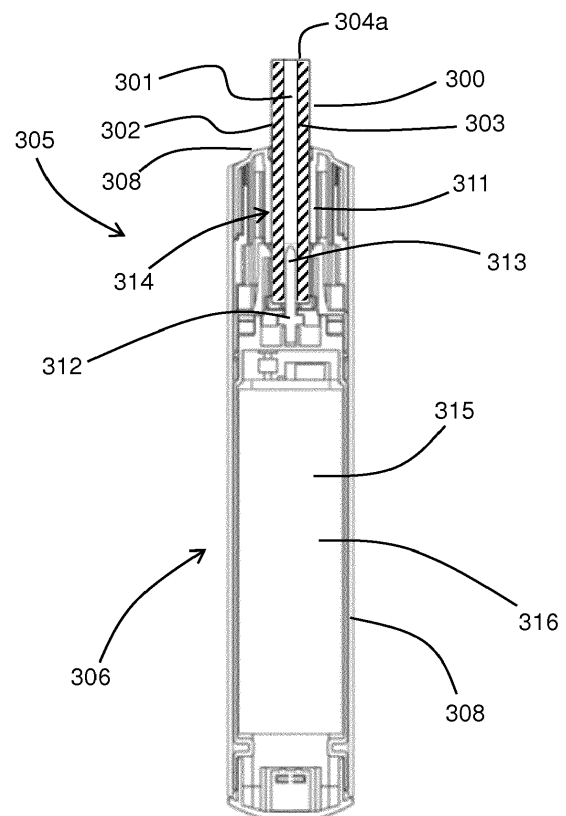


FIG 3C

EP 3 721 729 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to a smoking substitute system and particularly, although not exclusively, to a smoking substitute system including a consumable for cleaning a smoking substitute device.

BACKGROUND

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

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

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

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

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

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

with a mouthpiece at one end.

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

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

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

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

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

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

[0014] After a HT consumable has been consumed, it may be removed from the HT device (and can subsequently be replaced by a further HT consumable for a further smoking session). In some cases, residue from the removed HT consumable can remain on a heater of the HT device and on the HT device itself. In subsequent smoking sessions, residue on the heater can reduce the ability of the heater to heat the consumable. Further, residue on both the heater and the device may affect the flavour of the aerosol inhaled by a user. Thus, in general, residue may be detrimental to the smoking session.

[0015] Thus, there may be a need for improved design

of smoking substitute systems, in particular HT smoking substitute systems, to enhance the user experience and improve the function of the HT smoking substitute system.

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

SUMMARY OF THE INVENTION

[0017] At its most general, the present invention relates to a cleaning consumable for a smoking substitute device that is configured to receive a heating element therein for cleaning the heating element.

[0018] According to a first aspect of the present disclosure there is provided a cleaning consumable for cleaning a heating element of a smoking substitute device, the cleaning consumable comprising a substrate formed of cellulose monoacetate and having an elongate bore extending longitudinally at least partly therethrough for receipt of the heating element.

[0019] The provision of a cleaning consumable that comprises a bore for receipt of a heating element may allow cleaning of the heating element by movement (e.g. rotational movement) of the cleaning consumable relative to the heating element. In this way, residue on the heater may be removed by scouring (or abrasion).

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

[0021] The cleaning consumable (e.g. the substrate) may have a longitudinal length that is greater than 20 mm. The longitudinal length may be greater than e.g. 30 mm or 40 mm. The longitudinal length may be approximately 50 mm (e.g. 48 mm).

[0022] The cleaning consumable (e.g. the substrate) may have a transverse cross-sectional shape that is substantially circular (annular). The cross-sectional shape of the bore may alternatively be rectangular, elliptical, triangular, etc. The cleaning consumable (e.g. the substrate) may have a diameter (i.e. in a transverse direction) that is greater than 5 mm and less than 15 mm. The diameter may be greater than 5 mm and less than 10 mm. The diameter may e.g. be approximately 7 mm. The shape (e.g. and size) of the cross-section of the consumable (e.g. the substrate) may be consistent for the length (i.e. the entire length) of the consumable.

[0023] The bore may extend (e.g. centrally) fully through the substrate (i.e. from one end of the substrate to an opposing end along the longitudinal length of the consumable). The bore may alternatively only extend partway into the substrate. The bore may have a longitudinal length that is between 15 mm and 25 mm long, e.g. between 18 mm and 20 mm long, e.g. around 19 mm long.

[0024] The bore may have a transverse cross-sectional shape that is circular (or may e.g. be rectangular, elliptical, etc.) The bore may have a diameter (i.e. in the transverse direction) of between 1.5 mm and 2.5 mm, e.g. a diameter between 2 mm and 2.3 mm, e.g. a diam-

eter of around 2.15 mm. The shape (e.g. and size) of the cross-section of the bore may be consistent for the length (i.e. the entire length) of the bore.

[0025] The substrate may be a unitary body. That is, the cleaning consumable may be in the form of a single integrally formed substrate. The substrate e.g. the cellulose acetate substrate may be at least partly circumscribed by a wrapping layer e.g. an abrasive wrapping layer.

