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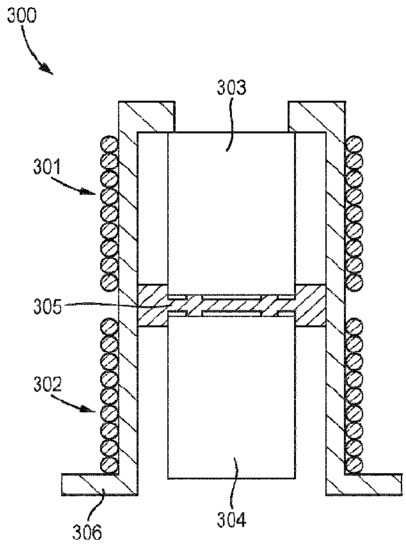
Fig. 3



(57) Abrégé/Abstract:
An aerosol provision device (300) for generating aerosol from an aerosol generating article (400) having a first section (403) housing a first aerosol generating material and a second section (404) housing a second aerosol generating material is disclosed. The aerosol provision device (300) comprises a first aerosol generator (301) comprising a first heating element for causing aerosol to be generated from the first aerosol generating material and a second aerosol generator (302) comprising a second heating element for causing aerosol to be generated from the second aerosol generating material. An insulating member (305) is arranged between the first and second heating elements.

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Abstract:

An aerosol provision device (300) for generating aerosol from an aerosol generating article (400) having a first section (403) housing a first aerosol generating material and a second section (404) housing a second aerosol generating material is disclosed. The aerosol provision device (300) comprises a first aerosol generator (301) comprising a first heating element for causing aerosol to be generated from the first aerosol generating material and a second aerosol generator (302) comprising a second heating element for causing aerosol to be generated from the second aerosol generating material. An insulating member (305) is arranged between the first and second heating elements.

AEROSOL PROVISION DEVICE

TECHNICAL FIELD

The present invention relates to an aerosol provision device, an aerosol provision system and a method of generating an aerosol.

BACKGROUND

Articles such as cigarettes, cigars and the like burn tobacco during use to create tobacco smoke. Attempts have been made to provide alternatives to these types of articles, which burn tobacco, by creating products that release compounds without burning. Apparatus is known that heats smokable material to volatilise at least one component of the smokable material, typically to form an aerosol which can be inhaled, without burning or combusting the smokable material. Such apparatus is sometimes described as a “heat-not-burn” apparatus or a “tobacco heating product” (THP) or “tobacco heating device” or similar. Various different arrangements for volatilising at least one component of the smokable material are known.

The material may be, for example, tobacco or other non-tobacco products or a combination, such as a blended mix, which may or may not contain nicotine.

It is desired to provide an improved aerosol provision device.

SUMMARY

According to an aspect there is provided an aerosol provision device for generating aerosol from an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material, wherein the aerosol provision device comprises:

a first aerosol generator comprising a first heating element for causing aerosol to be generated from the first aerosol generating material;

a second aerosol generator comprising a second heating element for causing aerosol to be generated from the second aerosol generating material; and

an insulating member arranged between the first and second heating elements.

According to various embodiments a thermally insulating member is provided between the first and second heating elements. The insulating member may act as a spacer. The insulating member is arranged to maintain a desired spacing between the two heating elements and also functions to reduce thermal transfer between the two heating elements. In particular, when an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material is desired to be heated in an aerosol provision device having two separate aerosol generators, it may be desired to heat the two sections to different temperatures. Accordingly, the insulating member is beneficial in terms of allowing the two different sections of the aerosol generating article to be heated to different temperatures and helps to stop one heating element which may be heated to a high temperature inadvertently heating the other heating element to the same or similar temperature by thermal conduction.

The insulating member may be solid. The insulating member may be gas impermeable in order to prevent gas from being able to pass through the insulating member.

Optionally, the first aerosol generator comprises a first induction coil and a first susceptor comprising material that is heatable by penetration with a varying magnetic field, wherein the first susceptor comprises the first heating element.

Optionally, the first susceptor is tubular.

Optionally, the first aerosol generator comprises a first resistive heater comprising the first heating element.

Optionally, the first resistive heater is tubular.

Optionally, the first heating element comprises an electrically resistive winding or thin film.

Optionally, the second aerosol generator comprises a second induction coil and a second susceptor comprising material that is heatable by penetration with a varying magnetic field, wherein the second susceptor comprises the second heating element.

Optionally, the second susceptor is tubular.

Optionally, the second aerosol generator comprises a second resistive heater comprising the second heating element.

Optionally, the second resistive heater is tubular.

Optionally, the second heating element comprises an electrically resistive winding or thin film.

Optionally, the insulating member is arranged between an end of the first heating element and an end of the second heating element.

Optionally, the insulating member is arranged to maintain a separation of 1.5-1.6 mm, 1.6-1.7 mm, 1.7-1.8 mm, 1.8-1.9 mm, 1.9-2.0 mm, 2.0-2.1 mm, 2.1-2.2 mm, 2.2-2.3 mm, 2.3-2.4 mm, 2.4-2.5 mm or 2.0 mm between an end of the first heating element and an end of the second heating element.

Optionally, an end or lip of the first heating element is received or located within a hole or recess formed within the insulating member.

Optionally, an end or lip of the second heating element is received or located within a hole or recess formed within the insulating member.

Optionally, the first heating element has a first external diameter d1, the second heating element has a second external diameter d2 and the insulating member has a third external diameter d3, wherein $d3 > d2$ and wherein $d3 > d1$.

Optionally, the insulating member is arranged so as to be in physical contact with the first heating element and/or the second heating element. Alternatively, the insulating member may be arranged so as not to be in physical contact with the first heating element and/or the second heating element.

According to various embodiments there is provided an aerosol provision device for generating aerosol from an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material, wherein the aerosol provision device comprises:

a first aerosol generator comprising a first induction coil and a first susceptor for heating the first section;

a second aerosol generator comprising a second induction coil and a second susceptor for heating the second section; and

an insulating member arranged between an end of the first susceptor and an end of the second susceptor.

According to various embodiments a thermally insulating member is provided between the first and second susceptors. The insulating member is arranged to maintain a desired spacing between the two susceptors and also functions to reduce thermal transfer between the two susceptors. In particular, when an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material is desired to be heated in an aerosol provision device having two separate heating units, it may be desired to heat the two sections to different temperatures. Accordingly, the insulating member is beneficial in terms of allowing the two different sections of the aerosol generating article to be heated to different temperatures and helps to stop one susceptor which may be heated to a high temperature inadvertently heating the other susceptor to the same or similar temperature by thermal conduction.

The insulating member may be arranged to maintain a separation of 1.5-1.6 mm, 1.6-1.7 mm, 1.7-1.8 mm, 1.8-1.9 mm, 1.9-2.0 mm, 2.0-2.1 mm, 2.1-2.2 mm, 2.2-2.3 mm, 2.3-2.4 mm, 2.4-2.5 mm or 2.0 mm between an end of the first susceptor and an end of the second susceptor. The first susceptor may be substantially cylindrical or tubular and/or the second susceptor may be substantially cylindrical or tubular. An end or lip of the first susceptor may be received or located within a hole or recess formed within the insulating member. An end or lip of the second susceptor may be received or located within a hole or recess formed within the insulating member. The first susceptor may have a first external diameter d1, the second susceptor may have a second external diameter d2 and the insulating member may have a third external diameter d3, wherein $d3 > d2$ and wherein $d3 > d1$. The insulating member may be arranged so as to be in physical contact with the first susceptor and/or the second susceptor.

Optionally, the insulating member is substantially annular or ring shaped.

Optionally, the insulating member comprises a thermally insulating material.

Optionally, the insulating member comprises a plastics material.

Optionally, the aerosol provision device comprises a non-combustible aerosol provision device.

The first heating element and the second heating element may be arranged to heat, but not burn, the aerosol generating article.

Optionally, the aerosol provision device further comprises an opening through which an aerosol generating article may be inserted, in use, and wherein the first aerosol generator is arranged closer to the opening than the second aerosol generator.

Optionally, the aerosol provision device further comprises control circuitry arranged to activate both the first aerosol generator and the second aerosol generator and to heat, in use, the second section of the aerosol generating article to a lower temperature than the first section of the aerosol generating article.

Other embodiments are contemplated wherein the second section of the aerosol generating article may be heated to a higher temperature than the first section of the aerosol generating article.

Optionally, the control circuitry is arranged to cause the first aerosol generator to heat, in use, the first section of the aerosol generating article to a temperature of T1, wherein T1 is selected from the group consisting of: (i) 250 °C; (ii) 200-210 °C; (iii) 210-220 °C; (iv) 220-230 °C; (v) 230-240 °C; (vi) 240-250 °C; (vii) 250-260 °C; (viii) 260-270 °C; (ix) 270-280 °C; (x) 280-290 °C; or (xi) 290-300 °C.

In another embodiment the control circuitry may be arranged to cause the second aerosol generator to heat, in use, the second section of the aerosol generating article to a temperature of T2, wherein T2 is selected from the group consisting of: (i) 250 °C; (ii) 200-210 °C; (iii) 210-220 °C; (iv) 220-230 °C; (v) 230-240 °C; (vi) 240-250 °C; (vii) 250-260 °C; (viii) 260-270 °C; (ix) 270-280 °C; (x) 280-290 °C; or (xi) 290-300 °C.

Optionally, the control circuitry may be arranged to turn the first aerosol generator ON and to leave the first aerosol generator ON for the duration of a session of use.

According to various embodiments the first aerosol generator may be arranged to be left ON for at least 80%, 85%, 90% or 95% of a session.

According to another embodiment the control circuitry may be arranged to set the first aerosol generator an initial target temperature of T3 and then to drop the target temperature to a lower temperature T4 during a session of use. According to an embodiment T3 and/or T4 may be selected from the group consisting of: (i) 250 °C; (ii) 200-210 °C; (iii) 210-220 °C; (iv) 220-230 °C; (v) 230-240 °C; (vi) 240-250 °C; (vii) 250-260 °C; (viii) 260-270 °C; (ix) 270-280 °C; (x) 280-290 °C; or (xi) 290-300 °C.

Optionally, the control circuitry may be arranged to cause the second aerosol generator to heat, in use, the second section of an aerosol generating article to a temperature of T2, wherein T2 is selected from the group consisting of: (i) 200 °C; (ii) 150-160 °C; (iii) 160-170 °C; (iv) 170-180 °C; (v) 180-190 °C; (vi) 190-200 °C; (vii) 200-210 °C; (viii) 210-220 °C; (ix) 220-230 °C; (x) 230-240 °C; or (xi) 240-250 °C.

In another embodiment the control circuitry may be arranged to cause the first aerosol generator to heat, in use, the first section of the aerosol generating article to a temperature of T1, wherein T1 is selected from the group consisting of: (i) 200 °C; (ii) 150-160 °C; (iii) 160-170 °C; (iv) 170-180 °C; (v) 180-190 °C; (vi) 190-200 °C; (vii) 200-210 °C; (viii) 210-220 °C; (ix) 220-230 °C; (x) 230-240 °C; or (xi) 240-250 °C.

Optionally, the control circuitry is arranged to turn the second aerosol generator ON and to leave the second aerosol generator ON for the duration of a session of use.

