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(54) **AN AEROSOL GENERATING ARTICLE AND AN AEROSOL GENERATING SYSTEM**

(57) An aerosol generating article (10) is configured for use with an electrically-operated aerosol generating device (40, 60) having a heater (58, 62). The aerosol generating article (10) has a distal end (12) and a mouth end (14) downstream of the distal end (12). The aerosol generating article (10) comprises an aerosol generating substrate (16) at the distal end (12), an air outlet (28) at the mouth end (14) and a primary air inlet (24) upstream

of the aerosol generating substrate (16). The aerosol generating article (10) also comprises a secondary air inlet (26) downstream of the aerosol generating substrate (16). The secondary air inlet (26) is selectively blocked when the aerosol generating article (10) is positioned in an aerosol generating device (40, 60) to substantially prevent airflow from the secondary air inlet (26) to the air outlet (28).

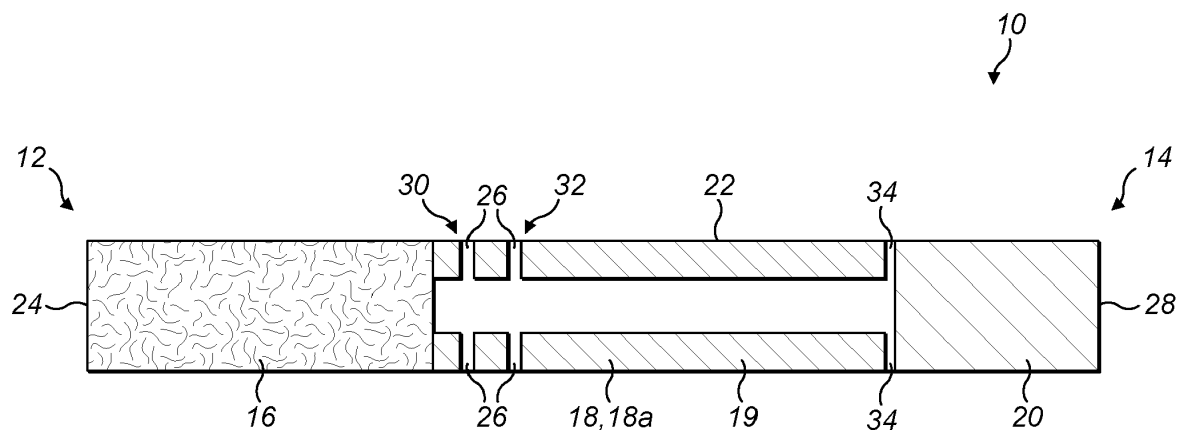


FIG. 1

Description

Technical Field

[0001] The present disclosure relates generally to aerosol generating articles, and more particularly to an aerosol generating article for use with an aerosol generating device for heating the aerosol generating article to generate an aerosol for inhalation by a user. Embodiments of the present disclosure also relate to an aerosol generating system comprising an aerosol generating device and an aerosol generating article. The present disclosure is particularly applicable to aerosol generating articles for use with a portable (hand-held) aerosol generating device, which may be self-contained and low temperature.

Technical Background

[0002] The popularity and use of reduced-risk or modified-risk devices (also known as aerosol generating devices or vapour generating devices) has grown rapidly in recent years as an alternative to the use of traditional tobacco products. Various devices and systems are available that heat or warm aerosol generating substances to generate an aerosol for inhalation by a user.

[0003] A commonly available reduced-risk or modified-risk device is the heated substrate aerosol generating device, or so-called heat-not-burn device. Devices of this type generate an aerosol or vapour by heating an aerosol generating substrate to a temperature typically in the range 150°C to 300°C. Heating the aerosol generating substrate to a temperature within this range, without burning or combusting the aerosol generating substrate, generates a vapour which typically cools and condenses to form an aerosol for inhalation by a user of the device.

[0004] Currently available aerosol generating devices can use one of a number of different approaches to provide heat to the aerosol generating substrate, including resistive heating and induction heating. Whichever approach is used to heat the aerosol generating substrate, it can be convenient to provide the aerosol generating substrate in the form of an aerosol generating article that is configured for use with an aerosol generating device. Aerosol generating articles are known in the art and typically comprise an aerosol generating substrate positioned at a distal end of the aerosol generating article and a filter positioned at the proximal (mouth) end.

[0005] It is conceivable that a user may inadvertently attempt to ignite the aerosol generating article in a conventional manner, using a flame or other ignition source. There is, therefore, a need to provide an aerosol generating article, for use with an aerosol generating device, which has a reduced susceptibility to ignition using a flame or other ignition source.

Summary of the Disclosure

[0006] According to a first aspect of the present disclosure, there is provided an aerosol generating article configured for use with an electrically-operated aerosol generating device having a heater, the aerosol generating article having a distal end and a mouth end downstream of the distal end, the aerosol generating article comprising:

an aerosol generating substrate at the distal end;
an air outlet at the mouth end; and
a primary air inlet upstream of the aerosol generating substrate and a secondary air inlet downstream of the aerosol generating substrate;
wherein the secondary air inlet is selectively blocked when the aerosol generating article is positioned in an aerosol generating device to substantially prevent airflow from the secondary air inlet to the air outlet.