[0026] In a second aspect there is disclosed a system comprising a smoking substitute device comprising a body and an elongate heating element projecting along a longitudinal axis from the body; and an elongate cleaning consumable comprising a substrate formed of cellulose monoacetate and configured for receipt of the elongate heating element therein for cleaning the elongate heating element.

[0027] The cleaning consumable may be as described above with respect to the first aspect. In this respect, the cleaning consumable may comprise a bore extending longitudinally at least partly therethrough. Alternatively, the cleaning consumable (e.g. the substrate) may be solid (i.e. having no bore therethrough). In this case, the cleaning consumable (e.g. the substrate) may be cylindrical (rather than e.g. tubular).

[0028] When the cleaning consumable (e.g. the substrate) is solid, the cleaning consumable is formed such that the heating element is able to pierce the substrate (for insertion into the cleaning consumable). For example, the substrate may be formed such that the cleaning consumable is capable of being pierced (e.g. with a force that is similar to that during insertion of a smoking substitute consumable onto the heater). Alternatively, or additionally, the cleaning consumable (e.g. the substrate) may comprise a weakened portion or a frangible portion that facilitates insertion of the heating element into the cleaning consumable.

[0029] A distal end of the heating element (i.e. distal from a base of the heating element where it is mounted to the device) may comprise a tapered portion, which may facilitate insertion of the heating element into the cleaning consumable.

[0030] When the cleaning consumable (e.g. the substrate) comprises a bore, a (transverse) cross-sectional of the bore may be substantially the same as a transverse cross-sectional shape of the heater. For example, both the heating element and the bore of the cleaning consumable may have a transverse cross-sectional shape that is substantially circular (i.e. the heating element may be generally cylindrical). Alternatively, both the heating element and the bore of the cleaning consumable may have a transverse cross-sectional shape that is rectangular (i.e. the heater may be a "blade heater"). The heating element may alternatively be in the shape of a tube (i.e. the heater may be a "tube heater"). In such an embodiment, the bore of the cleaning consumable may have a transverse cross-section that is annular (which may extend only partway through the substrate).

[0031] Like the bore, the shape and/or size (e.g. diameter) of the transverse profile of the heating element may be generally consistent for the entire length (or substantially the entire length) of the heating element. Alternatively, the bore and/or heater may be tapered along their respective lengths.

[0032] The heating element may have a diameter (e.g. when cylindrical) of between 1.5 mm and 2.5 mm, e.g. a diameter between 2 mm and 2.3 mm, e.g. a diameter of around 2.15 mm. The diameter of the bore of the cleaning consumable (e.g. the substrate) may be substantially the same as the diameter of the heating element. In this respect, the heating element may fit closely within the bore when inserted therein, such that internal surfaces of the cleaning consumable (e.g. the substrate) (defining the bore) contact outer surfaces of the heating element. In some embodiments, the bore may be smaller than the heating element (e.g. in diameter), such that the bore is forced to expand as the heating element is inserted therein. This may ensure contact between the cleaning consumable and the heating element. In other embodiments, the cross-sectional area of the bore may be larger than the cross-sectional area of the heating element.

[0033] The cleaning consumable may have a longitudinal length that is greater than a longitudinal length of the heating element. In this respect, the heating element may fully penetrate the substrate when received in cleaning consumable. That is, the entire length, or substantially the entire length, of the heating element may be received in the cleaning consumable (e.g. the substrate). The heating element may be between 15 mm and 25 mm long, e.g. between 18 mm and 20 mm long, e.g. around 19 mm long. The length of the cleaning consumable (e.g. the substrate) may be as provided above with respect to the first aspect.

[0034] The device may comprise an elongate body. An end of the elongate body may be configured for engagement with a heated tobacco (HT) consumable. The device may comprise a cavity that is configured for receipt of at least a portion of the HT consumable (i.e. for engagement with the HT consumable). The heating element may be disposed in (e.g. and project into) this cavity. The cleaning consumable may have the same size and shape as a HT consumable configured for use with the device. The consumable may have the same cross-section as a filter of the HT consumable.

[0035] An outer surface of the cleaning consumable (e.g. the wrapping layer) may be configured to contact an internal wall of the body defining cavity when received therein. In this way, when the cleaning consumable is moved relative to the device, the outer surface (e.g. the wrapping layer) of the cleaning consumable may move against the internal wall of the cavity so as to abrade/scour residue that has accumulated on the surface of the cavity. For example, an outer (e.g. circumferential) surface of the cleaning consumable (which may be at least partially circumscribed by the wrapping layer) may be formed so as to contact (i.e. lie against) an internal

wall defining the cavity. The cross-sectional shape (and size) of the cleaning consumable may be substantially the same as the cavity. For example, both the cleaning consumable and cavity may have a circular cross-sectional shape. The cleaning consumable may substantially fill the cavity when received therein.

