



(51) International Patent Classification:

A24D 1/20 (2020.01)

A24F 40/465 (2020.01)

A24F 40/46 (2020.01)

(21) International Application Number:

PCT/GB2022/051561

(22) International Filing Date:

17 June 2022 (17.06.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2108834.9

18 June 2021 (18.06.2021)

GB

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(81) Designated States (unless otherwise indicated, for every

kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every

kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,

(54) Title: COMPONENT FOR USE WITH A NON-COMBUSTIBLE AEROSOL PROVISION DEVICE

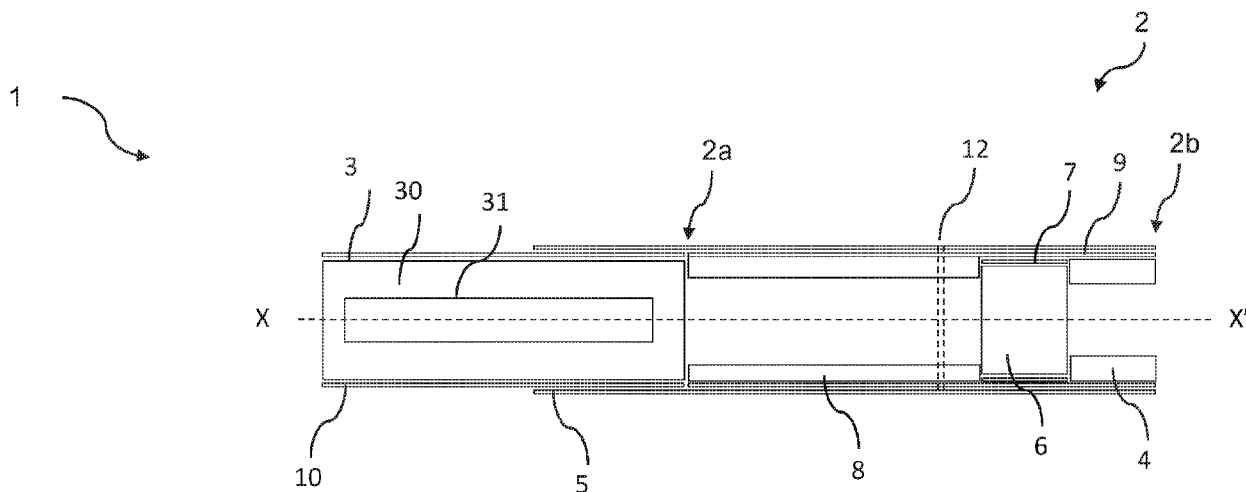


Figure 1

(57) Abstract: An aerosol-generating component for use with a non-combustible aerosol provision device. The aerosol-generating component comprises a heating material (31, 31a-g) in thermal contact with aerosol generating material (30), and the heating material (31, 31a-g) comprises a plurality of elongate portions (311a-c) or elements which extend through or around said aerosol generating material (30) in a first direction. The elongate portions (311a-c) or elements of the heating material (31, 31a-g) are substantially parallel. An article (1, 110) and a system are also described.

TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))*

Component for use with a non-combustible aerosol provision device

Technical field

The present invention relates to a component for use with a non-combustible aerosol provision device, and an article for use with a non-combustible aerosol provision device, and a non-combustible aerosol provision system.

Background

Certain tobacco industry products produce an aerosol during use, which is inhaled by a user. For example, tobacco heating devices heat an aerosol generating substrate such as tobacco to form an aerosol by heating, but not burning, the substrate. Such tobacco industry products commonly include mouthpieces through which the aerosol passes to reach the user's mouth.

Summary

According to a first aspect of the disclosure, there is provided an aerosol-generating component for use with a non-combustible aerosol provision device, the aerosol-generating component comprising a heating material in thermal contact with aerosol generating material, the heating material comprising a plurality of elongate portions or elements which extend through or around said aerosol generating material in a first direction and wherein the elongate portions or elements are substantially parallel.

According to a second aspect of the disclosure, there is provided an aerosol-generating component for use with a non-combustible aerosol provision device, the aerosol-generating component comprising a heating material in thermal contact with aerosol-generating material, the heating material comprising a first elongate or planar portion extending around or through the aerosol-generating material in a first direction, and at least one second elongate or planar portion extending around or through the aerosol-generating material in a second direction different to the first direction.

According to a third aspect of the disclosure, there is provided an aerosol-generating component for use with a non-combustible aerosol provision device, the aerosol-generating component comprising a heating material in thermal contact with aerosol-generating material, wherein the heating material extends generally longitudinally through the aerosol-generating material and has a length, a height and a width, wherein the width of the heating material is greater than the height of the heating

material, and wherein the height of a first portion of the heating material is at least 20% greater than the height of a second portion of the heating material.

5 According to a fourth aspect of the disclosure, there is provided an article for use with a non-combustible aerosol-provision device comprising an aerosol-generating component according to the first or second aspect.

10 According to a fifth aspect of the disclosure, there is provided a non-combustible aerosol provision system comprising: a non-combustible aerosol provision device; and an aerosol-generating component according to the first, second, or third aspect, or an article according to the fourth aspect.

Brief Description of the Drawings

15 Embodiments of the invention will now be described, by way of example only, with reference to accompanying drawings, in which:

Figure 1 is a side-on cross sectional view of an article for use with a non-combustible aerosol provision device, the article including a mouthpiece;

Figure 2a – is a side-on cross sectional view of an aerosol-generating section comprising a susceptor element;

20 Figure 2b is a top-down cross sectional view of the aerosol-generating section of Figure 2a;

Figure 3a is a side-on cross sectional view of an aerosol-generating section comprising an alternative susceptor element;

25 Figure 3b is a top-down cross sectional view of the aerosol-generating section of Figure 3a;

Figure 4a is a side-on cross sectional view of an aerosol-generating section comprising an alternative susceptor element;

Figure 4b is a top-down cross sectional view of aerosol-generating section of Figure 4a;

30 Figure 5 is a side-on cross sectional view of an aerosol-generating section comprising an alternative susceptor element;

Figure 6a is a side-on cross sectional view of an aerosol-generating section comprising an alternative susceptor element;

Figure 6b is a further side-on cross-sectional view of the aerosol-generating section of figure 6a;

35 Figure 7a is a side-on cross sectional view of a an aerosol-generating section comprising an alternative susceptor element;

Figure 7b is a further side-on cross-sectional view of the aerosol-generating section of figure 7a;

Figure 7c is a top-down cross sectional view of the aerosol-generating section of figure 7a;

5 Figure 8a is a side-on cross sectional view of an aerosol-generating section comprising an alternative susceptor element;

Figure 8b is a further side-on cross-sectional view of the aerosol-generating section of figure 8a;

10 Figure 8c is a top-down cross sectional view of the aerosol-generating section of figure 8a;

Figure 9a is a side-on cross sectional view of a further article for use with a non-combustible aerosol provision device, in this example the article including a capsule-containing mouthpiece;

15 Figure 9b is a cross sectional view of the capsule-containing mouthpiece shown in Figure 9a;

Figures 10 to 13 are schematic views of non-combustible aerosol provision devices.

Detailed description

20 As used herein, the term “delivery system” is intended to encompass systems that deliver at least one substance to a user, and includes:

combustible aerosol provision systems, such as cigarettes, cigarillos, cigars, and tobacco for pipes or for roll-your-own or for make-your-own cigarettes (whether based on tobacco, tobacco derivatives, expanded tobacco, reconstituted tobacco, tobacco substitutes or other smokable material);

25 non-combustible aerosol provision systems that release compounds from an aerosol-generating material without combusting the aerosol-generating material, such as electronic cigarettes, tobacco heating products, and hybrid systems to generate aerosol using a combination of aerosol-generating materials; and

30 aerosol-free delivery systems that deliver the at least one substance to a user orally, nasally, transdermally or in another way without forming an aerosol, including but not limited to, lozenges, gums, patches, articles comprising inhalable powders, and oral products such as oral tobacco which includes snus or moist snuff, wherein the at least one substance may or may not comprise nicotine.

35 According to the present disclosure, a “non-combustible” aerosol provision system is one where a constituent aerosol-generating material of the aerosol provision system (or

component thereof) is not combusted or burned in order to facilitate delivery of at least one substance to a user.

5 In some embodiments, the delivery system is a non-combustible aerosol provision system, such as a powered non-combustible aerosol provision system.

10 In some embodiments, the non-combustible aerosol provision system is an electronic cigarette, also known as a vaping device or electronic nicotine delivery system (END), although it is noted that the presence of nicotine in the aerosol-generating material is not a requirement.

15 In some embodiments, the non-combustible aerosol provision system is an aerosol-generating material heating system, also known as a heat-not-burn system. An example of such a system is a tobacco heating system.

20 In some embodiments, the non-combustible aerosol provision system is a hybrid system to generate aerosol using a combination of aerosol-generating materials, one or a plurality of which may be heated. Each of the aerosol-generating materials may be, for example, in the form of a solid, liquid or gel and may or may not contain nicotine. In some embodiments, the hybrid system comprises a liquid or gel aerosol-generating material and a solid aerosol-generating material. The solid aerosol-generating material may comprise, for example, tobacco or a non-tobacco product.

25 Typically, the non-combustible aerosol provision system may comprise a non-combustible aerosol provision device and a consumable for use with the non-combustible aerosol provision device.

30 In some embodiments, the disclosure relates to consumables comprising aerosol-generating material and configured to be used with non-combustible aerosol provision devices. These consumables are sometimes referred to as articles throughout the disclosure.

35 The terms 'upstream' and 'downstream' used herein are relative terms defined in relation to the direction of mainstream aerosol drawn through an article or device in use.

In some embodiments, the non-combustible aerosol provision system, such as a non-combustible aerosol provision device thereof, may comprise a power source and a controller. The power source may, for example, be an electric power source or an exothermic power source. In some embodiments, the exothermic power source
5 comprises a carbon substrate which may be energised so as to distribute power in the form of heat to an aerosol-generating material or to a heat transfer material in proximity to the exothermic power source.

In some embodiments, the non-combustible aerosol provision system comprises an
10 area for receiving the consumable, an aerosol generator, an aerosol generation area, a housing, a mouthpiece, a filter and/or an aerosol-modifying agent.

In some embodiments, the consumable for use with the non-combustible aerosol provision device may comprise aerosol-generating material, an aerosol-generating
15 material storage area, an aerosol-generating material transfer component, an aerosol generator, an aerosol generation area, a housing, a wrapper, a filter, a mouthpiece, and/or an aerosol-modifying agent.

A consumable is an article comprising or consisting of aerosol-generating material, part
20 or all of which is intended to be consumed during use by a user. A consumable may comprise one or more other components, such as an aerosol-generating material storage area, an aerosol-generating material transfer component, an aerosol generation area, a housing, a wrapper, a mouthpiece, a filter and/or an aerosol-modifying agent. A consumable may also comprise an aerosol generator, such as a heater, that emits heat
25 to cause the aerosol-generating material to generate aerosol in use. The heater may, for example, comprise combustible material, a material heatable by electrical conduction, or a susceptor.

A susceptor is a material that is heatable by penetration with a varying magnetic field,
30 such as an alternating magnetic field. The susceptor may be an electrically-conductive material, so that penetration thereof with a varying magnetic field causes induction heating of the heating material. The heating material may be magnetic material, so that penetration thereof with a varying magnetic field causes magnetic hysteresis heating of the heating material. The susceptor may be both electrically-conductive and magnetic,
35 so that the susceptor is heatable by both heating mechanisms. The device that is

configured to generate the varying magnetic field is referred to as a magnetic field generator, herein.

5 An aerosol-modifying agent is a substance, typically located downstream of the aerosol generation area, that is configured to modify the aerosol generated, for example by changing the taste, flavour, acidity or another characteristic of the aerosol. The aerosol-modifying agent may be provided in an aerosol-modifying agent release component, that is operable to selectively release the aerosol-modifying agent

10 The aerosol-modifying agent may, for example, be an additive or a sorbent. The aerosol-modifying agent may, for example, comprise one or more of a flavourant, a colourant, water, and a carbon adsorbent. The aerosol-modifying agent may, for example, be a solid, a liquid, or a gel. The aerosol-modifying agent may be in powder, thread or granule form. The aerosol-modifying agent may be free from filtration
15 material.

An aerosol generator is an apparatus configured to cause aerosol to be generated from the aerosol-generating material. In some embodiments, the aerosol generator is a heater configured to subject the aerosol-generating material to heat energy, so as to
20 release one or more volatiles from the aerosol-generating material to form an aerosol. In some embodiments, the aerosol generator is configured to cause an aerosol to be generated from the aerosol-generating material without heating. For example, the aerosol generator may be configured to subject the aerosol-generating material to one or more of vibration, increased pressure, or electrostatic energy.

25 The filamentary tow material described herein can comprise cellulose acetate fibre tow. The filamentary tow can also be formed using other materials used to form fibres, such as polyvinyl alcohol (PVOH), polylactic acid (PLA), polycaprolactone (PCL), poly(1-4 butanediol succinate) (PBS), poly(butylene adipate-co-terephthalate)(PBAT), starch
30 based materials, cotton, aliphatic polyester materials and polysaccharide polymers or a combination thereof. The filamentary tow may be plasticised with a suitable plasticiser for the tow, such as triacetin where the material is cellulose acetate tow, or the tow may be non-plasticised. The tow can have any suitable specification, such as fibres having a
35 'Y' shaped or other cross section such as 'X' shaped, filamentary denier values between 2.5 and 15 denier per filament, for example between 8.0 and 11.0 denier per filament and total denier values of 5,000 to 50,000, for example between 10,000 and 40,000.

In the figures described herein, like reference numerals are used to illustrate equivalent features, articles or components.

5 Figure 1 is a side-on cross sectional view of an article 1 for use in an aerosol delivery system.

The article 1 comprises a mouthpiece 2, and an aerosol-generating section 3, connected to the mouthpiece 2. The aerosol-generating section may alternatively be referred to as
10 an aerosol-generating component. In the present example, the aerosol generating section 3 comprises a cylindrical rod of aerosol-generating composition. The aerosol-generating composition comprises an aerosol-generating material 30 and a heating material, arranged in thermal contact with the aerosol-generating material.

The aerosol-generating material 30 may comprise a plurality of strands or strips of
15 aerosol-generating material. For example, the aerosol-generating material 30 may comprise a plurality of strands or strips of an aerosolisable material and/or a plurality of strands or strips of an amorphous solid, as described hereinbelow. In some embodiments, the aerosol-generating material 30 consists of a plurality of strands or strips of an aerosolisable material. In the present example, the aerosol-generating
20 composition comprises a plurality of strands and/or strips of aerosol-generating material 30, and is circumscribed by a wrapper 10. In the present example, wrapper 10 is a moisture impermeable wrapper.

In the present example, the aerosol-generating composition comprises a heating
25 material in the form of a susceptor element 31. The susceptor element 31 comprises susceptor material, which is heatable by using inductive heating. Inductive heating is a process of heating an electrically conducting object (such as a susceptor) by electromagnetic induction. A magnetic field generator may comprise an inductive element, for example, one or more inductor coils, and a device for passing a varying
30 electric current, such as an alternating electric current, through the inductive element. The varying electric current in the inductive element produces a varying magnetic field. The varying magnetic field penetrates a susceptor suitably positioned with respect to the inductive element, and generates eddy currents inside the susceptor. The susceptor has electrical resistance to the eddy currents, and hence the flow of the eddy currents
35 against this resistance causes the susceptor to be heated by Joule heating. In cases where the susceptor comprises ferromagnetic material such as iron, nickel or cobalt,

heat may also be generated by magnetic hysteresis losses in the susceptor, i.e. by the varying orientation of magnetic dipoles in the magnetic material as a result of their alignment with the varying magnetic field. In inductive heating, as compared to heating by conduction for example, heat is generated inside the susceptor, allowing for rapid
5 heating. Further, there need not be any physical contact between the inductive heater and the susceptor, allowing for enhanced freedom in construction and application.

In the present example, the susceptor element 31 is positioned substantially centrally within the rod of aerosol-generating composition, and extends through the rod of
10 aerosol-generating composition. In other examples, the heating material may be arranged to extend around the aerosol-generating material, for example as a wrap, or as a pattern of susceptor material printed on a wrapping material. The inventors have advantageously found that providing an aerosol-generating composition comprising a heating material, wherein the heating material is arranged in or around the aerosol-
15 generating material during the manufacture of the article, for example in the form of a susceptor element 31, can result in an improved article since correct positioning of the heating material in or around the aerosol-generating material to improve the thermal contact between the heating element and the aerosol-generating material can be ensured.

20

In figure 1, the susceptor element 31 is shown schematically. Figures 2-8 illustrate aerosol-generating sections 300, 301, 302, 303, 305, 305, 306 comprising a rod of aerosol-generating composition comprising exemplary susceptor elements 31a, 31b, 31c, 31d, 31e, 31f, 31g respectively, which are described in greater detail below. Each of
25 the exemplary susceptor elements 31a-31g illustrated in figures 2-8 is suitable for use as the susceptor element 31 in the aerosol-generating section 3 illustrated in figures 1, 9a and 9b. Exemplary susceptor elements 31a-31g are non-planar. The inventors have advantageously found that providing a heating material having a non-planar structure can result in improved aerosol-generation, due to the increased thermal contact
30 between the heating material and the aerosol-generating material 30, compared to heating material having a planar structure. Providing a non-planar susceptor element 31 advantageously provides an increased surface area compared to a susceptor element having a planar structure, which can result in increased thermal contact between the susceptor element 31 and the aerosol-generating material 30. In addition, the inventors
35 have found that a heating material having a non-planar structure can provide improved support and structure to the aerosol-generating material 30 around the heating

material. Advantageously, a non-planar heating material provided in the rod of aerosol-generating composition may help to reduce any loss of aerosol-generating material 30 from the end of the rod.

