

(19)



(11)

EP 3 711 519 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
23.09.2020 Bulletin 2020/39

(51) Int Cl.:
A24F 47/00 (2020.01)

(21) Application number: **19020149.1**

(22) Date of filing: **22.03.2019**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

- **LOMAS, Pete**
Speke,
Liverpool L24 9HP (GB)
- **FERRIE, Kate**
Speke,
Liverpool L24 9HP (GB)
- **SHENTON, Ross**
Speke,
Liverpool L24 9HP (GB)

(71) Applicant: **NERUDIA LIMITED**
Liverpool Merseyside L24 9HP (GB)

(74) Representative: **Mewburn Ellis LLP**
Aurora Building
Counterslip
Bristol BS1 6BX (GB)

(72) Inventors:
• **LORD, Chris**
Speke,
Liverpool L24 9HP (GB)

(54) SMOKING SUBSTITUTE SYSTEM

(57) A smoking substitute system includes a device comprising a body which comprises a cavity that is accessible through an opening in an outer wall of the body.

A cleaning tool comprising a base and an elongate pick extending from the base is receivable in the cavity by insertion through the opening.

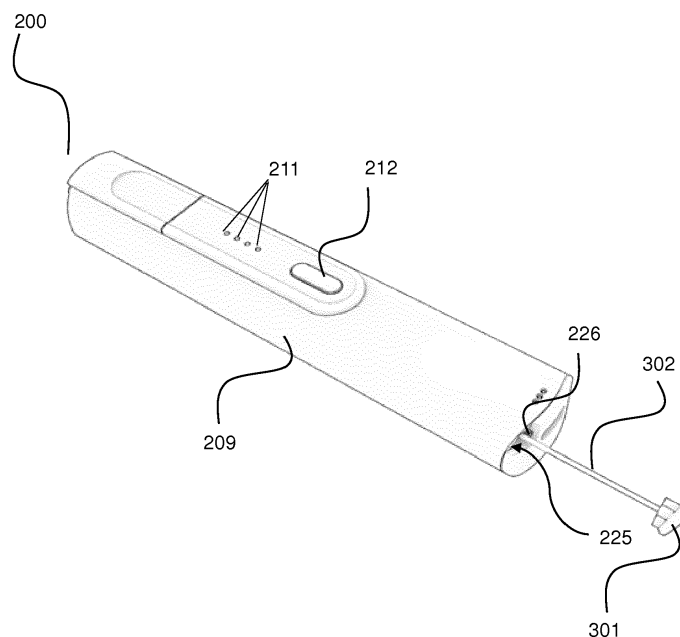


FIG 3B

EP 3 711 519 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to a smoking substitute system and particularly, although not exclusively, to a smoking substitute system comprising a device which comprises a cleaning tool to clean the 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 "consumables") that are designed to resemble a traditional cigarette and are cylindrical in form

with a mouthpiece at one end.

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

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

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

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

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

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

[0014] Such HT smoking substitute systems generate aerosols which can condense or "stick" onto parts of the device during use, which can cause the gradual blockage of parts of the device, having a detrimental effect on the user experience. 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

[0015] The present disclosure has been devised in the light of the above considerations.

SUMMARY OF THE INVENTION

[0016] At its most general, the present invention relates to a smoking substitute device having a cleaning tool secured in the device.

[0017] According to a first aspect of the present invention, there is provided a smoking substitute device, the device comprising: a body comprising a cavity that is accessible through an opening in an outer wall of the body; and a cleaning tool comprising: a base and an elongate pick extending from the base, the elongate pick receivable in the cavity by insertion through the opening.

[0018] By providing a device comprising an elongate pick which may be received through an opening in wall of the body, the invention provides a convenient means to quickly clean the device. As needed, the user can withdraw the cleaning tool from the cavity of the device and use the tool to remove any residue buildup from the device to ensure continued functioning of the device and an improved user experience. Since the tool resides within a cavity of the device when not being used, the tool is always at hand and the risk of losing the tool is reduced, which provides an advantage over the use of separate cleaning tools which do not engage with the device and which may need to be carried around separately from the device.

[0019] Optional features will now be set out. These are applicable singly or in any combination with any aspect.

[0020] Optionally, the cavity in the body comprises a tube adapted to receive the pick. Such a tube provides a barrier between the cavity and parts of the device, to ensure that the end of the pick cannot come into contact with internal parts of the device which could cause damage e.g. to delicate electronic components. In some embodiments the inner wall of the tube comprises metal, to provide a barrier of increased resilience to protect the internal components of the device.

[0021] In some embodiments, the cavity in the body may be formed parallel to the longitudinal axis of the device. This allows for accommodation of a longer cleaning tool which is then more useful for cleaning deeper internal components of the device.

[0022] In some embodiments the base may be exposed outside of the body when the cleaning tool is fully engaged in the cavity. In this way, easy access to the tool is provided for the user, to facilitate withdrawal of the cleaning tool from the device.

[0023] Optionally, a groove may be defined between the base of the cleaning tool and the body when the pick is received in cavity. Such a groove provides easier access to the base of the tool for the user, so that the user can more easily extract the cleaning tool from the device. For example, the groove may permit the user access behind the base and apply force to the base to extract the tool.

[0024] In some embodiments the groove may allow the user to grasp the pick from the cavity with a fingernail or thumbnail.

[0025] In some embodiments, the groove has a width of from 0.2 to 0.8 mm, for example 0.2 to 0.7 mm, 0.3 to 0.7 mm, 0.4 to 0.7 mm, 0.4 to 0.6 mm or 0.45 to 0.55 mm. In some embodiments, the groove is a continuation of a groove in the outer surface of the device housing, defined by a join between a base cap of the housing and a side wall. This provides an easier way to locate the tool by running a finger along the join until the position of the tool is found, and also provides a more discreet appearance since the groove which is adjacent the base of the tool to provide easy extraction blends with existing features of the device.

[0026] In some embodiments, the cleaning tool may have an enlarged base with respect to the pick. This allows the tool to include a narrow pick portion for easier cleaning of small parts, but a larger base which is easier to locate and grasp/hold during extraction of the tool or cleaning of the device.

[0027] In some embodiments, the cleaning tool may be detachable from the device.

[0028] Optionally, the cleaning tool may be located in the bottom of the device adjacent to the USB charging port.

[0029] Optionally, the pick may slide longitudinally inside the cavity and be retained in it.

[0030] In some embodiments, the elongate pick has a substantially circular cross-section. In some embodiments, the pick includes a portion of length which tapers towards the end distal the base. In this way, a more useful cleaning tool is provided with a pointed-tapered end which can more easily remove small amounts of residue from difficult-to-reach parts of the device. The circular cross-section makes insertion and withdrawal of the tool easier since exact orientation within the cavity is less important. In some embodiments, the pick comprises a first portion of length, extending from the base, of constant cross-section, followed by a terminal portion of length which tapers towards the end distal the base. This provides a better (more snug) fit between the pick and the cavity in the device, due to interference between the first portion of length and the cavity wall, while still providing the benefits of a narrow tip provided by the tapered portion.

[0031] In some embodiments, the base of the tool is adapted to conform with the local outside surface of the device when the tool is fully engaged with the device. This provides a discreet and aesthetically pleasing cleaning tool which does not interfere with the day-to-day use of the device. Additionally, this provides fewer protruding surfaces of the tool when engaged with the device, which reduces the risk that it becomes accidentally caught on an external object and removed from the device inadvertently.

[0032] In some embodiments, the pick portion of the cleaning tool has a cross-section which is less than 6 mm wide at its widest point, for example less than 5.5 mm, less than 5 mm, less than 4.5 mm or less than 4 mm. This makes the tool more useful for inserting into small

openings of the device during cleaning.

[0033] In some embodiments, the tool is made from plastics material. For example, the tool may be made from PEEK. In some embodiments, the tool (pick and base) in a single integral component made by e.g. injection moulding.