[0036] The cleaning consumable may have a greater longitudinal length than the cavity (i.e. defining the depth of the cavity). Thus, a first axial end of the cleaning consumable may project from the cavity when the cleaning consumable is received in the cavity. This first axial end of the cleaning consumable may be used by a user to move (e.g. rotate) the cleaning consumable when received in the cavity. The opposing second axial end of the consumable may abut a base of the cavity. Thus, when the cleaning consumable is moved (e.g. rotated) the second axial end of the consumable may scour the base of the cavity so as to clean the base.

[0037] The heating element may be rigidly mounted to the body (e.g. by a mount). The heating element may be formed of ceramic. The heating element may comprise a core (e.g. a ceramic core) comprising Al₂O₃. The core of the heating element may have a diameter of 1.8 mm to 2.1 mm, e.g. between 1.9 mm and 2 mm. The heating element may comprise an outer layer (e.g. an outer ceramic layer) comprising Al₂O₃. The thickness of the outer layer may be between 160 μm and 220 μm, e.g. between 170 μm and 190 μm, e.g. around 180 μm. The heating element may comprise a heating track, which may extend longitudinally along the heating element. The heating track may be sandwiched between the outer layer and the core of the heating element. The heating track may comprise tungsten and/or rhenium. The heating track may have a thickness of around 20 μm. The thermally conductive path may connect the heating track to the shroud. The heating track may form part of the thermally conductive path.

[0038] As is set forth above, the heating element projects into a cavity defined by the body of the device (e.g. along a longitudinal axis). In this respect, the heating element may extend from an internal base of the cavity towards an opening of the cavity. The length of the heating element (i.e. along the longitudinal axis of the heating element) may be less than the depth of the cavity. Hence, the heating element may extend for only a portion of the length of the cavity. That is, the heating element may not extend through (or beyond) the opening of the cavity.

[0039] The device may comprise a removable cap. The cap may at least partially enclose the heating element. The cap may be moveable between an open position in which access is provided to the heating element, and a closed position in which the cap at least partially encloses the heating element. The cap may be slideably engaged with the body of the device, and may be slideable between the open and closed positions.

[0040] The cap may define at least a portion of the cavity of the device (i.e. in which the heating element is located). That is, the cavity may be fully defined by the

cap, or each of the cap and body may define a portion of the cavity. The cap may comprise an opening to the cavity. The opening may be configured for receipt of at least a portion of the cleaning consumable. That is, the cleaning consumable may be inserted through the opening and into the cavity (for cleaning of the heating element).

[0041] The device may comprise a power source or may be connectable to a power source (e.g. a power source separate to the device). The power source may be electrically connectable to the heating element. In that respect, altering (e.g. toggling) the electrical connection of the power source to the heating element may affect a state of the heating element. For example, toggling the electrical connection of the power source to the heating element may toggle the heating element between an on state and an off state. The power source may be a power store. For example, the power source may be a battery or rechargeable battery (e.g. a lithium ion battery).

[0042] The device may comprise a user interface (UI). In some embodiments the UI may include input means to receive operative commands from the user. The input means of the UI may allow the user to control at least one aspect of the operation of the device. In some embodiments the input means may comprise a power button to switch the device between an on state and an off state.

[0043] In some embodiments the UI may additionally or alternatively comprise output means to convey information to the user. In some embodiments the output means may comprise a light to indicate a condition of the device to the user. The condition of the device indicated to the user may comprise a condition indicative of the operation of the heater. For example, the condition may comprise whether the heating element is in an off state or an on state. In some embodiments, the UI unit may comprise at least one of a button, a display, a touch-screen, a switch, a light, and the like. For example, the output means may comprise one or more (e.g. two, three, four, etc.) light-emitting diodes ("LEDs") that may be located on the body of the device.

[0044] The device may comprise a controller, or may be connectable to a controller that may be configured to control at least one function of the device. The controller may comprise a microcontroller that may e.g. be mounted on a printed circuit board (PCB). The controller may also comprise a memory, e.g. non-volatile memory. The memory may include instructions, which, when implemented, may cause the controller to perform certain tasks or steps of a method.

[0045] The controller may be configured to control the operation of the heating element. The controller may be configured to control the voltage applied by power source to the heating element. For example, the controller may be configured to toggle between applying a full output voltage (of the power source) to the heater and applying no voltage to the heater.

[0046] The device may comprise a sensor for detecting the presence of the cleaning consumable in the cavity.

The cleaning consumable may comprise an indicator that may be detected by the sensor. For example, the sensor may be a barcode reader, a light sensor, etc. for detecting the presence of the cleaning consumable. The sensor may be configured to detect whether the cleaning consumable or a HT consumable is received in the cavity. The sensor may provide a signal, indicative of a cleaning consumable being received in the cavity, to the controller. In response the controller may deactivate the heater. Thus, the device may be configured to deactivate the heater when a cleaning consumable is detected in the cavity. This may ensure that the cleaning consumable is not heated by the heater, which could otherwise present a safety risk.