According to various embodiments the second aerosol generator may be arranged to be left ON for at least 80%, 85%, 90% or 95% of a session.

According to another embodiment the control circuitry may be arranged to set the second aerosol generator an initial target temperature of T5 and then to increase the target temperature to a temperature T6 for a period of time and then further increase the target temperature to a temperature T7 during a session of use, wherein T7 > T6 > T5. According to an embodiment T5 = 0 and T6 and/or T7 may be selected from the group consisting of: (i) 150-160 °C; (ii) 160-170 °C; (iii) 170-180 °C; (iv) 180-190 °C; (v) 190-200 °C; (vi) 200-210 °C; (vii) 210-220 °C; (viii) 220-230 °C; (ix) 230-240 °C; (x) 240-250 °C; (xi) 250-260 °C; (xii) 260-270 °C; (xiii) 270-280 °C; (xiv) 280-290 °C; or (xv) 290-300 °C.

Optionally, the aerosol provision device further comprises an aluminium shroud which is arranged external to the first aerosol generator and/or the second aerosol generator in order to retain heat within the aerosol provision device and/or to reduce heat transfer to an outermost housing of the aerosol provision device.

Optionally, the aerosol provision device may further comprise one or more layers of graphite or graphite tape which are arranged external to the first aerosol generator and/or the second aerosol generator in order to retain heat within the aerosol provision device and/or to reduce heat transfer to an outermost housing of the aerosol provision device.

Optionally, the aerosol provision device further comprises a device arranged to recognise an aerosol generating article inserted, in use, into the aerosol provision device and to determine whether or not the first and second aerosol generator should be activated.

Optionally, the insulating member is gas impermeable.

According to another aspect there is provided an aerosol provision device for generating aerosol from an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material, wherein the aerosol provision device comprises:

a first aerosol generator comprising a first heating element for causing aerosol to be generated from the first aerosol generating material, wherein the first aerosol generator comprises a first resistive heater;

a second aerosol generator comprising a second heating element for causing aerosol to be generated from the second aerosol generating material, wherein the second aerosol generator comprises a second resistive heater; and

an insulating member arranged between the first and second heating elements, wherein the insulating member is gas impermeable.

Optionally, an end or lip of the first heating element is received or located within a hole or recess formed within the insulating member and wherein an end or lip of the second heating element is received or located within a hole or recess formed within the insulating member.

According to another aspect there is provided an aerosol provision system comprising:

an aerosol provision device as described above; and

an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material, wherein the aerosol generating article further comprises a mouth or filter section and wherein the first section is closer to the mouth or filter section than the second section.

Optionally, the first aerosol generating material comprises a liquid, gel or solid.

The gel may be provided as a thin film. The solid may be provided in the form of granules.

Optionally, the second aerosol generating material comprises a liquid, gel or solid.

The gel may be provided as a thin film. The solid may be provided in the form of granules.

Optionally, the first aerosol generating material and/or the second aerosol generating material comprise an active substance and/or a flavourant.

Optionally, the active substance comprises a nutraceutical, nootropic or psychoactive substance.

Optionally, the active substance is naturally occurring or is obtained synthetically.

Optionally, the active substance comprises nicotine, caffeine, taurine, theine, one or more vitamins such as B6 or B12 or C, or melatonin.

Optionally, the active substance comprises one or more constituents, derivatives or extracts of tobacco.

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

According to an embodiment the first aerosol generating material has a first physical state and the second aerosol generating material has a second physical state. The second physical state may be the same or different to the first physical state.

According to an embodiment the first aerosol generating material may comprise a liquid or gel (which may comprise a thin film) and the second aerosol generating material may comprise a solid which may be provided in the form of granules. The solid may comprise tobacco which may be provided in the form of tobacco granules.

Optionally, the aerosol provision device is arranged to generate aerosol from the aerosol generating article wherein the temperature of the aerosol emitted from the mouth or filter section of the aerosol generating article is arranged to be, in use, < 40 °C.

According to another aspect there is provided a method of generating an aerosol comprising:

providing an aerosol provision device as described above;

inserting an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material into the aerosol provision device; and

activating the first aerosol generator and/or the second aerosol generator.

BRIEF DESCRIPTION OF THE DRAWINGS

Various embodiments together with other arrangements given for illustrative purposes only will now be described, by way of example only, and with reference to the accompanying drawings in which:

Fig. 1A is a schematic diagram of a heating assembly of an aerosol provision device which is given for illustrative purposes and Fig. 1B is a cross-section of the heating assembly shown in Fig. 1A with an aerosol generating article disposed therein;

Fig. 2A is a schematic cross-section of an aerosol generating article for use with the aerosol provision device as shown in Figs. 1A-1B and which is given for illustrative purposes and Fig. 2B is a perspective view of the aerosol generating article;

Fig. 3 shows a schematic diagram of a heating assembly of an aerosol provision device according to an embodiment wherein the heating assembly comprises two aerosol generators, each aerosol generator comprising an induction coil and a susceptor and wherein the two susceptors are separated from each other by an insulating portion; and

Fig. 4 shows an aerosol generating article according to an embodiment, wherein the aerosol generating article comprises a filter section, a paper tube section, a liquid section and a tobacco section.

DETAILED DESRIPTION

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

The aerosol-generating material may comprise one or more active substances and/or flavours, one or more aerosol-former materials, and optionally one or more other functional material.

Apparatus is known that heats aerosol generating material to volatilise at least one component of the aerosol generating material, typically to form an aerosol which can be inhaled, without burning or combusting the aerosol generating material. Such apparatus is sometimes described as an “aerosol generating device”, an “aerosol provision device”, a “heat-not-bum device”, a “tobacco heating product”, a “tobacco heating product device”, a “tobacco heating device” or similar. In an embodiment the aerosol provision device is a tobacco heating product. The non-liquid aerosol generating material for use with a tobacco heating product comprises tobacco.

E-cigarette devices are also known which comprise aerosol provision devices which vaporise an aerosol generating material in the form of a liquid, which may or may not contain nicotine. The aerosol generating material may be in the form of or be provided as part of a rod, cartridge or cassette or the like which can be inserted into the apparatus. A heater for heating and volatilising the aerosol generating material may be provided as a "permanent" part of the apparatus.

The non-combustible aerosol provision system may comprise 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.

An aerosol provision device can receive an article comprising aerosol generating material for heating, also referred to as a "smoking article". An "article", "aerosol generating article" or "smoking article" in this context is a component that includes or contains in use the aerosol generating material, which is heated to volatilise the aerosol generating material, and optionally other components in use. A user may insert the article into the aerosol provision device before it is heated to produce an aerosol, which the user subsequently inhales. The article may be, for example, of a predetermined or specific size that is configured to be placed within a heating chamber of the device which is sized to receive the article.

The aerosol provision device according to various embodiments comprises a plurality of aerosol generators. 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 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.

The aerosol generator may comprise an induction coil. In some examples, the coil is configured to cause heating of at least one electrically-conductive heating element, so that heat energy is conductible from the at least one electrically-conductive heating element to aerosol generating material to thereby cause heating of the aerosol generating material.

In some examples, the coil is configured to generate, in use, a varying magnetic field for penetrating at least one heating element, to thereby cause induction heating and/or magnetic hysteresis heating of the at least one heating element. In such an arrangement, the or each heating element may be termed a “susceptor”. A coil that is configured to generate, in use, a varying magnetic field for penetrating at least one electrically-conductive heating element, to thereby cause induction heating of the at least one electrically-conductive heating element, may be termed an “induction coil” or “inductor coil”.

In some examples, the coils are helical. In some examples, the coils may encircle at least a part of a heating zone of the aerosol provision device that is configured to receive aerosol generating material. In some examples, the coils are a helical coils that encircle at least a part of the heating zone.

It has been found that induction heating units in an aerosol provision device reach a maximum operating temperature much more rapidly than corresponding resistive heating elements. According to various embodiments, the aerosol provision device may be configured such that one or both heating units reaches its maximum operating temperature at a rate of at least 100 °C per second. In a particular embodiment, the aerosol provision device may be configured such that one or both heating units reaches the maximum operating temperature at a rate of at least 150 °C per second.

Induction heating systems may be of interest because the varying magnetic field magnitude can be easily controlled by controlling power supplied to the heating unit. Moreover, as induction heating does not require a physical connection to be provided between the source of the varying magnetic field and the heat source, design freedom and control over the heating profile may be greater, and cost may be lower.

The aerosol provision device may comprise a heating assembly. The heating assembly may comprise a first aerosol generator and a second aerosol generator. The first aerosol generator and the second aerosol generator may comprise induction heating units and the units may be controllable independent from each other. Heating the aerosol generating material with independent heating units may provide more accurate control of heating of the aerosol generating material. Independently controllable heating units may also provide thermal energy differently to each portion of the aerosol generating material, resulting in differing temperature profiles across portions of the aerosol generating material.

According to various embodiments, the first and second aerosol generators may be configured to have temperature profiles which differ from each other in use. This may provide asymmetrical heating of the aerosol generating material along a longitudinal plane between the mouth end and the distal end of the aerosol provision device when the aerosol provision device is in use.

Alternatively, the first and second aerosol generators may be configured to have temperature profiles which are substantially the same in use. This may provide symmetrical heating of the aerosol generating material along a longitudinal plane between the mouth end and the distal end of the aerosol provision device when the aerosol provision device is in use.

An object that is capable of being inductively heated is known as a susceptor. 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 heating. Further, there need not be any physical contact between the inductive heater and the susceptor, allowing for enhanced freedom in construction and application.

Reference may be made to the temperature of heating elements throughout the present specification. The temperature of a heating element may also be conveniently referred to as the temperature of the heating unit which comprises the heating element. This does not necessarily mean that the entire heating unit is at the given temperature. For example, where reference is made to the temperature of an induction heating unit, it does not necessarily mean that both the inductive element and the susceptor have such a temperature. Rather, in this example, the temperature of the induction heating unit corresponds to the temperature of the heating element composed in the induction heating unit. For the avoidance of doubt, the temperature of a heating element and the temperature of a heating unit can be used interchangeably.

As used herein, “temperature profile” refers to the variation of temperature of a material over time. For example, the varying temperature of a heating element or heating unit measured at the heating element or heating unit for the duration of a smoking session may be referred to as the temperature profile of that heating element or heating unit. The heating elements or heating units provide heat to the aerosol generating material during use, to generate an aerosol. The temperature profile of the heating element or heating unit therefore induces the temperature profile of aerosol generating material disposed near the heating element or heating unit.

"Operating temperature" as used herein in relation to a heating element or heating unit refers to any heating element temperature at which the element can heat an aerosol generating material to produce sufficient aerosol for a satisfactory puff without burning the aerosol generating material. The maximum operating temperature of a heating element is the highest temperature reached by the element during a smoking session. The lowest operating temperature of the heating element refers to the lowest heating element temperature at which sufficient aerosol can be generated from the aerosol generating material by the heating element for a satisfactory puff. Where there are a plurality of heating elements or heating units present in the aerosol provision device, each heating element or heating unit has an associated maximum operating temperature. The maximum operating temperature of each heating element or heating unit may be the same, or it may differ for each heating element or heating unit.