[0034] In some embodiments, an interference fit is provided between the tool and the inner wall of the cavity when the tool is fully inserted into the cavity. The interference fit prevents the tool from accidentally coming loose from the device and falling out. In some embodiments, the interference fit is between the base of the tool and part of the device. In some embodiments, the interference fit is facilitated by friction between the outside surface of the base of the cleaning tool and the outside surface of the device.

[0035] The device may comprise an elongate body. An end of the elongate body may be configured for engagement with an aerosol-forming article. For example, the body may be configured for engagement with a heated tobacco (HT) consumable (or heat-not-burn (HNB) consumable). The terms "heated tobacco" and "heat-not-burn" are used interchangeably herein to describe a consumable that is of the type that is heated rather than combusted (or are used interchangeably to describe a device for use with such a consumable). The device may comprise a cavity that is configured for receipt of at least a portion of the consumable (i.e. for engagement with the consumable). The aerosol-forming article may be of the type that comprises an aerosol former (e.g. carried by an aerosol-forming substrate).

[0036] The device may comprise a heater for heating the aerosol-forming article. The heater may comprise a heating element, which may be in the form of a rod that extends from the body of the device. The heating element may extend from the end of the body that is configured for engagement with the aerosol-forming article.

[0037] The heater (and thus the heating element) may be rigidly mounted to the body. The heating element may be elongate so as to define a longitudinal axis and may, for example, have a transverse profile (i.e. transverse to a longitudinal axis of the heating element) that is substantially circular (i.e. the heating element may be generally cylindrical). Alternatively, the heating element may have a transverse profile that is rectangular (i.e. the heater may be a "blade heater"). The heating element may alternatively be in the shape of a tube (i.e. the heater may be a "tube heater"). The heating element may take other forms (e.g. the heating element may have an elliptical transverse profile). The shape and/or size (e.g. diameter) of the transverse profile of the heating element may be generally consistent for the entire length (or substantially the entire length) of the heating element.

[0038] 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 heating element may have a diameter of between 1.5 mm and 2.5 mm, e.g. a diameter between 2 mm and 2.3 mm, e.g. a diameter of around

2.15 mm.

[0039] The heating element may be formed of ceramic. The heating element may comprise a core (e.g. a ceramic core) comprising Al₂O₃. The core of the heating element may have a diameter of 1.8 mm to 2.1 mm, e.g. between 1.9 mm and 2 mm. The heating element may comprise an outer layer (e.g. an outer ceramic layer) comprising Al₂O₃. The thickness of the outer layer may be between 160 μ m and 220 μ m, e.g. between 170 μ m and 190 μ m, e.g. around 180 μ m. The heating element may comprise a heating track, which may extend longitudinally along the heating element. The heating track may be sandwiched between the outer layer and the core of the heating element. The heating track may comprise tungsten and/or rhenium. The heating track may have a thickness of around 20 μ m.

[0040] The heating element may be located in the cavity (of the device), and may extend (e.g. along a longitudinal axis) 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 heater) may be less than the depth of the cavity. Hence, the heating element may extend for only a portion of the length of the cavity. That is, the heating element may not extend through (or beyond) the opening of the cavity.

[0041] The heating element may be configured for insertion into an aerosol-forming article (e.g. a HT consumable) when an aerosol-forming article is received in the cavity. In that respect, a distal end (i.e. distal from a base of the heating element where it is mounted to the device) of the heating element may comprise a tapered portion, which may facilitate insertion of the heating element into the aerosol-forming article. The heating element may fully penetrate an aerosol-forming article when the aerosol-forming article is received in the cavity. That is, the entire length, or substantially the entire length, of the heating element may be received in the aerosol-forming article.

[0042] The heating element may have a length that is less than, or substantially the same as, an axial length of an aerosol-forming substrate forming part of an aerosol-forming article (e.g. a HT consumable). Thus, when such an aerosol-forming article is engaged with the device, the heating element may only penetrate the aerosol-forming substrate, rather than other components of the aerosol-forming article. The heating element may penetrate the aerosol-forming substrate for substantially the entire axial length of the aerosol-forming-substrate of the aerosol-forming article. Thus, heat may be transferred from (e.g. an outer circumferential surface of) the heating element to the surrounding aerosol-forming substrate, when penetrated by the heating element. That is, heat may be transferred radially outwardly (in the case of a cylindrical heating element) or e.g. radially inwardly (in the case of a tube heater).

[0043] Where the heater is a tube heater, the heating element of the tube heater may surround at least a portion of the cavity. When the portion of the aerosol-forming article is received in the cavity, the heating element may

surround a portion of the aerosol-forming article (i.e. so as to heat that portion of the aerosol-forming article). In particular, the heating element may surround an aerosol forming substrate of the aerosol-forming article. That is, when an aerosol-forming article is engaged with the device, the aerosol forming substrate of the aerosol-forming article may be located adjacent an inner surface of the (tubular) heating element. When the heating element is activated, heat may be transferred radially inwardly from the inner surface of the heating element to heat the aerosol forming substrate.

[0044] The cavity may comprise a (e.g. circumferential) wall (or walls) and the (tubular) heating element may extend around at least a portion of the wall(s). In this way, the wall may be located between the inner surface of the heating element and an outer surface of the aerosol-forming article. The wall (or walls) of the cavity may be formed from a thermally conductive material (e.g. a metal) to allow heat conduction from the heating element to the aerosol-forming article. Thus, heat may be conducted from the heating element, through the cavity wall (or walls), to the aerosol-forming substrate of an aerosol-forming article received in the cavity.

[0045] In some embodiments the device may comprise a cap disposed at the end of the body that is configured for engagement with an aerosol-forming article. Where the device comprises a heater having a heating element, 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.

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

[0047] The cap may be configured such that when an aerosol-forming article is engaged with the device (e.g. received in the cavity), only a portion of the aerosol-forming article is received in the cavity. That is, a portion of the aerosol-forming article (not received in the cavity) may protrude from (i.e. extend beyond) the opening. This (protruding) portion of the aerosol-forming article may be a terminal (e.g. mouth) end of the aerosol-forming article, which may be received in a user's mouth for the purpose of inhaling aerosol formed by the device.

[0048] The device may comprise a power source or may be connectable to a power source (e.g. a power

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

[0049] The device may comprise an input connection (e.g. a USB port, Micro USB port, USB-C port, etc.). The input connection may be configured for connection to an external source of electrical power, such as a mains electrical supply outlet. The input connection may, in some cases, be used as a substitute for an internal power source (e.g. battery or rechargeable battery). That is, the input connection may be electrically connectable to the heater (for providing power to the heater). Hence, in some forms, the input connection may form at least part of the power source of the device.

[0050] Where the power source comprises a rechargeable power source (such as a rechargeable battery), the input connection may be used to charge and recharge the power source.

[0051] 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.

[0052] In some embodiments the UI may additionally or alternatively comprise output means to convey information to the user. In some embodiments the output means may comprise a light to indicate a condition of the device (and/or the aerosol-forming article) to the user. The condition of the device (and/or aerosol-forming article) indicated to the user may comprise a condition indicative of the operation of the heater. For example, the condition may comprise whether the heater is in an off state or an on state. In some embodiments, the UI unit may comprise at least one of a button, a display, a touchscreen, 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.

[0053] The device may further comprise a puff sensor (e.g. airflow sensor), which form part of the input means of the UI. The puff sensor may be configured to detect a user drawing on an end (i.e. a terminal (mouth) end) of the aerosol-forming article. The puff sensor may, for example, be a pressure sensor or a microphone. The puff sensor may be configured to produce a signal indicative of a puff state. The signal may be indicative of the user drawing (an aerosol from the aerosol-forming article) such that it is e.g. in the form of a binary signal. Alternatively or additionally, the signal may be indicative of a

characteristic of the draw (e.g. a flow rate of the draw, length of time of the draw, etc).

[0054] The device may comprise a controller, or may be connectable to a controller that may be configured to control at least one function of the device. The controller may comprise a microcontroller that may e.g. be mounted on a printed circuit board (PCB). The controller may also comprise a memory, e.g. non-volatile memory. The memory may include instructions, which, when implemented, may cause the controller to perform certain tasks or steps of a method. Where the device comprises an input connection, the controller may be connected to the input connection.