[0047] In some embodiments, where the device comprises a UI, the controller may be operatively connected to one or more components of the UI. The controller may be configured to receive command signals from an input means of the UI. The controller may be configured to control the heater in response to the command signals. For example, the controller may be configured to receive "on" and "off" command signals from the UI and, in response, may control the heater so as to be in a corresponding on or off state.

[0048] The controller may be configured to send output signals to a component of the UI. The UI may be configured to convey information to a user, via an output means, in response to such output signals (received from the controller). For example, where the device comprises one or more LEDs, the LEDs may be operatively connected to the controller. Hence, the controller may be configured to control the illumination of the LEDs (e.g. in response to an output signal). For example, the controller may be configured to control the illumination of the LEDs according to (e.g. an on or off) state of the heater.

[0049] According to a third aspect there is provided a kit comprising a cleaning consumable according to the first aspect and at least one e.g. a plurality of smoking substitute consumables.

[0050] The smoking substitute consumable(s) may be heat not burn (HNB) (or HT) consumables. The heat not burn consumable(s) may each comprise an aerosol-forming substrate and one or more filters. The cleaning consumable and smoking substitute consumable(s) may have substantially the same shape. The cleaning consumable and smoking substitute consumable(s) may have substantially the same length and e.g. diameter/cross-sectional area.

[0051] According to a fourth aspect there is provided a method of cleaning a smoking substitute device, the method comprising inserting an elongate heating element of the device into a cleaning consumable, and scouring the heating element by agitating the cleaning consumable.

[0052] The scouring is such that residue that has accumulated on the heating element may be removed/dislodged/abraded from the heating element by the cleaning consumable.

[0053] The cleaning consumable and the device may be as described above with respect to the first and second aspects.

[0054] Agitating the cleaning consumable may comprise rotating cleaning consumable about a longitudinal axis of the heating element. Agitating the cleaning consumable may comprise a repetitive movement (e.g. a reciprocating movement along the longitudinal axis). Agitating the cleaning consumable may comprise a combination of longitudinal and rotational movement of the cleaning consumable relative to the heating element.

[0055] The heating element may project within a cavity of the device, and the method may comprise inserting the cleaning consumable into the cavity (so as to receive the heating element therein). The method may comprise scouring one or more inner walls of the device defining the cavity. In this way, the heating element and the inner walls of the device may be scoured concurrently using the cleaning consumable. The method may comprise substantially filling the cavity with the cleaning consumable.

[0056] According to a fifth aspect there is provided a method of cleaning a smoking substitute device comprising an elongate heating element projecting within a cavity defined by inner walls of the device, the method comprising inserting a cleaning consumable into the cavity such that the elongate heating element is received in the cleaning consumable, and scouring the inner walls by agitating the cleaning consumable.

[0057] The cleaning consumable and device of the fifth aspect may be as otherwise described above with respect to the first and second aspects. The method may comprise scouring the inner walls by using the rotational motion and/or reciprocating motion of the cleaning consumable as discussed above in relation to the fourth aspect.

[0058] The method may comprise scouring the inner walls and heating element concurrently/simultaneously by agitating the cleaning consumable e.g. by using the rotational motion and/or reciprocating motion of the cleaning consumable as discussed above in relation to the fourth aspect.

[0059] The invention includes the combination of the aspects and preferred features described except where such a combination is clearly impermissible or expressly avoided.

[0060] The skilled person will appreciate that except where mutually exclusive, a feature or parameter described in relation to any one of the above aspects may be applied to any other aspect. Furthermore, except where mutually exclusive, any feature or parameter described herein may be applied to any aspect and/or combined with any other feature or parameter described herein.

SUMMARY OF THE FIGURES

[0061] 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:

Figures 1A, 1B and 1C are a perspective view, side section view and front section view of a cleaning consumable according to a first embodiment;

Figures 2A and 2B are a side section view and front section view of a cleaning consumable according to a second embodiment;

Figure 3A is a front view of a smoking substitute system with a cleaning consumable disengaged from the device; and

Figures 3B and 3C are front and section views of the smoking substitute system with the cleaning consumable engaged with the device.

DETAILED DESCRIPTION OF THE INVENTION

[0062] 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.

[0063] Figure 1A, 1B and 1C illustrate a first embodiment of a cleaning consumable 100 for a smoking substitute device. The cleaning consumable 100 is in the form of an elongate unitary substrate formed of a cellulose monoacetate and comprises a bore 101 extending centrally through the cleaning consumable 100 along a longitudinal axis. As will be described further below, this bore 101 is for receipt of a heating element of the smoking substitute device for cleaning a heating element.

[0064] The cleaning consumable 100 comprises an annular transverse cross-section so as to have an outer circumferential surface 102 surrounding (and concentrically aligned with) an internal circumferential surface 103 (defining the bore 101). The outer 102 and inner 103 circumferential surfaces extend between transverse (annular shaped) ends 104a, 104b of the cleaning consumable 100.

[0065] In the present embodiment, the cleaning consumable 100 has a longitudinal length of 48 mm and an outer diameter of 7 mm. The diameter of the bore is 2.15 mm.