In the aerosol provision device according to an embodiment each heating element or heating unit may be arranged to heat, but not burn, aerosol generating material. Although the temperature profile of each heating element or heating unit may induce the temperature profile of each associated portion of aerosol generating material, the temperature profiles of the heating element or heating unit and the associated portion of aerosol generating material may not exactly correspond. For example, there may be "bleed" in the form of conduction, convection and/or radiation of heat energy from one portion of the aerosol generating material to another; there may be variations in conduction, convection and/or radiation of heat energy from the heating elements or heating units to the aerosol generating material; there may be a lag between the change in the temperature profile of the heating element or heating unit and the change in the temperature profile of the aerosol generating material, depending on the heat capacity of the aerosol generating material.

The aerosol provision device may comprise a controller for controlling each aerosol generator present in the aerosol provision device. The controller may comprise a printed circuit board ("PCB"). The controller may be configured to control the power supplied to each heating unit, and controls the "programmed heating profile" of each heating unit present in the aerosol provision device. For example, the controller may be programmed to control the current supplied to a plurality of inductors to control the resulting temperature profiles of the corresponding induction heating elements or induction heating units. As between the temperature profile of heating elements/units and aerosol generating material described above, the programmed heating profile of a heating element or heating unit may not exactly correspond to the observed temperature profile of a heating element or heating unit, for the same reasons given above.

The term “operating temperature” can also be used in relation to the aerosol generating material. In this case, the term refers to any temperature of the aerosol generating material itself at which sufficient aerosol is generated from the aerosol generating material for a satisfactory puff. The maximum operating temperature of the aerosol generating material is the highest temperature reached by any part of the aerosol generating material during a smoking session. In some embodiments, the maximum operating temperature of the aerosol generating material is greater than 200 °C, 210 °C, 220 °C, 230 °C, 240 °C, 250 °C, 260 °C or 270 °C. In some embodiments, the maximum operating temperature of the aerosol generating material is less than 300 °C, 290 °C, 280 °C, 270 °C, 260 °C or 250 °C. The lowest operating temperature is the lowest temperature of aerosol generating material at which sufficient aerosol is generated from the material to product sufficient aerosol for a satisfactory “puff”. In some embodiments, the lowest operating temperature of the aerosol generating material is greater than 90 °C, 100 °C, 110 °C, 120 °C, 130 °C, 140 °C or 150 °C. In some embodiments, the lowest operating temperature of the aerosol generating material is less than 150 °C, 140 °C, 130 °C or 120 °C.

An object of various embodiments is to reduce the amount of time it takes for an aerosol provision device to be ready for use, and more generally improve the inhalation experience for a user. Surprisingly, it has been found that reducing the time taken for a heating element or heating unit to reach an operating temperature may at least partially alleviate “hot puff”, a phenomenon which occurs when the generated aerosol contains a high water content. Accordingly, the aerosol provision device according to various embodiments may provide an inhalable aerosol to a consumer which has better organoleptic properties than an aerosol provided by a conventional aerosol provision device which does not include a heating unit which reaches a maximum operating temperature as rapidly.

In some embodiments, the aerosol provision device is configured such that at least one heating element in the device reaches its maximum operating temperature within 20 seconds, and the first temperature at which the at least one heating unit is held for at least 1 second, 2 seconds, 3 seconds, 4 seconds, 5 seconds, 10 seconds, or 20 seconds is the maximum operating temperature. That is, in these embodiments, the heating unit is not held at a temperature which is not the maximum operating temperature before reaching the maximum operating temperature. In some embodiments, the at least one heating unit reaches its maximum operating temperature within the given period from ambient temperature.

The aerosol provision device may be configured to operate as described herein. The aerosol provision device may at least partially be configured to operate in this manner by a controller which may be programmed to operate the device in one or more different modes. Accordingly, references herein to the configuration of the aerosol provision device or components thereof may refer to the controller being programmed to operate the aerosol provision device as disclosed herein, amongst other features (such as spatial arrangement of the heating units).

Aerosol generating articles for aerosol provision devices (such as tobacco heating products) usually contain more water and/or aerosol generating agent than combustible smoking articles to facilitate formation of an aerosol in use. This higher water and/or aerosol generating agent content can increase the risk of condensate collecting within the aerosol provision device during use, particularly in locations away from the heating unit(s). This problem may be greater in aerosol provision devices with enclosed heating chambers, and particularly those with external heaters, than those provided with internal heaters (such as "blade" heaters). Without wishing to be bound by theory, it is believed that since a greater proportion/surface area of the aerosol generating material is heated by external-heating heating assemblies, more aerosol is released than an aerosol provision device which heats the aerosol generating material internally, leading to more condensation of the aerosol within the aerosol provision device.

Various programmed heating profiles may be employed in an aerosol provision device configured to externally heat aerosol generating material to provide a desirable amount of aerosol to the user whilst keeping the amount of aerosol which condenses inside the aerosol provision device relatively low. For example, the maximum operating temperature of a heating unit may affect the amount of condensate formed. It may be that lower maximum operating temperatures provide less undesirable condensate. The difference between maximum operating temperatures of heating units in a heating assembly may also affect the amount of condensate formed. Further, the point in a session of use at which each heating unit reaches its maximum operating temperature may affect the amount of condensate formed.

In use, the aerosol provision device may heat an aerosol generating material to provide an inhalable aerosol. The aerosol provision device may be referred to as "ready for use" when at least a portion of the aerosol generating material has reached a lowest operating temperature and a user can take a puff which contains a satisfactory amount of aerosol. In some embodiments the aerosol provision device may be ready for use within approximately 20 seconds of supplying power to one or both heating units, or 15 seconds, or 10 seconds or 5 seconds. The aerosol provision device may be ready for use within approximately 20 seconds of activation of the device, or 15 seconds, or 10 seconds or 5 seconds. The aerosol provision device may begin supplying power to a heating unit such as the first aerosol generator or the second aerosol generator when the device is activated, or it may begin supplying power to the heating unit after the aerosol provision device is activated. The aerosol provision device may be configured such that power starts being supplied to one or the heating units some time after activation of the aerosol provision device, such as at least 1 second, 2 seconds or 3 seconds after activation of the aerosol provision device. The aerosol provision device may be configured such that power is not supplied to one of the heating units, or any heating unit present in the heating assembly until at least 2.5 seconds after activation of the aerosol provision device. This may prolong battery life by avoiding unintentional activation of the heating unit(s).

The aerosol provision device may be ready for use more quickly than corresponding aerosol provision devices known in the art, providing an improved user experience. Generally, the point at which the aerosol provision device is ready for use will be some time after one of the heating units has reached its maximum operating temperature, as it will take some amount of time to transfer sufficient thermal energy from the heating unit to the aerosol generating material in order to generate the aerosol. The aerosol provision device may be ready for use within 20 seconds of one of the heating units reaching its maximum operating temperature, or 15 seconds, or 10 seconds or 5 seconds.

In some embodiments, the user's sensorial experience arising from the aerosol generated by the present device is like that of smoking a combustible cigarette, such as a factory-made cigarette.

The aerosol provision device may indicate that it is ready for use via an indicator. In an embodiment, the aerosol provision device may be configured such that the indicator indicates that the aerosol provision device is ready for use within approximately 20 seconds of power being supplied to one of the heating units, or 15 seconds, or 10 seconds or 5 seconds. In a particular embodiment, the aerosol provision device may be configured such that the indicator indicates that the aerosol provision device is ready for use within approximately 20 seconds of activation of the device, or 15 seconds, or 10 seconds or 5 second. In another embodiment, the device is configured such that the indicator indicates that the device is ready for use within approximately 20 seconds of the first aerosol generator reaching its maximum operating temperature, or 15 seconds, or 10 seconds.

As used herein, "puff" refers to a single inhalation by the user of the aerosol generated by the aerosol provision device.

“Session of use” as used herein refers to a single period of use of the aerosol provision device by a user. The session of use begins at the point at which power is first supplied to at least one heating unit present in the heating assembly. The device will be ready for use after a period of time has elapsed from the start of the session of use.

The session of use ends at the point at which no power is supplied to any of the heating units in the aerosol provision device. The end of the session of use may coincide with the point at which the aerosol generating article is depleted (the point at which the total particulate matter yield (mg) in each puff would be deemed unacceptably low by a user). The session may comprise a plurality of puffs. The session may have a duration less than 7 minutes, or 6 minutes, or 5 minutes, or 4 minutes and 30 seconds, or 4 minutes, or 3 minutes and 30 seconds. In some embodiments, the session of use may have a duration of from 2 to 5 minutes, or from 3 to 4.5 minutes, or 3.5 to 4.5 minutes or approximately 4 minutes. A session may be initiated by the user actuating a button or switch on the device, causing at least one heating unit to begin rising in temperature when activated or some time after activation.

A session of use may be determined to begin when power or energy is first supplied to a heating unit after an aerosol generating article has been inserted into the aerosol provision device. A session of use may be determined to begin when power or energy is first supplied to one or more heating units in order to raise the temperature of the one or more heating units to an operating temperature Tmin such that a user can take a first puff of aerosol generated from the aerosol generating material. According to various embodiments Tmin may be in the range: (i) 200-210 °C; (ii) 210-220 °C; (iii) 220-230 °C; (iv) 230-240 °C; (v) 240-250 °C; (vi) 250-260 °C; (vii) 260-270 °C; (viii) 270-280 °C; (ix) 280-290 °C; and (x) 290-300 °C.

A session of use may be determined to end when power or energy is no longer supplied to the one or more heating units. A session of use may be determined to end when the aerosol generating material is substantially spent or wherein a user is unable to take further puffs of aerosol generated from the aerosol generating material.

A session of use may be determined to relate to a period of time during which a user is enabled to take multiple puffs of aerosol generated from aerosol generating material without replacement or replenishment of the aerosol generating material.

In some embodiments, the aerosol provision device may be operable in at least a first (e.g. base) mode of operation and a second (e.g. boost) mode of operation.

The heating assembly may be operable in a maximum of two modes of operation, or may be operable in more than two modes, such as three modes, four modes, or five modes. Each mode of operation may be associated with a predetermined heating profile for each heating unit in the heating assembly, such as a programmed heating profile. One or more of the programmed heating profiles may be programmed by a user. Additionally, or alternatively, one or more of the programmed heating profiles may be programmed by the manufacturer. In these examples, the one or more programmed heating profiles may be fixed such that an end user cannot alter the one or more programmed heating profiles.

The modes of operation may be selectable by a user. For example, the user may select a desired mode of operation by interacting with a user interface. Power may begin to be supplied to a first aerosol generator at substantially the same time as the desired mode of operation is selected.

Each mode may be associated with a temperature profile which differs from the temperature profiles of the other modes. Further, one or more modes may be associated with a different point at which the device is ready for use. For example, the heating assembly may configured such that, in a first mode, the device is ready for use a first period of time after the start of a session of use, and in a second mode, the device is ready for use a second period of time after the start of the session. The first period of time may be different from the second period of time.

In some examples, the heating assembly may be configured such that the aerosol provision device is ready for use within 30, 25 seconds, 20 seconds or 15 seconds of supplying power to a heating unit when operated in the first mode. The heating assembly may also be configured such that the aerosol provision device is ready for use in a shorter period of time when operating in the second mode - within 25 seconds, 20 seconds, 15 seconds, or 10 seconds of supplying power to a heating unit when operating in the second mode. In a particular embodiment, the aerosol provision device may be configured such that the indicator indicates that the aerosol provision device is ready for use within 20 seconds of selection of a first (e.g. base) mode, and within 10 seconds of selection of a second (e.g. boost) mode.