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

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

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

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

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

[0060] The device may comprise a wireless interface

configured to communicate wirelessly (e.g. via Bluetooth (e.g. a Bluetooth low-energy connection) or Wi-Fi) with an external device. Similarly, the input connection may be configured for wired connection to an external device so as to provide communication between the device and the external device.

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

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

[0063] According to a second aspect of the present invention, there is provided a smoking substitute device, the device comprising a cleaning tool having a base and an elongate pick extending from the base, the pick comprising at least a portion of length of cylindrical cross-section.

[0064] Optionally the pick of the cleaning tool may have a tapered tip.

[0065] According to a third aspect of the present invention, there is provided a smoking substitute device, the device comprising: a body comprising a cavity, and a cleaning tool comprising an elongate cleaning portion extending from an enlarged base, the elongate cleaning portion receivable in the cavity and wherein, when the cleaning portion is received therein, the base remains outside of the cavity to allow removal of the cleaning portion from the cavity by grasping the base.

[0066] According to a fourth aspect of the invention there is provided a smoking substitute device, the device comprising: a body comprising a cavity that is accessible through an opening in an outer wall of the body; wherein the cavity is adapted to receive a cleaning tool comprising a base and an elongate pick extending from the base. The invention includes the combination of the aspects and preferred features described except where such a combination is clearly impermissible or expressly avoided.

[0067] 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

[0068] 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 a schematic of a smoking substitute system;

Figure 1B is a schematic of a variation of the smoking substitute system of Figure 1A;

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

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

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

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

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

Figure 3A is a perspective view of the smoking substitute device with cleaning tool secured in the device.

Figure 3B is a perspective view of the smoking substitute device with cleaning tool detached from the device.

Figure 3C is a perspective view of the cleaning tool.

Figure 3D is a front view of the cleaning tool.

DETAILED DESCRIPTION OF THE INVENTION

[0069] 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.

[0070] Figure 1A is a schematic providing a general overview of a smoking substitute system 100. The system 100 includes a substitute smoking device 101 and an aerosol-forming article in the form of a consumable 102, which comprises an aerosol former 103. The system is configured to vaporise the aerosol former by heating

the aerosol former 103 (so as to form a vapour/aerosol for inhalation by a user).

[0071] In the illustrated system, the heater 104 forms part of the consumable 102 and is configured to heat the aerosol former 103. In this variation, the heater 104 is electrically connectable to the power source 105, for example, when the consumable 102 is engaged with the device 101. Heat from the heater 104 vaporises the aerosol former 103 to produce a vapour. The vapour subsequently condenses to form an aerosol, which is ultimately inhaled by the user.

[0072] The system 100 further comprises a power source 105 that forms part of the device 101. In other embodiments the power source 105 may be external to (but connectable to) the device 101. The power source 105 is electrically connectable to the heater 104 such that it is able to supply power to the heater 104 (i.e. for the purpose of heating the aerosol former 103). Thus, control of the electrical connection of the power source 105 to the heater 104 provides control of the state of the heater 104. The power source 105 may be a power store, for example a battery or rechargeable battery (e.g. a lithium ion battery).

[0073] The system 100 further comprises an I/O module comprising a connector 106 (e.g. in the form of a USB port, Micro USB port, USB-C port, etc.). The connector 106 is configured for connection to an external source of electrical power, e.g. a mains electrical supply outlet. The connector 106 may be used in substitution for the power source 105. That is the connector 106 may be electrically connectable to the heater 104 so as to supply electricity to the heater 104. In such embodiments, the device may not include a power source, and the power source of the system may instead comprise the connector 106 and an external source of electrical power (to which the connector 106 provides electrical connection).

[0074] In some embodiments, the connector 106 may be used to charge and recharge the power source 105 where the power source 105 includes a rechargeable battery.

[0075] The system 100 also comprises a user interface (UI) 107. Although not shown, the UI 107 may include input means to receive commands from a user. The input means of the UI 107 allows the user to control at least one aspect of the operation of the system 100. The input means may, for example, be in the form of a button, touch-screen, switch, microphone, etc.

[0076] The UI 107 also comprises output means to convey information to the user. The output means may, for example, comprise lights (e.g. LEDs), a display screen, speaker, vibration generator, etc.

[0077] The system 100 further comprises a controller 108 that is configured to control at least one function of the device 101, and a memory 109 coupled to the controller 108. In the illustrated embodiment, the controller 108 is a component of the device 101, but in other embodiments may be separate from (but connectable to) the device 101. The controller 108 is configured to control

at least one function of the device 101. The memory 109 stores controller-executable instructions that causes the controller 109 to perform one or more functions. The controller 108 is configured to control the operation of the heater 104 and, for example, may be configured to control the voltage applied from the power source 105 to the heater 104. The controller 108 may be configured to toggle the supply of power to the heater 104 between an on state, in which the full output voltage of the power source 105 is applied to the heater 104, and an off state, in which the no voltage is applied to the heater 104.

[0078] Although not shown, the system 100 may also comprise a voltage regulator to regulate the output voltage from the power source 105 to form a regulated voltage. The regulated voltage may then be applied to the heater 104.

[0079] In addition to being connected to the heater 104, the controller 108 is operatively connected to the UI 107. Thus, the controller 108 may receive an input signal from the input means of the UI 107. Similarly, the controller 108 may transmit output signals to the UI 107. In response, the output means of the UI 107 may convey information, based on the output signals, to a user. The controller also comprises a memory 109, which is a non-volatile memory. The memory 109 includes instructions, which, when implemented, cause the controller to perform certain tasks or steps of a method.

[0080] Figure 1B is a schematic showing a variation of the system 100 of Figure 1A. In the system 100' of Figure 1B, the heater 104 forms part of the device 101, rather than the consumable 102. In this variation, the heater 104 is electrically connected to the power source 105.

[0081] Figures 2A and 2B illustrate a heated-tobacco (HT) smoking substitute system 200. The system 200 is an example of the systems 100, 100' described in relation to Figures 1A or 1B. System 200 includes an HT device 201 and an HT consumable 202. The description of Figures 1A and 1B above is applicable to the system 200 of Figures 2A and 2B, and will thus not be repeated.

[0082] The device 201 and the consumable 202 are configured such that the consumable 202 can be engaged with the device 201. Figure 2A shows the device 201 and the consumable 202 in an engaged state, whilst Figure 2B shows the device 201 and the consumable 202 in a disengaged state.

[0083] The device 201 comprises a body 209 and cap 210. In use the cap 210 is engaged at an end of the body 209. Although not apparent from the figures, the cap 210 is moveable relative to the body 209. In particular, the cap 210 is slideable and can slide along a longitudinal axis of the body 209.

[0084] The device 201 comprises an output means (forming part of the UI of the device 201) in the form of a plurality of light-emitting diodes (LEDs) 211 arranged linearly along the longitudinal axis of the device 201 and on an outer surface of the body 209 of the device 201. A button 212 is also arranged on an outer surface of the body 209 of the device 201 and is axially spaced (i.e.

along the longitudinal axis) from the plurality of LEDs 211.

[0085] Figure 2C show a detailed section view of the consumable 202 of the system 200. The consumable 202 generally resembles a cigarette. In that respect, the consumable 202 has a generally cylindrical form with a diameter of 7 mm and an axial length of 70 mm. The consumable 202 comprises an aerosol forming substrate 213, a terminal filter element 214, an upstream filter element 215 and a spacer element 216. In other embodiments, the consumable may further comprise a cooling element. A cooling element may exchange heat with vapour that is formed by the aerosol-forming substrate 213 in order to cool the vapour so as to facilitate condensation of the vapour.