5 In some examples, heating material may be printed on the wrapper 10 in a pattern, for example a two dimensional projection of any of the susceptor elements 31a-31g. In such examples, the wrapper 10 comprises the heating material. Any of the aerosol-generating sections 300, 301, 302, 303, 305, 305, 306 of figures 2 to 8 may be provided in place of aerosol-generating section 3 of the embodiments of figures 1 and 9a.

10

Figures 2 to 4 illustrate exemplary non-planar susceptor elements comprising a plurality of elongate portions which extend through the aerosol-generating section.

Figure 2a is a side-on cross sectional view of an aerosol-generating section 300,
15 comprising a rod of aerosol-generating composition comprising aerosol-generating material 30 and a susceptor element 31a. Figure 2b is a top-down cross sectional view of the aerosol-generating section 300, along the line X-X'. Susceptor element 31a is formed from a susceptor material, for example an electrically-conductive wire, which may be wound or bent into the illustrated shape. Advantageously, the non-linear shape
20 of the susceptor element 31a increases the contact area between the aerosol-generating material 30 and the susceptor element 31a.

Susceptor element 31a comprises a plurality of elongate portions 311a, 311b, 311c which extend through the aerosol-generating composition, along the x-x' axis. Elongate
25 portions 311a, 311b, 311c are substantially parallel. In the present example, the elongate portions 311a, 311b, 311c are joined together by connecting portions 312a, 312b, which extend between elongate portions 311a and 311c, and 311a and 311b respectively. Connecting portions 311a, 311b provide structure to the susceptor element 31a in the cross-sectional direction, and may reduce movement of the aerosol-generating material
30 in the longitudinal direction. Connecting portions 312a, 312b also hold the elongate portions 311a, 311b, 311c in a spaced apart configuration. Providing a susceptor element comprising spaced apart elongate portions 311a, 311b, 311c can improve the thermal contact between the susceptor element and the aerosol-generating material 30 across the length and breadth of the rod of aerosol-generating composition. The connecting
35 portions 312a, 312b between elongate elements allow the entire susceptor element to be positioned as a single component. Elongate portions 311a, 311b, 311c improve the

contact between the susceptor element 31a and the aerosol-generating material 30 along the length of the susceptor element.

5 Extending from a first end of the susceptor element 31a is a joining portion 313. In the present example, joining portion 313 extends from the central elongate portion 311b to a distal end 300a of the aerosol-generating section 300. In other examples the susceptor element 31a may be configured differently, and joining portion 313 may extend from another of the elongate portions.

10 Susceptor element 31a may suitably be formed from a single continuous piece of susceptor material. A plurality of susceptor elements 31a may be formed together or in sequence on a single continuous piece of susceptor material, to provide a feed of susceptor elements 31a. Each of the plurality of susceptor elements 31a may be separated by a length of susceptor material, joining portion 313. The feed of susceptor
15 elements 31a may be provided together with a source of aerosol-generating material to form a rod of aerosol-generating composition comprising a susceptor element 31a, by forming the rod of aerosol-generating composition around the susceptor element 31a, and cutting the rod at a position overlying the joining portion 313 separating each of the susceptor elements 31a. Suitably, the susceptor element 31a is included in the rod of
20 aerosol-generating composition at the rod-forming stage.

Figure 3 is a side-on cross sectional view of an aerosol-generating section 301 comprising aerosol-generating material 30 and a susceptor element 31b. Figure 3b is a top-down cross sectional view of the aerosol-generating section 301, along the line x-x'.
25 The susceptor element 31b comprises a plurality of elongate portions 311a', 311b', 311c'. As described in relation to Figure 2a, the plurality of elongate portions are substantially parallel. The elongate portions 311a', 311b', 311c' are spaced apart, and extend through the rod of aerosol-generating composition substantially parallel to the longitudinal axis. In the present example the elongate portions 311a', 311b', 311c' are not connected. In
30 the present example the susceptor element 31b comprises three elongate portions. In other examples the susceptor element may comprise a different number of elongate portions, for example 2, 4, 5, or 6 elongate portions. The inventors have advantageously found that by providing a susceptor element 31b comprising spaced apart elongate portions, the thermal contact between the susceptor element 31b and the aerosol-
35 generating material 30 can be improved across both the length and cross-section of the rod of aerosol-generating composition. Each of the elongate portions 311a', 311b', 311c'

of the susceptor element 31b may be formed from a single continuous piece of susceptor material, such as an electrically conductive wire. In the example of figure 3, each of the elongate portions 311a', 311b', 311c' may be formed from a different material, or the same material (e.g. susceptor material) but having a different physical characteristic such as wire gauge.

Figure 4a is a side-on cross sectional view of an aerosol-generating section 302 comprising aerosol-generating material 30 and a susceptor element 31c. Figure 4b is a top-down cross sectional view of the aerosol-generating section 302, along the line x-x'. The susceptor element 31c comprises two elongate portions 311a'', 311b'' connected at their ends by connecting portions 312a', 312b'. In the present example, connecting portions 312a', 312b' form a curved section at either end of the susceptor element 31c. In other embodiments connecting portions 312a', 312b' may extend straight across between the elongate portions 311a'', 311b'' to form a substantially rectangular arrangement with elongate portions 311a'', 311b'', or be configured to form any other suitable shape. In the present example, a joining portion 313' extends from a central position on connecting portion 312a'. Joining portion 313' extends to the end of the rod of aerosol-generating composition in the present example, although in other examples the joining portion 313' may extend out from the susceptor element 31c but not to the end of the rod of aerosol-generating composition.

As described in relation to figure 2a, a plurality of susceptor elements 31c may be formed from a single continuous piece of susceptor material to form a feed of susceptor elements 31c. Each of the susceptor elements 31c may be joined to an adjacent susceptor element by a joining portion 313'. During manufacture, the feed of susceptor elements may be supplied together with a source of aerosol-generating material 30 at the rod forming stage, to form a rod of aerosol-generating composition including the feed of susceptor elements. The susceptor element containing rod of aerosol-generating composition can be cut at a position overlying a joining portion 313', to form a rod of aerosol-generating composition comprising a single susceptor element 31c. The waisted profile of the susceptor element 31c at the joining portion 313' reduces the cutting force required during manufacture.

As described in relation to figure 2, the spaced apart elongate portions 311a'', 311b'', 311c'', can improve the thermal contact between the susceptor element 31c and the aerosol-generating material 30 across the length and breadth of the rod of aerosol-

generating composition. The connecting portions 312a', 312b' between the elongate elements allow the entire susceptor element 31c to be positioned as a single component, whilst providing the benefit of a susceptor element which extends through different portions of the rod of aerosol-generating composition.

5

Figures 5 to 8 illustrate further exemplary non-planar susceptor elements, each of which comprises at least one portion which extends in a different direction to the length of the susceptor element. Each of the exemplary non-planar susceptor elements illustrated in figures 5 to 8 is arranged in the rod of aerosol-generating composition such that at least one portion of the susceptor element extends in a direction which is different to that of the longitudinal axis x-x'.

10

Figure 5 is a side-on cross-sectional view of an aerosol-generating section 303 comprising aerosol-generating material 30 and a susceptor element 31d. Susceptor element 31d comprises an elongate portion 311a'', and a cross portion 314. Cross portion 314 extends substantially perpendicularly to the elongate portion 311a'', to form an L-shape susceptor element. Cross portion 314 can provide additional support to the aerosol-generating material 30 around the cross-portion 314, which in the present case is positioned at the distal end of the rod of aerosol-generating composition. Cross portion 314 extends in a direction which is different to that in which the elongate portion 311a'' extends. Providing a portion which extends in a different direction to the direction in which a first portion extends can provide improved structural support to the rod of aerosol-generating composition by forming a structure which can reduce movement of the aerosol-generating material 30, and improve the structural stability of the rod. Providing a susceptor element 31d having an L-shape configuration can reduce the problem of aerosol-generating material being displaced from the end of the rod of aerosol-generating composition 303, due to the cross portion 314 providing a retaining structure at the distal end of the rod. The inventors have found that reducing the displacement of aerosol-generating material 30, in use, can advantageously result in a more consistent packing density of aerosol-generating material 30 along the length of the rod, which can result in more consistent and improved aerosol generation.

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Figure 6a is a side-on cross sectional view of an aerosol-generating section 304 comprising aerosol-generating material 30 and a susceptor element 31e. Susceptor element 31e comprises a repeating pattern of obliquely extending portions 315a, 315b.

35

In the present embodiment, obliquely extending portions 315a, 315b extend at an angle to the longitudinal axis x-x'. Similarly to the effect described in relation to the cross portion 314 of figure 5, and the connecting portions 312a, 312b, 312a', 312b' of figures 2 and 4, obliquely extending portions 315a, 315b improve the thermal contact between the susceptor element and the aerosol-generating material 30 across the width of the susceptor element 31e, and provide additional support to the aerosol-generating material 30 around the obliquely extending portions, helping to reduce displacement of the aerosol-generating material 30.

As already described, the non-planar structure of susceptor element 31e provided by obliquely extending portions 315a, 315b results in an increased surface area compared to a planar susceptor element of the same length, and thereby provides improved thermal contact between the susceptor element and the aerosol-generating material 30. In the present example, obliquely extending portion 315a extends in a first direction, and obliquely extending portion 315b extends in a second direction which is different to the first direction. The angle formed between adjacent obliquely extending portions 315a, 315b may be between about 90° and about 170°, for example about 95° or about 100°, or about 110°. Susceptor element 31e may suitably comprise a crimped wire, or a corrugated sheet of heating material. Susceptor element 31e may be formed from a wire having any suitable gauge, or from a sheet of heating material having any suitable width. Figure 6b is a further side-on cross sectional view of the aerosol-generating section 304 of Figure 6a, along the line y-y'. In the view of figure 6b, the white portions represent alternating ridges and troughs between obliquely extending portions 315a, 315b.

Each of the exemplary non-planar susceptor elements 31a-31e described above may suitably be formed from a wire or a sheet material configured to have a non-planar structure. The wire or sheet material may be bent or moulded to provide the non-planar structure, or the wire or sheet material may be embossed, or have elements forming the non-planar structure deposited on its surface.

Figure 7a is a side-on cross sectional view of an aerosol-generating section 305 comprising a susceptor element 31f. Susceptor element 31f comprises an elongate portion 311a''' with protrusions 316 arranged thereon. As described in relation to figure 2, elongate portion 311a''' is substantially parallel with the longitudinal axis x-x'. Protrusions 316 extend outwardly at positions along the elongate portion 311a''', i.e. at

an angle to the longitudinal axis. The structure of protrusions 316 arranged on an elongate portion 311a''' effectively forms peaks and troughs, with the protrusions 316 forming the peaks and troughs being formed between adjacent protrusions. This peak and trough structure can advantageously grip the aerosol-generating material, resulting in improved structural integrity of the rod of aerosol generating composition.

Preferably, protrusions 316 are formed by compressing a flat plate of susceptor material to form respectively thicker and thinner regions. The thicker regions form the protrusions 316 on the elongate element. Preferably, the susceptor element 31f is moulded or embossed to form elongate portion 311a''' and protrusions 316 from a single piece of material. Alternatively, protrusions 316 may be formed as deposits on the surface of a wire or sheet material forming the elongate portion 311a''''', or protrusions 316 may be separately formed and adhered or otherwise attached or secured to the elongate portion 311a'''. Protrusions 316 provide additional surface area along the length of elongate portion 311a''', which can improve the thermal contact between the susceptor element 31f and the aerosol-generating material. Protrusions 316 may also reduce displacement of the aerosol-generating material by providing additional structure to the rod of aerosol-generating composition. Protrusions 316 are illustrated as substantially square edged in figure 7. In other examples, protrusions 316 may have a wave-like profile along the elongate portion 311a''', depending on the type of embossing design or other manufacturing method used.

Protrusions 316 may be positioned directly opposite another protrusion 316 on the opposing surface of the elongate element 311a''', or may be offset in the longitudinal direction.

Figure 7b is a further side-on cross sectional view of the aerosol-generating section 305 of figure 7a, along the line y-y'.

Figure 7c is a top-down cross-sectional view of the aerosol-generating section 305 of figure 7a.

Figure 8a is a side-on cross sectional view of an aerosol-generating section 306 comprising a susceptor element 31g. Susceptor element 31g comprises an elongate portion 311a''''', which extends the length of the susceptor element 31g. Side portions 316 extend outwardly from the elongate portion 311a'''''' and in the same plane as

elongate portion 311a'''''. Figure 8b is a further side-on cross sectional view of the aerosol-generating section 306 of figure 8a, taken along the line y-y'. First alternating tab 317 extends away from the elongate portion in a first direction, where the first direction does not lie in the same plane as side portions 316. In the present example, 5 the first direction is substantially perpendicular to the direction in which side portion 316 extends. Second alternating tab 318 extends away from the elongate portion in a second direction, which is different again from the first direction and the plane in which side portions 316 lie. In the present example, the second direction is also substantially perpendicular to the direction in which side portion 316 extends. The 10 arrangement of first and second alternating tabs 317, 318, side portions 316 and elongate portion 311a'''''' can be more readily visualised in figure 8c, which is a top-down cross-sectional view of the aerosol-generating section of figure 8a.

An exemplary method of forming a susceptor element 31g is described below. First and 15 second alternating tabs 317, 318 may be formed by forming cuts in the sides of a sheet of susceptor material to form separable tabs on either side of an elongate portion 311a'''''. A first separable tab may be bent or moulded in a first direction to form first alternating tab 317. The separable tab directly adjacent to the first alternating tab 317 is not bent, and forms a side portion 316. The next separable tab along, directly adjacent 20 the opposite edge of the side portion 316 may be bent or moulded in the first direction to form another first alternating tab 317. This process may be repeated, or performed concurrently to form an arrangement of alternating side portions 316 and first alternating tabs 317 on one side of a sheet of susceptor material. Similarly, cuts may be formed on the opposing side of a sheet of susceptor material to form alternating side 25 portions 316 and second alternating tabs 318, which may be bent or moulded in a second direction, for example the opposite direction to the first direction, as illustrated in figures 8a, 8b, 8b.

Each of exemplary susceptor elements 31a-31g may be configured to extend through the 30 full length of the rod of aerosol-generating composition, or partially through the rod of aerosol-generating composition. For example, the susceptor element may extend through 100% of the length of the rod of aerosol-generating composition, or about 90%, about 80%, or about 70% of the length of the rod of aerosol-generating composition.

35 The plurality of strands or strips of aerosol-generating material 30 may be aligned within the aerosol-generating section such that their longitudinal dimension is in

parallel alignment with the longitudinal axis, X-X' of the article 1. Alternatively, the strands or strips may generally be arranged such that their longitudinal dimension aligned is transverse to the longitudinal axis of the article.

5 At least about 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90% or 95 % of the plurality of strands or strips may be arranged such that their longitudinal dimension is in parallel alignment with the longitudinal axis of the article. A majority of the strands or strips may be arranged such that their longitudinal dimensions are in parallel alignment with the longitudinal axis of the article. In some embodiments, about 95% to
10 about 100% of the plurality of strands or strips are arranged such that their longitudinal dimension is in parallel alignment with the longitudinal axis of the article. In some embodiments, substantially all of the strands or strips are arranged in the aerosol-generating section such that their longitudinal dimension is in parallel alignment with the longitudinal axis of the aerosol-generating section of the article.

15

The aerosol-generating composition comprises an aerosol-generating material 30. The aerosol-generating material 30 may comprise a binder and an aerosol former.

An aerosol-generating material is a material that is capable of generating aerosol, for
20 example when heated, irradiated or energized in any other way. The aerosol-generating material 30 may be in the form of a solid, liquid, or semi-solid, such as a gel and may or may not contain an active substance and/or flavourants.

The aerosol-generating composition comprises at least one aerosol-generating material
25 30. The aerosol-generating material 30 may comprise a plurality of aerosol-generating materials. The aerosol-generating materials may be the same as each other or different to each other. For example, the aerosol-generating composition may comprise a first aerosol-generating material and a second aerosol-generating material. Further (for example, third, fourth, fifth or more) aerosol-generating materials may also be included
30 in the composition.

At least one of the aerosol-generating materials is an aerosol-generating material comprising a binder (which may be a gelling agent) and an aerosol former. Optionally, an active and/or filler may also be present. Optionally, a solvent, such as water, is also
35 present and one or more other components of the aerosol-generating material may or may not be soluble in the solvent.

In some embodiments, the binder comprises or is a gelling agent. The binder may comprise one or more compounds selected from the group comprising alginates, pectins, starches (and derivatives), celluloses (and derivatives), gums, silica or silicones compounds, clays, polyvinyl alcohol and combinations thereof. For example, in some
5 embodiments, the binder comprises one or more of alginates, pectins, hydroxyethyl cellulose, hydroxypropyl cellulose, carboxymethylcellulose, pullulan, xanthan gum, guar gum, carrageenan, agarose, acacia gum, fumed silica, PDMS, sodium silicate, kaolin and polyvinyl alcohol. In some embodiments, the binder comprises a
10 hydrocolloid. In some cases, the binder comprises alginate and/or pectin, and may be combined with a setting agent (such as a calcium source) during formation of the aerosol-generating material. In some cases, the aerosol-generating material may comprise a calcium-crosslinked alginate and/or a calcium-crosslinked pectin.

15 The binder may comprise one or more compounds selected from cellulosic binders, non-cellulosic binders, guar gum, acacia gum and mixtures thereof.

In some embodiments, the cellulosic binder is selected from the group consisting of: hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose,
20 carboxymethylcellulose (CMC), hydroxypropyl methylcellulose (HPMC), methyl cellulose, ethyl cellulose, cellulose acetate (CA), cellulose acetate butyrate (CAB), cellulose acetate propionate (CAP) and combinations thereof.

In some embodiments, the binder comprises (or is) one or more of hydroxyethyl
25 cellulose, hydroxypropyl cellulose, hydroxypropyl methylcellulose (HPMC), carboxymethylcellulose, guar gum, or acacia gum.