Providing an aerosol provision device such as a tobacco heating product with a heating assembly that is operable in a plurality of modes (e.g. base mode and boost mode) gives more choice to the consumer, particularly where each mode is associated with a different maximum heater temperature. Moreover, such an aerosol provision device is capable of providing different aerosols having differing characteristics, because volatile components in the aerosol generating material will be volatilised at different rates and concentrations at different heater temperatures. This allows a user to select a particular mode based on a desired characteristic of the inhalable aerosol, such as degree of tobacco flavour, nicotine concentration, and aerosol temperature. For example, modes in which the aerosol provision device is ready for use more quickly (e.g. a second or “boost” mode) may provide a quicker first puff, or a greater nicotine content per puff, or a more concentrated flavour per puff. Conversely, modes in which the aerosol provision device is ready for use at a later point in the session of use (e.g. a first or base mode) may provide a longer overall session of use, lower nicotine content per puff, and more sustained delivery of flavour.

In embodiments wherein the aerosol provision device is ready for use more quickly in a second (e.g. boost) mode, and/or the first and/or second aerosol generator has a higher maximum operating temperature in the second mode, the second mode may be referred to as a “boost” mode. Various embodiments provide an aerosol provision device which is operable in a first “normal” or “base” mode and a second “boost” mode. The “boost” mode may provide a quicker first puff, or a greater nicotine content per puff, or a more concentrated flavour per puff.

The aerosol provision device may comprise a maximum of two heating units. In other examples, the aerosol provision device may comprise more than two independently controllable heating units, such as three, four or five independently controllable heating units.

As discussed hereinabove, in some embodiments, at least one of the heating units provided in the heating assembly may comprise an induction heating unit. In these embodiments, the heating unit comprises an inductor (for example, one or more inductor coils), and the aerosol provision device may be arranged to pass a varying electrical current, such as an alternating current, through the inductor. The varying electric current in the inductor produces a varying magnetic field. When the inductor and the heating element are suitably relatively positioned so that the varying magnetic field produced by the inductor penetrates the heating element, one or more eddy currents are generated inside the heating element. The heating element has a resistance to the flow of electrical currents, so when such eddy currents are generated in the object, their flow against the electrical resistance of the object causes the object to be heated by Joule heating. Supplying a varying magnetic field to a susceptor may conveniently be referred to as supplying energy to a susceptor.

Another aspect is an aerosol generating system comprising an aerosol provision device as described herein in combination with an aerosol generating article.

An aerosol provision device will now be described for illustrative purposes.

Fig. 1A shows an induction heating assembly 100 of an aerosol provision device which is given for illustrative purposes to illustrate various aspects of a heat not burn aerosol provision device. Fig. 1B shows a cross section of the induction heating assembly 100 of the device. The heating assembly 100 has a first or proximal or mouth end 102, and a second or distal end 104. In use, a user will inhale the formed aerosol from the mouth end 102 of the aerosol provision device. The mouth end 102 may be an open end.

The heating assembly 100 comprises a first induction heating unit 110 and a second induction heating unit 120. The first induction heating unit 110 comprises a first inductor coil 112 and a first heating element 114. The second induction heating unit 120 comprises a second inductor coil 122 and a second heating element 124.

Figs. 1A and 1B show an aerosol generating article 130 received within a single susceptor 140 (see Fig. 1B). The single susceptor 140 forms both the first induction heating element 114 and the second induction heating element 124. The susceptor 140 may be formed from any material suitable for heating by induction. For example, the susceptor 140 may comprise metal. In some embodiments, the susceptor 140 may comprise non-ferrous metal such as copper, nickel, titanium, aluminium, tin, or zinc, and/or ferrous material such as iron, nickel or cobalt. Additionally or alternatively the susceptor 140 may comprise a semiconductor such as silicon carbide, carbon or graphite.

Each induction heating element present in the aerosol provision device may have any suitable shape. In the embodiment shown in Fig. 1B, the induction heating elements 114,124 define a receptacle to surround an aerosol generating article and to heat the aerosol generating article externally. In other arrangement (not shown), one or more induction heating elements may be substantially elongate and may be arranged to penetrate an aerosol generating article and to heat the aerosol generating article internally.

As shown in Fig. 1B, the first induction heating element 114 and second induction heating element 124 may be provided together as a monolithic susceptor element 140. That is, in some embodiments, there is no physical distinction between the first 114 and second 124 heating elements. Rather, the differing characteristics between the first and second aerosol generators 110,120 are defined by separate inductor coils 112,122 surrounding each induction heating element 114,124, so that they may be controlled independently from each other. In other embodiments (not depicted), physically distinct inductive heating elements may be employed.

The first and second inductor coils 112,122 may be made from an electrically conducting material. For example, the first and second inductor coils 112,122 may be made from LITZ (RTM) wire/cable which is wound in a helical fashion to provide helical inductor coils 112,122. LITZ (RTM) wire comprises a plurality of individual wires which are individually insulated and which are twisted together to form a single wire. LITZ (RTM) wires are designed to reduce the skin effect losses in a conductor. In the example induction heating assembly 100, the first and second inductor coils 124,126 are made from copper LITZ (RTM) wire which has a circular cross section. In other examples the LITZ (RTM) wire can have other shape cross sections, such as rectangular.

The first inductor coil 112 is configured to generate a first varying magnetic field for heating the first induction heating element 114 and the second inductor coil 122 is configured to generate a second varying magnetic field for heating a second section of the susceptor 124. The first inductor coil 112 and the first induction heating element 114 taken together form a first induction heating unit 110. Similarly, the second inductor coil 122 and the second induction heating element 124 taken together form a second induction heating unit 120.

In this example, the first inductor coil 112 is adjacent to the second inductor coil 122 in a direction along the longitudinal axis of the device heating assembly 100 (that is, the first and second inductor coils 112,122 do not overlap). The susceptor arrangement 140 may comprise a single susceptor. Ends 150 of the first and second inductor coils 112,122 can be connected to a controller such as a PCB (not shown). In embodiments, the controller may comprise a PID controller (proportional integral derivative controller).

The varying magnetic field generates eddy currents within the first inductive heating element 114, thereby rapidly heating the first induction heating element 114 to a maximum operating temperature within a short period of time from supplying the alternative current to the coil 112, for example within 20, 15, 12, 10, 5, or 2 seconds. Arranging the first induction heating unit 110 which is configured to rapidly reach a maximum operating temperature closer to the mouth end 102 of the heating assembly 100 than the second induction heating unit 120 may mean that an acceptable aerosol is provided to a user as soon as possible after initiation of a session of use.

It will be appreciated that the first and second inductor coils 112,122, in some examples, may have at least one characteristic different from each other. For example, the first inductor coil 112 may have at least one characteristic different from the second inductor coil 122. More specifically, in one example, the first inductor coil 112 may have a different value of inductance than the second inductor coil 122. In Figs. 1A and 1B, the first and second inductor coils 112,122 are of different lengths such that the first inductor coil 112 is wound over a smaller section of the susceptor 140 than the second inductor coil 122. Thus, the first inductor coil 112 may comprise a different number of turns than the second inductor coil 122 (assuming that the spacing between individual turns is substantially the same). In yet another example, the first inductor coil 112 may be made from a different material to the second inductor coil 122. In some examples, the first and second inductor coils 112,122 may be substantially identical.

In this example, the first inductor coil 112 and the second inductor coil 122 are wound in the same direction. However, in another embodiment, the inductor coils 112,122 may be wound in opposite directions. This can be useful when the inductor coils are active at different times. For example, initially, the first inductor coil 112 may be operating to heat the first induction heating element 114, and at a later time, the second inductor coil 122 may be operating to heat the second induction heating element 124. 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 one example, the first inductor coil 112 may be a right-hand helix and the second inductor coil 122 a left-hand helix. In another example, the first inductor coil 112 may be a left-hand helix and the second inductor coil 122 may be a right-hand helix.

The coils 112,122 may have any suitable geometry. Without wishing to be bound by theory, configuring an induction heating element to be smaller (e.g. smaller pitch helix; fewer revolutions in the helix; shorter overall length of the helix), may increase the rate at which the induction heating element can reach a maximum operating temperature. In some embodiments, the first coil 112 may have a length of less than approximately 20 mm, less than 18 mm, less than 16 mm, or a length of approximately 14 mm, in the longitudinal direction of the heating assembly 100. The first coil 112 may have a length shorter than the second coil 124 in the longitudinal direction of the heating assembly 100. Such an arrangement may provide asymmetrical heating of the aerosol generating article along the length of the aerosol generating article.

The single susceptor 140 of this example is hollow and therefore defines a receptacle within which aerosol generating material is received. For example, the article 130 can be inserted into the susceptor 140. In this example the susceptor 140 is tubular, with a circular cross section. The induction heating elements 114,124 are arranged to surround the aerosol generating article 130 and heat the aerosol generating article 130 externally. The aerosol provision device is configured such that, when the aerosol generating article 130 is received within the susceptor 140, the outer surface of the article 130 abuts the inner surface of the susceptor 140. This ensures that the heating is most efficient. The article 130 of this example comprises aerosol generating material. The aerosol generating material is positioned within the susceptor 140. The article 130 may also comprise other components such as a filter, wrapping materials and/or a cooling structure. The heating assembly 100 is not limited to two heating units. In some examples, the heating assembly 100 may comprise three, four, five, six, or more than six heating units. These heating units may each be controllable independent from the other heating units present in the heating assembly 100.

Referring to Figs. 2A and 2B, there is shown a partially cut-away section view and a perspective view of an example of an aerosol generating article 200 which is given for illustrative purposes only. The aerosol generating article 200 shown in Figs. 2A and 2B corresponds to the aerosol generating article 130 shown in Fig. 1.

The aerosol generating article 200 may be any shape suitable for use with an aerosol provision device. The aerosol generating article 130 may be in the form of or provided as part of a cartridge or cassette or rod which can be inserted into the apparatus. In the arrangement shown in Figs. 1A, 1B and 2, the aerosol generating article 130 is in the form of a substantially cylindrical rod that includes a body of smokable material 202 and a filter assembly 204 in the form of a rod.

The filter assembly 204 includes three segments, a cooling segment 206, a filter segment 208 and a mouth end segment 210. The article 200 has a first end 212, also known as a mouth end or a proximal end and a second end 214, also known as a distal end. The body of aerosol generating material 202 is located towards the distal end 214 of the article 200.

In one example, the cooling segment 206 is located adjacent the body of aerosol generating material 202 between the body of aerosol generating material 202 and the filter segment 208, such that the cooling segment 206 is in an abutting relationship with the aerosol generating material 202 and the filter segment 208. In other examples, there may be a separation between the body of aerosol generating material 202 and the cooling segment 206 and between the body of aerosol generating material 202 and the filter segment 208. The filter segment 208 is located in between the cooling segment 206 and the mouth end segment 210. The mouth end segment 210 is located towards the proximal end 212 of the article 200, adjacent the filter segment 208. In one example, the filter segment 208 is in an abutting relationship with the mouth end segment 210. In one embodiment, the total length of the filter assembly 204 is between 37 mm and 45 mm, and optionally the total length of the filter assembly 204 is 41 mm.