[0066] Figure 2A and 2B illustrate a second embodiment of a cleaning consumable 200. The cleaning consumable 200 of figures 2A and 2B is similar in shape to the cleaning consumable 100 of the first embodiment, except that it does not comprise a bore. Thus, the cleaning consumable 200 has a solid cylindrical shape defined by an outer circumferential surface 202 and opposing (circular) ends 204a, 204b.

[0067] Like the cleaning consumable 100 of the first embodiment, the cleaning consumable 200 is for cleaning a heating element of a smoking substitute device. Because the cleaning consumable 200 does not include a bore, it is configured to be pierced by the heating element for receipt of the heating element therein. The cleaning consumable 200 is formed of a cellulose monoacetate that is formed so as to allow this piercing to occur.

[0068] Figures 3A, 3B and 3C illustrate a heated-tobacco (HT) smoking substitute system 305. The system 305 comprises a HT device 306 and a cleaning consumable that is similar to the described above and shown in figures 1A-1C. The HT device 306 is for use with HT consumables (not shown).

[0069] The device 306 and the cleaning consumable 300 are configured such that the cleaning consumable 300 can be engaged with the device 306 for cleaning. Figure 3A shows the device 201 and the consumable 202 in a disengaged state, whilst Figure 3B shows the device 306 and the cleaning consumable 300 in a disengaged state. As will be described further below, and as is shown in Figure 3B, the cleaning consumable 300 can be rotated when engaged with the device 306 for cleaning.

[0070] The device 306 comprises a body 307 and cap 308. In use the cap 308 is engaged at an end of the body 307. Although not apparent from the figures, the cap 308 is moveable relative to the body 307. In particular, the cap 308 is slideable and can slide along a longitudinal axis of the body 307.

[0071] The device 306 also comprises an output means (forming part of the UI of the device 306) in the form of a plurality of light-emitting diodes (LEDs) 309 arranged linearly along the longitudinal axis of the device 306 and on an outer surface of the body 307 of the device 306. A button 310 is also arranged on an outer surface of the body 307 of the device 306 and is axially spaced (i.e. along the longitudinal axis) from the plurality of LEDs 309.

[0072] Figure 3C illustrates a second view of the device 306 with the cleaning consumable 300 in an engaged state. The cap 308 of the device 306 includes an opening to an internal cavity 314 defined by a circumferential internal wall 311 of the cap 308. The opening and the cavity 314 are formed so as to receive a portion of the cleaning consumable 300 therein. That is, during engagement of the cleaning consumable 300 with the device 306, a portion of the cleaning consumable 300 is received through the opening and into the cavity 314. After such engagement, a first axial end 304a of the cleaning consumable 300 protrudes from the cavity 314 (i.e. so as to protrude from the device 306). As will be described further below, this first axial end 304a can be gripped by a user for removing the cleaning consumable 300 from the device 306 and for moving (e.g. rotating) the cleaning consumable 300 in the device 306.

[0073] The device 306 comprises a heater 312 comprising heating element 313. In normal use, the heater

312 projects into a HT consumable so as to heat e.g. a tobacco portion of the HT consumable. This produces an aerosol that can be inhaled by a user. Once the tobacco portion is consumed, the HT consumable can be removed. In some cases, residue from the HT consumable may remain (e.g. stuck) on the heating element 313 when the HT consumable is removed. As will be described further below, the cleaning consumable 300 may be used to remove this residue from the heating element 313.

[0074] The heater 312 is rigidly mounted to the body 308 and projects into the cavity 314 defined by the circumferential internal wall 311. In the illustrated embodiment, the heater 312 is a rod heater and the heating element 313 has a circular transverse profile. The heating element 313 projects from an internal base of the cavity 314 along a longitudinal axis towards the opening. As is apparent from Figure 3C, the length (i.e. along the longitudinal axis) of the heating element 313 is less than a depth of the cavity 314. In this way, the heating element 313 does not protrude from or extend beyond the opening (i.e. beyond the end of the device 306). In general, the shape and size of the cleaning consumable 300 is substantially the same as the shape and size of a HT consumable for use with the device 306. In this way, the cleaning consumable 300 can replace a HT consumable in packaging containing a plurality of HT consumables without necessitating changes to the packaging.

[0075] When the cleaning consumable 300 is received in the cavity 314, the heating element 313 is received in the bore 301 of the cleaning consumable 300. Substantially the entire length of the heating element 313 is received in the bore 301. The diameter of the bore 301 is substantially the same as the diameter of the heating element 313 such that the heating element 313 closely fits within the bore 301. In this way, an outer circumferential surface of the heating element 313 contacts (i.e. lies against) the inner circumferential surface 303 of the cleaning consumable 300. Thus, when the cleaning consumable 300 is moved relative to the heating element 313, when received in the cavity 314, the inner circumferential surface 303 moves across an outer surface of the heating element 313 so as to scour or abrade residue that has collected on the heating element 313 (e.g. through use of the device 306). For example, such movement may be in the form of a rotation (i.e. twisting) of the cleaning consumable 300 about the longitudinal axis of the heating element 313. This movement may be performed by a user gripping an end of the consumable 300 projecting from the cavity 314 (when the consumable 300 is received therein).