In some embodiments, the binder comprises (or is) one or more non-cellulosic binders, including, but not limited to, agar, xanthan gum, gum Arabic, guar gum, locust bean
30 gum, pectin, carrageenan, starch, alginate, and combinations thereof. In preferred embodiments, the non-cellulose based binder is alginate or agar.

In some examples, alginate is comprised in the binder in an amount of from about 5 to
40 wt% of the aerosol-generating material, or 15 to 40 wt%. That is, the aerosol-
35 generating material comprises alginate in an amount of about 5 to 40 wt% by dry weight of the aerosol-generating material, or 15 to 40wt%. In some examples, the

aerosol-generating material comprises alginate in an amount of from about 20 to 40 wt%, or about 15 wt% to 35 wt% of the aerosol-generating material.

5 In some examples, pectin is comprised in the binder in an amount of from about 3 to 15 wt% of the aerosol-generating material. That is, the aerosol-generating material comprises pectin in an amount of from about 3 to 15 wt% by dry weight of the aerosol-generating material. In some examples, the aerosol-generating material comprises pectin in an amount of from about 5 to 10wt% of the aerosol-generating material.

10 In some examples, guar gum is comprised in the binder in an amount of from about 3 to 40 wt% of the aerosol-generating material. That is, the aerosol-generating material comprises guar gum in an amount of from about 3 to 40 wt% by dry weight of the aerosol-generating material. In some examples, the aerosol-generating material comprises guar gum in an amount of from about 5 to 10 wt% of the aerosol-generating material. In some examples, the aerosol-generating material comprises guar gum in an amount of from about 15 to 40 wt% of the aerosol-generating material, or from about 20 to 40wt%, or from about 15 to 35 wt%.

In examples, the alginate is present in an amount of at least about 50 wt% of the binder.
20 In examples, the aerosol-generating material comprises alginate and pectin, and the ratio of the alginate to the pectin is from 1:1 to 10:1. The ratio of the alginate to the pectin is typically >1:1, i.e. the alginate is present in an amount greater than the amount of pectin. In examples, the ratio of alginate to pectin is from about 2:1 to 8:1, or about 3:1 to 6:1, or is approximately 4:1.

25 The aerosol-generating material may be formed by forming a slurry, which is then dried to form a solid. The inclusion of a binder in the slurry results in the aerosol-generating material being formed from a dried gel. It has been found that, by including a binder in the aerosol-generating material, flavourant compounds, for example, menthol, are
30 stabilised within the gel matrix allowing a higher flavourant loading to be achieved than in non-gel compositions. The flavouring (e.g. menthol) is stabilised at high concentrations and the products have a good shelf life.

In some embodiments, the binder comprises alginate, and the binder is present in the
35 aerosol-generating material in an amount of from 10 – 30wt%, 20-35wt% or 25 – 30wt% of the slurry / aerosol-generating material (calculated on a dry weight basis). In

some embodiments, alginate is the only binder present in the aerosol-generating material. In other embodiments, the binder comprises alginate and at least one further binder, such as pectin.

5 The aerosol-generating material comprises an aerosol former. An "aerosol former" (also referred to herein as an aerosol former material) is an agent that promotes the generation of an aerosol. An aerosol former may promote the generation of an aerosol by promoting an initial vaporisation and/or the condensation of a gas to an inhalable solid and/or liquid aerosol. In some embodiments, an aerosol former may improve the
10 delivery of flavour from the aerosol generating material. In general, any suitable aerosol former or agents may be included in the aerosol generating material of the invention, including those described herein. Other suitable aerosol formers include, but are not limited to: a polyol such as sorbitol, glycerol, and glycols like propylene glycol or triethylene glycol; a non-polyol such as monohydric alcohols, high boiling point
15 hydrocarbons, acids such as lactic acid, glycerol derivatives, esters such as diacetin, triacetin, triethylene glycol diacetate, triethyl citrate or myristates including ethyl myristate and isopropyl myristate and aliphatic carboxylic acid esters such as methyl stearate, dimethyl dodecanedioate and dimethyl tetradecanedioate.

20 The aerosol former may be included in the aerosol-generating material in an amount of up to about 80wt% of the aerosol-generating material, such as from about 0.1wt%, 0.5wt%, 1wt%, 3wt%, 5wt%, 7wt% or 10% to about 80wt%, 75wt%, 70wt%, 65wt%, 60wt%, 55wt%, 50wt%, 45wt%, 40wt%, 35wt%, 30wt% or 25wt% of an aerosol former material. In some embodiments, the aerosol-generating material comprises an aerosol
25 former in an amount of about 40 to 80wt%, 40 to 75wt%, 50 to 70wt%, or 55 to 65wt%.

In some embodiments, the aerosol former is glycerol, propylene glycol, or a mixture of glycerol and propylene glycol. Glycerol may be present in an amount of from 10 to 20 % by weight of the tobacco material, for example 13 to 16 % by weight of the composition,
30 or about 14% or 15% by weight of the composition. Propylene glycol, if present, may be present in an amount of from 0.1 to 0.3% by weight of the composition.

The aerosol former material may act as a plasticiser. In some cases, the aerosol former material comprises one or more compound selected from erythritol, propylene glycol, glycerol, triacetin, sorbitol and xylitol. In some cases, the aerosol former material
35 comprises, consists essentially of, or consists of glycerol. It has been established that if

the content of the plasticiser is too high, the aerosol-generating material may absorb water resulting in a material that does not create an appropriate consumption experience in use. It has been established that if the plasticiser content is too low, the aerosol-generating material may be brittle and easily broken. The plasticiser content
5 specified herein provides an aerosol-generating material flexibility which allows the sheet to be wound onto a bobbin, which is useful in manufacture of consumables or can allow the sheet to be transported prior to shredding.

The aerosol former may enhance the mouthfeel, as well as the organoleptic properties
10 in general, of the aerosol produced by the aerosol-generating material when heated and inhaled by a user, particularly where the aerosol-generating material comprises relatively high quantities (e.g. >40 wt%) of aerosol former. The capability of aerosol-generating materials to retain high quantities of aerosol former may reduce the need for other components of the aerosol-generating material, such as the expanded botanical
15 material, to be loaded with high quantities of aerosol former. This may improve manufacturing efficiency.

The aerosol-generating material may comprise a filler. The filler is generally a non-tobacco component, that is, a component that does not include ingredients originating
20 from tobacco. The filler component may be a non-tobacco fibre such as wood fibre or pulp or wheat fibre. The filler component may also be an inorganic material such as chalk, perlite, vermiculite, diatomaceous earth, colloidal silica, magnesium oxide, magnesium sulphate, magnesium carbonate. The filler component may also be a non-tobacco cast material or a non-tobacco extruded material. The filler component may be
25 present in an amount of 0 to 20% by weight of the tobacco material, or in an amount of from 1 to 10% by weight of the composition. In some embodiments, the filler component is absent.

In some cases, the aerosol-generating material comprises 5-50wt%, 10-40wt% or 15-
30 30wt% of the filler. In some such cases the aerosol-generating material comprises at least 1wt% of the filler, for example, at least 5 wt%, at least 10wt%, at least 20wt% at least 30wt%, at least 40wt%, or at least 50wt% of a filler. In exemplary embodiments the aerosol-generating material comprises from 5-25wt% of a filler comprising fibres. Suitably the filler consists of fibres, or is in the form of fibres.

In some embodiments, the aerosol-generating material comprises less than 60wt% of the filler, such as from 1wt% to 60wt%, or 5wt% to 50wt%, or 5wt% to 30wt%, or 10wt% to 20wt%.

- 5 In other embodiments, the aerosol-generating material comprises less than 20wt%, suitably less than 10wt% or less than 5wt% of the filler.

The filler may comprise one or more organic filler materials such as wood pulp, cellulose and cellulose derivatives (such as methylcellulose, hydroxypropyl cellulose,
10 and carboxymethyl cellulose (CMC)). An inorganic filler, such as calcium carbonate or chalk may be used. In some embodiments, the aerosol-generating material comprises no calcium carbonate such as chalk.

Suitably, the filler is fibrous. For example, the filler may be a fibrous organic filler
15 material such as wood pulp, hemp fibre, cellulose or cellulose derivatives (such as methylcellulose, hydroxypropyl cellulose, and carboxymethyl cellulose (CMC)). Without wishing to be bound by theory, it is believed that including fibrous filler in an aerosol-generating material may increase the tensile strength of the material. Additionally, including a fibrous filler has been found to improve the handling of the
20 aerosol-generating material during manufacturing. In particular, it has been found that the resulting aerosol-generating material is less “tacky” and consequently is easier to shred during manufacturing. Including a fibrous filler can therefore increase manufacturing efficiency, reducing the likelihood of machine stops during shredding. Including a fibrous filler in the aerosol-generating material also means that the aerosol-
25 generating material is less likely to clump together (e.g. agglomerate) once it has been shredded. When the shredded aerosol-generating material is included in consumables, reduced agglomeration optimises the distribution of the shredded aerosol-generating material in the consumables. It is therefore more likely that each consumable will contain a similar quantity of shredded aerosol-generating material, which may improve
30 homogeneity of the flavourant loading within batches of consumables and/or within a given consumable.

In some embodiments, the aerosol-generating material comprises a substance to be delivered. The substance to be delivered may comprise one or more active constituents,
35 one or more flavours, one or more aerosol-former materials, and/or one or more other functional materials.

In some embodiments, the substance to be delivered comprises an active substance.

5 The active substance as used herein may be a physiologically active material, which is a material intended to achieve or enhance a physiological response. The active substance may for example be selected from nutraceuticals, nootropics, psychoactives. The active substance may be naturally occurring or synthetically obtained. The active substance may comprise for example nicotine, caffeine, taurine, theine, vitamins such as B6 or B12 or C, melatonin, cannabinoids, or constituents, derivatives (including, where
10 appropriate but not limited to, the corresponding acid forms of these materials), or combinations thereof. The active substance may comprise one or more constituents, derivatives or extracts of tobacco, cannabis or another botanical.

In some embodiments, the active substance comprises nicotine. In some embodiments,
15 the active substance comprises caffeine, melatonin or vitamin B12.

As noted herein, the active substance may comprise or be derived from one or more botanicals or constituents, derivatives or extracts thereof. As used herein, the term "botanical" includes any material derived from plants including, but not limited to,
20 extracts, leaves, bark, fibres, stems, roots, seeds, flowers, fruits, pollen, husk, shells or the like. Alternatively, the material may comprise an active compound naturally existing in a botanical, obtained synthetically. The material may be in the form of liquid, gas, solid, powder, dust, crushed particles, granules, pellets, shreds, strips, sheets, or the like. Example botanicals are tobacco, eucalyptus, star anise, hemp, cocoa,
25 cannabis, fennel, lemongrass, peppermint, spearmint, rooibos, chamomile, flax, ginger, ginkgo biloba, hazel, hibiscus, laurel, licorice (liquorice), matcha, mate, orange skin, papaya, rose, sage, tea such as green tea or black tea, thyme, clove, cinnamon, coffee, aniseed (anise), basil, bay leaves, cardamom, coriander, cumin, nutmeg, oregano, paprika, rosemary, saffron, lavender, lemon peel, mint, juniper, elderflower, vanilla,
30 wintergreen, beefsteak plant, curcuma, turmeric, sandalwood, cilantro, bergamot, orange blossom, myrtle, cassis, valerian, pimento, mace, damien, marjoram, olive, lemon balm, lemon basil, chive, carvi, verbena, tarragon, geranium, mulberry, ginseng, theanine, theacrine, maca, ashwagandha, damiana, guarana, chlorophyll, baobab or any combination thereof. The mint may be chosen from the following mint varieties:
35 *Mentha Arvensis*, *Mentha c.v.*, *Mentha niliaca*, *Mentha piperita*, *Mentha piperita citrata c.v.*, *Mentha piperita c.v.*, *Mentha spicata crispa*, *Mentha cardifolia*, *Memtha longifolia*,

Mentha suaveolens variegata, Mentha pulegium, Mentha spicata c.v. and Mentha suaveolens

5 In some embodiments, the active substance comprises or is derived from one or more botanicals or constituents, derivatives or extracts thereof and the botanical is tobacco material.

10 As used herein, the term “tobacco material” refers to a material derived from a plant of the Nicotiana species. The selection of the plant of the Nicotiana species is not limited, and the types of tobacco or tobaccos used may vary. The term “tobacco material” may include one or more of tobacco, tobacco derivatives, expanded tobacco, reconstituted tobacco or tobacco substitutes. The tobacco material may comprise one or more of ground tobacco, tobacco fibre, cut tobacco, extruded tobacco, leaf tobacco, tobacco stem, reconstituted tobacco and/or tobacco extract. As used herein, “leaf tobacco”
15 means cut lamina tobacco.

In some embodiments, the tobacco material is selected from flue-cured or Virginia, Burley, sun-cured, Maryland, dark-fired, dark air cured, light air cured, Indian air cured, Red Russian and Rustica tobaccos, and mixtures thereof, as well as various other
20 rare or specialty tobaccos, green or cured. Tobacco material produced via any other type of tobacco treatment which could modify the tobacco taste, such as fermented tobacco or genetic modification or crossbreeding techniques, is also within the scope of the present disclosure. For example, it is envisaged that tobacco plants may be genetically engineered or crossbred to increase or decrease production of components,
25 characteristics or attributes.

In some embodiments, the tobacco material is sun-cured tobacco, selected from Indian Kurnool and Oriental tobaccos, including Izmir, Basma, Samsun, Katerini, Prelip, Komotini, Xanthi and Yambol tobaccos. In some embodiments, the tobacco material is
30 dark air cured tobacco, selected from Passanda, Cubano, Jatin and Besuki tobaccos. In some embodiments, the tobacco material is light air cured tobacco, selected from North Wisconsin and Galpao tobaccos.

In some embodiments, the tobacco material is selected from Brazilian tobaccos,
35 including Mata Fina and Bahia tobaccos. In some embodiments, the tobacco material is selected from criollo, Piloto Cubano, Olor, Green River, Isabela DAC, White Pata,

Eluru, Jatim, Madura, Kasturi, Connecticut Seed, Broad Leaf, Connecticut, Pennsylvanian, Italian dry air cured, Paraguayan dry air cured and One Sucker tobaccos.

5 For the preparation of smoking/vaping or smokeless tobacco products, plants of the Nicotiana species may be subjected to a curing process. Certain types of tobaccos may be subjected to alternative types of curing processes, such as fire curing or sun curing. Preferably, but not necessarily, harvested tobaccos that are cured are aged. The tobacco can be harvested in different stages of growth, for example when the plant
10 is has reached a level of maturity and the lower leaves are ready for harvest whilst the upper leaves are still in development.

In some embodiments, at least one portion of the plant of the Nicotiana species (e.g., at least a portion of the tobacco material) is employed in an immature form. That is, in
15 some embodiments, the plant, or at least one portion of that plant, is harvested before reaching a stage normally regarded as ripe or mature.

In some embodiments, at least a portion of the plant of the Nicotiana species (e.g. at least a portion of the tobacco material) is employed in a mature form. That is, in some
20 embodiments, the plant, or at least one portion of that plant, is harvested when that plant (or plant portion) reaches a point that is traditionally viewed as being ripe, over-ripe or mature, which can be accomplished through the use of tobacco harvesting techniques conventionally employed by farmers. Both Oriental tobacco and Burley tobacco plants can be harvested. Also, the Virginia tobacco leaves can be harvested or
25 primed depending upon their stalk position.

The Nicotiana species may be selected for the content of various compounds that are present in the plant. For example, plants may be selected on the basis that those plants produce relatively high quantities of one or more of the compounds desired to be
30 isolated (i.e. the volatile compounds of interest). In certain embodiments, plants of the Nicotiana species are specifically cultivated for their abundance of leaf surface compounds. Tobacco plants may be grown in green-houses, growth chambers, or outdoors in fields, or grown hydroponically.

35 Various parts or portions of the plant of the Nicotiana species may be utilised. In some embodiments, the whole plant, or substantially the whole plant, is harvested and

employed as such. As used herein, the term “substantially the whole plant” means that at least 90% of the plant is harvested, such as at least 95% of the plant, such as at least 99% of the plant. Alternatively, in some embodiments, various parts or pieces of the plant are harvested or separated for further use after harvest. In some embodiments, the tobacco material is selected from the leaves, stems, stalks of the plant, and various combinations of these parts. The tobacco material of the disclosure may thus comprise an entire plant or any portion of a plant of the Nicotiana species.

The tobacco material may comprise or consist of reconstituted tobacco, tobacco lamina, paper reconstituted tobacco, extruded tobacco, bandcast reconstituted tobacco, or a combination of reconstituted tobacco and another form of tobacco, such as tobacco lamina or granules.

In some embodiments, the aerosol-generating material is substantially free from botanical material. In particular, in some embodiments, the aerosol-generating material is substantially tobacco free.

In some embodiments, the active substance comprises or is derived from one or more botanicals or constituents, derivatives or extracts thereof and the botanical is selected from eucalyptus, star anise, cocoa and hemp.

In some embodiments, the active substance comprises or is derived from one or more botanicals or constituents, derivatives or extracts thereof and the botanical is selected from rooibos and fennel.

In some embodiments, the substance to be delivered comprises a flavour.