In use, portions 202a,202b of the body of aerosol generating material 202 may correspond to the first induction heating element 114 and second induction heating element 124 of the portion 100 shown in Fig. 1B respectively.

The body of smokable material may have a plurality of portions 202a,202b which correspond to the plurality of induction heating elements present in the aerosol provision device. For example, the aerosol generating article 200 may have a first portion 202a which corresponds to the first induction heating element 114 and a second portion 202b which corresponds to the second induction heating element 124. These portions 202a,202b may exhibit temperature profiles which are different from each other during a session of use. The temperature profiles of the portions 202a,202b may derive from the temperature profiles of the first induction heating element 114 and second induction heating element 124 respectively.

Where there are a plurality of portions 202a,202b of a body of aerosol generating material 202, any number of the substrate portions 202a,202b may have substantially the same composition. In a particular example, all of the portions 202a,202b of the substrate have substantially the same composition. The body of aerosol generating material 202 may be a unitary, continuous body and there may be no physical separation between the first and second portions 202a,202b. Furthermore, the first and second portions 202a,202b may have substantially the same composition.

According to various embodiments the body of aerosol generating material 202 comprises tobacco. The body of smokable material 202 may consist of tobacco, may consist substantially entirely of tobacco, may comprise tobacco and aerosol generating material other than tobacco, may comprise aerosol generating material other than tobacco, or may be free of tobacco. The aerosol generating material may include an aerosol generating agent such as glycerol. In a particular embodiment, the aerosol generating material may comprise one or more tobacco components, filler components, binders and aerosol generating agents.

The “aerosol generating agent” is an agent that promotes the generation of an aerosol. An aerosol generating agent 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 generating agent may improve the delivery of flavour from the aerosol generating article.

In a particular embodiment, the aerosol generating material comprises a tobacco component in an amount of from 60 to 90% by weight of the tobacco composition, a filler component in an amount of 0 to 20% by weight of the tobacco composition, and an aerosol generating agent in an amount of from 10 to 20% by weight of the tobacco composition. The tobacco component may comprise paper reconstituted tobacco in an amount of from 70 to 100% by weight of the tobacco component. In one example, the body of aerosol generating material 202 is between 34 mm and 50 mm in length, optionally, the body of aerosol generating material 202 is between 38 mm and 46 mm in length, optionally still, the body of aerosol generating material 202 is 42 mm in length.

In one example, the total length of the article 200 is between 71 mm and 95 mm, optionally, total length of the article 200 is between 79 mm and 87mm, optionally still, total length of the article 200 is 83 mm. An axial end of the body of aerosol generating material 202 is visible at the distal end 214 of the article 200. However, in other embodiments, the distal end 214 of the article 200 may comprise an end member (not shown) covering the axial end of the body of aerosol generating material 202.

The body of aerosol generating material 202 is joined to the filter assembly 204 by annular tipping paper (not shown), which is located substantially around the circumference of the filter assembly 204 to surround the filter assembly 204 and extends partially along the length of the body of aerosol generating material 202. In one example, the tipping paper is made of 58GSM standard tipping base paper. In one example has a length of between 42 mm and 50 mm, and optionally, the tipping paper has a length of 46 mm.

In one example, the cooling segment 206 is an annular tube and is located around and defines an air gap within the cooling segment. The air gap provides a chamber for heated volatilised components generated from the body of aerosol generating material 202 to flow. The cooling segment 206 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 200 is in use during insertion into the device 100. In one example, the thickness of the wall of the cooling segment 206 is approximately 0.29 mm.

The cooling segment 206 provides a physical displacement between the aerosol generating material 202 and the filter segment 208. The physical displacement provided by the cooling segment 206 will provide a thermal gradient across the length of the cooling segment 206. In one example the cooling segment 206 is configured to provide a temperature differential of at least 40 °C between a heated volatilised component entering a first end of the cooling segment 206 and a heated volatilised component exiting a second end of the cooling segment 206. In one example the cooling segment 206 is configured to provide a temperature differential of at least 60 °C between a heated volatilised component entering a first end of the cooling segment 206 and a heated volatilised component exiting a second end of the cooling segment 206. This temperature differential across the length of the cooling element 206 protects the temperature sensitive filter segment 208 from the high temperatures of the aerosol generating material 202 when it is heated by the heating assembly 100 of the device aerosol provision device. If the physical displacement was not provided between the filter segment 208 and the body of aerosol generating material 202 and the heating elements 114,124 of the heating assembly 100, then the temperature sensitive filter segment may 208 become damaged in use, so it would not perform its required functions as effectively.

In one example the length of the cooling segment 206 is at least 15 mm. In one example, the length of the cooling segment 206 is between 20 mm and 30 mm, more particularly 23 mm to 27 mm, more particularly 25 mm to 27 mm and more particularly 25 mm.

The cooling segment 206 may be made of paper and hence is comprises of a material that does not generate compounds of concern, for example, toxic compounds when in use adjacent to the heater assembly 100 of the aerosol provision device. In one example, the cooling segment 206 may be manufactured from a spirally wound paper tube which provides a hollow internal chamber yet maintains mechanical rigidity. Spirally wound paper tubes are able to meet the tight dimensional accuracy requirements of high-speed manufacturing processes with respect to tube length, outer diameter, roundness and straightness.

In another example, the cooling segment 206 is a recess created from stiff plug wrap or tipping paper. The stiff plug wrap or tipping paper 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 200 is in use during insertion into the device 100.

For each of the examples of the cooling segment 206, the dimensional accuracy of the cooling segment is sufficient to meet the dimensional accuracy requirements of high-speed manufacturing process.

The filter segment 208 may be formed of any filter material sufficient to remove one or more volatilised compounds from heated volatilised components from the smokable material. In one example the filter segment 208 is made of a mono-acetate material, such as cellulose acetate. The filter segment 208 provides cooling and irritation-reduction from the heated volatilised components without depleting the quantity of the heated volatilised components to an unsatisfactory level for a user.

The density of the cellulose acetate tow material of the filter segment 208 controls the pressure drop across the filter segment 208, which in turn controls the draw resistance of the article 200. Therefore, the selection of the material of the filter segment 208 is important in controlling the resistance to draw of the article 200. In addition, the filter segment 208 performs a filtration function in the article 200.

In one example, the filter segment 208 is made of a 8Y15 grade of filter tow material, which provides a filtration effect on the heated volatilised material, whilst also reducing the size of condensed aerosol droplets which result from the heated volatilised material which consequentially reduces the irritation and throat impact of the heated volatilised material to satisfactory levels.

The presence of the filter segment 208 provides an insulating effect by providing further cooling to the heated volatilised components that exit the cooling segment 206. This further cooling effect reduces the contact temperature of the user's lips on the surface of the filter segment 208. One or more flavours may be added to the filter segment 208 in the form of either direct injection of flavoured liquids into the filter segment 208 or by embedding or arranging one or more flavoured breakable capsules or other flavour carriers within the cellulose acetate tow of the filter segment 208.

In one example, the filter segment 208 is between 6 mm to 10 mm in length, optionally 8 mm. The mouth end segment 210 is an annular tube and is located around and defines an air gap within the mouth end segment 210. The air gap provides a chamber for heated volatilised components that flow from the filter segment 208. The mouth end segment 210 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 is in use during insertion into the device 100. In one example, the thickness of the wall of the mouth end segment 210 is approximately 0.29 mm.

In one example, the length of the mouth end segment 210 is between 6 mm to 10 mm and optionally 8 mm. In one example, the thickness of the mouth end segment is 0.29 mm. The mouth end segment 210 may be manufactured from a spirally wound paper tube which provides a hollow internal chamber yet maintains critical mechanical rigidity. Spirally wound paper tubes are able to meet the tight dimensional accuracy requirements of high-speed manufacturing processes with respect to tube length, outer diameter, roundness and straightness. The mouth end segment 210 provides the function of preventing any liquid condensate that accumulates at the exit of the filter segment 208 from coming into direct contact with a user.

It should be appreciated that, in one example, the mouth end segment 210 and the cooling segment 206 may be formed of a single tube and the filter segment 208 is located within that tube separating the mouth end segment 210 and the cooling segment 206.

A ventilation region 216 is provided in the article 200 to enable air to flow into the interior of the article 200 from the exterior of the article 200. In one example the ventilation region 216 takes the form of one or more ventilation holes 216 formed through the outer layer of the article 200. The ventilation holes may be located in the cooling segment 206 to aid with the cooling of the article 200. In one example, the ventilation region 216 comprises one or more rows of holes, and optionally, each row of holes is arranged circumferentially around the article 200 in a cross-section that is substantially perpendicular to a longitudinal axis of the article 200.

In one example, there are between one to four rows of ventilation holes to provide ventilation for the article 200. Each row of ventilation holes may have between 12 to 36 ventilation holes 216. The ventilation holes 216 may, for example, be between 100 to 500 μm in diameter. In one example, an axial separation between rows of ventilation holes 216 is between 0.25 mm and 0.75 mm, optionally, an axial separation between rows of ventilation holes 216 is 0.5 mm.

In one example, the ventilation holes 216 are of uniform size. In another example, the ventilation holes 216 vary in size. The ventilation holes can be made using any suitable technique, for example, one or more of the following techniques: laser technology, mechanical perforation of the cooling segment 206 or pre-perforation of the cooling segment 206 before it is formed into the article 200. The ventilation holes 216 are positioned so as to provide effective cooling to the article 200.

In one example, the rows of ventilation holes 216 are located at least 11mm from the proximal end 212 of the article, optionally the ventilation holes are located between 17mm and 20mm from the proximal end 212 of the article 200. The location of the ventilation holes 216 is positioned such that user does not block the ventilation holes 216 when the article 200 is in use.

Providing the rows of ventilation holes between 17 mm and 20 mm from the proximal end 212 of the article 200 enables the ventilation holes 216 to be located outside of the device 100, when the article 200 is fully inserted in the device 100, as can be seen in Fig. 1. By locating the ventilation holes outside of the apparatus, non-heated air is able to enter the article 200 through the ventilation holes from outside the device 100 to aid with the cooling of the article 200.

The length of the cooling segment 206 is such that the cooling segment 206 will be partially inserted into the device 100, when the article 200 is fully inserted into the device 100. The length of the cooling segment 206 provides a first function of providing a physical gap between the heater arrangement of the device 100 and the heat sensitive filter arrangement 208, and a second function of enabling the ventilation holes 216 to be located in the cooling segment, whilst also being located outside of the device 100, when the article 200 is fully inserted into the device 100. As can be seen from Fig. 1, the majority of the cooling element 206 is located within the device 100. However, there is a portion of the cooling element 206 that extends out of the device 100. It is in this portion of the cooling element 206 that extends out of the device 100 in which the ventilation holes 216 are located.

An aerosol provision device according to various embodiments will now be described in more detail with reference to Fig. 3.

Fig. 3 shows a heating assembly of an aerosol provision device 300 according to an embodiment. The aerosol provision device 300 is arranged to generate aerosol from an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material which in use is inserted into an upper opening in the body of the aerosol provision device 300. An aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material which may be inserted into the aerosol provision device 300 is described in more detail below with reference to Fig. 4.