[0007] According to a second aspect of the present disclosure, there is provided an aerosol generating system comprising:

an aerosol generating article having a distal end and a mouth end downstream of the distal end, the aerosol generating article comprising:

an aerosol generating substrate at the distal end;
an air outlet at the mouth end;
a primary air inlet upstream of the aerosol generating substrate and a
secondary air inlet downstream of the aerosol generating substrate;

an electrically-operated aerosol generating device including a cavity for receiving at least part of the aerosol generating article and a heater for heating the aerosol generating substrate;
wherein the secondary air inlet is substantially blocked when at least part of the aerosol generating article is positioned in the cavity to substantially prevent airflow from the secondary air inlet to the air outlet.

[0008] The aerosol generating article is configured for use with an aerosol generating device for heating the aerosol generating substrate, without burning the aerosol generating substrate, to volatilise at least one component of the aerosol generating substrate and thereby generate a heated vapour which cools and condenses to form an aerosol for inhalation by a user of the aerosol generating device. The aerosol generating device is a hand-held, portable, device.

[0009] In general terms, a vapour is a substance in the gas phase at a temperature lower than its critical temperature, which means that the vapour can be condensed to a liquid by increasing its pressure without reducing the temperature, whereas an aerosol is a suspension of fine solid particles or liquid droplets, in air or another gas. It should, however, be noted that the terms 'aerosol' and

'vapour' may be used interchangeably in this specification, particularly with regard to the form of the inhalable medium that is generated for inhalation by a user.

[0010] The secondary air inlet is not blocked or obstructed prior to positioning the aerosol generating article in an aerosol generating device. In addition, the aerosol generating substrate presents a higher resistance-to-draw than the secondary air inlet. Hence, if a user draws on the mouth end of the aerosol generating article when it is not positioned in an aerosol generating device, air is essentially drawn into the article through the secondary air inlet whilst no or very little air is drawn through the primary air inlet. Thus, the air stream bypasses the aerosol generating substrate and there is insufficient airflow through the aerosol generating substrate to permit ignition and/or sustain combustion of the aerosol generating substrate. This reduces the likelihood of the user being able to ignite the aerosol generating substrate, for example using an external ignition source, such as a flame, applied to the distal end.

[0011] The secondary air inlet may be positioned closer to the distal end than to the mouth end. This positioning facilitates selective blocking of the secondary air inlet when the aerosol generating article is positioned in an aerosol generating device, for example when the aerosol generating article is inserted into a cavity, e.g., a heating chamber, of an aerosol generating device.

[0012] The aerosol generating article may include a wrapper. The wrapper may circumscribe the aerosol generating substrate and may extend between the distal end and the mouth end to form a rod. The wrapper may comprise a material which is substantially non-electrically conductive and non-magnetically permeable and may, for example, comprise a paper wrapper, e.g., comprising cigarette paper. The use of a wrapper may facilitate manufacture and handling of the aerosol generating article and may enhance aerosol generation.

[0013] The secondary air inlet may extend through the wrapper. A reliable airflow route is, therefore, provided from the secondary air inlet to the air outlet when the aerosol generating article is not positioned in an aerosol generating device.

[0014] The aerosol generating article may include a plurality of secondary air inlets. The plurality of secondary air inlets may be spaced circumferentially around the wrapper. The aerosol generating article may include first and second rows of circumferentially spaced secondary air inlets in the wrapper. The second row may be positioned downstream of the first row. A reliable airflow route is thus provided between the secondary air inlets and the air outlet, for example even in the unlikely event that some of the secondary air inlets become unexpectedly blocked. A low resistance-to-draw may also be achieved when a plurality of secondary air inlets are provided, thereby ensuring that there is substantially no airflow from the primary air inlet to the air outlet when the aerosol generating article is not positioned in an aerosol generating device.

[0015] The wrapper may cooperate with an inner sur-

face of a cavity of an aerosol generating device when at least part of the aerosol generating article is positioned in the cavity to substantially block the secondary air inlet. The secondary air inlet is thus reliably blocked when the aerosol generating article is positioned in an aerosol generating device, thus ensuring that when a user draws on the mouth end, air flows through the primary air inlet and not the secondary air inlet(s). This ensures that the air flows through the aerosol generating substrate and that an acceptable quantity of vapour is generated.

[0016] The aerosol generating article may include a vapour cooling element which may be positioned in the wrapper downstream of the aerosol generating substrate. The vapour cooling element promotes cooling of the vapour as it flows from the aerosol generating substrate towards the mouth end to form an aerosol with suitable characteristics for inhalation by a user. The secondary air inlet may be provided in the vapour cooling element. The secondary air inlet in the vapour cooling element may be aligned with the secondary air inlet in the wrapper. The vapour cooling element may comprise a hollow tube, e.g., a hollow paper tube, which may have a thickness greater than a thickness of the wrapper. The secondary air inlet may be provided in a wall of the hollow tube. Manufacture of aerosol generating articles according to the present disclosure is thereby facilitated.

[0017] The aerosol generating article may comprise a mouthpiece filter positioned at the mouth end. The filter may, for example, comprise cellulose acetate fibres and/or paper. The filter may comprise one or more filter segments. Each filter segment may be individually wrapped with a wrapper and the filter segments may be further combined by a combining wrapper.

[0018] The aerosol generating article may further comprise ventilation holes between the mouth end and the secondary air inlet. The ventilation holes are thus arranged in an area of the aerosol generating article where they are not blocked when the aerosol generating article is positioned in an aerosol generating device. The ventilation holes may allow an aerosol with different characteristics to be generated during use of the aerosol generating article in an aerosol generating device. The ventilation holes may have an open surface area lower than an open surface area of the secondary air inlet. Thus, the ventilation holes provide a higher resistance-to-draw than the secondary air inlet such that air tends to flow through the secondary air inlet to the air outlet if a user draws on the mouth end when the aerosol generating article is not positioned in an aerosol generating device. It will be understood that the resistance-to-draw is dependent upon the size of the ventilation holes.