[0086] The aerosol-forming substrate 213 is substantially cylindrical and is located at an upstream end 217 of the consumable 202, and comprises the aerosol former of the system 200. In that respect, the aerosol forming substrate 213 is configured to be heated by the device 201 to release a vapour. The released vapour is subsequently entrained in an airflow flowing through the aerosol-forming substrate 213. The airflow is produced by the action of the user drawing on a downstream 218 (i.e. terminal or mouth) end of the consumable 202.

[0087] In the present embodiment, the aerosol forming substrate 213 comprises tobacco material that may, for example, include any suitable parts of the tobacco plant (e.g. leaves, stems, roots, bark, seeds and flowers). The tobacco may comprise one or more of leaf tobacco, stem tobacco, tobacco powder, tobacco dust, tobacco derivatives, expanded tobacco, homogenised tobacco, shredded tobacco, extruded tobacco, cut rag tobacco and/or reconstituted tobacco (e.g. slurry recon or paper recon). For example, the aerosol-forming substrate 213 may comprise a gathered sheet of homogenised (e.g. paper/slurry recon) tobacco or gathered shreds/strips formed from such a sheet.

[0088] In order to generate an aerosol, the aerosol forming substrate 213 comprises at least one volatile compound that is intended to be vaporised/aerosolised and that may provide the user with a recreational and/or medicinal effect when inhaled. The aerosol-forming substrate 213 may further comprise one or more additives. For example, such additives may be in the form of humectants (e.g. propylene glycol and/or vegetable glycerine), flavourants, fillers, aqueous/non-aqueous solvents and/or binders.

[0089] The terminal filter element 214 is also substantially cylindrical, and is located downstream of the aerosol forming substrate 213 at the downstream end 218 of the consumable 202. The terminal filter element 214 is in the form of a hollow bore filter element having a bore 219 (e.g. for airflow) formed therethrough. The diameter of the bore 219 is 2 mm. The terminal filter element 214 is formed of a porous (e.g. monoacetate) filter material. As set forth above, the downstream end 218 of the consumable 202 (i.e. where the terminal filter 214 is located) forms a mouthpiece portion of the consumable 202 upon

which the user draws. Airflow is drawn from the upstream end 217, thorough the components of the consumable 202, and out of the downstream end 218. The airflow is driven by the user drawing on the downstream end 218 (i.e. the mouthpiece portion) of the consumable 202.

[0090] The upstream filter element 215 is located axially adjacent to the aerosol-forming substrate 213, between the aerosol-forming substrate 213 and the terminal filter element 214. Like the terminal filter 214, the upstream filter element 215 is in the form of a hollow bore filter element, such that it has a bore 220 extending axially therethrough. In this way, the upstream filter 215 may act as an airflow restrictor. The upstream filter element 215 is formed of a porous (e.g. monoacetate) filter material. The bore 220 of the upstream filter element 215 has a larger diameter (3 mm) than the terminal filter element 214.

[0091] The spacer 216 is in the form of a cardboard tube, which defines a cavity or chamber between the upstream filter element 215 and the terminal filter element 214. The spacer 216 acts to allow both cooling and mixing of the vapour/aerosol from the aerosol-forming substrate 213. The spacer has an external diameter of 7 mm and an axial length of 14 mm.

[0092] Although not apparent from the figure, the aerosol-forming substrate 213, upstream filter 215 and spacer 216 are circumscribed by a paper wrapping layer. The terminal filter 214 is circumscribed by a tipping layer that also circumscribes a portion of the paper wrapping layer (so as to connect the terminal filter 214 to the remaining components of the consumable 202). The upstream filter 215 and terminal filter 214 are circumscribed by further wrapping layers in the form of plug wraps.

[0093] Returning now to the device 201, Figure 2D illustrates a detailed view of the end of the device 201 that is configured to engage with the consumable 202. The cap 210 of the device 201 includes an opening 221 to an internal cavity 222 (more apparent from Figure 2D) defined by the cap 210. The opening 221 and the cavity 222 are formed so as to receive at least a portion of the consumable 202. During engagement of the consumable 202 with the device 201, a portion of the consumable 202 is received through the opening 221 and into the cavity 222. After engagement (see Figure 2B), the downstream end 218 of the consumable 202 protrudes from the opening 221 and thus also protrudes from the device 201. The opening 221 includes laterally disposed notches 226. When a consumable 202 is received in the opening 221, these notches 226 remain open and could, for example, be used for retaining a cover in order to cover the end of the device 201.

[0094] Figure 2E shows a cross section through a central longitudinal plane through the device 201. The device 201 is shown with the consumable 202 engaged therewith.

[0095] The device 201 comprises a heater 204 comprising heating element 223. The heater 204 forms part of the body 209 of the device 201 and is rigidly mounted

to the body 209. In the illustrated embodiment, the heater 204 is a rod heater with a heating element 223 having a circular transverse profile. In other embodiments the heater may be in the form of a blade heater (e.g. heating element with a rectangular transverse profile) or a tube heater (e.g. heating element with a tubular form).

[0096] The heating element 223 of the heater 204 projects from an internal base of the cavity 222 along a longitudinal axis towards the opening 221. As is apparent from the figure, the length (i.e. along the longitudinal axis) of the heating element is less than a depth of the cavity 222. In this way, the heating element 223 does not protrude from or extend beyond the opening 221.

[0097] When the consumable 202 is received in the cavity 222 (as is shown in Figure 2E), the heating element 223 penetrates the aerosol-forming substrate 213 of the consumable 202. In particular, the heating element 223 extends for nearly the entire axial length of the aerosol-forming substrate 213 when inserted therein. Thus, when the heater 204 is activated, heat is transferred radially from an outer circumferential surface the heating element 223 to the aerosol-forming substrate 213.

[0098] The device 201 further comprises an electronics cavity 224. A power source, in the form of a rechargeable battery 205 (a lithium ion battery), is located in electronics cavity 224.

[0099] The device 201 includes a connector (i.e. forming part of an IO module of the device 201) in the form of a USB port 206. The connector may alternatively be, for example, a micro-USB port or a USB-C port for examples. The USB port 206 may be used to recharge the rechargeable battery 205.

[0100] The device 201 includes a controller (not shown) located in the electronics cavity 224. The controller comprises a microcontroller mounted on a printed circuit board (PCB). The USB port 206 is also connected to the controller 208 (i.e. connected to the PCB and microcontroller).

[0101] The controller 208 is configured to control at least one function of the device 202. For example, the controller 208 is configured to control the operation of the heater 204. Such control of the operation of the heater 204 may be accomplished by the controller toggling the electrical connection of the rechargeable battery 205 to the heater 204. For example, the controller 208 is configured to control the heater 204 in response to a user depressing the button 212. Depressing the button 212 may cause the controller to allow a voltage (from the rechargeable battery 205) to be applied to the heater 204 (so as to cause the heating element 223 to be heated).

[0102] The controller is also configured to control the LEDs 211 in response to (e.g. a detected) a condition of the device 201 or the consumable 202. For example, the controller may control the LEDs to indicate whether the device 201 is in an on state or an off state (e.g. one or more of the LEDs may be illuminated by the controller when the device is in an on state).

[0103] The device 201 comprises a further input means

(i.e. in addition to the button 212) in the form of a puff sensor 225. The puff sensor 225 is configured to detect a user drawing (i.e. inhaling) at the downstream end 218 of the consumable 202. The puff sensor 225 may, for example, be in the form of a pressure sensor, flowmeter or a microphone. The puff sensor 225 is operatively connected to the controller 208 in the electronics cavity 224, such that a signal from the puff sensor 225, indicative of a puff state (i.e. drawing or not drawing), forms an input to the controller 208 (and can thus be responded to by the controller 208).

[0104] Figures 3A and 3B are a perspective views of the smoking substitute device 201 specifically showing the bottom view of the device 201. Referring to Figure 3B, the body 209 of the device 201 comprises a cavity 225 which is formed parallel to longitudinal axis of the device 201 and is configured to receive a cleaning tool 300 inside the cavity 225. The cavity 225 in the device 201 includes a tube (not shown in figure) to receive the cleaning tool 300. The tube is made of metal; however, the tube may be formed of any material. The cleaning tool 300 sits inside tube to prevent damage to internal components of the device 201 such as internal electronics. The cavity 225 in the body 209 is accessible through an opening 226 formed in the end cap 227 of the device 201.