As used herein, the terms “flavour” and “flavourant” refer to materials which, where local regulations permit, may be used to create a desired taste, aroma or other somatosensorial sensation in a product for adult consumers. They may include naturally occurring flavour materials, botanicals, extracts of botanicals, synthetically obtained materials, or combinations thereof (e.g., tobacco, cannabis, licorice (liquorice), hydrangea, eugenol, Japanese white bark magnolia leaf, chamomile, fenugreek, clove, maple, matcha, menthol, Japanese mint, aniseed (anise), cinnamon, turmeric, Indian spices, Asian spices, herb, wintergreen, cherry, berry, red berry, cranberry, peach, apple, orange, mango, clementine, lemon, lime, tropical fruit, papaya,

rhubarb, grape, durian, dragon fruit, cucumber, blueberry, mulberry, citrus fruits, Drambuie, bourbon, scotch, whiskey, gin, tequila, rum, spearmint, peppermint, lavender, aloe vera, cardamom, celery, cascarilla, nutmeg, sandalwood, bergamot, geranium, khat, naswar, betel, shisha, pine, honey essence, rose oil, vanilla, lemon oil, orange oil, orange blossom, cherry blossom, cassia, caraway, cognac, jasmine, ylang-ylang, sage, fennel, wasabi, piment, ginger, coriander, coffee, hemp, a mint oil from any species of the genus *Mentha*, eucalyptus, star anise, cocoa, lemongrass, rooibos, flax, ginkgo biloba, hazel, hibiscus, laurel, mate, orange skin, rose, tea such as green tea or black tea, thyme, juniper, elderflower, basil, bay leaves, cumin, oregano, paprika, rosemary, saffron, lemon peel, mint, beefsteak plant, curcuma, cilantro, myrtle, cassia, valerian, pimento, mace, damien, marjoram, olive, lemon balm, lemon basil, chive, carvi, verbena, tarragon, limonene, thymol, camphene), flavour enhancers, bitterness receptor site blockers, sensorial receptor site activators or stimulators, sugars and/or sugar substitutes (e.g., sucralose, acesulfame potassium, aspartame, saccharine, cyclamates, lactose, sucrose, glucose, fructose, sorbitol, or mannitol), and other additives such as charcoal, chlorophyll, minerals, botanicals, or breath freshening agents. They may be imitation, synthetic or natural ingredients or blends thereof. They may be in any suitable form, for example, liquid such as an oil, solid such as a powder, or gas.

20

In some embodiments, the flavour comprises menthol, spearmint and/or peppermint. In some embodiments, the flavour comprises flavour components of cucumber, blueberry, citrus fruits and/or redberry. In some embodiments, the flavour comprises eugenol. In some embodiments, the flavour comprises flavour components extracted from tobacco. In some embodiments, the flavour comprises flavour components extracted from cannabis.

25

In some embodiments, the aerosol-generating material may comprise up to about 80wt%, 70wt%, 60wt%, 55wt%, 50wt% or 45wt% of flavourant. In some cases, the aerosol-generating material may comprise at least about 0.1wt%, 1wt%, 10wt%, 20wt%, 30wt%, 35wt% or 40wt% of flavourant (all calculated on a dry weight basis). For example, the aerosol-generating material may comprise 1-80wt%, 10-80wt%, 20-70wt%, 30-60wt%, 35-55wt% or 30-45wt% of flavourant. In exemplary embodiments, the aerosol-generating material comprises 35 – 50wt% of flavourant. In some cases, the flavourant comprises, consists essentially of or consists of menthol.

35

In some embodiments, the flavour may comprise a sensate, which is intended to achieve a somatosensorial sensation which are usually chemically induced and perceived by the stimulation of the fifth cranial nerve (trigeminal nerve), in addition to or in place of aroma or taste nerves, and these may include agents providing heating, cooling, tingling, numbing effect. A suitable heat effect agent may be, but is not limited to, vanillyl ethyl ether and a suitable cooling agent may be, but not limited to eucolyptol, WS-3.

The aerosol-generating composition may comprise an aerosol generating material in the form of an “amorphous solid”. The aerosol-generating material may be a “monolithic solid”. In some embodiments, the aerosol-generating material may be a dried gel.

The aerosol-generating composition may comprise an aerosol generating material in the form of an aerosol-generating film. The aerosol-generating film may be formed by combining a binder, such as a gelling agent, with a solvent, such as water, an aerosol-former and one or more other components, such as active substances, to form a slurry and then heating the slurry to volatilise at least some of the solvent to form the aerosol-generating film. The slurry may be heated to remove at least about 60 wt%, 70 wt%, 80 wt%, 85 wt% or 90 wt% of the solvent. The aerosol-generating film may be a continuous film or a discontinuous film, such an arrangement of discrete portions of film on a support. The aerosol-generating film may be substantially tobacco free.

The aerosol-generating material may comprise or be a sheet, which may optionally be shredded to form a shredded sheet. The sheet of aerosolisable material may be cut lengthwise and/or width-wise, for example in a cross-cut type shredding process, to define a cut length for the strands or strips of aerosolisable material, in addition to a cut width.

The aerosol-generating composition may comprise any combination of the above aerosol-generating materials. For example, the aerosol-generating composition may comprise a blend of aerosol-generating materials, at least one of which comprises a binder and an aerosol-former. In some embodiments, the aerosol-generating composition comprises (e.g. a first) aerosol-generating material comprising a binder and an aerosol former and (e.g. a second) different aerosol-generating material. For

example, the second aerosol-generating material may be a botanical material, such as tobacco lamina.

5 In some embodiments, the aerosol-generating material is prepared by forming a slurry comprising components of the aerosol-generating material or precursors thereof, forming a layer of the slurry, setting the slurry to form a gel and drying to form the aerosol-generating material. Optionally, the setting the slurry at step comprises applying a setting agent to the slurry. In some embodiments, a setting agent is sprayed on the slurry, such as a top surface of the slurry.

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In some embodiments, the setting agent comprises or consists of calcium acetate, calcium formate, calcium carbonate, calcium hydrogencarbonate, calcium chloride, calcium lactate, or a combination thereof. In some embodiments, the setting agent comprises or consists of calcium formate and/or calcium lactate. In particular
15 embodiments, the setting agent comprises or consists of calcium formate. It has been identified that, typically, employing calcium formate as a setting agent results in an aerosol-generating material having a greater tensile strength and greater resistance to elongation.

20 The total amount of the setting agent, such as a calcium source, may be 0.5-5wt% (calculated on a dry weight basis). Suitably, the total amount may be from about 1wt%, 2.5wt% or 4wt% to about 4.8wt% or 4.5wt%. It has been found that the addition of too little setting agent may result in an aerosol-generating material which does not stabilise the aerosol-generating material components and results in these components dropping
25 out of the aerosol-generating material. It has been found that the addition of too much setting agent results in an aerosol-generating material that is very tacky and consequently has poor handleability.

30 When the aerosol-generating material does not contain tobacco, a higher amount of setting agent may need to be applied. In some cases the total amount of setting agent may therefore be from 0.5-12wt% such as 5-10wt%, calculated on a dry weight basis. Suitably, the total amount may be from about 5wt%, 6wt% or 7wt% to about 12wt% or 10wt%. In this case the aerosol-generating material will not generally contain any tobacco.

35

The process comprises forming a layer of the slurry. This typically comprises spraying, casting or extruding the slurry. In examples, the slurry layer is formed by electro spraying the slurry. In examples, the slurry layer is formed by casting the slurry.

- 5 In some examples, all of the steps of the process, at least partially, occur simultaneously (for example, during electro spraying). In some examples, the steps of the process occur sequentially.

10 The aerosol-generating material may comprise 1 to 60 wt% of a gelling agent, 0.1 to 70 wt% of an aerosol former material, 5 to 50 % of filler in the form of fibres, and 0.1 to 80 wt% of a flavourant and/or active substance.

15 The aerosol-generating material may comprise 10 to 40 wt% gelling agent, 10 to 70 wt% of an aerosol former material, 20 to 40 wt% of filler and optionally 10 to 50 wt% of a flavourant.

In an embodiment, the aerosol-generating material comprises alginate in an amount of 32.8 w%, glycerol in an amount of 19.2 wt% and menthol in an amount of 48 wt%.

20 In an embodiment, the aerosol-generating material comprises alginate in amount of 26.2 wt%, glycerol in an amount of 15.4 wt%, menthol in an amount of 38.4 wt% and fibres (from wood pulp) in an amount of 20 wt%.

25 In an embodiment, the aerosol-generating material comprises alginate in an amount of 32 wt%, pectin in an amount of 8 wt% and glycerol in an amount of 60 wt%.

30 In an embodiment, the aerosol-generating material comprises alginate in an amount of 24 wt%, pectin in an amount of 6 wt%, cellulose fibres in an amount of 10 wt% and glycerol in an amount of 60 wt%.

In an embodiment, the aerosol-generating material comprises carboxymethyl cellulose (CMC) in an amount of about 7 wt%, cellulose fibres (from wood pulp) in an amount of about 43 wt % and glycerol in an amount of about 50 wt%.

35 The mouthpiece 2 includes a cooling section 8, also referred to as a cooling element, positioned immediately downstream of and adjacent to the aerosol-generating section

3. In the present example, the cooling section 8 is in an abutting relationship with the source of aerosol-generating material. The mouthpiece 2 also includes, in the present example, a body of material 6 downstream of the cooling section 8, and a hollow tubular element 4 downstream of the body of material 6, at the mouth end of the article

5 1.

The cooling section 8 comprises a hollow channel, having an internal diameter of between about 1 mm and about 4 mm, for example between about 2 mm and about 4 mm. In the present example, the hollow channel has an internal diameter of about 3

10 mm. The hollow channel extends along the full length of the cooling section 8. In the present example, the cooling section 8 comprises a single hollow channel. In alternative embodiments, the cooling section can comprise multiple channels, for example, 2, 3 or 4 channels. In the present example, the single hollow channel is substantially cylindrical, although in alternative embodiments, other channel geometries/cross-

15 sections may be used. The hollow channel can provide a space into which aerosol drawn into the cooling section 8 can expand and cool down. In all embodiments, the cooling section is configured to limit the cross-sectional area of the hollow channel/s, to limit tobacco displacement into the cooling section, in use.

20 The cooling section 8 preferably has a wall thickness in a radial direction, which can be measured, for example, using a calliper. The wall thickness of the cooling section 8, for a given outer diameter of cooling section, defines the internal diameter for the cavity surrounded by the walls of the cooling section 8. The cooling section 8 can have a wall thickness of at least about 1.5 mm and up to about 2 mm. In the present example, the

25 cooling section 8 has a wall thickness of about 2 mm. The inventors have advantageously found that providing a cooling section 8 having a wall thickness within this range improves the retention of the source of aerosol-generating material in the aerosol generating section, in use, by reducing the longitudinal displacement of strands and/or strips of aerosol-generating material when the aerosol generator is inserted into

30 the article.

The cooling section 8 is formed from filamentary tow. Other constructions can be used, such as a plurality of layers of paper which are parallel wound, with butted seams, to form the cooling section 8; or spirally wound layers of paper, cardboard tubes, tubes

35 formed using a papier-mâché type process, moulded or extruded plastic tubes or similar. The cooling section 8 is manufactured to have a rigidity that is sufficient to

withstand the axial compressive forces and bending moments that might arise during manufacture and whilst the article 1 is in use.

5 The wall material of the cooling section 8 can be relatively non-porous, such that at least 90% of the aerosol generated by the aerosol generating section 3 passes longitudinally through the one or more hollow channels rather than through the wall material of the cooling section 8. For instance, at least 92% or at least 95% of the aerosol generated by the aerosol generating section 3 can pass longitudinally through the one or more hollow channels.

10

The filamentary tow forming the cooling section 8 preferably has a total denier of less than 45,000, more preferably less than 42,000. This total denier has been found to allow the formation of a cooling section 8 which is not too dense. Preferably, the total denier is at least 20,000, more preferably at least 25,000. In preferred embodiments, 15 the filamentary tow forming the cooling section 8 has a total denier between 25,000 and 45,000, more preferably between 35,000 and 45,000. Preferably the cross-sectional shape of the filaments of tow are 'Y' shaped, although in other embodiments other shapes such as 'X' shaped filaments can be used.

20 The filamentary tow forming the cooling section 8 preferably has a denier per filament of greater than 3. This denier per filament has been found to allow the formation of a tubular element 4 which is not too dense. Preferably, the denier per filament is at least 4, more preferably at least 5. In preferred embodiments, the filamentary tow forming the hollow tubular element 4 has a denier per filament between 4 and 10, more 25 preferably between 4 and 9. In one example, the filamentary tow forming the cooling section 8 has an 8Y40,000 tow formed from cellulose acetate and comprising 18% plasticiser, for instance triacetin.

Preferably, the density of the material forming the cooling section 8 is at least about 30 0.20 grams per cubic centimetre (g/cc), more preferably at least about 0.25 g/cc. Preferably, the density of the material forming the cooling section 8 is less than about 0.80 grams per cubic centimetre (g/cc), more preferably less than 0.6 g/cc. In some embodiments, the density of the material forming the cooling section 8 is between 0.20 and 0.8 g/cc, more preferably between 0.3 and 0.6 g/cc, or between 0.4 g/cc and 0.6 35 g/cc or about 0.5 g/cc. These densities have been found to provide a good balance between improved firmness afforded by denser material and minimising the overall

weight of the article. For the purposes of the present invention, the "density" of the material forming the cooling section 8 refers to the density of any filamentary tow forming the element with any plasticiser incorporated. The density may be determined by dividing the total weight of the material forming the cooling section 8 by the total
5 volume of the material forming the cooling section 8, wherein the total volume can be calculated using appropriate measurements of the material forming the cooling section 8 taken, for example, using callipers. Where necessary, the appropriate dimensions may be measured using a microscope.

10 Preferably, the length of the cooling section 8 is less than about 30 mm. More preferably, the length of the cooling section 8 is less than about 25 mm. Still more preferably, the length of the cooling section 8 is less than about 20 mm. In addition, or as an alternative, the length of the cooling section 8 is preferably at least about 10 mm. Preferably, the length of the cooling section 8 is at least about 15 mm. In some
15 preferred embodiments, the length of the cooling section 8 is from about 15 mm to about 20 mm, more preferably from about 16 mm to about 19 mm. In the present example, the length of the cooling section 8 is 19 mm.

The cooling section 8 is located around and defines an air gap within the mouthpiece 2
20 which acts as a cooling section. The air gap provides a chamber through which heated volatilised components generated by the rod of aerosol-generating material 3 flow. The cooling section 8 is hollow to provide a chamber for aerosol accumulation yet rigid enough to withstand axial compressive forces and bending moments that might arise during manufacture and whilst the article 1 is in use. The cooling section 8 provides a
25 physical displacement between the aerosol-generating section 3 and the body of material 6. The physical displacement provided by the cooling section 8 can provide a thermal gradient across the length of the cooling section 8.

Preferably, the mouthpiece 2 comprises a cavity having an internal volume greater than
30 110 mm³. Providing a cavity of at least this volume has been found to enable the formation of an improved aerosol. More preferably, the mouthpiece 2 comprises a cavity, for instance formed within the cooling section 8, having an internal volume greater than 110 mm³, and still more preferably greater than 130 mm³, allowing further improvement of the aerosol. In some examples, the internal cavity comprises a volume
35 of between about 130 mm³ and about 230 mm³, for instance about 134 mm³ or 227 mm³.

The cooling section 8 can be configured to provide a temperature differential of at least 40 degrees Celsius between a heated volatilised component entering a first, upstream end of the cooling section 8 and a heated volatilised component exiting a second, downstream end of the cooling section 8. The cooling section 8 is preferably configured to provide a temperature differential of at least 60 degrees Celsius, preferably at least 80 degrees Celsius and more preferably at least 100 degrees Celsius between a heated volatilised component entering a first, upstream end of the cooling section 8 and a heated volatilised component exiting a second, downstream end of the cooling section 8. This temperature differential across the length of the cooling section 8 protects the temperature sensitive body of material 6 from the high temperatures of the aerosol-generating section 3 when it is heated.

When in use, the aerosol-generating section may exhibit a pressure drop of from about 15 to about 40 mm H₂O. In some embodiments, the aerosol-generating section 3 exhibits a pressure drop across the aerosol-generating section of from about 15 to about 30 mm H₂O.

The aerosol-generating material 30 may have a packing density of between about 400 mg/cm³ and about 900 mg/cm³ within the aerosol-generating section 3. A packing density higher than this may increase the pressure drop.

At least about 45% of a volume of the aerosol-generating section 3 is filled with the aerosol-generating material 30. In some embodiments, from about 65% to about 85% of the volume of the cavity is filled with the aerosol-generating material 30. The susceptor element 31 may fill about 1% of the volume of the aerosol-generating section 3, or up to about 5% of the volume of the aerosol-generating section 3. Advantageously, a non-planar susceptor element 31 may provide a structure to the rod of aerosol-generating composition which provides for gaps in the aerosol-generating material 30, whilst also gripping the aerosol-generating material 30 and packing out the rod, which can reduce the amount of aerosol-generating material required. In some examples, the susceptor element 31 and the aerosol-generating material 30 may fill up to about 50% of the volume of the aerosol-generating section 3, or up to about 60% of the volume of the aerosol-generating section, or up to about 70% of the volume of the aerosol-generating section 3, or about up to 80% of the volume of the aerosol-generating section 3.