[0019] The aerosol generating substrate may comprise a non-liquid aerosol generating material, for example any type of solid or semi-solid material. Example types of aerosol generating substrate include powder, granules, pellets, shreds, strands, particles, gel, strips, loose leaves, cut leaves, cut filler, porous material, foam material or sheets. The aerosol generating substrate may

comprise plant derived material and in particular, may comprise tobacco. It may advantageously comprise re-constituted tobacco, for example including tobacco and any one or more of cellulose fibres, tobacco stalk fibres and inorganic fillers such as CaCO₃.

[0020] Consequently, the aerosol generating device with which the aerosol generating articles are intended for use may be referred to as a "heated tobacco device", a "heat-not-burn tobacco device", a "device for vaporising tobacco products", and the like, with this being interpreted as a device suitable for achieving these effects. The features disclosed herein are equally applicable to devices which are designed to vaporise any aerosol generating substrate.

[0021] The aerosol generating substrate may comprise a plug of aerosol generating material. That is, the aerosol generating substrate may comprise an aerosol generating plug. The aerosol generating substrate may comprise a tobacco plug.

[0022] As noted above, the aerosol generating article may be formed substantially in the shape of a rod, and may broadly resemble a cigarette, having a tubular region with an aerosol generating substrate arranged in a suitable manner. The mouthpiece filter may be in coaxial alignment with the aerosol generating substrate. One or more vapour collection regions, cooling regions (e.g., a vapour cooling element as described above), and other structures may also be included in some designs.

[0023] The aerosol generating substrate may comprise an aerosol-former. Examples of aerosol-formers include polyhydric alcohols and mixtures thereof such as glycerine or propylene glycol. Typically, the aerosol generating substrate may comprise an aerosol-former content of between approximately 5% and approximately 50% on a dry weight basis. In some embodiments, the aerosol generating substrate may comprise an aerosol-former content of between approximately 10% and approximately 20% on a dry weight basis, and possibly approximately 15% on a dry weight basis.

[0024] Upon heating, the aerosol generating substrate may release volatile compounds. The volatile compounds may include nicotine and/or flavour compounds such as tobacco flavouring.

[0025] The heater may be an internal heater which is inserted in the aerosol generating substrate. For example, it may comprise a heating blade or pin.

[0026] The heater may comprise an external heater, for example to heat the aerosol generating substrate through the wrapper. For example, the heater may comprise a heating tube comprising a chamber dimensioned to at least receive the aerosol generating substrate of the aerosol generating article.

[0027] The heater may comprise a resistive heater. The resistive heater may comprise a resistive heating element, for example a resistive heating blade or a resistive heating tube.

[0028] The heater may comprise an inductively heatable susceptor and the aerosol generating device may

comprise an electromagnetic field generator, such as an induction coil, arranged to generate an alternating electromagnetic field for inductively heating the inductively heatable susceptor. This arrangement provides a particularly convenient way to heat the aerosol generating substrate using induction heating.

[0029] The induction coil may comprise a Litz wire or a Litz cable. It will, however, be understood that other materials could be used. The induction coil may be substantially helical in shape and may extend around a heating chamber in which the aerosol generating article is positioned in use. The circular cross-section of a helical induction coil may, for example, facilitate the insertion of the aerosol generating article comprising the aerosol generating substrate and optionally one or more of said inductively heatable susceptors, into the heating chamber and ensures uniform heating of the aerosol generating substrate.

[0030] The inductively heatable susceptor may comprise one or more, but not limited, of aluminium, iron, nickel, stainless steel and alloys thereof, e.g. Nickel Chromium or Nickel Copper. With the application of an electromagnetic field in its vicinity, the susceptor may generate heat due to eddy currents and magnetic hysteresis losses resulting in a conversion of energy from electromagnetic to heat.

[0031] The induction coil may be arranged to operate in use with a fluctuating electromagnetic field having a magnetic flux density of between approximately 20mT and approximately 2.0T at the point of highest concentration.

[0032] The aerosol generating device may include a power source and circuitry which may be configured to operate at a high frequency. The power source and circuitry may be configured to operate at a frequency of between approximately 80 kHz and 500 kHz, possibly between approximately 150 kHz and 250 kHz, and possibly at approximately 200 kHz. The power source and circuitry could be configured to operate at a higher frequency, for example in the MHz range, depending on the type of inductively heatable susceptor that is used.

[0033] The cavity of the aerosol generating device may comprise blocking means configured for obstructing the secondary air inlet when the aerosol generating substrate of the article is in a heating position in the cavity. The blocking means may be stationary or retractable. The blocking means may comprise at least one resilient ring.

Brief Description of the Drawings

[0034]

Figure 1 is diagrammatic cross-sectional view of an aerosol generating article illustrating an airflow route from a plurality of secondary air inlets to an air outlet; Figure 2 is a diagrammatic cross-sectional view of a first example of an aerosol generating system comprising a first example of an electrically-operated aer-

osol generating device and the aerosol generating article illustrated in Figure 1; and

Figure 3 is a diagrammatic cross-sectional view of a second example of an aerosol generating system comprising a second example of an electrically-operated aerosol generating device and the aerosol generating article illustrated in Figure 1.