[0105] Figure 3C is a perspective view of the cleaning tool 300 and Figure 3D is a front view of the cleaning tool 300. The cleaning tool 300 allows users to quickly clean the base of the heating element conveniently. The cleaning tool 300 would be located in the bottom of the device 201 adjacent to a USB charger 229. The cleaning tool 300 is detachable from the device 201 and allows user to remove the cleaning tool 300 when required. The cleaning tool 300 gives the user an opportunity to quick clean the device 201. For example, the user may use the cleaning tool 300 to access the consumable cavity through opening in the cap, or the base of the rod heater through window exposed by lifting the cap. The cleaning tool may also be easily replaced easily if lost as it is made of simple plastic components such as PEEK.

[0106] The cleaning tool 300 comprises a base 301 and an elongate pick 302 extending from the base 301. The cleaning tool 300 has an enlarged base 301 with respect to the pick 302. The pick 302 of the cleaning tool 300 is of cylindrical shape having constant cross section for the portion of length which extends from the base to a location close to the end distal the base. The cleaning tool 300 also comprises a tapered tip 303 which is not sharp enough to damage the rod heater but provides an effective means to target the areas which requires cleaning. The base also includes a shoulder section 304 of a cross-sectional size slightly larger than the pick, which sits within an outer portion of the cavity 225 when the cleaning tool is fully engaged with the device. Due to the corresponding shapes and sizes of the shoulder section 304 and the outermost section of the cavity 225, an interference fit between the cleaning tool 300 and the de-

vice 201 is provided to hold the cleaning tool in place and prevent inadvertent removal or loss.

[0107] Referring to Figure 3A which illustrates the perspective view of the device when the cleaning tool is secured in the cavity the base 301 of the cleaning tool is exposed outside of the body 209 and the pick 302 along with the tapered tip 303 is secured inside the cavity when the pick is received in cavity. As is evident from the Figure, the surface of the base 301 is adapted in shape and size to conform with the surrounding portion of the surface of the base cap 227 of the device 201. This creates a smooth transition from the surface of the device to the surface of the base of the cleaning tool when the tool is engaged. This is not only aesthetically pleasing but reduces the risk that the base 301 of the tool 300 becomes accidentally caught on an external object and removed from the device. A groove 228 is defined between the base 301 of the cleaning tool 300 and the body 209 when the cleaning tool is received in cavity 225. The groove 228 has a width of around 0.5 mm and a portion 228A of the groove 228 is aligned with the join 230 between the base cap 227 of the device 201 and the body 209 of the body of the device 201. Together, the groove at the join 230 and the groove 228A circumscribe the device 201 between the base cap 227 and the body 209. The groove 228 allows user to grasp the cleaning tool 300 from the cavity with a fingernail and detach the cleaning tool from the device so to clean the device. The base 301 of the cleaning tool 300 may be gripped by the user at the time of removing the cleaning tool 300 from the device.

[0108] When the user wishes to extract the cleaning tool 300 from the device 201 in order to clean the device, the user can use a thumbnail, fingernail or small object such as a coin which they can insert into the portion 228A of the groove 228 around the base 301 of the tool 300. Pushing the base 301 away from the device 201 will then overcome the friction in the interference fit between the shoulder 304 and the cavity 225 and extract the cleaning tool slightly from the device. The tool will then be "loose" within the cavity 225 and can be easily withdrawn from the device by hand. After use, the user inserts the tip 303 of the pick 302 into the cavity 225 and pushes the tool 300 into the cavity. A firm push to fully engage the tool will create the interference fit between the shoulder 304 of the tool 300 and the inner wall of the cavity 225, to prevent inadvertent removal of the tool 300.

[0109] 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.

[0110] 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.

[0111] 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.

[0112] Any section headings used herein are for organizational purposes only and are not to be construed as limiting the subject matter described.

[0113] 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.

[0114] 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%.

[0115] The words "preferred" and "preferably" are used herein refer to embodiments of the invention that may provide certain benefits under some circumstances. It is to be appreciated, however, that other embodiments may also be preferred under the same or different circumstances. The recitation of one or more preferred embodiments therefore does not mean or imply that other embodiments are not useful, and is not intended to exclude other embodiments from the scope of the disclosure, or from the scope of the claims.

Claims

1. A smoking substitute device, the device comprising: a body comprising a cavity that is accessible through an opening in an outer wall of the body; and a cleaning tool comprising:
 - a base and
 - an elongate pick extending from the base,
 - the elongate pick receivable in the cavity by insertion through the opening.

2. The device according to claim 1, wherein the cavity comprises a tube adapted to receive the pick.
3. The device according to claim 1 or 2, wherein the cavity in the body is formed parallel to the longitudinal axis of the device.
4. The device according to any one of claims 1 to 3, wherein the base is exposed outside of the body when the cleaning tool is received in cavity.
5. The device according to any one of claims 1 to 4, wherein a groove is defined between the base of the cleaning tool and the body of the device when the pick is engaged in the cavity; and wherein the groove optionally allows a user to grasp the pick from the cavity with a fingernail or a thumbnail.
6. The device according to any one of claims 1 to 5, wherein the base of the cleaning tool is enlarged with respect to the pick.
7. The device according to any one of claims 1 to 6, wherein the cleaning tool is detachable from the device.
8. The device according to any one of claims 1 to 7, wherein the cleaning tool is located in the bottom of the device adjacent to a USB charging port.
9. The device according to any one of claims 1 to 8, wherein the pick slides longitudinally inside the cavity and retained in it.
10. The device according to any one of claims 1 to 9, wherein the elongate pick has a substantially circular cross-section and/or a portion of length which tapers towards and end of the pick distal the base.
11. The device according to any one of claims 1 to 10, wherein the base of the cleaning tool is adapted to conform with the local outside surface of the device when the tool is fully engaged with the device.
12. The device according to any one of claims 1 to 11, wherein an interference fit is provided between the cleaning tool and the inner wall of the cavity when the tool is fully inserted into the cavity.
13. A smoking substitute device, the device comprising:
 - a cleaning tool having a base and an elongate pick extending from the base;
 - the pick comprising at least a portion of length of cylindrical cross-section.
14. The device according to claim 13, wherein the cleaning tool has a tapered tip.

15. A smoking substitute device, the device comprising a body comprising a cavity that is accessible through an opening in an outer wall of the body; wherein the cavity is adapted to receive a cleaning tool comprising a base and an elongate pick extending from the base.