The aerosol generating article which may be inserted into the aerosol provision device 300 may comprise a number of sections. According to an embodiment the aerosol generating article may comprise a mouth section which may comprise a cellulose acetate filter. The mouth section may be followed by a paper tube section. The paper tube section may be followed by a first (e.g. liquid or gel) section which may comprise a cartomiser or a cartridge having a reservoir of liquid or gel and the first (e.g. liquid or gel) section may be followed by a second (e.g. solid) section which may comprise an active substance. The active substance 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 or melatonin.

The active substance may comprise one or more constituents, derivatives or extracts of tobacco.

According to an embodiment the second section may comprise a tobacco rod. The gel may be provided in the form of a thin film. The aerosol provision device 300 as illustrated in Fig. 3 comprises a first aerosol generator which comprises a first induction coil 301 and a first susceptor 303 for heating the first section of the aerosol generating article when the aerosol generating article is inserted into the aerosol provision device 300.

The aerosol provision device 300 further comprises a second aerosol generator comprising a second induction coil 302 and a second susceptor 304 for heating the second section of the aerosol generating article when the aerosol generating article is inserted into the aerosol provision device 300.

Other embodiments are also contemplated wherein either the first aerosol generator and/or the second aerosol generator may comprise a resistive heater comprising an electrically conductive heating element. The resistive heater may comprise an electrically resistive winding or thin film which may be arranged into a tube which surrounds the aerosol generating article.

According to an embodiment the first aerosol generator may comprise an induction coil and a susceptor and the second aerosol generator may comprise a resistive heater. Alternatively, the first aerosol generator may comprise a resistive heater and the second aerosol generator may comprise an induction coil and a susceptor.

It will be understood, therefore, that the heating element which heats either the first section or second section of the aerosol generating material may comprise either a susceptor (of an induction heating unit) or an electrically conductive heating element such as an electrically resistive winding or thin film (of a resistive heating unit).

The first aerosol generator and the second aerosol generator are arranged to heat, but not burn, the aerosol generating article.

According to various embodiments an insulating member, portion or spacer 305 is provided between the first susceptor 303 and the second susceptor 304 (or more generally the first and second heating elements) wherein the insulating member, portion or spacer 305 is arranged to maintain a separation distance between the first susceptor 303 and the second susceptor 304 (or the first and second heating elements).

The insulating member, portion or spacer 305 is arranged to maintain a desired spacing between the two susceptors 303,304 (or heating elements) and may also function to reduce thermal transfer between the two susceptors 303,304 (or heating elements). In particular, when an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material is desired to be heated in the aerosol provision device 300 it may be desired to heat the two sections of the aerosol generating article to different temperatures. Accordingly, the insulating member, portion or spacer 305 is beneficial in terms of allowing the two different sections of the aerosol generating article to be heated to different temperatures and helps to stop one susceptor (or heating element) which may be heated to a high temperature inadvertently heating the other susceptor (or heating element) to the same or similar temperature by thermal conduction.

The insulating member, portion or spacer 305 may be substantially annular or ring shaped. The insulating member, portion or spacer 305 may be solid and may be gas impermeable so that a gas is unable to pass through the insulating member, portion or spacer 305.

The insulating member or spacer 305 may be arranged to maintain a separation of 1.5-1.6 mm, 1.6-1.7 mm, 1.7-1.8 mm, 1.8-1.9 mm, 1.9-2.0 mm, 2.0-2.1 mm, 2.1-2.2 mm, 2.2-2.3 mm, 2.3-2.4 mm, 2.4-2.5 mm or 2.0 mm between an end of the first susceptor 303 (or first heating element) and an end of the second susceptor 304 (or second heating element). Other embodiments are contemplated wherein the separation distance which is maintained between the two heating elements is less than 1.5 mm or greater than 2.5 mm.

The first susceptor 303 (or heating element) may be substantially cylindrical or tubular and/or the second susceptor 304 (or heating element) may also be substantially cylindrical or tubular. According to an embodiment an end or lip of the first susceptor 303 (or heating element) may be received or located within a hole or recess formed within the insulating member or spacer 305. Similarly, according to an embodiment an end or lip of the second susceptor 304 (or heating element) may be received or located within a hole or recess formed within the insulating member or spacer 305.

The first susceptor 303 (or heating element) may have a first external diameter d1, the second susceptor 304 (or heating element) may have a second external diameter d2 and the insulating member, portion or spacer 305 may have a third external diameter d3, wherein d3 > d2 and wherein d3 > d1.

The insulating member, portion or spacer 305 may be arranged so as to be in physical contact with the first susceptor 303 (or heating element) and/or the second susceptor 304 (or heating element).

The insulating member, portion or spacer 305 may be arranged so as not to be in physical contact with the first susceptor 303 (or heating element) and/or the second susceptor 304 (or heating element). That is, there may be an air gap between the insulating member and one or both of the first and second susceptors (or heating elements). The insulating member, portion or spacer 305 may comprise a thermally insulating material such as a plastics material or other suitable thermally insulating material.

According to another arrangement the first susceptor 303 and the second susceptor 304 may be separated by an air gap i.e. no spacer 305 is provided. Other arrangements are contemplated wherein more generally the first and second heating elements are separated by an air gap. The overall thickness of the air gap and/or the insulating member, portion or spacer 305 may be 1.5-1.6 mm, 1.6-1.7 mm, 1.7-1.8 mm, 1.8-1.9 mm, 1.9-2.0 mm, 2.0-2.1 mm, 2.1-2.2 mm, 2.2-2.3 mm, 2.3-2.4 mm or 2.4-2.5 mm. The overall thickness of the air gap or the insulating member, portion or spacer 305 may be 2.0 mm. Other embodiments are contemplated wherein the overall thickness may be less than 1.5 mm or greater than 2.5 mm.

The insulating member, portion or spacer 305 may comprise a plastic component or plastic spacer which may be arranged to keep the susceptors 303,304 or heating elements separated by an optimum separation distance which according to various embodiments may be in the range 1.5-2.5 mm. Other embodiments are contemplated wherein the insulating member, portion or spacer 305 arranged between the two heating elements may comprise any suitable thermally insulating material.

The aerosol provision device 300 comprises an opening through which an aerosol generating article is inserted in use. The first aerosol generator which comprises the first induction coil 301 and the first susceptor 303 (or more generally a first heating element) is arranged closer to the opening than the second aerosol generator which comprises the second induction coil 302 and the second susceptor 304 (or more generally a second heating element).

The aerosol provision device 300 comprises control circuitry which is arranged to activate both the first aerosol generator and the second aerosol generator. In particular, the control circuitry is arranged to activate the first and second induction coils 301,302 in order to generate a time varying magnetic field. The time varying magnetic field induced by the first induction coil 301 will heat the first susceptor 303 and the time varying magnetic field induced by the second induction coil 302 will heat the second susceptor 304.

Alternatively, the control circuitry may be arranged to pass an electrical current through a first resistive heating element and/or a second resistive heating element, wherein the resistive heating element(s) comprises an electrically conductive element.

According to various embodiments the second section of the aerosol generating article (which may comprise solid granules) may be arranged to be heated to a lower temperature (e.g. 200 °C) than the first section of the aerosol generating article which may comprise a cartomiser or cartridge housing a liquid or a gel which may be arranged to be heated to a temperature of e.g. 250 °C. However, other embodiments are contemplated wherein the first section may comprise solid granules and the second section may comprise a liquid or a gel. The gel may comprise a thin film.

The control circuitry may be arranged to cause the first aerosol generator comprising the first induction coil 301 and the first susceptor 303 (or more generally first heating element) to heat, in use, the first section of the aerosol generating article to a temperature of approximately 250 °C. According to various embodiments, the first aerosol generator may be arranged to heat the first section of the aerosol generating article to a temperature of 200-210 °C, 210-220 °C, 220-230 °C, 230-240 °C, 240-250 °C, 250-260 °C, 260-270 °C, 270-280 °C, 280-290 °C or 290-300 °C.

The control circuitry may be arranged to turn the first aerosol generator ON and to leave the first aerosol generator ON for the whole duration of a session. Other embodiments are contemplated wherein the control circuity may be arranged to turn the first aerosol generator ON for at least 80%, 85%, 90% or 95% of the total duration of a session.

The control circuitry may be arranged to cause the second aerosol generator to heat, in use, the second section of the aerosol provision device to a temperature of T2, wherein T2 may be 200 °C. Other embodiments are contemplated wherein T2 is in the range 150-160 °C, 160-170 °C, 170-180 °C, 180-190 °C, 190-200 °C, 200-210 °C, 210-220 °C, 220-230 °C, 230-240 °C or 240-250 °C.

The control circuitry may be arranged to turn the second aerosol generator ON and to leave the second aerosol generator ON for the duration of a session. Other embodiments are contemplated wherein the control circuity may be arranged to turn the first aerosol generator ON for at least 80%, 85%, 90% or 95% of the total duration of a session.

The aerosol provision device 300 may further comprise an aluminium shroud which is arranged external to the first aerosol generator and the second aerosol generator. The aluminium shroud may be arranged to retain heat within heating assembly of the aerosol provision device 300. The aluminium shroud may also reduce heat transfer to an outermost housing of the aerosol provision device 300. One or more layers of graphite or graphite tape may be arranged external to the first aerosol generator and the second aerosol generator in order to retain heat within the aerosol provision device 300 and/or to reduce heat transfer to an outermost housing of the aerosol provision device 300.

The aerosol provision device 300 may further comprise a recognition device which is arranged to recognise an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material at the point that the aerosol generating article is inserted into the aerosol provision device 300. The recognition device may be arranged to determine whether or not the first and second aerosol generator should be activated.

According to various embodiments an aerosol provision system is disclosed which comprises both an aerosol provision device 300 and an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material. The aerosol generating article further comprises a mouth section and wherein the first section of the aerosol generating article is closer to the mouth section than the second section of the aerosol generating article.

The aerosol provision device 300 is arranged to generate aerosol from the aerosol generating article. The temperature of the aerosol emitted from the mouth section of the aerosol generating article may be arranged to be, in use, < 40 °C.

Fig. 4 shows in more detail an aerosol generating article 400 according to an embodiment. The aerosol generating article 400 comprises a filter section 401 which according to an embodiment may be 10 mm long. The filter section 401 may comprise a cellulose acetate filter tow such as Tow 5.0/30,000. The cellulose acetate tow may be surrounded by an outer wrap which may comprise HENGFENG (RTM) 27 gsm paper.

The filter section 401 may also be referred to as a mouth section since a user will place the filter section 401 in their mouth. After the filter section 401 a paper tube section 402 is provided which may according to an embodiment be 16 mm in length. The paper tube section 402 is essentially a spacer and may comprise DELFORT (RTM) 21.0 mm/21.8 mm.

After the paper tube section 402 a first section 403 is provided. In the particular embodiment shown in Fig. 4 the first section 403 comprises a cartomiser or cartridge which may comprise a wick 405 of non-woven cotton which may be impregnated with a gel or liquid. The wick 405 may be surrounded by an outer wrap of aluminium foil 406 which may have a thickness of 32 μm.

The aerosol generating article 400 further comprises a second section 404 following the first section 403 wherein the second section 404 may comprise a tobacco plug. More generally, the second section 404 may comprise an active substance. The active substance 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 or melatonin. The active substance may comprise one or more constituents, derivatives or extracts of tobacco.