Detailed Description of Embodiments

[0035] Embodiments of the present disclosure will now be described by way of example only and with reference to the accompanying drawings.

[0036] Referring to Figure 1, there is shown diagrammatically an example of an aerosol generating article 10. The aerosol generating article 10 is elongate and substantially cylindrical and is of a so-called "stick" type. The aerosol generating article 10 has a distal (or upstream) end 12 and a mouth (or downstream) end 14.

[0037] The aerosol generating article 10 comprises the following elements arranged sequentially and in co-axial alignment in a downstream direction, in other words from the distal end 12 to the mouth end 14: an aerosol generating substrate 16, an optional vapour cooling element 18, and an optional filter 20, for example comprising cellulose acetate fibres. The elements are all assembled inside a wrapper 22 to form a rod, and the wrapper 22 holds the elements in position to form the aerosol generating article 10. The wrapper 22 is substantially non-electrically conductive and non-magnetically permeable, and typically comprises a paper wrapper, e.g., cigarette paper.

[0038] The aerosol generating substrate 16 comprises a solid or semi-solid material (i.e. a non-liquid material) and may comprise plant derived material, and in particular tobacco. The aerosol generating substrate 16 typically comprises a tobacco plug. The aerosol generating substrate 16 may include an aerosol-former, such as glycerine or propylene glycol, to facilitate the generation of a vapour or aerosol when heated.

[0039] The vapour cooling element 18 typically comprises a hollow paper tube 18a having a thickness which is greater than the thickness of the paper wrapper 22. As heated vapour flows through the vapour cooling element 18 in the downstream direction, from the aerosol generating substrate 16 towards the mouth end 14, the vapour cools and condenses to form an aerosol with suitable characteristics for inhalation by a user. The vapour cooling element 18 (e.g. hollow paper tube 18a) may contact the aerosol generating substrate 16 at a first end as shown in Figure 1.

[0040] The aerosol generating article 10 includes: a primary air inlet 24 at the distal end 12, upstream of the aerosol generating substrate 16; a plurality of secondary air inlets 26 downstream of the aerosol generating substrate 16; and an air outlet 28 at the mouth end 14. The primary air inlet 24 is provided by an open end of the wrapper 22. The secondary air inlets 26 are provided as

first and second rows 30, 32 of circumferentially spaced secondary air inlets 26, with the second row 32 being positioned downstream of the first row 30. In the illustrated example, the secondary air inlets 26 extend through the paper wrapper 22 and through a wall 19 of the hollow paper tube 18a. The air outlet 28 is provided by a downstream end of the filter 20.

[0041] The aerosol generating article 10 may also include ventilation holes 34. The ventilation holes 34 are positioned between the secondary air inlets 26 and the air outlet 28, and can be provided in the wall 19 of the hollow paper tube 18a as shown and/or in the filter 20. The ventilation holes 34 can comprise a multitude of circumferentially spaced perforations which have an open surface area that is lower than an open surface area of the secondary air inlets 26.

[0042] If a user draws on the mouth end 14 of the aerosol generating article 10 when it is not positioned in an aerosol generating device, i.e., as shown in Figure 1, air is drawn into the article 10 through the secondary air inlets 26 as shown diagrammatically by the arrows because the secondary air inlets 26 provide a lower resistance-to-draw than the aerosol generating substrate 16. Thus, air does not flow through the primary air inlet 24 and through the aerosol generating substrate 16. This helps to prevent ignition of the aerosol generating substrate 16, for example using an external ignition source, such as a flame, applied to the distal end 12 of the aerosol generating article 10.

[0043] As will be described in further detail below, the secondary air inlets 26 are blocked when the aerosol generating article 10 is positioned in an aerosol generating device 40, 60 to substantially prevent airflow from the secondary air inlets 26 to the air outlet 28. Thus, when a user draws on the mouth end 14 of the aerosol generating article 10, air is drawn into the article 10 through the primary air inlet 24, and hence through the aerosol generating substrate 16. This facilitates vapour generation when the aerosol generating substrate 16 is heated during use of the aerosol generating article 10 in an aerosol generating device 40, 60.

[0044] In more detail, and referring to Figure 2, there is shown diagrammatically a first example of an aerosol generating system 1. The aerosol generating system 1 comprises a first example of an electrically-operated aerosol generating device 40 and an aerosol generating article 10 as described above. The aerosol generating device 40 has a proximal end 42 and a distal end 44 and comprises a device body 46 which includes a power source 48 and a controller 50. The power source 48 typically comprises one or more batteries which could, for example, be inductively rechargeable.

[0045] The aerosol generating device 40 comprises a substantially cylindrical heating chamber 52 having air inlets 52a. The heating chamber 52 is positioned at the proximal end 42 of the aerosol generating device 40 and is arranged to receive the substantially cylindrical aerosol generating article 10 via an opening 56. The aerosol gen-

erating device 40 includes a plurality of air inlets 54 formed in the device body 46 which deliver air to the heating chamber 52 via the air inlets 52a.