10

15

20

25

30

35

40

45

50

55

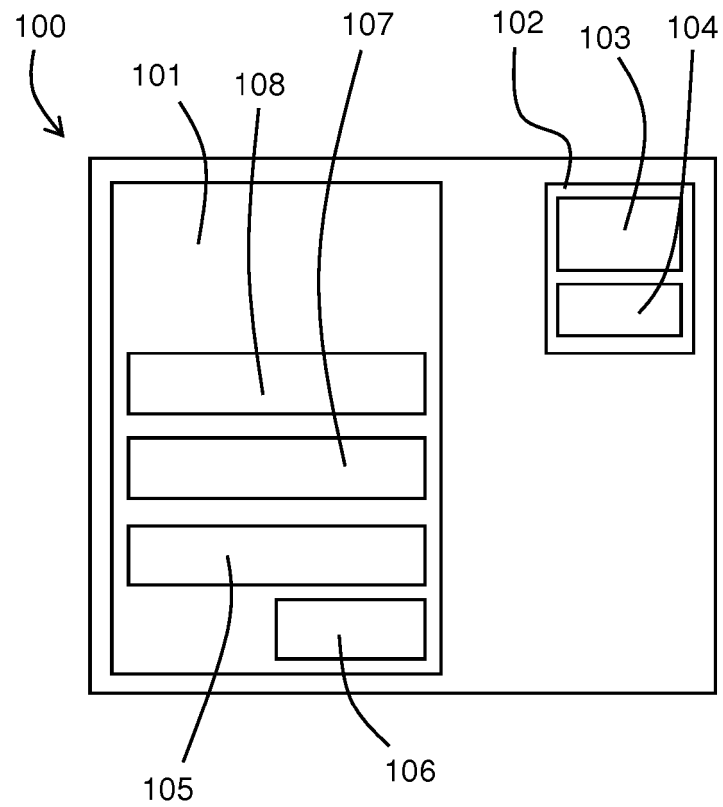


FIG1A

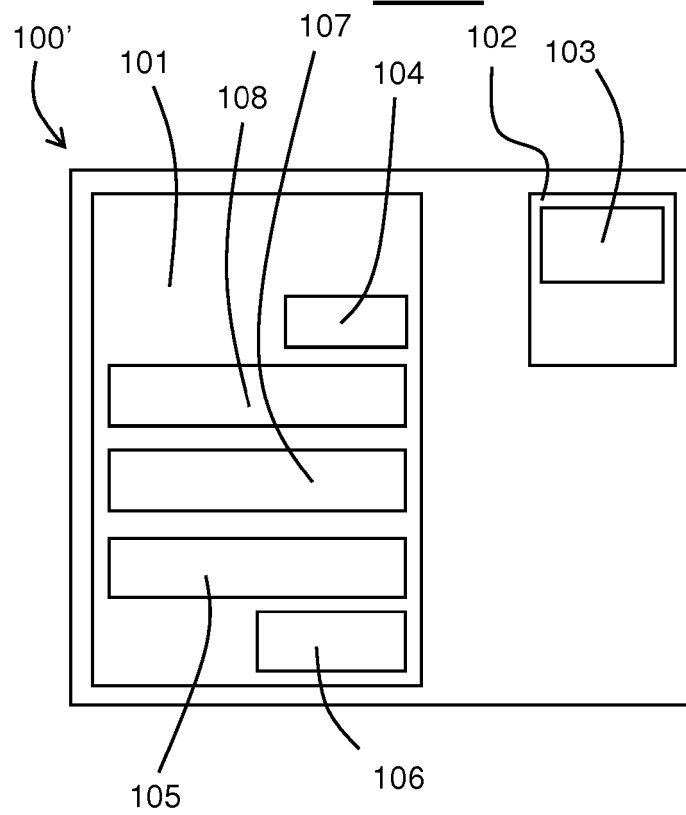


FIG1B

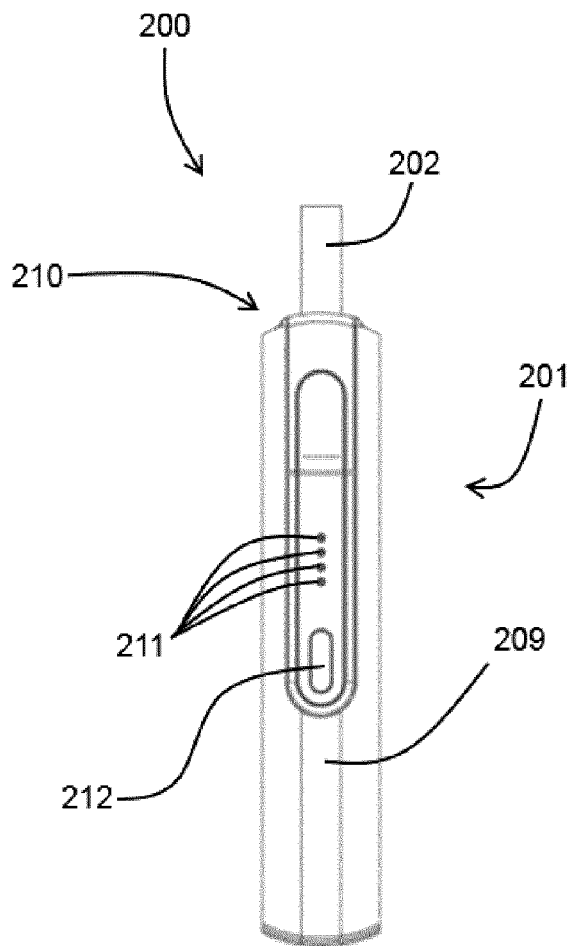


FIG 2A

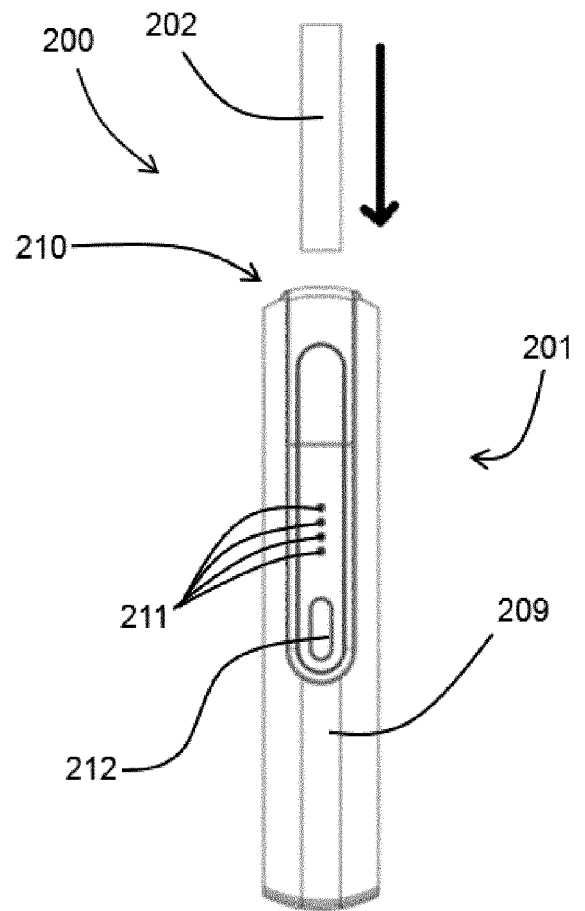
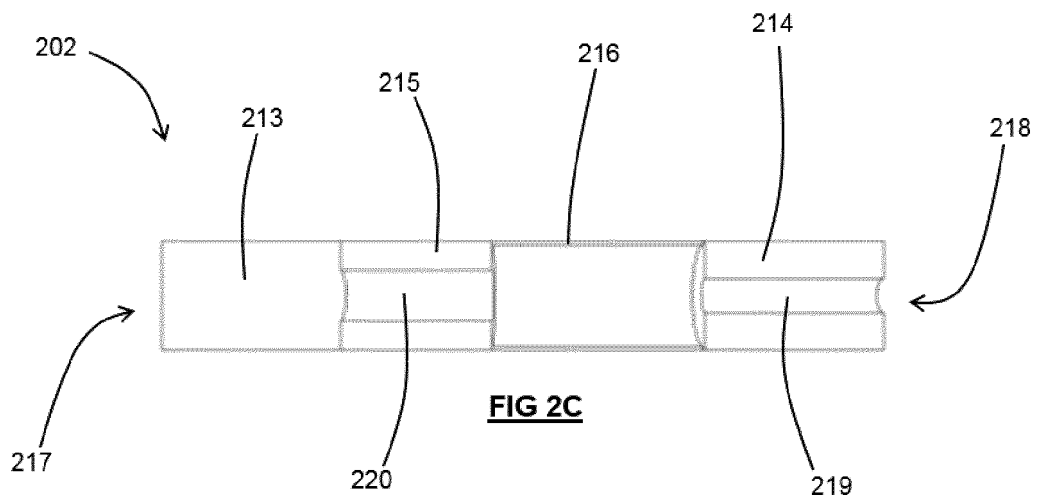
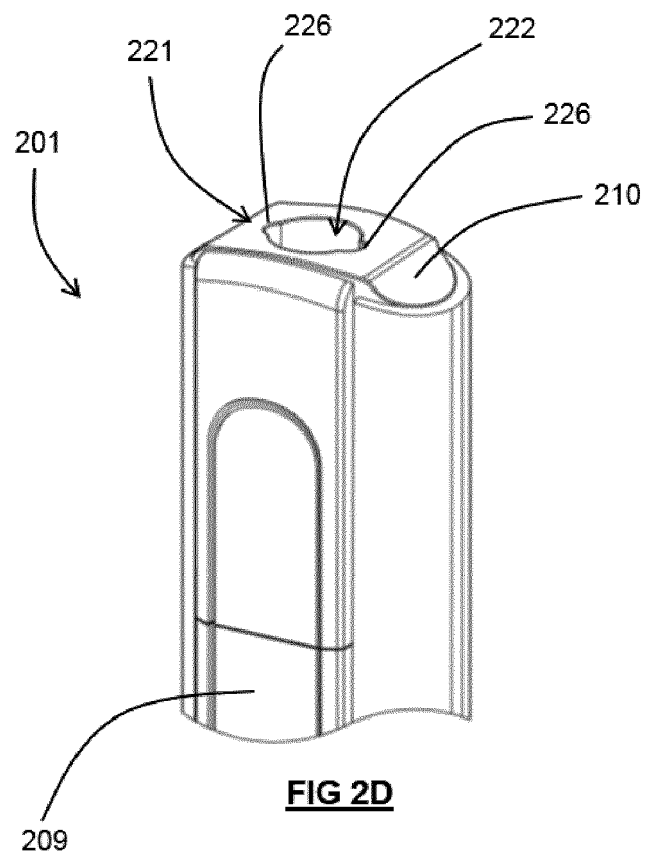