In the present embodiment, the moisture impermeable wrapper 10 which circumscribes the rod of aerosol-generating material comprises aluminium foil. In other embodiments, the wrapper 10 comprises a paper wrapper, optionally comprising
5 a barrier coating to make the material of the wrapper substantially moisture impermeable. Aluminium foil has been found to be particularly effective at enhancing the formation of aerosol within the aerosol-generating section 3. In the present example, the aluminium foil has a metal layer having a thickness of about 6 μm . In the present example, the aluminium foil has a paper backing. However, in alternative
10 arrangements, the aluminium foil can be other thicknesses, for instance between 4 μm and 16 μm in thickness. The aluminium foil also need not have a paper backing, but could have a backing formed from other materials, for instance to help provide an appropriate tensile strength to the foil, or it could have no backing material. Metallic layers or foils other than aluminium can also be used. The total thickness of the
15 wrapper is preferably between 20 μm and 60 μm , more preferably between 30 μm and 50 μm , which can provide a wrapper having appropriate structural integrity and heat transfer characteristics. The tensile force which can be applied to the wrapper before it breaks can be greater than 3,000 grams force, for instance between 3,000 and 10,000 grams force or between 3,000 and 4,500 grams force. Where the wrapper comprises
20 paper or a paper backing, i.e. a cellulose based material, the wrapper can have a basis weight greater than about 30 gsm. For example, the wrapper can have a basis weight in the range from about 40 gsm to about 70 gsm. Such basis weights provide an improved rigidity to the rod of aerosol-generating composition. The improved rigidity provided by wrappers having a basis weight in this range can make the aerosol-generating
25 section 3 more resistant to crumpling or other deformation under the forces to which the article is subject, in use. Providing a rod of aerosol-generating composition having increased rigidity can be beneficial where the plurality of strands or strips of aerosol-generating material are aligned within the aerosol-generating section such that their longitudinal dimension is in parallel alignment with the longitudinal axis, since
30 longitudinally aligned strands or strips of aerosol-generating material may provide less rigidity to the rod of aerosol generating composition than when the strands or strips are not aligned. The improved rigidity of the rod of aerosol-generating composition allows the article to withstand the increased forces to which the article is subject, in use.

35 In the present example, the moisture impermeable wrapper 10 is also substantially impermeable to air. In alternative embodiments, the wrapper 10 preferably has a

permeability of less than 100 Coresta Units, more preferably less than 60 Coresta Units. It has been found that low permeability wrappers, for instance having a permeability of less than 100 Coresta Units, more preferably less than 60 Coresta Units, result in an improvement in the aerosol formation in the aerosol-generating section 3. Without
5 wishing to be bound by theory, it is hypothesised that this is due to reduced loss of aerosol compounds through the wrapper 10. The permeability of the wrapper 10 can be measured in accordance with ISO 2965:2009 concerning the determination of air permeability for materials used as cigarette papers, filter plug wrap and filter joining paper.

10

The body of material 6 and hollow tubular element 4 each define a substantially cylindrical overall outer shape and share a common longitudinal axis. The body of material 6 is wrapped in a first plug wrap 7. Preferably, the first plug wrap 7 has a basis weight of less than 50 gsm, more preferably between about 20 gsm and 40 gsm.

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Preferably, the first plug wrap 7 has a thickness of between 30 μm and 60 μm , more preferably between 35 μm and 45 μm . Preferably, the first plug wrap 7 is a non-porous plug wrap, for instance having a permeability of less than 100 Coresta units, for instance less than 50 Coresta units. However, in other embodiments, the first plug wrap 7 can be a porous plug wrap, for instance having a permeability of greater than
20 200 Coresta Units.

Preferably, the length of the body of material 6 is less than about 15 mm. More preferably, the length of the body of material 6 is less than about 12 mm. In addition, or as an alternative, the length of the body of material 6 is at least about 5 mm.

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Preferably, the length of the body of material 6 is at least about 8 mm. In some preferred embodiments, the length of the body of material 6 is from about 5 mm to about 15 mm, more preferably from about 6 mm to about 12 mm, even more preferably from about 6 mm to about 12 mm, most preferably about 6 mm, 7 mm, 8 mm, 9 mm or 10 mm. In the present example, the length of the body of material 6 is 10 mm.

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In the present example, the body of material 6 is formed from filamentary tow. In the present example, the tow used in the body of material 6 has a denier per filament (d.p.f.) of 5 and a total denier of 25,000. In the present example, the tow comprises plasticised cellulose acetate tow. The plasticiser used in the tow comprises about 9% by
35 weight of the tow. In the present example, the plasticiser is triacetin. In other examples, different materials can be used to form the body of material 6. For instance,

rather than tow, the body 6 can be formed from paper, for instance in a similar way to paper filters known for use in cigarettes. For instance, the paper, or other cellulose-based material, can be provided as one or more portions of sheet material which is folded and/or crimped to form body 6. The sheet material can have a basis weight of
5 from 15gsm to 60gsm, for instance between 20 and 50 gsm. The sheet material can, for instance, have a basis weight in any of the ranges between 15 and 25 gsm, between 25 and 30 gsm, between 30 and 40 gsm, between 40 and 45 gsm and between 45 and 50 gsm. Additionally or alternatively, the sheet material can have a width of between 50mm and 200mm, for instance between 60mm and 150mm, or between 80mm and
10 150mm. For instance, the sheet material can have a basis weight of between 20 and 50 gsm and a width between 80mm and 150mm. This can, for instance, enable the cellulose-based bodies to have appropriate pressure drops for an article having dimensions as described herein.

15 Alternatively, the body 6 can be formed from tows other than cellulose acetate, for instance polylactic acid (PLA), other materials described herein for filamentary tow or similar materials. The tow is preferably formed from cellulose acetate. The tow, whether formed from cellulose acetate or other materials, preferably has a d.p.f. of at least 5. Preferably, to achieve a sufficiently uniform body of material 6, the tow has a
20 denier per filament of no more than 12 d.p.f., preferably no more than 11 d.p.f. and still more preferably no more than 10 d.p.f.

The total denier of the tow forming the body of material 6 is preferably at most 30,000, more preferably at most 28,000 and still more preferably at most 25,000. These values
25 of total denier provide a tow which takes up a reduced proportion of the cross sectional area of the mouthpiece 2 which results in a lower pressure drop across the mouthpiece 2 than tows having higher total denier values. For appropriate firmness of the body of material 6, the tow preferably has a total denier of at least 8,000 and more preferably at least 10,000. Preferably, the denier per filament is between 5 and 12 while the total
30 denier is between 10,000 and 25,000. Preferably the cross-sectional shape of the filaments of tow are 'Y' shaped, although in other embodiments other shapes such as 'X' shaped filaments can be used, with the same d.p.f. and total denier values as provided herein.

35 Irrespective of the material used to form the body 6, the pressure drop across body 6, can, for instance, be between 0.3 and 5mmWG per mm of length of the body 6, for

instance between 0.5mmWG and 2mmWG per mm of length of the body 6. The pressure drop can, for instance, be between 0.5 and 1mmWG/mm of length, between 1 and 1.5mmWG/mm of length or between 1.5 and 2mmWG/mm of length. The total pressure drop across body 6 can, for instance, be between 3mmWG and 8mmWG, or
5 between 4mmWG and 7mmWG. The total pressure drop across body 6 can be about 5, 6 or 7mmWG.

As shown in Figure 1, the mouthpiece 2 of the article 1 comprises an upstream end 2a adjacent to the aerosol-generating section 3 and a downstream end 2b distal from the aerosol-generating section 3. At the downstream end 2b, the mouthpiece 2 has a
10 hollow tubular element 4 formed from filamentary tow. This has advantageously been found to significantly reduce the temperature of the outer surface of the mouthpiece 2 at the downstream end 2b of the mouthpiece which comes into contact with a consumer's mouth when the article 1 is in use. In addition, the use of the tubular
15 element 4 has also been found to significantly reduce the temperature of the outer surface of the mouthpiece 2 even upstream of the tubular element 4. Without wishing to be bound by theory, it is hypothesised that this is due to the tubular element 4 channelling aerosol closer to the centre of the mouthpiece 2, and therefore reducing the transfer of heat from the aerosol to the outer surface of the mouthpiece 2.

20 The "wall thickness" of the hollow tubular element 4 corresponds to the thickness of the wall of the tube 4 in a radial direction. This may be measured, for example, using a calliper. The wall thickness is advantageously greater than 0.9 mm, and more preferably 1.0mm or greater. Preferably, the wall thickness is substantially constant
25 around the entire wall of the hollow tubular element 4. However, where the wall thickness is not substantially constant, the wall thickness is preferably greater than 0.9 mm at any point around the hollow tubular element 4, more preferably 1.0mm or greater. In the present example, the wall thickness of the hollow tubular element 4 is about 1.3 mm.

30 Preferably, the length of the hollow tubular element 4 is less than about 20 mm. More preferably, the length of the hollow tubular element 4 is less than about 15 mm. Still more preferably, the length of the hollow tubular element 4 is less than about 10 mm. In addition, or as an alternative, the length of the hollow tubular element 4 is at least
35 about 5 mm. Preferably, the length of the hollow tubular element 4 is at least about 6 mm. In some preferred embodiments, the length of the hollow tubular element 4 is

from about 5 mm to about 20 mm, more preferably from about 6 mm to about 10 mm, even more preferably from about 6 mm to about 8 mm, most preferably about 6 mm, 7 mm or about 8 mm. In the present example, the length of the hollow tubular element 4 is 7 mm.

5

Preferably, the density of the hollow tubular element 4 is at least about 0.25 grams per cubic centimetre (g/cc), more preferably at least about 0.3 g/cc. Preferably, the density of the hollow tubular element 4 is less than about 0.75 grams per cubic centimetre (g/cc), more preferably less than 0.6 g/cc. In some embodiments, the density of the hollow tubular element 4 is between 0.25 and 0.75 g/cc, more preferably between 0.3 and 0.6 g/cc, and more preferably between 0.4 g/cc and 0.6 g/cc or about 0.5 g/cc. These densities have been found to provide a good balance between improved firmness afforded by denser material and the lower heat transfer properties of lower density material. For the purposes of the present invention, the "density" of the hollow tubular element 4 refers to the density of the filamentary tow forming the element with any plasticiser incorporated. The density may be determined by dividing the total weight of the hollow tubular element 4 by the total volume of the hollow tubular element 4, wherein the total volume can be calculated using appropriate measurements of the hollow tubular element 4 taken, for example, using callipers. Where necessary, the appropriate dimensions may be measured using a microscope.

The filamentary tow forming the hollow tubular element 4 preferably has a total denier of less than 45,000, more preferably less than 42,000. This total denier has been found to allow the formation of a tubular element 4 which is not too dense. Preferably, the total denier is at least 20,000, more preferably at least 25,000. In preferred embodiments, the filamentary tow forming the hollow tubular element 4 has a total denier between 25,000 and 45,000, more preferably between 35,000 and 45,000. Preferably the cross-sectional shape of the filaments of tow are 'Y' shaped, although in other embodiments other shapes such as 'X' shaped filaments can be used.

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The filamentary tow forming the hollow tubular element 4 preferably has a denier per filament of greater than 3. This denier per filament has been found to allow the formation of a tubular element 4 which is not too dense. Preferably, the denier per filament is at least 4, more preferably at least 5. In preferred embodiments, the filamentary tow forming the hollow tubular element 4 has a denier per filament between 4 and 10, more preferably between 4 and 9. In one example, the filamentary

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tow forming the hollow tubular element 4 has an 7.3Y36,000 tow formed from cellulose acetate and comprising 18% plasticiser, for instance triacetin.

The hollow tubular element 4 preferably has an internal diameter of greater than
5 3.0mm. Smaller diameters than this can result in increasing the velocity of aerosol
passing though the mouthpiece 2 to the consumers mouth more than is desirable, such
that the aerosol becomes too warm, for instance reaching temperatures greater than
40°C or greater than 45°C. More preferably, the hollow tubular element 4 has an
internal diameter of greater than 3.1mm, and still more preferably greater than 3.5mm
10 or 3.6mm. In one embodiment, the internal diameter of the hollow tubular element 4
is about 4.7 mm.

The hollow tubular element 4 preferably comprises from 15% to 22% by weight of
plasticiser. For cellulose acetate tow, the plasticiser is preferably triacetin, although
15 other plasticisers such as polyethelyne glycol (PEG) can be used. More preferably, the
hollow tubular element 4 comprises from 16% to 20% by weight of plasticiser, for
instance about 17%, about 18% or about 19% plasticiser.

In the present example, the first hollow tubular element 4, body of material 6 and
20 cooling section 8 are combined using a second plug wrap 9 which is wrapped around all
three sections. Preferably, the second plug wrap 9 has a basis weight of less than 50
gsm, more preferably between about 20 gsm and 45 gsm. Preferably, the second plug
wrap 9 has a thickness of between 30 µm and 60 µm, more preferably between 35 µm
and 45 µm. The second plug wrap 9 is preferably a non-porous plug wrap having a
25 permeability of less than 100 Coresta Units, for instance less than 50 Coresta Units.
However, in alternative embodiments, the second plug wrap 9 can be a porous plug
wrap, for instance having a permeability of greater than 200 Coresta Units.

In the present example, the article 1 has an outer circumference of about 23 mm. In
30 other examples, the article can be provided in any of the formats described herein, for
instance having an outer circumference of between 20mm and 26mm. Since the article
is to be heated to release an aerosol, improved heating efficiency can be achieved using
articles having lower outer circumferences within this range, for instance
circumferences of less than 23mm. To achieve improved aerosol via heating, while
35 maintaining a suitable product length, article circumferences of greater than 19mm
have also been found to be particularly effective. Articles having circumferences of

between 20mm and 24mm, and more preferably between 20mm and 23mm, have been found to provide a good balance between providing effective aerosol delivery while allowing for efficient heating.

5 A tipping paper 5 is wrapped around the full length of the mouthpiece 2 and over part of the aerosol-generating section 3 and has an adhesive on its inner surface to connect the mouthpiece 2 and rod 3. In the present example, the rod of aerosol-generating composition is wrapped in wrapper 10, which forms a first wrapping material, and the tipping paper 5 forms an outer wrapping material which extends at least partially over
10 the rod of aerosol-generating composition to connect the mouthpiece 2 and the aerosol-generating section 3. In some examples, the tipping paper can extend only partially over the aerosol-generating section.

In the present example, the tipping paper 5 extends 5 mm over the aerosol-generating
15 section 3 but it can alternatively extend between 3 mm and 10 mm over the rod 3, or more preferably between 4 mm and 6 mm, to provide a secure attachment between the mouthpiece 2 and rod 3. The tipping paper can have a basis weight greater than 20 gsm, for instance greater than 25 gsm, or preferably greater than 30 gsm, for example 37 gsm. These ranges of basis weights have been found to result in tipping papers
20 having acceptable tensile strength while being flexible enough to wrap around the article 1 and adhere to itself along a longitudinal lap seam on the paper. The outer circumference of the tipping paper 5, once wrapped around the mouthpiece 2, is about 23 mm.

25 The article has a ventilation level of about 10% of the aerosol drawn through the article. In alternative embodiments, the article can have a ventilation level of between 1% and 20% of aerosol drawn through the article, for instance between 1% and 12%. Ventilation at these levels helps to increase the consistency of the aerosol inhaled by the user at the mouth end 2b, while assisting the aerosol cooling process. The ventilation is
30 provided directly into the mouthpiece 2 of the article 1. In the present example, the ventilation is provided into the cooling section 8, which has been found to be particularly beneficial in assisting with the aerosol generation process. The ventilation is provided via perforations 12, in the present case formed as a single row of laser perforations, positioned 13 mm from the downstream, mouth-end 2b of the mouthpiece
35 2. In alternative embodiments, two or more rows of ventilation perforations may be provided. These perforations pass through the tipping paper 5, second plug wrap 9 and

cooling section 8. In alternative embodiments, the ventilation can be provided into the mouthpiece at other locations, for instance into the body of material 6 or first tubular element 4. Preferably, the article is configured such that the perforations are provided about 28mm or less from the upstream end of the article 1, preferably between 20mm and 28mm from the upstream end of the article 1. In the present example, the apertures are provided about 25mm from the upstream end of the article.

Figure 2a is a side-on cross sectional view of a further article 1' including a capsule-containing mouthpiece 2'. Figure 2b is a cross sectional view of the capsule-containing mouthpiece shown in Figure 2a through the line A-A' thereof. Article 1' and capsule-containing mouthpiece 2' are the same as the article 1 and mouthpiece 2 illustrated in Figure 1, except that an aerosol modifying agent is provided within the body of material 6, in the present example in the form of a capsule 11, and that an oil-resistant first plug wrap 7' surrounds the body of material 6. In other examples, the aerosol modifying agent can be provided in other forms, such as material injected into the body of material 6 or provided on a thread, for instance the thread carrying a flavourant or other aerosol modifying agent, which may also be disposed within the body of material 6.

The capsule 11 can comprise a breakable capsule, for instance a capsule which has a solid, frangible shell surrounding a liquid payload. In the present example, a single capsule 11 is used. The capsule 11 is entirely embedded within the body of material 6. In other words, the capsule 11 is completely surrounded by the material forming the body 6. In other examples, a plurality of breakable capsules may be disposed within the body of material 6, for instance 2, 3 or more breakable capsules. The length of the body of material 6 can be increased to accommodate the number of capsules required. In examples where a plurality of capsules is used, the individual capsules may be the same as each other, or may differ from one another in terms of size and/or capsule payload. In other examples, multiple bodies of material 6 may be provided, with each body containing one or more capsules.

The capsule 11 has a core-shell structure. In other words, the capsule 11 comprises a shell encapsulating a liquid agent, for instance a flavourant or other agent, which can be any one of the flavourants or aerosol modifying agents described herein. The shell of the capsule can be ruptured by a user to release the flavourant or other agent into the body of material 6. The first plug wrap 7' can comprise a barrier coating to make the

material of the plug wrap substantially impermeable to the liquid payload of the capsule 11. Alternatively or in addition, the second plug wrap 9 and/or tipping paper 5 can comprise a barrier coating to make the material of that plug wrap and/or tipping paper substantially impermeable to the liquid payload of the capsule 11.

5

In the present example, the capsule 11 is spherical and has a diameter of about 3 mm. In other examples, other shapes and sizes of capsule can be used. For example, the capsule may have a diameter less than 4 mm, or less than 3.5 mm, or less than 3.25 mm. In alternative embodiments, the capsule may have a diameter greater than about 3.25 mm, for example greater than 3.5 mm, or greater than 4 mm. The total weight of the capsule 11 may be in the range about 10 mg to about 50 mg.