[0046] The aerosol generating article 10 is positioned in the heating chamber 52 by inserting the distal end 12 into the heating chamber 52 via the opening 56. The heating chamber 52 and aerosol generating article 10 are dimensioned so that the mouth end 14, and in particular the filter 20, projects from the heating chamber 52 at the proximal end 42 of the aerosol generating device 40. As can be clearly seen in Figure 2, the wrapper 22 of the aerosol generating article 10 cooperates with an inner surface 53a of a cavity 53 defined by the heating chamber 52 thereby substantially blocking the secondary air inlets 26 and preventing air flow from the secondary air inlets 26 to the air outlet 28. The inner surface 53a of the cavity 53 may further comprise dedicated blocking means, such as one or more sealing rings, positioned about the secondary air inlets 26 to ensure a hermetic closure of the secondary air inlets 26. The blocking means may be resilient to slightly retract (e.g., be pushed) when the aerosol generating article 10 is inserted in the cavity 53.

[0047] The aerosol generating device 40 comprises a resistive heating element 58 mounted on the device body 46 so that it projects into the heating chamber 52. Thus, the heating element 58 is inserted into the aerosol generating substrate 16 during insertion of an aerosol generating article 10 into the heating chamber 52 by a user. For example, the heating element 58 could be a blade or an elongate pin which penetrates the aerosol generating substrate 16 as the aerosol generating article 10 is inserted into the heating chamber 52 via the opening 56.

[0048] During operation of the aerosol generating device 40, electrical energy is supplied by the power source 48 to the resistive heating element 58 and the resistive heating element 58 is thereby heated. The heat is transferred from the resistive heating element 58 to the aerosol generating substrate 16, causing it to heat up without burning and thereby produce a vapour. When a user draws on the mouth end 14 of the aerosol generating article 10, air is drawn into the heating chamber 52 through the air inlets 54, 52a. The air flows through the primary air inlet 24 of the aerosol generating article 10 and through the aerosol generating substrate 16 and, hence, vapour generated by heating the aerosol generating substrate 16 is entrained in the airstream and conveyed towards the air outlet 28 at the mouth end 14 of the aerosol generating article 10. The vapour cools and condenses as it flows through the vapour cooling element 18 to form an aerosol. The aerosol then passes through the filter 20 and is inhaled by a user.

[0049] Referring to Figure 3, there is shown diagrammatically a second example of an aerosol generating system 2. The aerosol generating system 2 is similar to the aerosol generating system 1 described above with reference to Figure 2, and corresponding components are identified using the same reference numerals.

[0050] The aerosol generating system 2 comprises a

second example of an electrically-operated aerosol generating device 60 and an aerosol generating article 10 as described above.

[0051] The aerosol generating device 60 comprises a magnetic field generator 62 for generating an electromagnetic field. The magnetic field generator 62 comprises a substantially helical induction coil 64. The induction coil 64 has a circular cross-section and extends around the substantially cylindrical heating chamber 52. The induction coil 64 can be energised by the power source 48 and controller 50. The controller 50 includes, amongst other electronic components, an inverter which is arranged to convert a direct current from the power source 48 into an alternating high-frequency current for the induction coil 64.

[0052] The aerosol generating system 2 further includes an inductively heatable susceptor (not shown) located proximate, or in contact with, the aerosol generating substrate 16. The inductively heatable susceptor may, for example, comprise a blade-shaped or pin-shaped or ring-shaped susceptor mounted on the device body 46 in the same way as the resistive heating element 58 illustrated in Figure 2. The inductively heatable susceptor may alternatively comprise a susceptor element which is positioned in, or particulate susceptor material which is dispersed throughout, the aerosol generating substrate 16 during manufacture and assembly of the aerosol generating article 10.

[0053] Irrespective of the particular configuration of the inductively heatable susceptor, and as will be understood by one of ordinary skill in the art, when the induction coil 64 is energised during use of the aerosol generating system 2, an alternating and time-varying electromagnetic field is produced. This couples with the inductively heatable susceptor and generates eddy currents and/or magnetic hysteresis losses in the susceptor causing it to heat up. The heat is then transferred from the inductively heatable susceptor to the aerosol generating substrate 16, for example by conduction, radiation and convection, to heat the aerosol generating substrate 16 without burning and thereby produce a vapour. Airflow through the aerosol generating device 60, and hence through the aerosol generating article 10, is the same as that described above in connection with the aerosol generating system 1 of Figure 2. Note in particular that the secondary air inlets 26 are once again blocked when the aerosol generating article 10 is positioned in the heating chamber 52 of the aerosol generating device 60 causing air to flow from the air inlets 54, 52a and through the primary air inlet 24 of the aerosol generating article 10.

[0054] Although exemplary embodiments have been described in the preceding paragraphs, it should be understood that various modifications may be made to those embodiments without departing from the scope of the appended claims. Thus, the breadth and scope of the claims should not be limited to the above-described exemplary embodiments.

[0055] Any combination of the above-described fea-

tures in all possible variations thereof is encompassed by the present disclosure unless otherwise indicated herein or otherwise clearly contradicted by context.

[0056] Unless the context clearly requires otherwise, throughout the description and the claims, the words "comprise", "comprising", and the like, are to be construed in an inclusive as opposed to an exclusive or exhaustive sense; that is to say, in the sense of "including, but not limited to".

Claims

1. An aerosol generating article (10) configured for use with an electrically-operated aerosol generating device (40, 60) having a heater (58, 62), the aerosol generating article (10) having a distal end (12) and a mouth end (14) downstream of the distal end (12), the aerosol generating article (10) comprising:

an aerosol generating substrate (16) at the distal end (12);

an air outlet (28) at the mouth end (14); and

a primary air inlet (24) upstream of the aerosol generating substrate (16) and a secondary air inlet (26) downstream of the aerosol generating substrate (16);

wherein the secondary air inlet (26) is selectively blocked when the aerosol generating article (10) is positioned in an aerosol generating device (40, 60) to substantially prevent airflow from the secondary air inlet (26) to the air outlet (28).