[0076] The outer circumferential surface 302 of the cleaning consumable 300 has substantially the same diameter (and shape) as the cavity 314 such that the cleaning consumable 300 substantially fills the cavity 314. In this way the cleaning consumable 300 closely fits within the cavity 314 such that the outer circumferential surface 302 of the cleaning consumable 300 contacts and lies against the inner wall 311 of the device 306. This, when

the cleaning consumable 300 is moved relative to the device 306, the outer circumferential surface 302 moves across the inner wall 311 of the device 306 so as to scour or abrade residue that has collected on the inner wall 311. Again, such movement may be in the form of rotation of the cleaning consumable about a longitudinal axis of the heating element 313.

[0077] The device 306 further comprises an electronics cavity 315. A power source, in the form of a rechargeable battery 316 (a lithium ion battery), is located in electronics cavity 315. The device 306 includes a controller (not shown) located in the electronics cavity 315, which comprises a microcontroller mounted on a printed circuit board (PCB). The controller is configured to control at least one function of the device 306. For example, the controller is configured to control the operation of the heater 312. Such control of the operation of the heater 312 may be accomplished by the controller toggling the electrical connection of the rechargeable battery 316 to the heater 312. For example, the controller is configured to control the heater 312 in response to the user depressing the button 310. Depressing the button 310 may cause the controller to allow a voltage (from the rechargeable battery 316) to be applied to the heater 312 (so as to cause the heating element 313 to be heated).

[0078] Whilst not shown, the device 306 comprise a sensor for detecting the presence of the cleaning consumable 300 in the cavity 314. The sensor is, in particular, configured to detect between the presence of a cleaning consumable 300 in the cavity 314 and a HT consumable. For example, the cleaning consumable 300 may comprise a colour indicator, bar code, magnetic strip etc. that may be detected by the sensor and that, when detected, is indicative of the cleaning consumable being received in the cavity 314. The sensor may provide a signal to the controller that is indicative of a cleaning consumable 300 (as opposed to a HT consumable) being received in the cavity 314. The controller may be configured such that, in response, the controller prevents activation of the heater 312 (i.e. even when requested by a user via the button 310. Thus, activation of the heater 312 may be prevented whilst the device 306 is being cleaned (which could otherwise present a safety issue). In some cases, the controller may instead be configured to initiate a heater protocol representative of a cleaning cycle.

[0079] The controller is also configured to control the LEDs 309 in response to (e.g. a detected) a condition of the device 306. For example, the controller may control the LEDs to indicate whether the device 306 is in an on state or an off state (e.g. one or more of the LEDs may be illuminated by the controller when the device 306 is in an on state).

[0080] 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.

[0081] 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.

[0082] 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.

[0083] Any section headings used herein are for organizational purposes only and are not to be construed as limiting the subject matter described.

[0084] 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.

[0085] 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%.