10

In the present example, the capsule 11 is located at a longitudinally central position within the body of material 6. That is, the capsule 11 is positioned so that its centre is 5 mm from each end of the body of material 6. In the present example, the centre of the capsule is positioned 36 mm from the upstream end of the article 1. Preferably, the capsule is positioned so that its centre is positioned between 28 mm and 38 mm from the upstream end of the article 1, more preferably between 34 mm and 38 mm from the upstream end of the article 1. In the present example, the centre of the capsule is positioned 12 mm from the downstream end of the mouthpiece 2b. Providing a capsule at this position results in improved volatilisation of the capsule contents, due to the proximity of the capsule to the aerosol-generating section of the article which is heated in use, whilst also being far enough from the aerosol-generating section which, in use, is inserted into an aerosol provision system, to enable the user to readily access the capsule and burst it with their fingers.

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In other examples, the capsule 11 can be located at a position other than a longitudinally central position in the body of material 6, i.e. closer to the downstream end of the body of material 6 than the upstream end, or closer to the upstream end of the body of material 6 than the downstream end. Preferably, the mouthpiece 2' is configured so that the capsule 11 and the ventilation holes 12 are longitudinally offset from each other in the mouthpiece 2'. For example, the ventilation holes 12 may be provided immediately upstream of the capsule position, i.e. between about 1 mm and about 10 mm upstream of the capsule position.

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The article 1 is suitable for use with a non-combustible aerosol provision device.

Figure 10 shows an example of a non-combustible aerosol provision device 16 having a proximal end 16a and a distal end 16b.

5 In broad outline, the device 16 may be used to cause an article 1 comprising a susceptor and aerosol generating material, for instance the article 1 described herein, to generate an aerosol which is inhaled by a user of the device 16. The device 16 and the article 1 together form a system.

10 The device 16 comprises a magnetic field generator comprising a coil 17 configured to generate varying magnetic field. The varying magnetic field causes a susceptor in the article 1 to generate heat which, in turn, heats the generating aerosol to form an aerosol

The device 16 comprises a housing 18 which surrounds and houses various components
15 of the device 16. The device 16 has an opening 19 in one end, through which the article 1 may be inserted. In use, the article 1 may be fully or partially inserted into the heating assembly.

The device 16 may also include a user-operable control element 20, such as a button or
20 switch, which operates the device 16 when pressed. For example, a user may turn on the device 16 by operating the switch 20.

The device 16 may also comprise an electrical component, such as a socket/port 21,
which can receive a cable to charge a power source 22 of the device 100. For example,
25 the socket 21 may be a charging port, such as a USB charging port.

In use, a user inserts an article 1 into the opening 19, operates the user control 20 to
begin heating the aerosol generating material and draws on the aerosol generated in the
device. This causes the aerosol to flow through the device 16 along a flow path towards
30 the proximal end 16a of the device 16.

The other end of the device furthest away from the opening 19 may be known as the
distal end 16b of the device 16 because, in use, it is the end furthest away from the
mouth of the user. As a user draws on the aerosol generated in the device, the aerosol
35 flows away from the distal end of the device 100.

The power source 22 may be, for example, a battery, such as a rechargeable battery or a non-rechargeable battery. Examples of suitable batteries include, for example, a lithium battery (such as a lithium-ion battery), a nickel battery (such as a nickel–cadmium battery), and an alkaline battery. The battery is electrically coupled to the magnetic
5 field generator to supply electrical power when required and under control of a controller (not shown) to heat the aerosol generating material.

The device further comprises at least one electronics module 23. The electronics module 23 may comprise, for example, a printed circuit board (PCB). The PCB 23 may
10 support at least one controller, such as a processor, and memory. The PCB 23 may also comprise one or more electrical tracks to electrically connect together various electronic components of the device 16. For example, battery terminals (not shown) may be electrically connected to the PCB 23 so that power can be distributed throughout the device 16. The socket 21 may also be electrically coupled to the battery via the electrical
15 tracks.

The device 16 includes a magnetic field generator comprising a coil 17 that is configured to inductively heat a susceptor in the article 1.

20 The coil 17 is an inductor coil. The inductor coil is made from an electrically conducting material. In this example, the inductor coil is made from Litz wire/cable which is wound in a helical fashion to provide a helical inductor coil. Litz wire comprises a plurality of individual wires which are individually insulated and are twisted together to form a single wire. Litz wires are designed to reduce the skin effect losses in a
25 conductor. In the example device 16, the inductor coil is made copper and the Litz wire has a rectangular cross section. In other examples the Litz wire can have other shape cross sections, such as circular.

The inductor coil 17 is configured to generate a first varying magnetic field for heating a
30 susceptor an article. The inductor coil 17 can be connected to the PCB 23.

The device comprises inductor coil support tube 24. The coil support tube 24 is defined by an outer surface an inner surface. The outer surface of the coil support tube supports the inductor coil of the magnetic field generator 17. The inner surface defines
35 a cavity into which the article 1 can be inserted. Tube 24 is preferably made from a

material that is not heatable by penetration with a varying magnetic field. This is to avoid the inductor heating the tube during use and also to reduce power consumption.

Referring to Figure 10, the device 16' comprises two magnetic field generators
5 comprises a first inductor coil 17a and a second inductor coil 17b. The first inductor coil 17a is configured to generate a first varying magnetic field for heating a susceptor in the article 1 and the second inductor coil 17b is configured to generate a second varying magnetic field for heating a second susceptor. In this example, the first inductor coil 17a is adjacent to the second inductor coil 17b in a direction along the longitudinal axis
10 of the device 16 (that is, the first and second inductor coils 17a, 17b do not overlap). The first and second inductor coils 17a, 17b can be connected to the PCB 23. The first and second coils are supported by the coil support tube 24'.

It will be appreciated that the first and second inductor coils 17a, 17b, in some
15 examples, may have at least one characteristic different from each other. For example, the first inductor coil 17a may have at least one characteristic different from the second inductor coil 17b. More specifically, in one example, the first inductor coil 17a may have a different value of inductance than the second inductor coil 17b. The first and second inductor coils 17a, 17b can be of different lengths. Thus, the first inductor coil 17a may
20 comprise a different number of turns than the second inductor coil 17b (assuming that the spacing between individual turns is substantially the same). In yet another example, the first inductor coil 17a may be made from a different material to the second inductor coil 17b. In some examples, the first and second inductor coils 17a, 17b may be substantially identical.

25 In this example, the first inductor coil 17a and the second inductor coil 17b are wound in opposite directions. This can be useful when the inductor coils are active at different times. For example, initially, the first inductor coil 17a may be operating to heat a first section/portion of the article 110, and at a later time, the second inductor coil 17b may
30 be operating to heat a second section/portion of the article 110. Winding the coils in opposite directions helps reduce the current induced in the inactive coil when used in conjunction with a particular type of control circuit. In Figure 10, the first inductor coil 17a is a right-hand helix and the second inductor coil 17b is a left-hand helix. However, in another embodiment, the inductor coils 17a, 17b may be wound in the same
35 direction, or the first inductor coil 17a may be a left-hand helix and the second inductor coil 17b may be a right-hand helix.

In use, the article 1 described herein can be inserted into a non-combustible aerosol provision device such as the device 16 and 16' described with reference to Figures 10 and 11. At least a portion of a mouthpiece 2 of the article 1 protrudes from the non-combustible aerosol provision device 16, 16' and can be placed into a user's mouth. An aerosol is produced by heating the aerosol generating section 3 comprising aerosol-generating material and a susceptor at least partially embedded in the aerosol-generating material using the device 16, 16'. The aerosol produced by the aerosol generating material passes through the mouthpiece 2 to the user's mouth.

Referring to Figure 12, the magnetic field generator comprises a single coil 17. The magnetic field generator is configured to inductively heat the susceptor in the aerosol-generating composition 3 by generation of a varying magnetic field.

The outer surface of the article 1 may be dimensioned so that the outer surface of the article 1 abuts the inner surface of the coil support tube 24'. This ensures that the heating is most efficient because the aerosol-generating section is closer to the coil 17.

Figure 13 shows an article 1 as described herein received within the coil support tube 24' of the device 16'. The magnetic field generator comprises two coils 17a and 17b. This enables different portions of the aerosol-generating section 3 to be heated at different times and/or to different temperatures.

The various embodiments described herein are presented only to assist in understanding and teaching the claimed features. These embodiments are provided as a representative sample of embodiments only, and are not exhaustive and/or exclusive. It is to be understood that advantages, embodiments, examples, functions, features, structures, and/or other aspects described herein are not to be considered limitations on the scope of the invention as defined by the claims or limitations on equivalents to the claims, and that other embodiments may be utilised and modifications may be made without departing from the scope of the claimed invention. Various embodiments of the invention may suitably comprise, consist of, or consist essentially of, appropriate combinations of the disclosed elements, components, features, parts, steps, means, etc, other than those specifically described herein. In addition, this disclosure may include other inventions not presently claimed, but which may be claimed in future."

Claims

1. An aerosol-generating component for use with a non-combustible aerosol provision device, the aerosol-generating component comprising a heating material in thermal contact with aerosol generating material, the heating material comprising a
5 plurality of elongate portions or elements which extend through or around said aerosol generating material in a first direction and wherein the elongate portions or elements are substantially parallel.
2. An aerosol-generating component according to claim 1, wherein the heating
10 material comprises a plurality of strands of heating material.
3. An aerosol-generating component according to claim 2, wherein the plurality of strands of heating material are non-planar.
- 15 4. An aerosol-generating component for use with a non-combustible aerosol provision device, the aerosol-generating component comprising a heating material in thermal contact with aerosol-generating material, the heating material comprising a first elongate or planar portion extending around or through the aerosol-generating material in a first direction, and at least one second elongate or planar portion
20 extending around or through the aerosol-generating material in a second direction different to the first direction.
5. An aerosol-generating component according to claim 4, wherein the second direction forms an angle of at least 90 degrees with the first direction.
25
6. An aerosol-generating component according to claim 4 or 5, wherein the length of the at least one portion is less than a length of the length of the heating material in the first direction.
- 30 7. An aerosol-generating component according to claim 4, 5 or 6, wherein the at least one portion is curved.
8. An aerosol-generating component according to claim 4, 5 or 6, wherein the at least one portion extends diagonal to the first direction.
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9. An aerosol-generating component according to claim 4, 5 or 6, wherein the at least one portion extends substantially perpendicularly to the first direction.
10. An aerosol-generating component according to any one of claims 4 to 9,
5 wherein the heating material further comprises a plurality of elongate portions or elements which extend through or around said aerosol generating material in the first direction and wherein the elongate portions or elements are substantially parallel with the first direction.
- 10 11. An aerosol-generating component according to any one of claims 4 to 10, wherein the at least one portion comprises a plurality of portions.
12. An aerosol-generating component according to claim 11, wherein each of the plurality of portions extends in the same direction.
- 15 13. An aerosol-generating component according to any one of claims 2 to 12, wherein the article further comprises at least one portion extending in a third direction.
14. An aerosol-generating component according to any one of claims 1 to 13,
20 wherein the length of the heating material in the first direction is greater than the width of the heating material.
15. An aerosol-generating component for use with a non-combustible aerosol provision device, the aerosol-generating component comprising a heating material in
25 thermal contact with aerosol-generating material, wherein the heating material extends generally longitudinally through the aerosol-generating material and has a length, a height and a width, wherein the width of the heating material is greater than the height of the heating material, and wherein the height of a first portion of the heating material is at least 20% greater than the height of a second portion of the heating material.
- 30 16. An article for use with a non-combustible aerosol-provision device comprising an aerosol-generating component according to any one of claims 1 to 15.
17. An article according to claim 16, the article further comprising a mouthpiece
35 arranged downstream of the aerosol-generating component.

18. A non-combustible aerosol provision system comprising:
a non-combustible aerosol provision device; and
an aerosol-generating component according to any one of claims 1 to 15, or an
5 article according to claim 16.