2. An aerosol generating article according to claim 1, wherein the secondary air inlet (26) is positioned closer to the distal end (12) than to the mouth end (14).

3. An aerosol generating article according to claim 1 or claim 2, wherein the aerosol generating article (10) includes a wrapper (22) which circumscribes the aerosol generating substrate (16) and extends between the distal end (12) and the mouth end (14) to form a rod.

4. An aerosol generating article according to claim 3, wherein the secondary air inlet (26) extends through the wrapper (22).

5. An aerosol generating article according to claim 3 or claim 4, wherein the aerosol generating article (10) includes a plurality of secondary air inlets (26) spaced circumferentially around the wrapper (22).

6. An aerosol generating article according to claim 5, wherein the aerosol generating article (10) includes first and second rows (30, 32) of circumferentially spaced secondary air inlets (26) in the wrapper (22),

and the second row (32) is positioned downstream of the first row (30).

7. An aerosol generating article according to any of claims 3 to 6, wherein the wrapper (22) cooperates with an inner surface (53a) of a cavity (53) of an aerosol generating device (40, 60) when at least part of the aerosol generating article (10) is positioned in the cavity (53) to substantially block the secondary air inlet (26).

8. An aerosol generating article according to any preceding claim, wherein the aerosol generating article (10) includes a vapour cooling element (18) positioned in the wrapper (22) downstream of the aerosol generating substrate (16) and the secondary air inlet (26) is provided in the vapour cooling element (18).

9. An aerosol generating article according to claim 8, wherein the vapour cooling element (18) comprises a hollow tube (18a) and the secondary air inlet (26) is provided in a wall (19) of the hollow tube (18a).

10. An aerosol generating article according to claim 8 or claim 9 when dependent on any of claims 3 to 7, wherein the hollow tube (18a) is a paper tube having a thickness which is greater than a thickness of the wrapper (22).

11. An aerosol generating article according to any preceding claim, further comprising a mouthpiece filter (20) at the mouth end (14).

12. An aerosol generating article according to any preceding claim, further comprising ventilation holes (34) between the mouth end (14) and the secondary air inlet (26) having an open surface area lower than an open surface area of the secondary air inlet (26).

13. An aerosol generating system (1, 2) comprising:

an aerosol generating article (10) having a distal end (12) and a mouth end (14) downstream of the distal end (12), the aerosol generating article (10) comprising:

an aerosol generating substrate (16) at the distal end (12);

an air outlet (28) at the mouth end (14);

a primary air inlet (24) upstream of the aerosol generating substrate (16) and a secondary air inlet (26) downstream of the aerosol generating substrate (16);

an electrically-operated aerosol generating device (40, 60) including a cavity (53) for receiving at least part of the aerosol generating article (10) and a heater (58, 62) for heating the aerosol

generating substrate (16);
wherein the secondary air inlet (26) is substantially blocked when at least part of the aerosol generating article (10) is positioned in the cavity (53) to substantially prevent airflow from the secondary air inlet (26) to the air outlet (28). 5

- 14.** An aerosol generating system according to claim 13, wherein the aerosol generating article (10) is as defined in any of claims 2 to 12. 10

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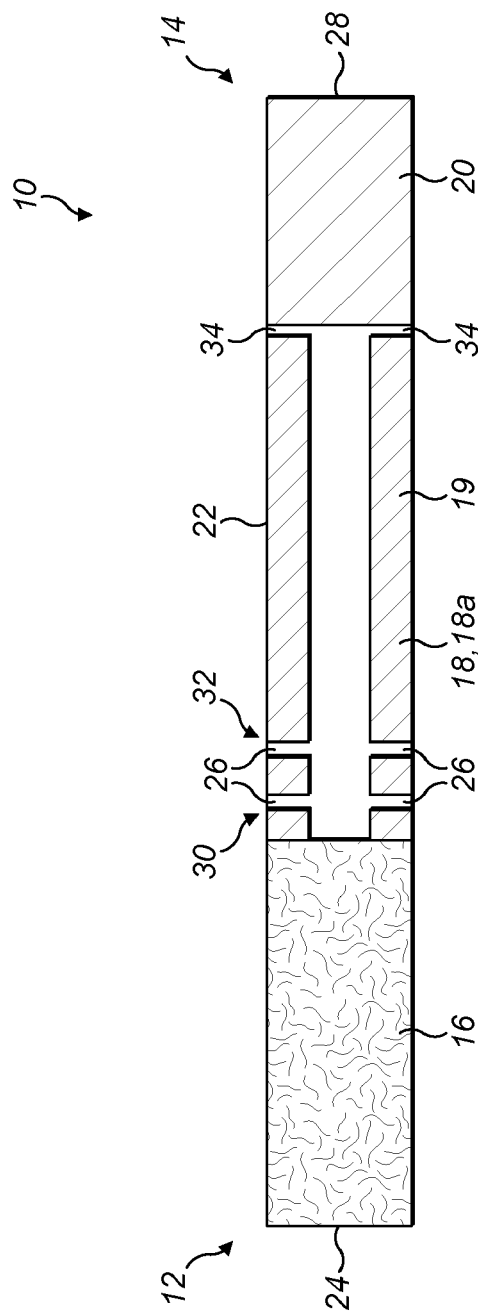