FIG 2B





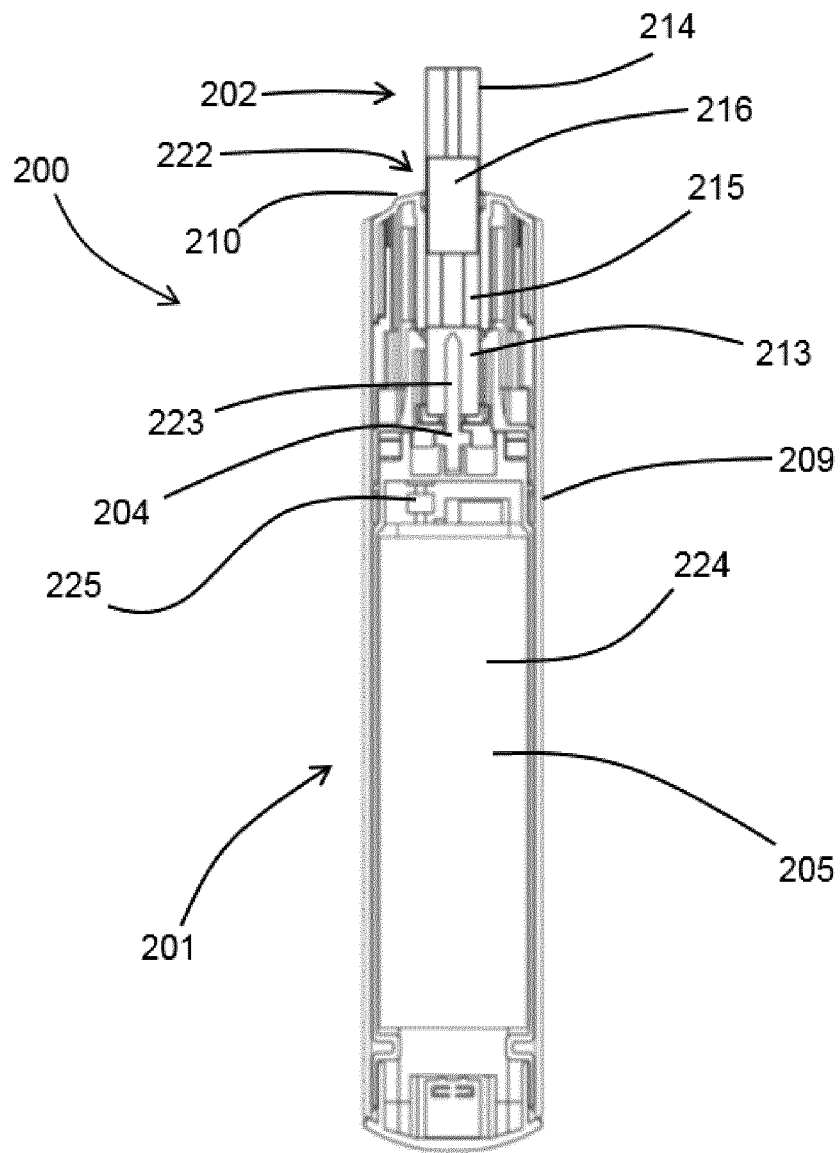


FIG 2E

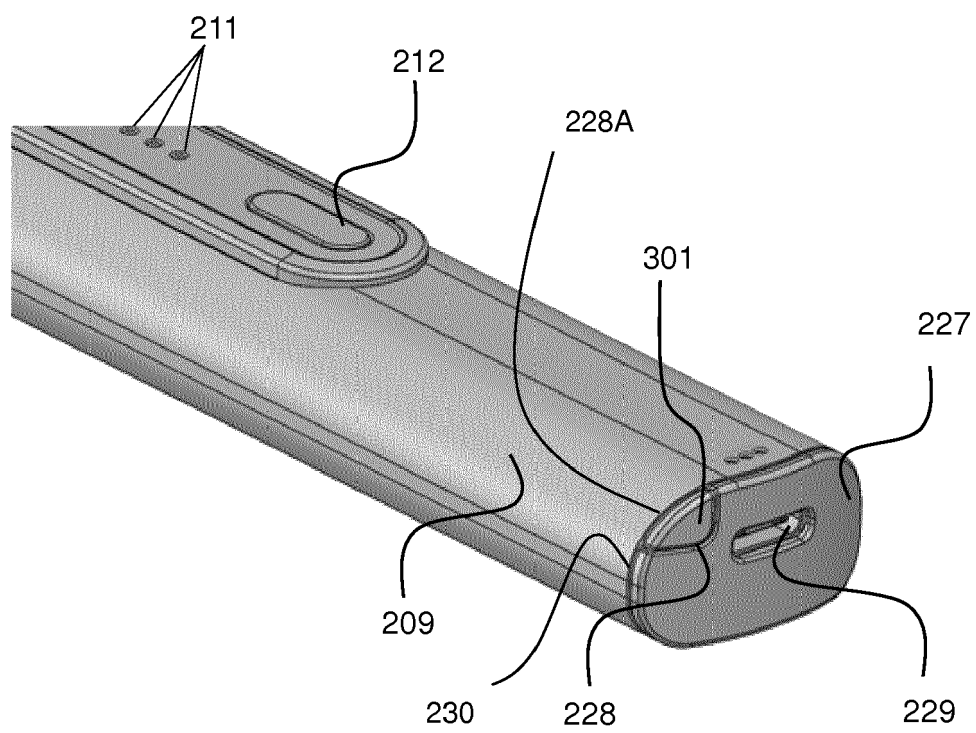


FIG 3A

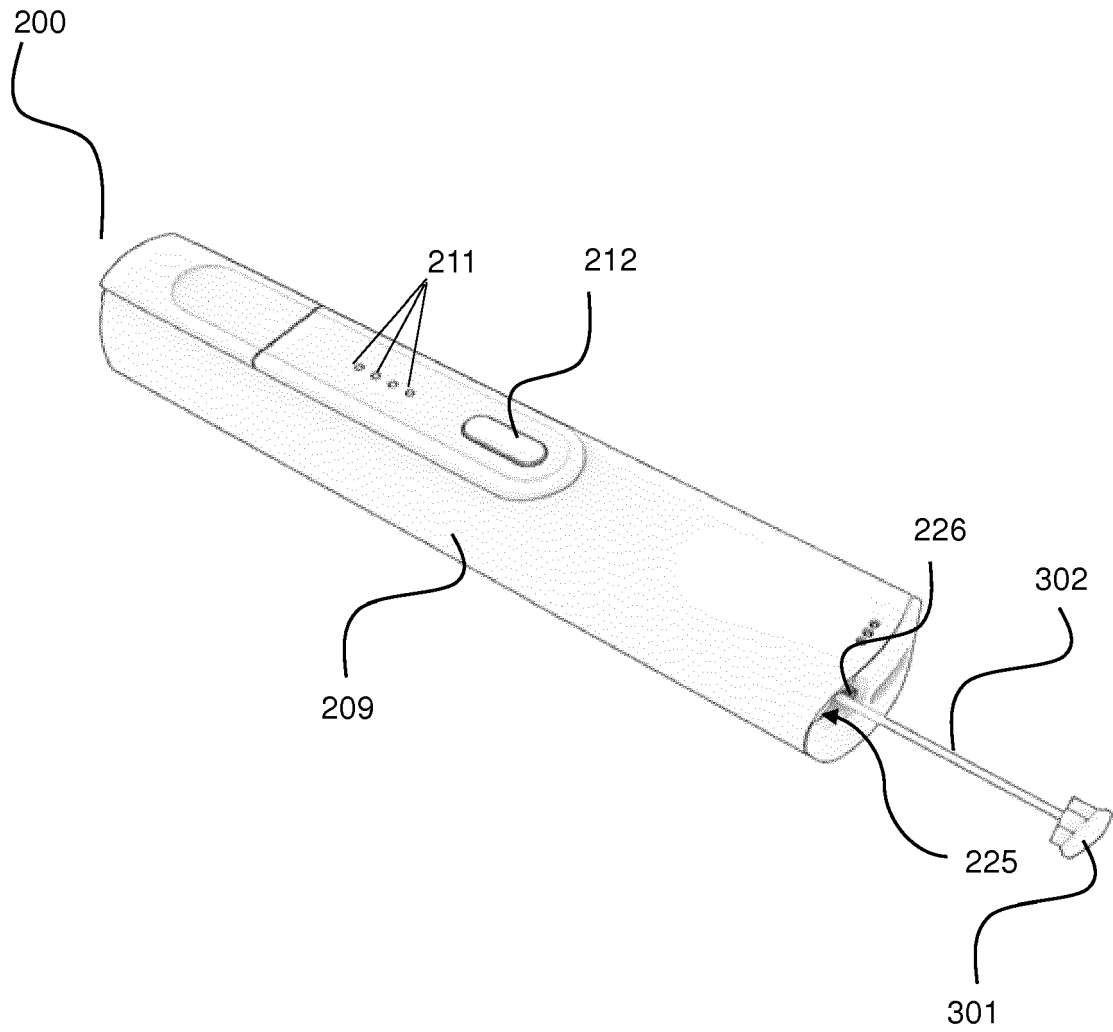


FIG 3B

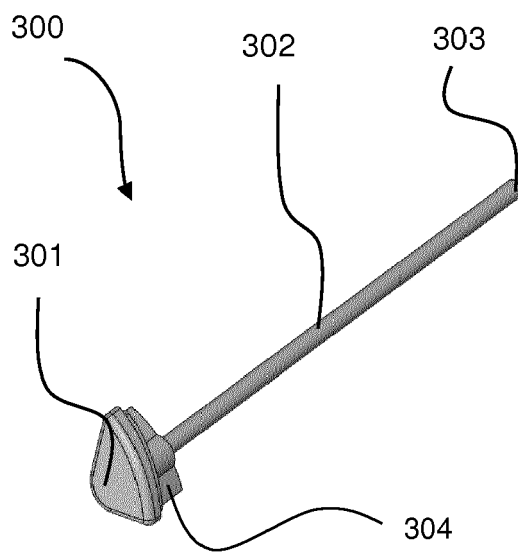


FIG 3C

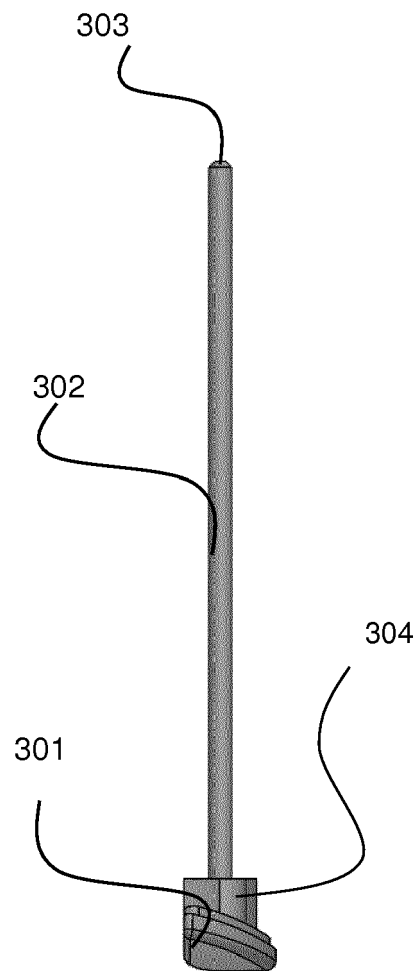


FIG 3D



EUROPEAN SEARCH REPORT

 Application Number
 EP 19 02 0149

5

10

15

20

25

30

35

40

45

50

55

2

EPO FORM 1503 03.82 (P04C01)

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 2 201 850 A1 (PHILIP MORRIS PROD [CH]) 30 June 2010 (2010-06-30)	1-4,7,9,10,15	INV. A24F47/00
Y	* paragraph [0052] - paragraph [0061] *	5,6,8,11-14	
Y	----- US 944 418 A (DREW JACK [US]) 28 December 1909 (1909-12-28) * the whole document *	5,6,8,11-14	
X	----- WO 2019/030166 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 14 February 2019 (2019-02-14) * the whole document *	1,3,4,7	
A		2,5,6,8-15	
X	----- WO 2017/194763 A2 (BRITISH AMERICAN TOBACCO (INVESTMENTS) LTD [GB]) 16 November 2017 (2017-11-16) * page 10, line 4 - line 6 *	15	
			TECHNICAL FIELDS SEARCHED (IPC)
			A24F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 6 September 2019	Examiner Cardan, Cosmin
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			

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

EP 19 02 0149