[0086] 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

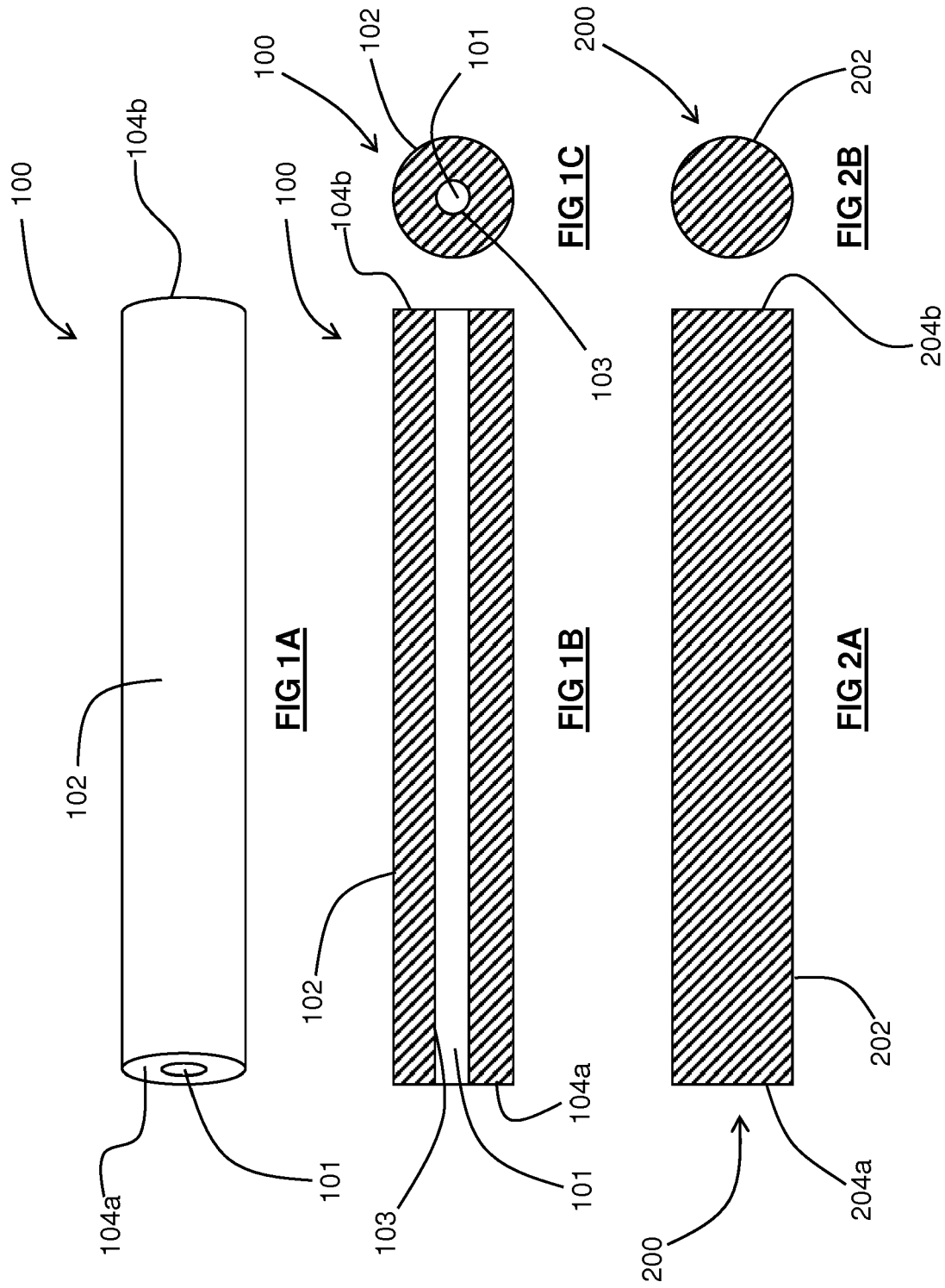
1. A cleaning consumable for cleaning a heating element of a smoking substitute device, the cleaning consumable comprising a substrate formed of cellulose monoacetate and having an elongate bore ex-

tending longitudinally at least partly therethrough for receipt of the heating element.

2. A cleaning consumable according to claim 1 that has a longitudinal length that is greater than 40 mm. 5
3. A smoking substitute system comprising:
 - a smoking substitute device comprising a body and an elongate heating element projecting along a longitudinal axis from the body; and 10
 - an elongate cleaning consumable comprising a substrate formed of cellulose monoacetate and configured for receipt of the elongate heating element therein for cleaning the heating element. 15
4. A smoking substitute system according to claim 3 wherein a longitudinal length of the cleaning consumable is greater than a longitudinal length of the heating element. 20
5. A smoking substitute system according to claim 3 or 4 wherein the cleaning consumable comprises a bore extending longitudinally therethrough. 25
6. A smoking substitute system according to claim 5 wherein the bore has a transverse cross-section that is substantially the same as a transverse cross-section of the heating element. 30
7. A smoking substitute system according to any one of claims 3 to 6 wherein the device comprises a cavity and the heating element projects into the cavity such that when the cleaning consumable is received in the cavity the heating element is inserted into the consumable. 35
8. A smoking substitute system according to claim 7 wherein the cleaning consumable substantially fills the cavity when received therein. 40
9. A smoking substitute system according to claim 7 or 8 wherein an outer surface of the cleaning consumable contacts an inner wall defining the cavity when received therein. 45
10. A smoking substitute system according to any one of claims 3 to 9 wherein the device is a heated tobacco device. 50
11. A method of cleaning a substitute smoking device, the method comprising:
 - inserting a heating element of the substitute smoking device into a cleaning consumable; 55
 - and
 - scouring the heating element by agitating the

cleaning consumable.

12. A method according to claim 11 wherein agitating the cleaning consumable comprises rotating the cleaning consumable about a longitudinal axis of the heating element.
13. A method according to claim 11 or 12 wherein the heating element projects within a cavity of the device and the method comprises inserting the cleaning consumable into the cavity for receipt of the heating element into the cleaning consumable, the method further comprising scouring one or more walls defining the cavity by agitating the cleaning consumable in the cavity.
14. A method according to claim 13 comprising scouring the heating element and the walls of the cavity concurrently.