The first (e.g. liquid or gel) section 403 and the second (e.g. solid) section 404 may be provided in an outer wrap of HENGFENG (RTM) 27 gsm paper. The first (e.g. liquid or gel) section 403 of the aerosol generating article 400 may house a liquid or gel aerosol generating material and the second (e.g. solid) section 404 may house a solid aerosol generating material. The solid aerosol generating material may comprise granules formed from an active substance. The active substance 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 or melatonin. The active substance may comprise one or more constituents, derivatives or extracts of tobacco.

According to the embodiment shown and described with reference to Fig. 4, the overall length of the aerosol generating article 400 may be 48 mm and the aerosol generating article may have a diameter of 22.8 mm, 22.9 mm or 23.0 mm.

Alternative embodiments are contemplated wherein the aerosol generating article may be constituted differently. For example, according to an embodiment the aerosol generating article may comprise a filter section, a paper tube section and a combined first and second section wherein the combined first and second section comprises a mixture of shred gel and tobacco. More generally, the combined first and second section may comprise a mixture of active substances. The active substances may be physiologically active material, which is a material intended to achieve or enhance a physiological response. The active substances may for example be selected from nutraceuticals, nootropics, psychoactives. The active substances may be naturally occurring or synthetically obtained. The active substances may comprise for example nicotine, caffeine, taurine, theine, vitamins such as B6 or B12 or C, or melatonin. The active substances may comprise one or more constituents, derivatives or extracts of tobacco. According to an embodiment the overall length of the aerosol generating article may be longer e.g. 75 mm and the diameter may be smaller e.g. 20.35 mm.

According to another embodiment the aerosol generating article may comprise a filter section, a paper tube section and a combined first and second section wherein the combined first and second section comprises a tobacco rod formed with a double layer wrap enveloping the tobacco rod. More generally, the combined first and second section may comprise a rod formed of a mixture of active substances. The active substances may be physiologically active material, which is a material intended to achieve or enhance a physiological response. The active substances may for example be selected from nutraceuticals, nootropics, psychoactives. The active substances may be naturally occurring or synthetically obtained. The active substances may comprise for example nicotine, caffeine, taurine, theine, vitamins such as B6 or B12 or C or melatonin. The active substances may comprise one or more constituents, derivatives or extracts of tobacco.

The double layer wrap may comprise a gel sheet which directly wraps the rod. An outer paper overwrap may be provided. According to this embodiment the overall length of the aerosol generating article may be 75 mm and the diameter may be 20.35 mm.

According to another embodiment the aerosol generating article may comprise a filter section, a paper tube section, a first section comprising a solid rod comprising an active substance and a second section comprising a cartomiser or cartridge comprising a liquid or gel. The active substance 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 or melatonin. The active substance may comprise one or more constituents, derivatives or extracts of tobacco.

It will be understood, therefore, that this alternative embodiment reverses the position of the liquid or gel section and the rod section as shown in Fig. 4. According to this embodiment the overall length of the aerosol generating article may be 75 mm and the diameter may be 20.35 mm.

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 provision device for generating aerosol from an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material, wherein the aerosol provision device comprises:

a first aerosol generator comprising a first heating element for causing aerosol to be generated from the first aerosol generating material;

a second aerosol generator comprising a second heating element for causing aerosol to be generated from the second aerosol generating material; and

an insulating member arranged between the first and second heating elements.

2. An aerosol provision device as claimed in claim 1, wherein the first aerosol generator comprises a first induction coil and a first susceptor comprising material that is heatable by penetration with a varying magnetic field, wherein the first susceptor comprises the first heating element.

3. An aerosol provision device as claimed in claim 2, wherein the first susceptor is tubular.

4. An aerosol provision device as claimed in claim 1, wherein the first aerosol generator comprises a first resistive heater comprising the first heating element.

5. An aerosol provision device as claimed in claim 4, wherein the first resistive heater is tubular.

6. An aerosol provision device as claimed in claim 4 or 5, wherein the first heating element comprises an electrically resistive winding or thin film.

7. An aerosol provision device as claimed in any preceding claim, wherein the second aerosol generator comprises a second induction coil and a second susceptor comprising material that is heatable by penetration with a varying magnetic field, wherein the second susceptor comprises the second heating element.

8. An aerosol provision device as claimed in claim 7, wherein the second susceptor is tubular.

9. An aerosol provision device as claimed in any of claims 1-6, wherein the second aerosol generator comprises a second resistive heater comprising the second heating element.

10. An aerosol provision device as claimed in claim 9, wherein the second resistive heater is tubular.

11. An aerosol provision device as claimed in claim 9 or 10, wherein the second heating element comprises an electrically resistive winding or thin film.

12. An aerosol provision device as claimed in any preceding claim, wherein the insulating member is arranged between an end of the first heating element and an end of the second heating element.

13. An aerosol provision device as claimed in claim 12, wherein the insulating member is arranged to maintain a separation of 1.5-1.6 mm, 1.6-1.7 mm, 1.7-1.8 mm, 1.8-1.9 mm, 1.9-2.0 mm, 2.0-2.1 mm, 2.1-2.2 mm, 2.2-2.3 mm, 2.3-2.4 mm, 2.4-2.5 mm or 2.0 mm between an end of the first heating element and an end of the second heating element.

14. An aerosol provision device as claimed in any preceding claim, wherein an end or lip of the first heating element is received or located within a hole or recess formed within the insulating member.

15. An aerosol provision device as claimed in any preceding claim, wherein an end or lip of the second heating element is received or located within a hole or recess formed within the insulating member.

16. An aerosol provision device as claimed in any preceding claim, wherein the first heating element has a first external diameter d1, the second heating element has a second external diameter d2 and the insulating member has a third external diameter d3, wherein d3 > d2 and wherein d3 > d1.

17. An aerosol provision device as claimed in any preceding claim, wherein the insulating member is arranged so as to be in physical contact with the first heating element and/or the second heating element.

18. An aerosol provision device as claimed in any preceding claim, wherein the insulating member is substantially annular or ring shaped.

19. An aerosol provision device as claimed in any preceding claim, wherein the insulating member comprises a thermally insulating material.

20. An aerosol provision device as claimed in claim 19, wherein the insulating member comprises a plastics material.

21. An aerosol provision device as claimed in any preceding claim, wherein the aerosol provision device comprises a non-combustible aerosol provision device.

22. An aerosol provision device as claimed in any preceding claim, wherein the aerosol provision device further comprises an opening through which an aerosol generating article is inserted, in use, and wherein the first aerosol generator is arranged closer to the opening than the second aerosol generator.

23. An aerosol provision device as claimed in claim 22, further comprising control circuitry arranged to activate both the first aerosol generator and the second aerosol generator and to heat, in use, the second section of the aerosol generating article to a lower temperature than the first section of the aerosol generating article.

24. An aerosol provision device as claimed in claim 23, wherein the control circuitry is arranged to cause the first aerosol generator to heat, in use, the first section of the aerosol generating article to a temperature of T1, wherein T1 is selected from the group consisting of: (i) 250 °C; (ii) 200-210 °C; (iii) 210-220 °C; (iv) 220-230 °C; (v) 230-240 °C; (vi) 240-250 °C; (vii) 250-260 °C; (viii) 260-270 °C; (ix) 270-280 °C; (x) 280-290 °C; or (xi) 290-300 °C.

25. An aerosol provision device as claimed in claim 23 or 24, wherein the control circuitry is arranged to turn the first aerosol generator ON and to leave the first aerosol generator ON for the duration of a session of use.

26. An aerosol provision device as claimed in claim 23, 24 or 25, wherein the control circuitry is arranged to cause the second aerosol generator to heat, in use, the second section of the aerosol generating article to a temperature of T2, wherein T2 is selected from the group consisting of: (i) 200 °C; (ii) 150-160 °C; (iii) 160-170 °C; (iv) 170-180 °C; (v) 180-190 °C; (vi) 190-200 °C; (vii) 200-210 °C; (viii) 210-220 °C; (ix) 220-230 °C; (x) 230-240 °C; or (xi) 240-250 °C.

27. An aerosol provision device as claimed in any of claims 23-26, wherein the control circuitry is arranged to tum the second aerosol generator ON and to leave the second aerosol generator ON for the duration of a session of use.

28. An aerosol provision device as claimed in any preceding claim, further comprising an aluminium shroud which is arranged external to the first aerosol generator and/or the second aerosol generator in order to retain heat within the aerosol provision device and/or to reduce heat transfer to an outermost housing of the aerosol provision device.

29. An aerosol provision device as claimed in any preceding claim, further comprising one or more layers of graphite or graphite tape which are arranged external to the first aerosol generator and/or the second aerosol generator in order to retain heat within the aerosol provision device and/or to reduce heat transfer to an outermost housing of the aerosol provision device.

30. An aerosol provision device as claimed in any preceding claim, further comprising a device arranged to recognise an aerosol generating article inserted, in use, into the aerosol provision device and to determine whether or not the first and/or second aerosol generator should be activated.

31. An aerosol provision device as claimed in any preceding claim, wherein the insulating member is gas impermeable.

32. An aerosol provision device for generating aerosol from an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material, wherein the aerosol provision device comprises:

a first aerosol generator comprising a first heating element for causing aerosol to be generated from the first aerosol generating material, wherein the first aerosol generator comprises a first resistive heater;

a second aerosol generator comprising a second heating element for causing aerosol to be generated from the second aerosol generating material, wherein the second aerosol generator comprises a second resistive heater; and

an insulating member arranged between the first and second heating elements, wherein the insulating member is gas impermeable.

33. An aerosol provision device as claimed in claim 32, wherein an end or lip of the first heating element is received or located within a hole or recess formed within the insulating member and wherein an end or lip of the second heating element is received or located within a hole or recess formed within the insulating member.

34. An aerosol provision system comprising:

an aerosol provision device as claimed in any preceding claim; and

an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material, wherein the aerosol generating article further comprises a mouth or filter section and wherein the first section is closer to the mouth or filter section than the second section.

35. A method of generating an aerosol comprising:

providing an aerosol provision device as claimed in any of claims 1-33;

inserting an aerosol generating article having a first section housing a first aerosol generating material and a second section housing a second aerosol generating material into the aerosol provision device; and

activating the first aerosol generator and/or the second aerosol generator.