FIG. 1

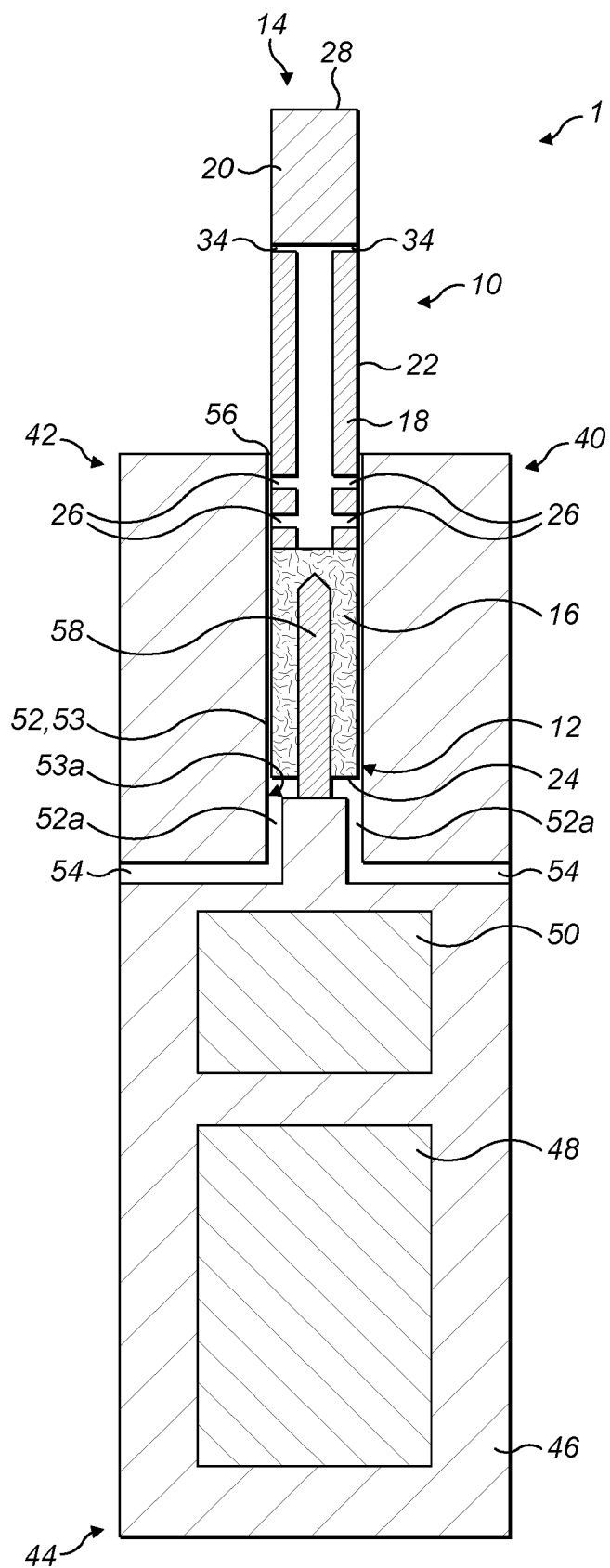


FIG. 2

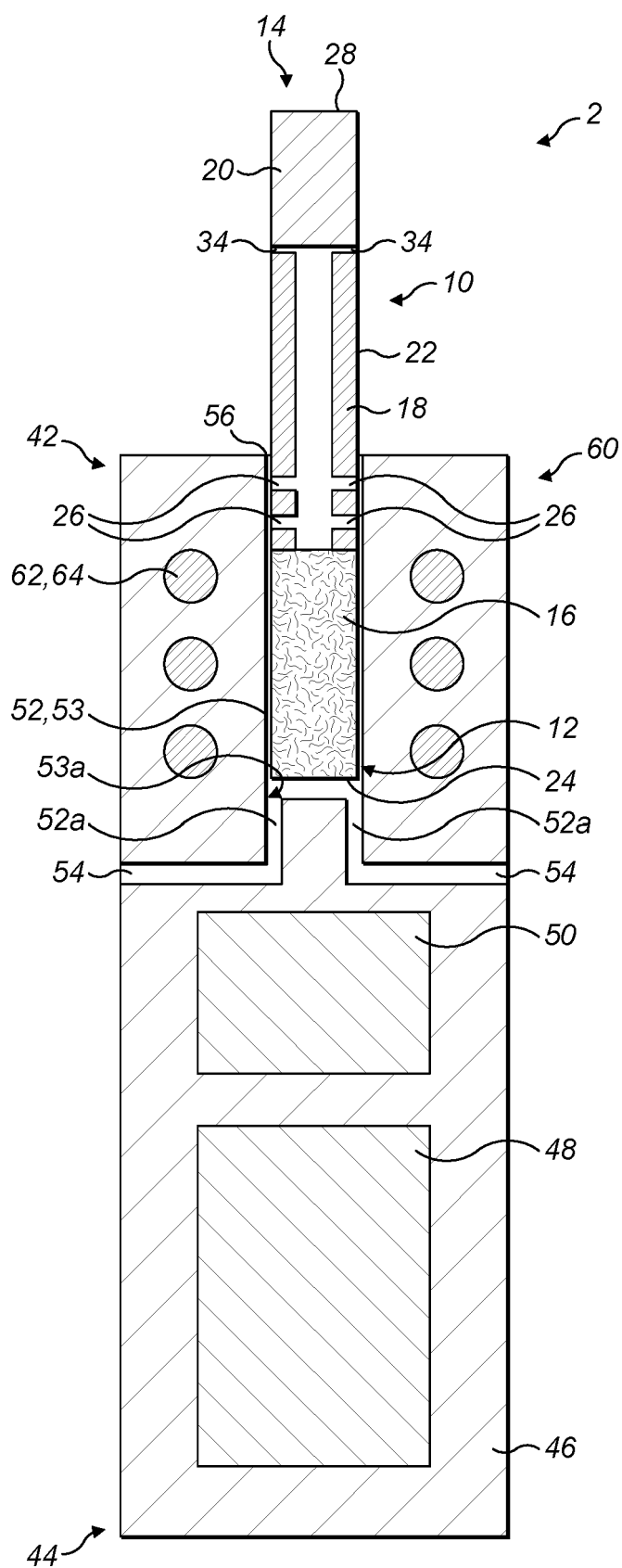


FIG. 3



EUROPEAN SEARCH REPORT

 Application Number
 EP 20 18 5837

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 3 662 771 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 10 June 2020 (2020-06-10)	1-3, 7-11, 13, 14	INV. A24D1/20
Y	* paragraphs [0001], [0007], [0117], [0125]; figures 1-4 *	12	
A	-----	4-6	
X	US 2020/205467 A1 (LIU HUACHEN [CN] ET AL) 2 July 2020 (2020-07-02)	1,8-11	
A	* paragraphs [0001], [0002], [0021], [0023]; figures 2-4 *	2-7, 12-14	
X	WO 2020/089091 A1 (NERUDIA LTD [GB]) 7 May 2020 (2020-05-07)	1,3,4, 7-9, 11	
A	* page 10, lines 6-26; figures 1,4 *	13,14	
X	WO 2017/198837 A1 (BRITISH AMERICAN TOBACCO LTD [GB]) 23 November 2017 (2017-11-23)	1,3-6, 11	
Y	* abstract; figures *	12	
A	-----	2,10,13, 14	TECHNICAL FIELDS SEARCHED (IPC)
X	WO 2020/128043 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 25 June 2020 (2020-06-25)	1	A24D
A	* abstract; figure 1 *	13	A24F
X	CN 206 744 572 U (CHINA TOBACCO HUNAN IND CO LTD) 15 December 2017 (2017-12-15)	1	
A	* figure 5 *	13	
A	EP 2 394 520 A1 (SHIMIZU KAZUHIKO [JP]) 14 December 2011 (2011-12-14)	13,14	
	* abstract; figures 1,2,4 *		
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 20 November 2020	Examiner Kock, Søren
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)

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

EP 20 18 5837

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.

20-11-2020

10

15

20

25

30

35

40

45

50

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3662771 A1	10-06-2020	AU 2014359184 A1	17-03-2016
		CA 2932333 A1	11-06-2015
		CN 105722416 A	29-06-2016
		EA 201690843 A1	30-09-2016
		EP 3076815 A1	12-10-2016
		EP 3662771 A1	10-06-2020
		HK 1223519 A1	04-08-2017
		JP 6707447 B2	10-06-2020