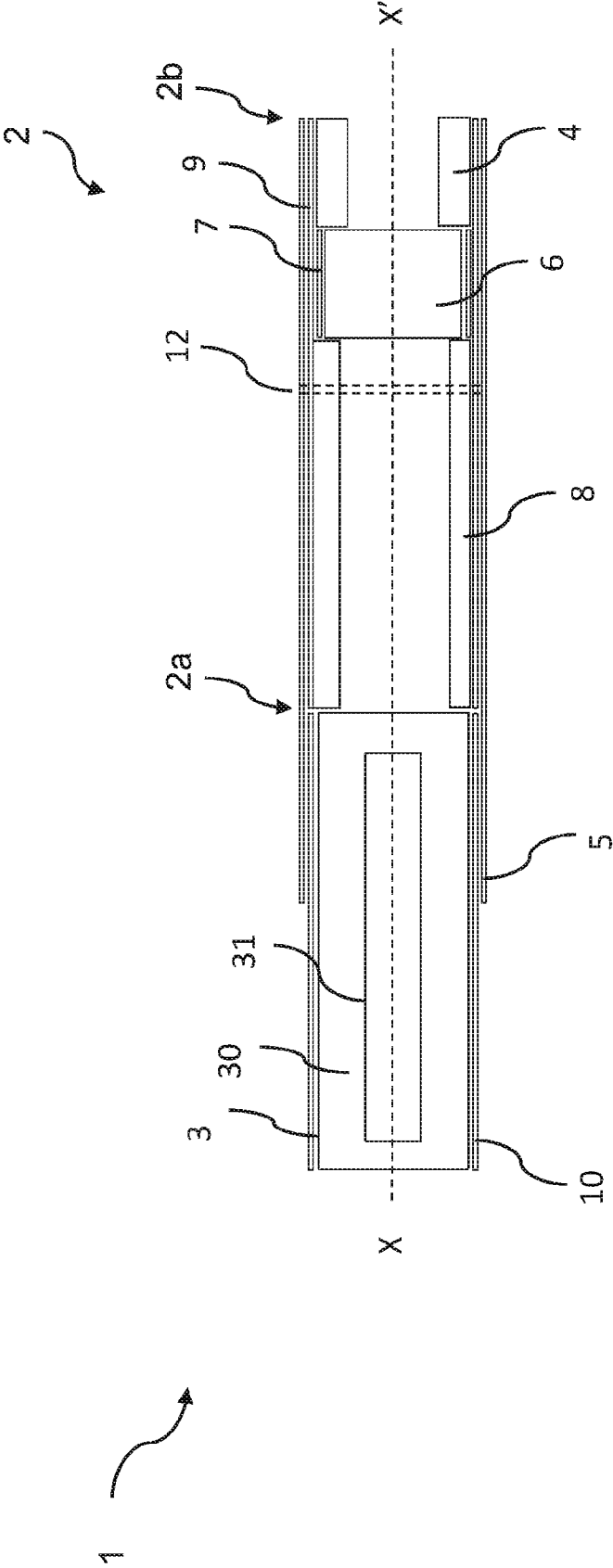


Figure 1

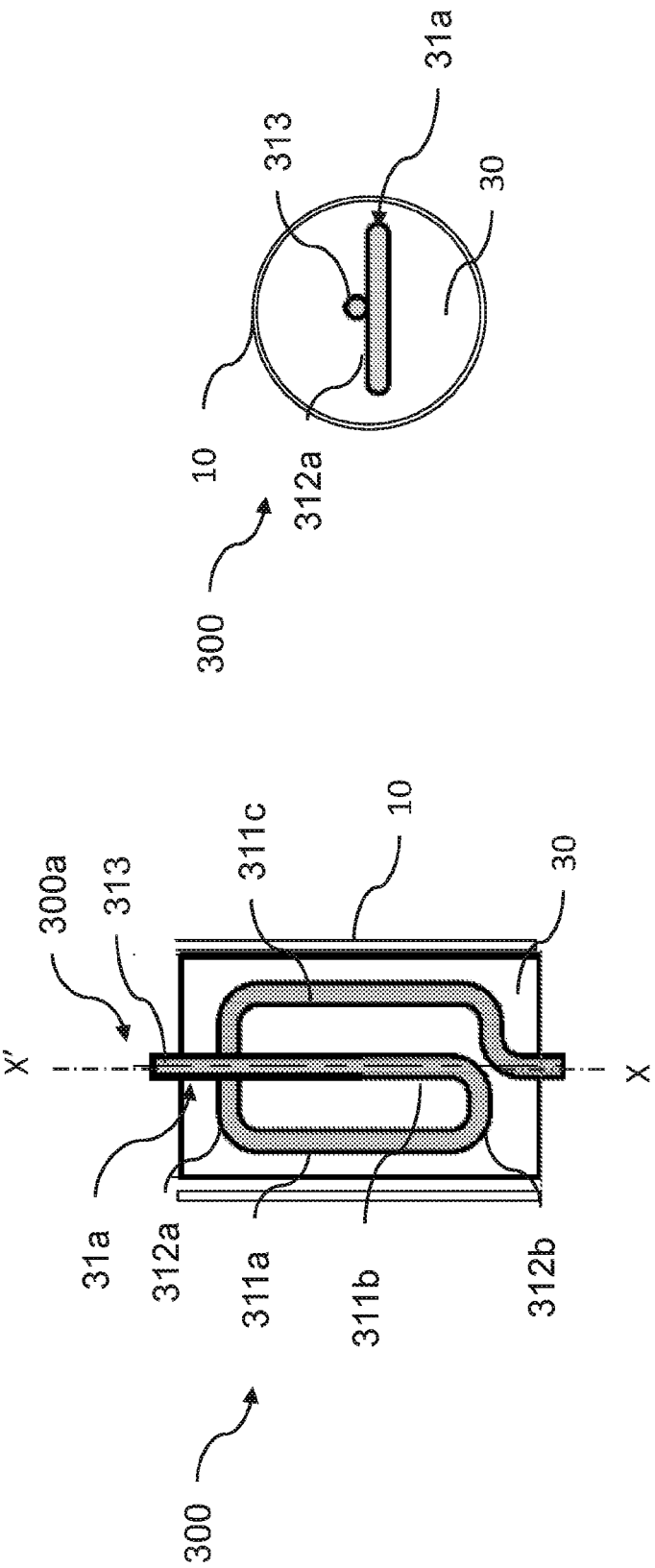


Figure 2b

Figure 2a

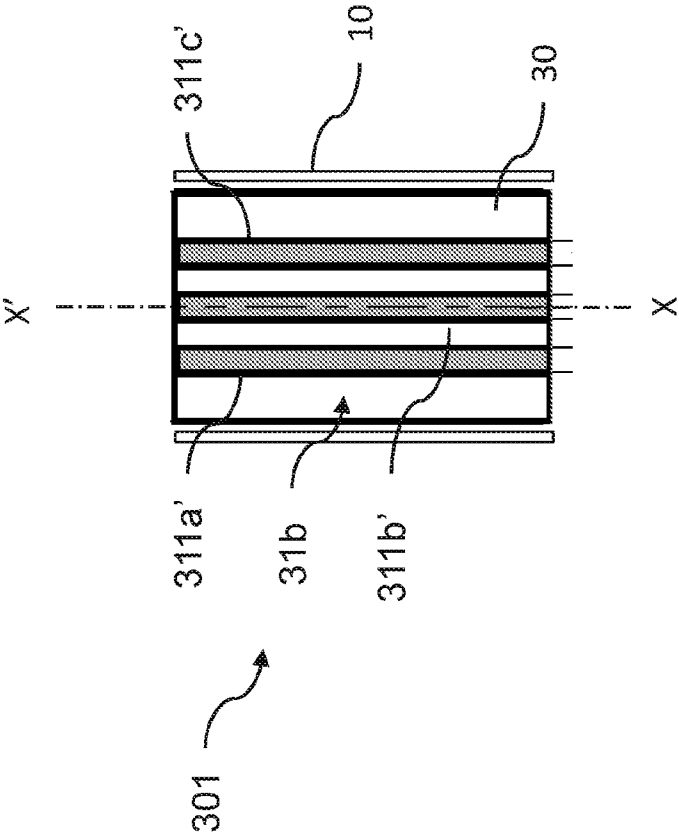


Figure 3a

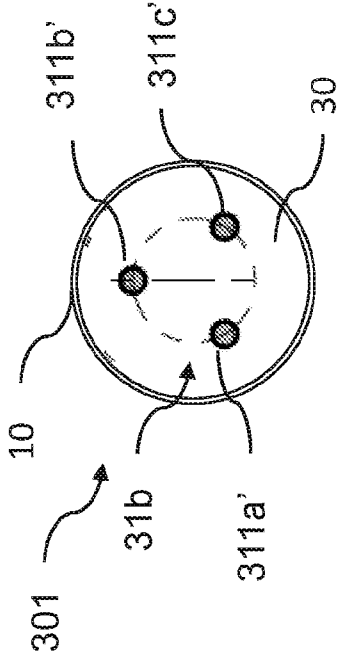


Figure 3b

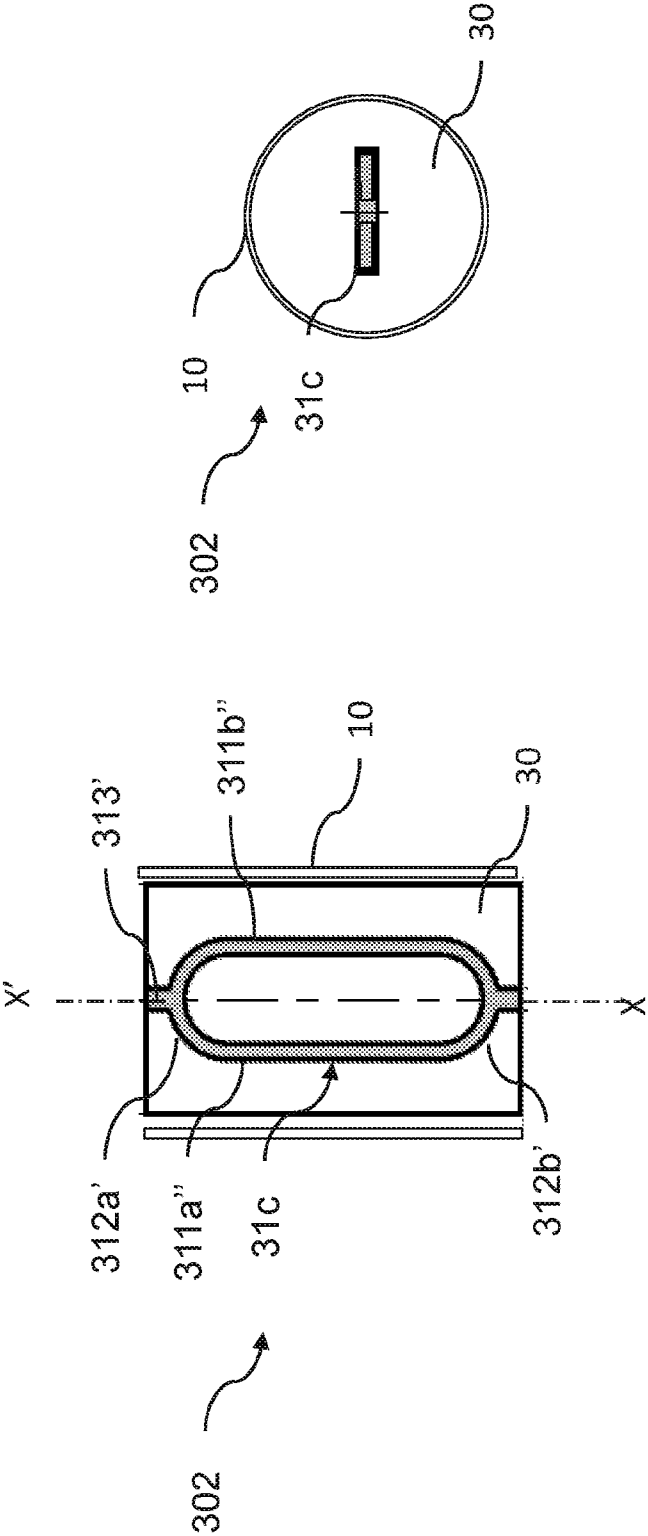


Figure 4a

Figure 4b

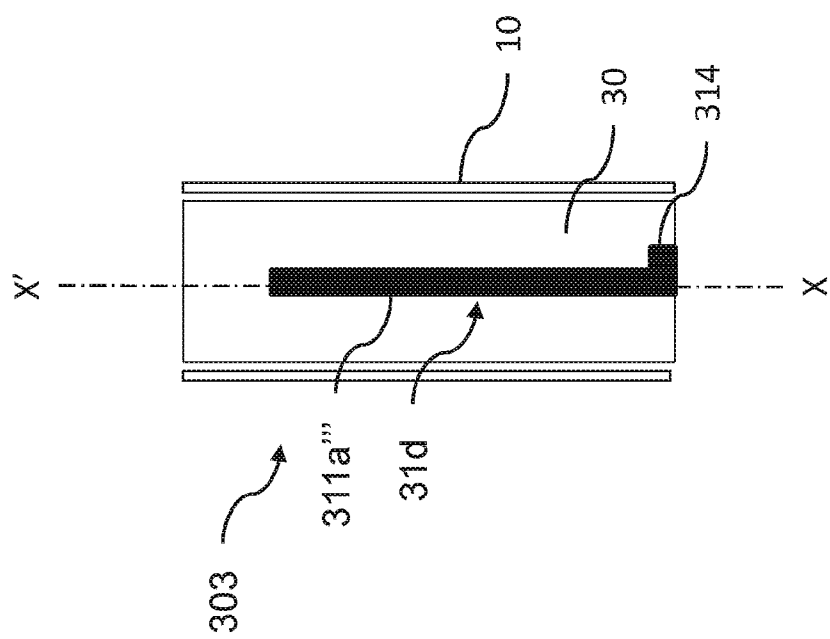


Figure 5

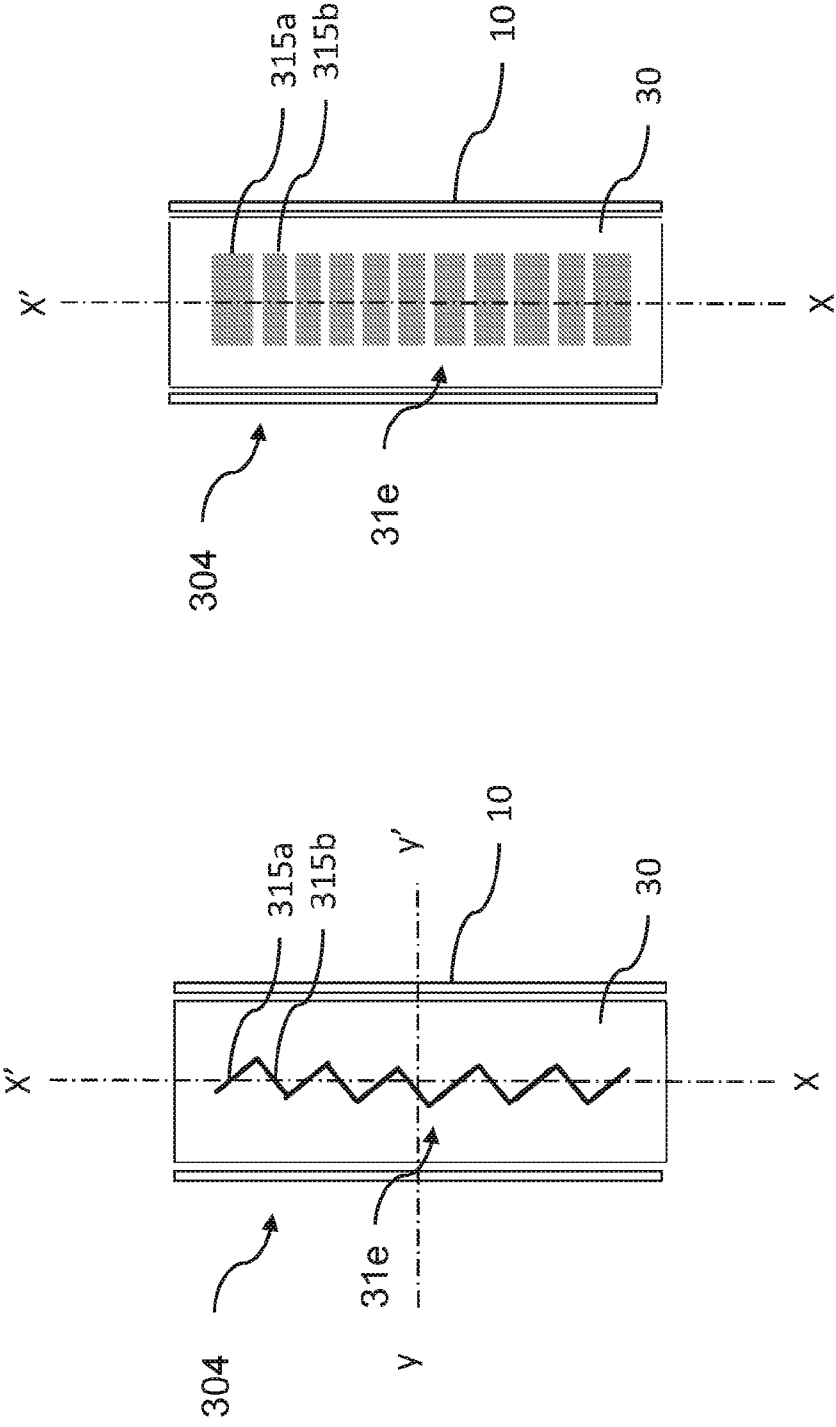


Figure 6b

Figure 6a

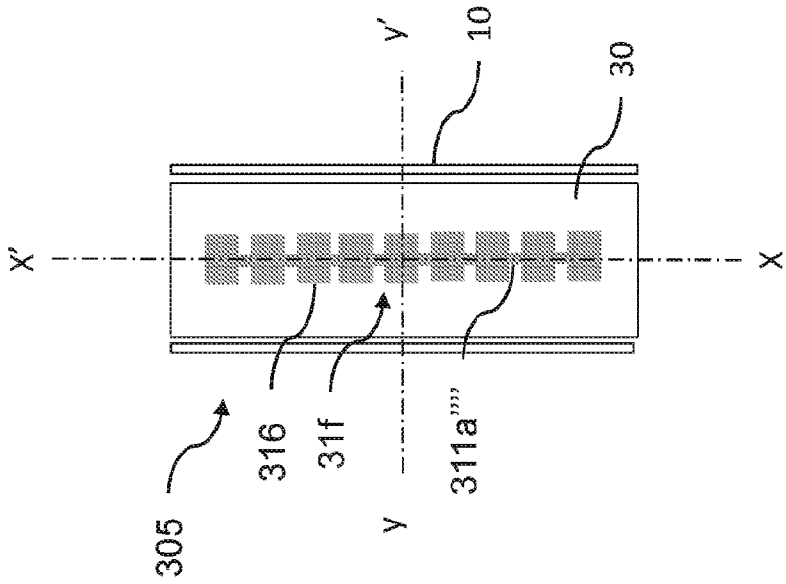


Figure 7a

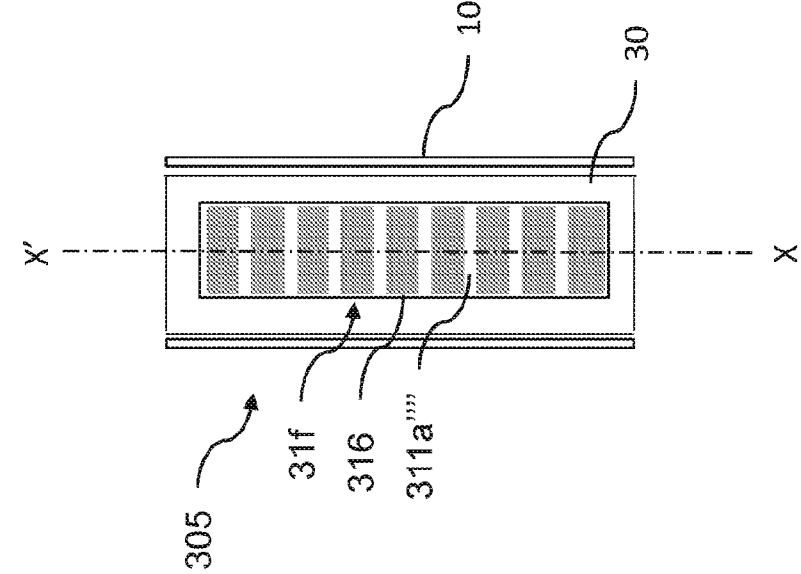


Figure 7b

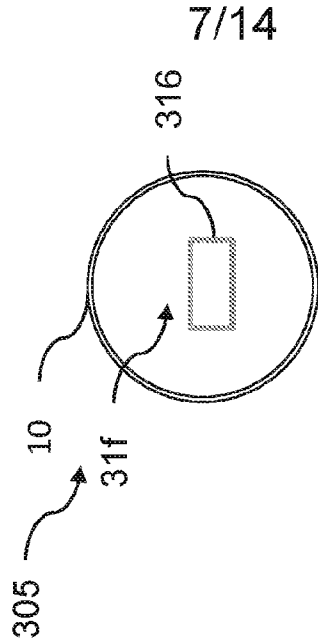


Figure 7c

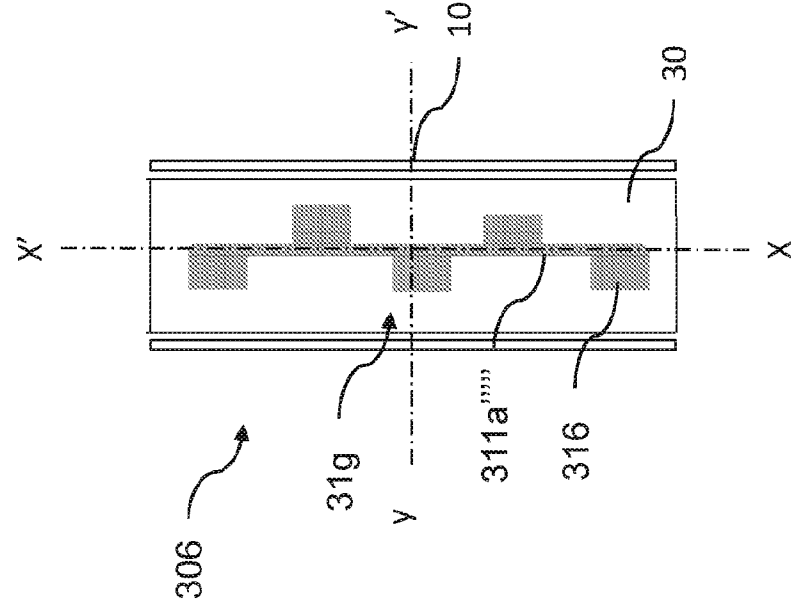


Figure 8a

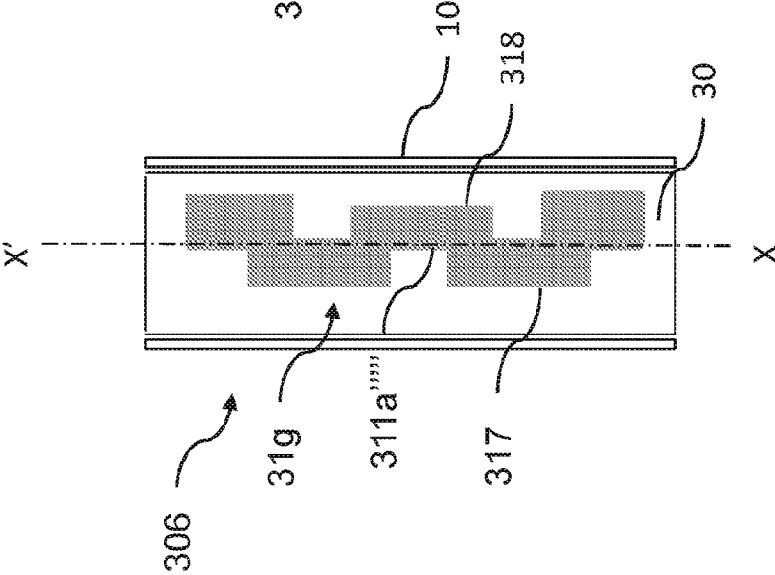


Figure 8b

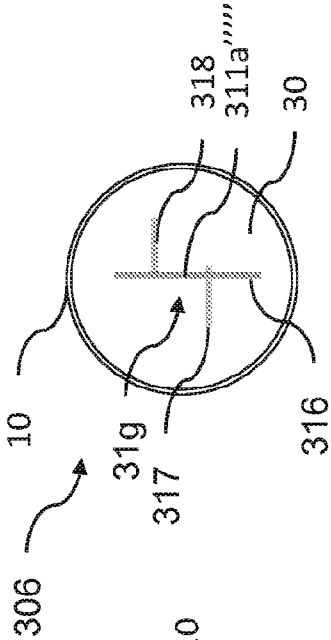


Figure 8c

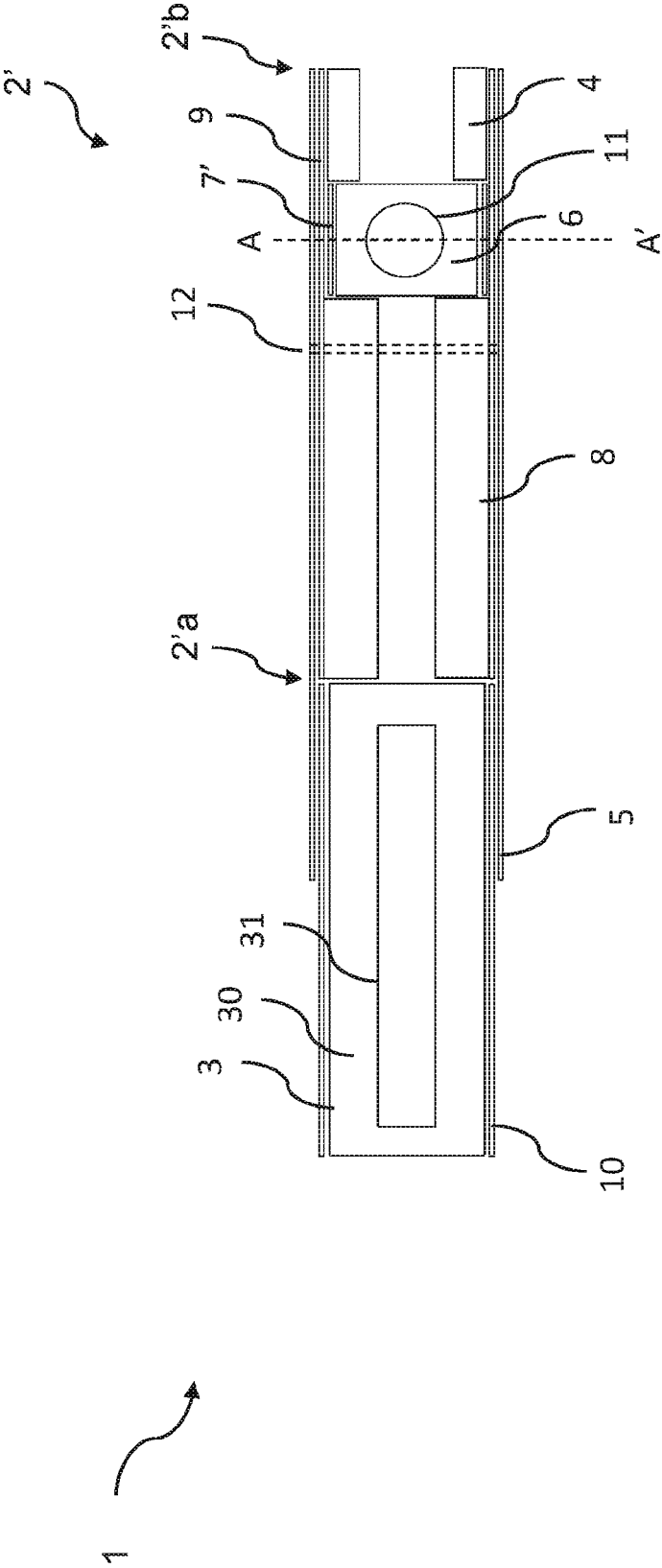


Figure 9a

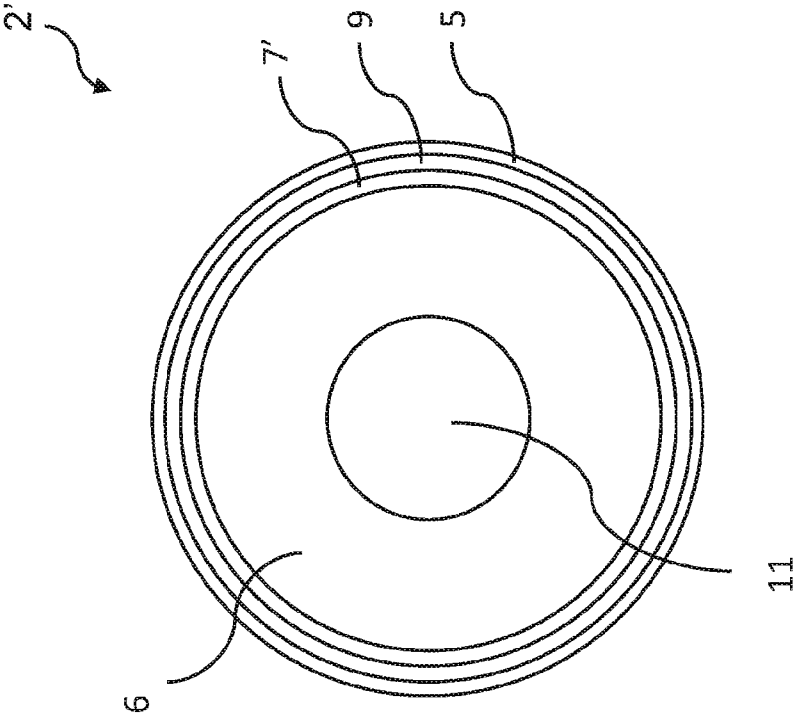


Figure 9b

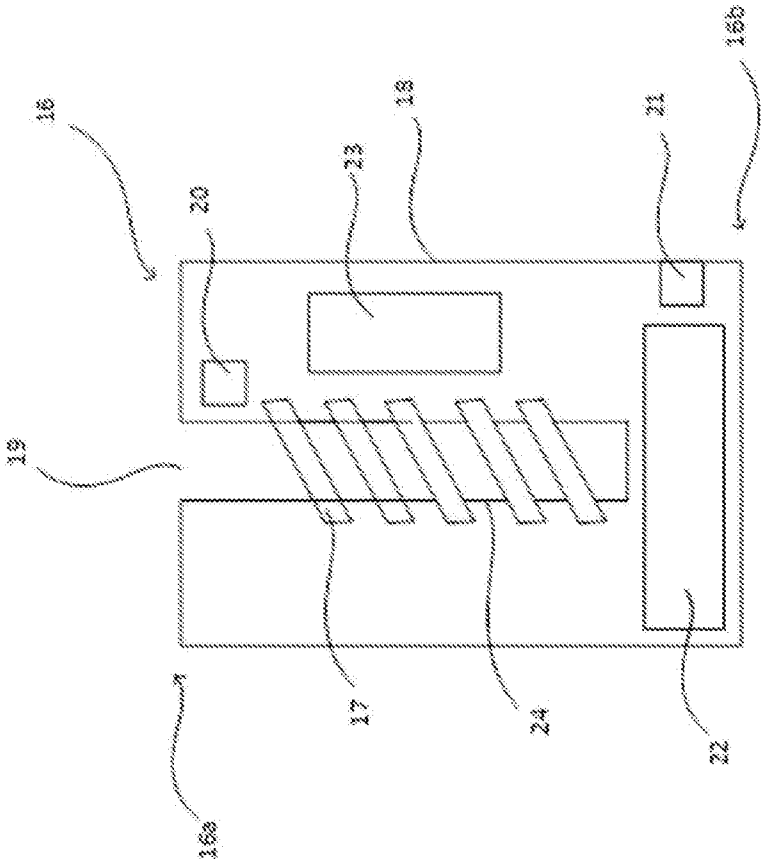


Figure 10

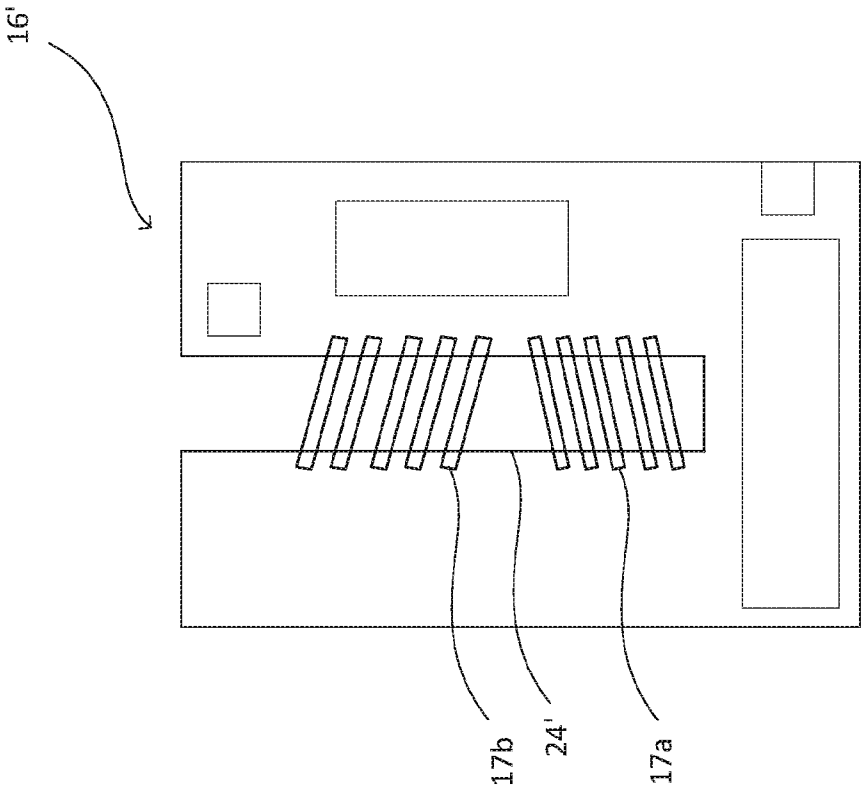


Figure 11

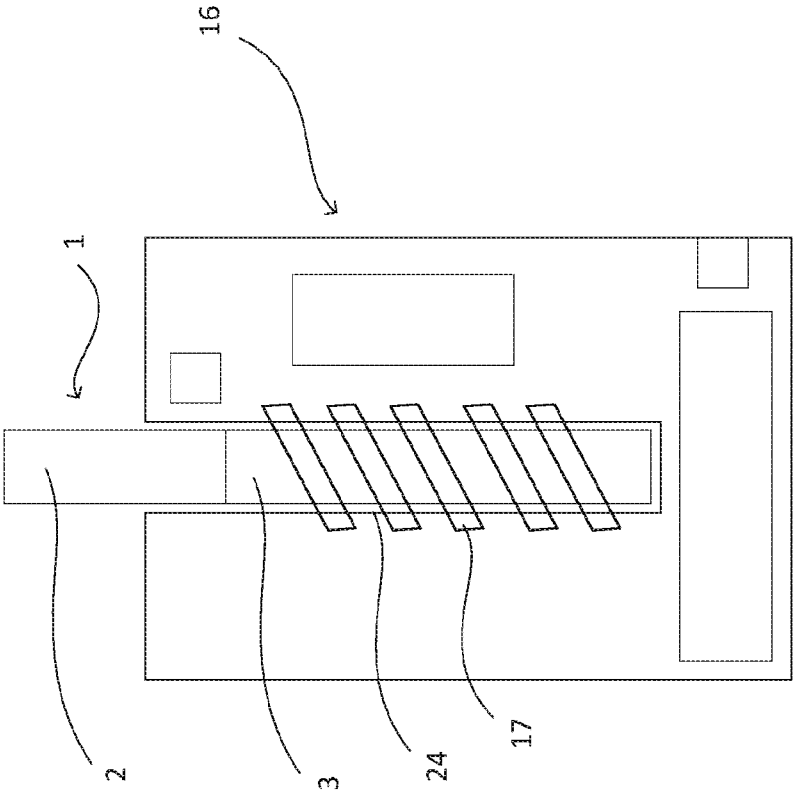


Figure 12

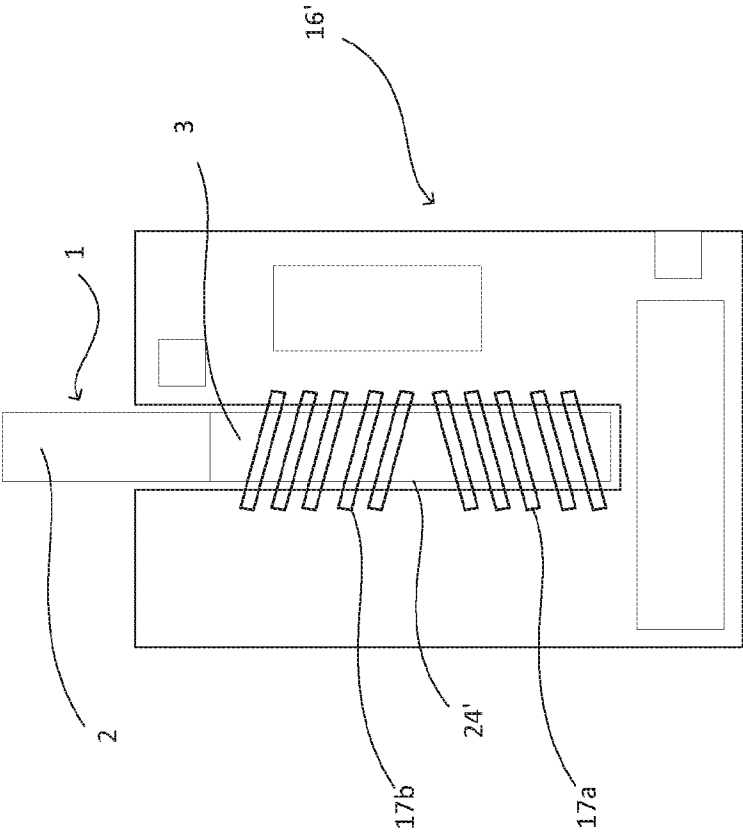


Figure 13

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2022/051561

A. CLASSIFICATION OF SUBJECT MATTER INV. A24D1/20 A24F40/46 A24F40/465 ADD. 		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A24D A24F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2017/086508 A1 (MIRONOV OLEG [CH] ET AL) 30 March 2017 (2017-03-30) paragraphs [0020], [0021], [0097]; figure 1 -----	1
X	WO 2020/174028 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 3 September 2020 (2020-09-03) page 1, line 30 - page 2, line 8; figures 1, 2 page 35, lines 13-27 page 36, lines 21-28 -----	1-3, 16-18
X	US 2019/200677 A1 (CHONG ALEXANDER CHINHAK [US] ET AL) 4 July 2019 (2019-07-04) paragraphs [0039], [0045]; figures 1,2e ----- -/-	1-3, 16-18
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 21 September 2022		Date of mailing of the international search report 30/11/2022
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Schwarzer, Bernd

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2022/051561

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2021/084039 A1 (JT INT SA [CH]) 6 May 2021 (2021-05-06) page 4, lines 9-11, 20-22; figures 1a-1c, 3a, 3b page 5, lines 2-13 page 7, lines 27-30 page 11, line 27 - page 12, line 3 -----	1, 2, 16-18