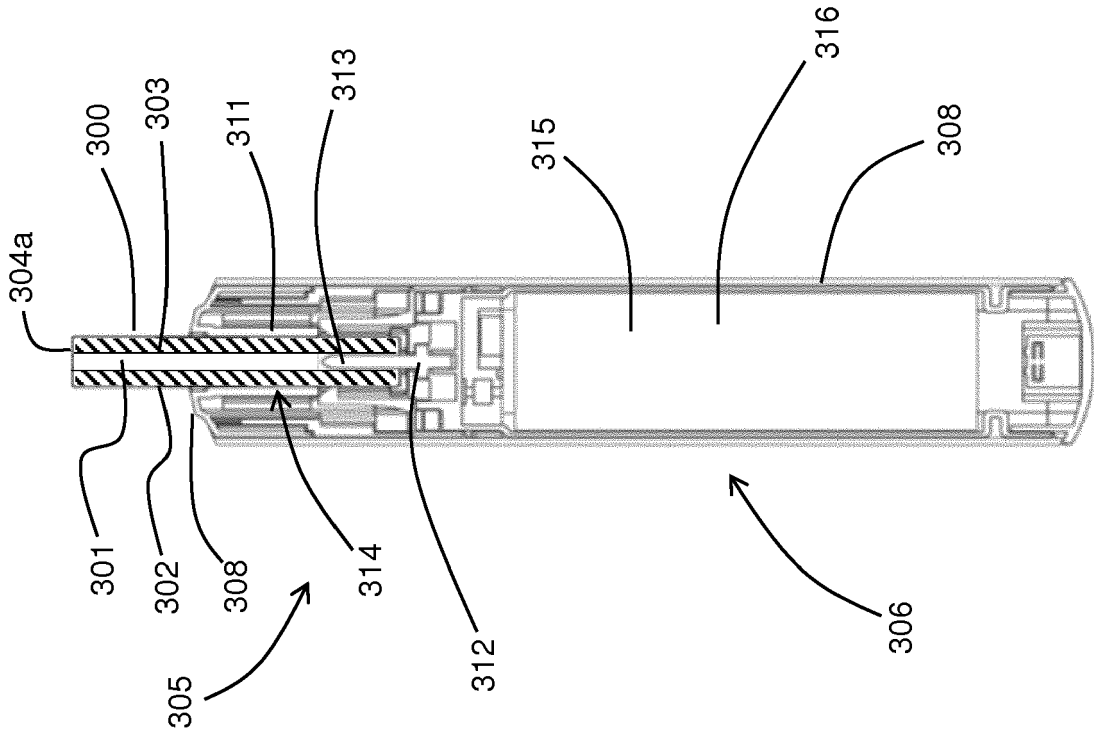


FIG 3C

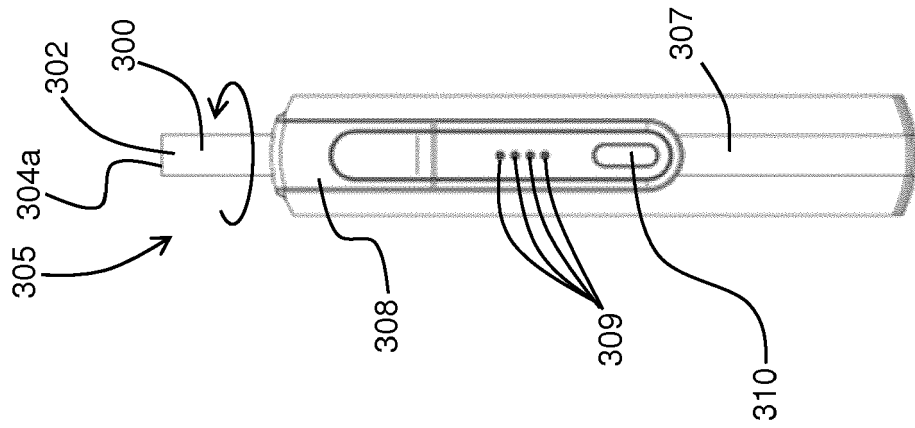


FIG 3B

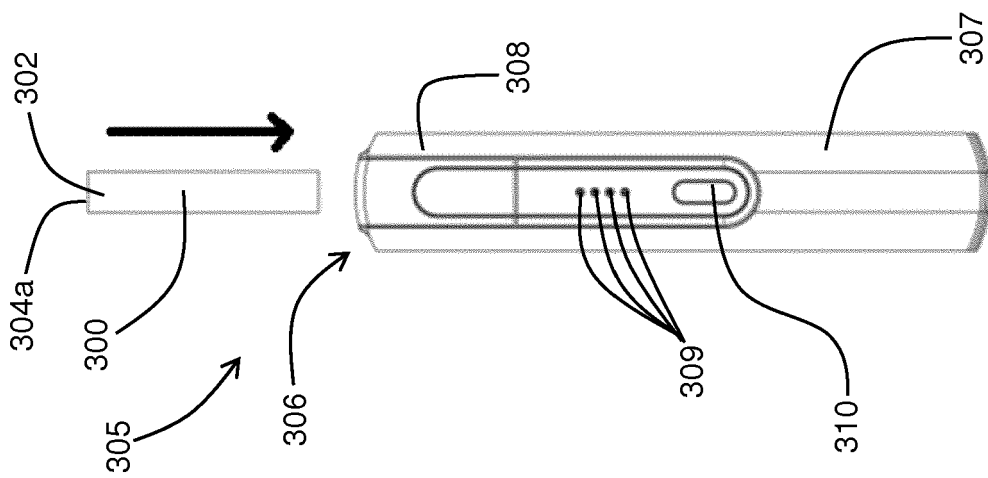


FIG 3A



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