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.

06-09-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2201850 A1	30-06-2010	AR 075320 A1	23-03-2011
		AU 2009332645 A1	07-07-2011
		BR PI0923531 A2	26-01-2016
		CA 2748219 A1	01-07-2010
		CN 102264251 A	30-11-2011
		CO 6390090 A2	29-02-2012
		EP 2201850 A1	30-06-2010
		EP 2378905 A1	26-10-2011
		IL 213435 A	31-12-2014
		JP 5548703 B2	16-07-2014
		JP 2012513750 A	21-06-2012
		KR 20110096548 A	30-08-2011
		MY 156132 A	15-01-2016
		NZ 593341 A	27-09-2013
		RU 2011130819 A	27-01-2013
		SG 172779 A1	29-08-2011
		TW 201029590 A	16-08-2010
		UA 102423 C2	10-07-2013
		US 2010163063 A1	01-07-2010
		US 2014196736 A1	17-07-2014
		US 2016374402 A1	29-12-2016
		US 2017055589 A1	02-03-2017
		WO 2010073122 A1	01-07-2010
		ZA 201104216 B	29-02-2012

US 944418 A	28-12-1909	NONE	

WO 2019030166 A1	14-02-2019	NONE	

WO 2017194763 A2	16-11-2017	AR 108446 A1	22-08-2018
		AU 2017263072 A1	22-11-2018
		BR 112018073458 A2	26-03-2019
		CA 3023777 A1	16-11-2017
		CL 2018003195 A1	03-05-2019
		CN 109195463 A	11-01-2019
		EP 3454680 A2	20-03-2019
		JP 2019521656 A	08-08-2019
		KR 20180134974 A	19-12-2018
		TW 201742555 A	16-12-2017
		US 2019208816 A1	11-07-2019
		WO 2017194763 A2	16-11-2017

EPO FORM P0459

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