Fig. 1A

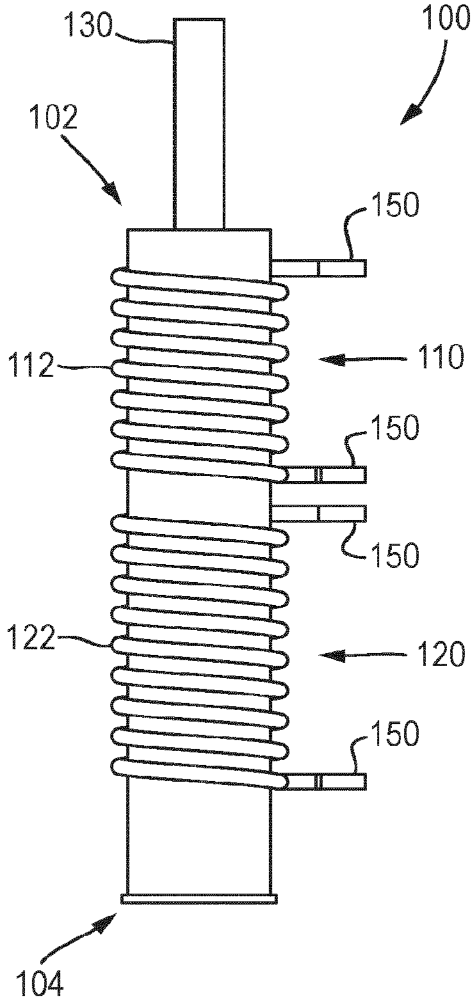
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Fig. 1B

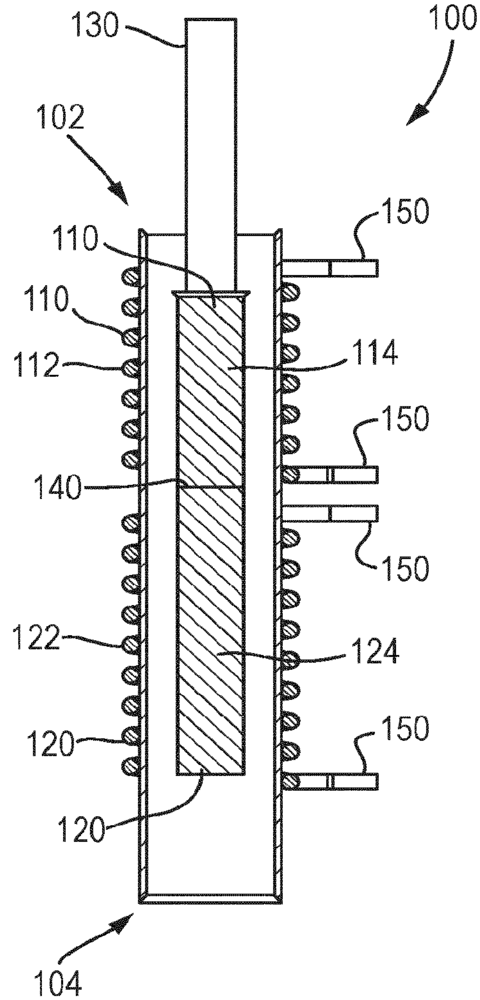
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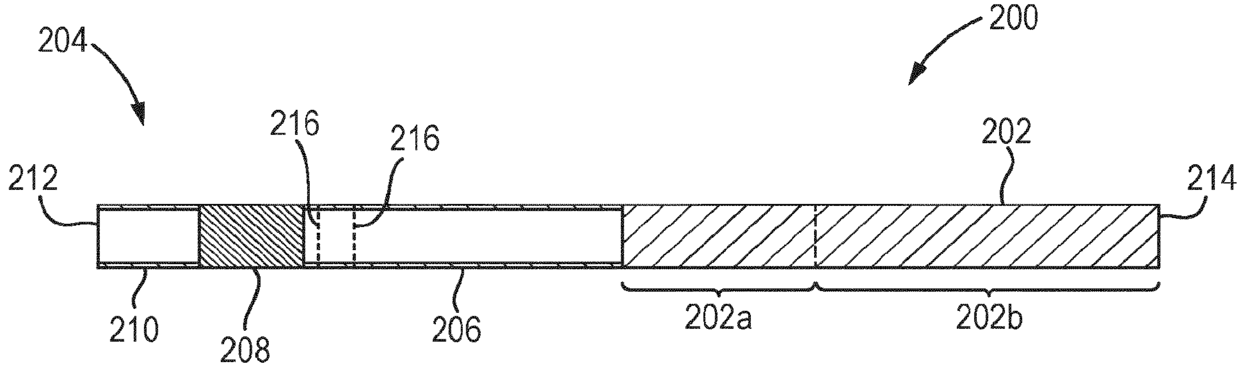
Fig. 2A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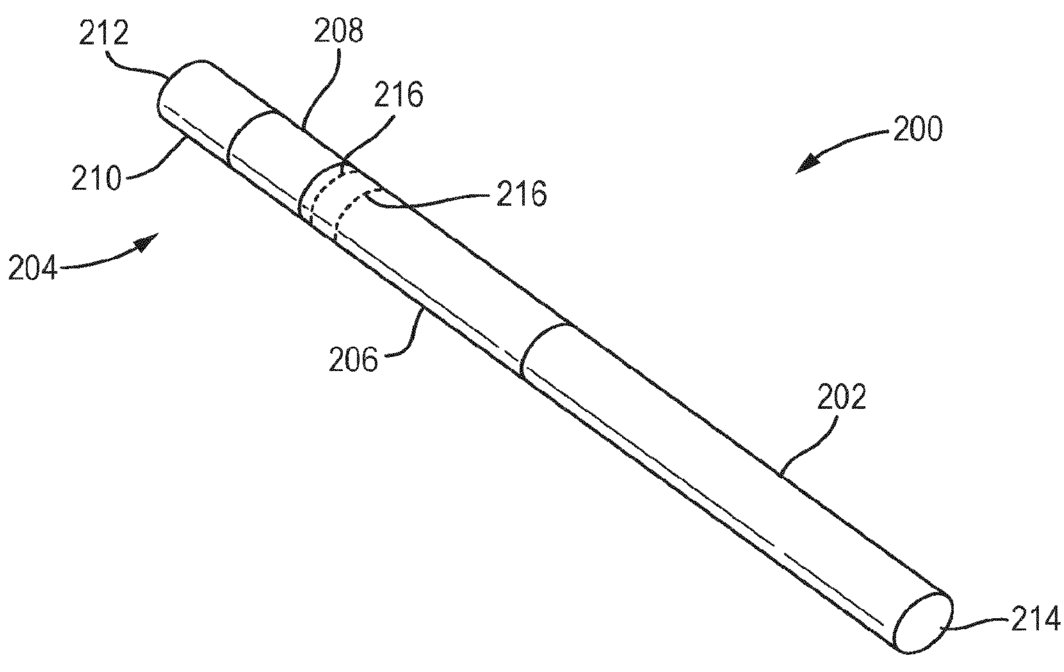
202a
202b

Fig. 2B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214

Fig. 3

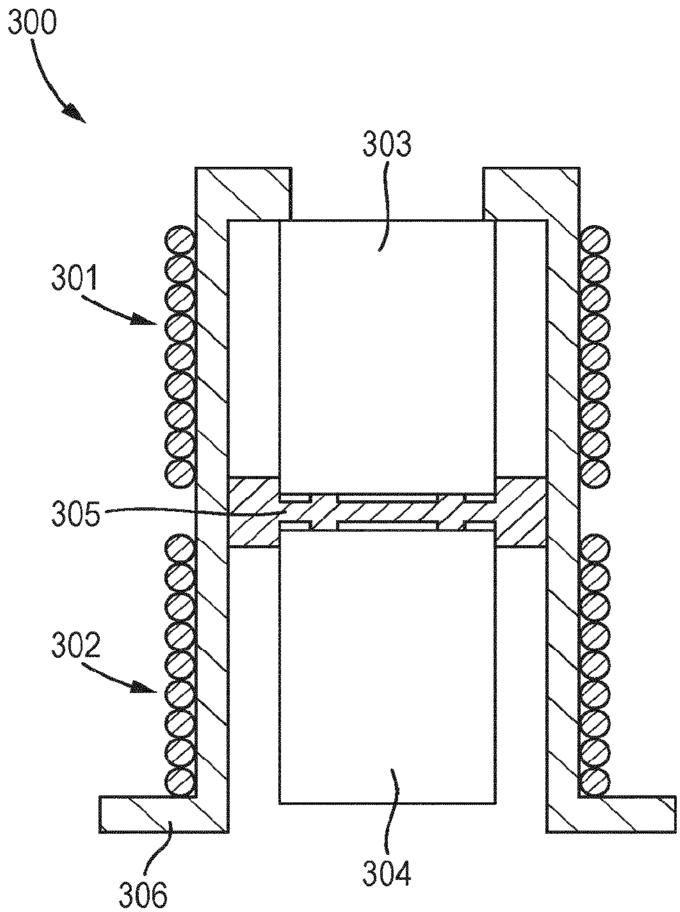

Fig.4

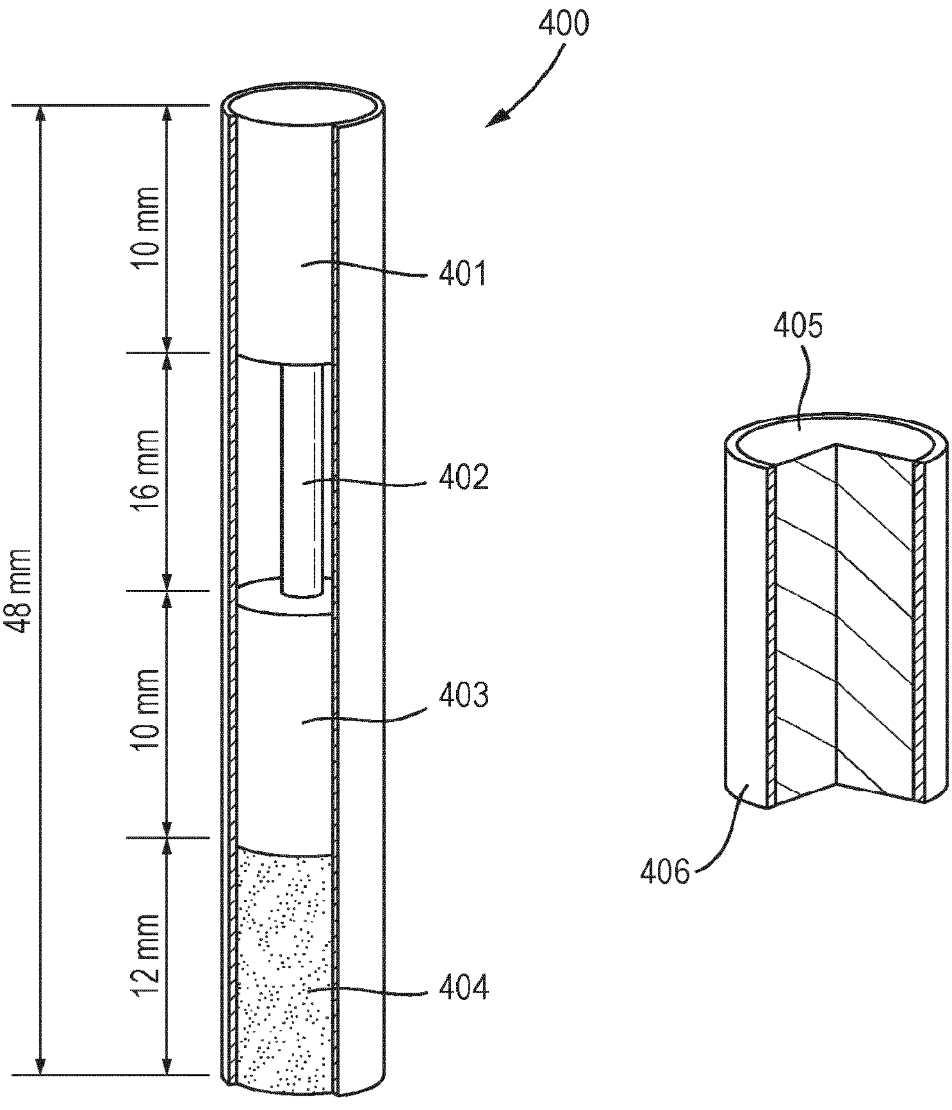

Fig. 3