X	WO 2021/074090 A1 (JT INT SA [CH]) 22 April 2021 (2021-04-22) page 4, lines 15-20; figures 1a-1c, 4a, 4b page 5, lines 7-14, 24-28 page 12, lines 13-20 -----	1, 2, 16-18
X	WO 2019/224073 A1 (JT INT SA [CH]) 28 November 2019 (2019-11-28) page 17, lines 30-32; figures 1a, 2a, 8 page 18, lines 8-19 page 22, lines 20-26 -----	1, 16-18
X	WO 2020/064685 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 2 April 2020 (2020-04-02) page 27, lines 4-16; figures 1, 2, 3, 5 page 31, lines 8-23 -----	1, 16-18

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2022/051561

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims;; it is covered by claims Nos.:
1-3 (completely) ; 16-18 (partially)

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-3(completely); 16-18(partially)

The first potential invention relates to a component of a HNB article. This component comprises aerosol-generating material and an elongate heating material (e.g. a susceptor) in thermal contact with the aerosol-generating material. A plurality of these heating materials (susceptors) extend in parallel in a first direction through or around said aerosol-generating material.

2. claims: 4-14(completely); 16-18(partially)

The second potential invention relates to a component of a HNB article. This component comprises aerosol-generating material and an elongate heating material (e.g. a susceptor) in thermal contact with the aerosol-generating material. A first elongate heating material (susceptor) extends in a first direction through or around said aerosol-generating material and a second elongate heating material (susceptor) extends in a second (different to the first) direction through or around said aerosol-generating material.

3. claims: 15(completely); 16-18(partially)

The third potential invention relates to a component of a HNB article. This component comprises aerosol-generating material and a heating material (e.g. a susceptor) in thermal contact with the aerosol-generating material. The heating material (susceptor) extends generally longitudinally through said aerosol-generating material and a first portion of the susceptor has a height at least 20% greater than the height of a second portion of said susceptor.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2022/051561

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2017086508 A1	30-03-2017	AR 100583 A1	19-10-2016
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