		JP 2016538848 A	15-12-2016
		JP 2020054386 A	09-04-2020
		KR 20160094938 A	10-08-2016
		PH 12016500335 A1	02-05-2016
		UA 121375 C2	25-05-2020
US 2020205467 A1	02-07-2020	US 2016331032 A1	17-11-2016
		WO 2015082649 A1	11-06-2015

		AU 2018272358 A1	19-12-2019
		CA 3063952 A1	10-12-2019
		CN 107087811 A	25-08-2017
		EP 3632231 A1	08-04-2020
		GB 2575958 A	29-01-2020
		JP 2020522245 A	30-07-2020
		KR 20200007019 A	21-01-2020
		PH 12019550245 A1	20-07-2020
		US 2020205467 A1	02-07-2020
		WO 2018214953 A1	29-11-2018
WO 2020089091 A1	07-05-2020	-----	
		TW 202025921 A	16-07-2020
WO 2017198837 A1	23-11-2017	WO 2020089091 A1	07-05-2020

		AR 108511 A1	29-08-2018
		AU 2017267294 A1	29-11-2018
		AU 2020201368 A1	12-03-2020
		BR 112018073462 A2	02-07-2019
		CA 3024764 A1	23-11-2017
		CL 2018003259 A1	03-05-2019
		CN 109414058 A	01-03-2019
		EP 3457874 A1	27-03-2019
		EP 3666091 A1	17-06-2020
		HU E049534 T2	28-10-2020
		JP 2019523639 A	29-08-2019
		JP 2020110155 A	27-07-2020
		KR 20180090897 A	13-08-2018
		KR 20180095080 A	24-08-2018
		KR 20190116572 A	14-10-2019
		NZ 748330 A	29-05-2020

EPO FORM P0459

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

55

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

EP 20 18 5837

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.

20-11-2020

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		PH 12018502420 A1	30-09-2019
		PL 3457874 T3	16-11-2020
		RU 2020107546 A	30-03-2020
		TW 201742553 A	16-12-2017
		US 2019116874 A1	25-04-2019
		WO 2017198837 A1	23-11-2017

WO 2020128043	A1	25-06-2020	NONE

CN 206744572	U	15-12-2017	NONE

EP 2394520	A1	14-12-2011	EP 2394520 A1
		JP 4739433 B2	03-08-2011
		JP 2010178730 A	19-08-2010
		US 2011290269 A1	01-12-2011
		WO 2010090338 A1	12-08-2010

EPO FORM P0459

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