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(54) **A SUBSTITUTE SMOKING CONSUMABLE**

(57) The present disclosure relates to a heat not burn (HNB) consumable comprising a housing defining a chamber having an upstream portion housing an aerosol-forming substrate and a downstream chimney portion, wherein the chimney portion is tapered for directing aerosol from the substrate towards a downstream aperture.

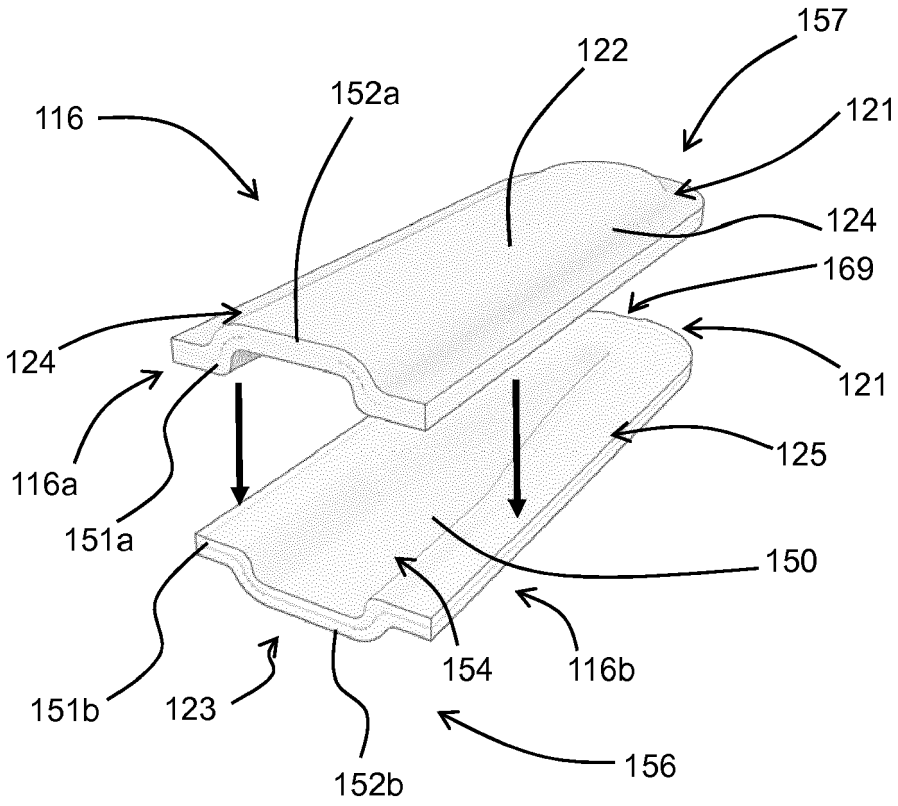

Figure 10

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Description

Field of the disclosure

[0001] The present disclosure relates to a consumable for a smoking substitute device. In particular, but not exclusively, to a combined heat not burn consumable. It also relates to a heat not burn system comprising a consumable and a heating element, and a device for housing the system.

Background

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

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

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

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

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

[0007] In general, smoking substitute systems are intended to provide a substitute for the rituals of smoking, whilst providing the user with a similar experience and satisfaction to those experienced with traditional smoking and with combustible tobacco products. Some smoking substitute systems use smoking substitute articles that are designed to resemble a traditional cigarette and are cylindrical in form with a mouthpiece at one end.

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

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

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

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

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

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

[0014] A first existing implementation of the HNB approach is the IQOS™ device from Philip Morris Ltd. The IQOS™ device uses a consumable, including reconstituted tobacco contained within a metallic foil and paper wrapper. The consumable is a cylindrical, rod-shaped consumable designed to resemble a traditional cigarette which is inserted into a heater device. The heater device has a thermally conductive heating blade which penetrates the reconstituted tobacco of the consumable, when the consumable is inserted into the heating device. Activation of the heating device heats the heating element, which, in turn, heats the tobacco in the consumable. The heating of the tobacco causes it to release nicotine vapour and flavours which may be drawn through the

mouthpiece by the user through inhalation.

[0015] A second existing implementation of the HNB approach is the device known as Glo™ from British American Tobacco. Glo™ also uses a rod-shaped consumable similar in appearance to a traditional cigarette. The consumable includes reconstituted tobacco in a paper wrapping which is heated in a heating device. When the consumable is placed in the heating device, the tobacco is surrounded by a heating element. Activation of the heating device heats the heating element, which, in turn, heats the tobacco in the consumable. The heating of the tobacco causes it to release nicotine vapour and flavours which may be drawn through the consumable by the user through inhalation. The tobacco, when heated by the heating device, is configured to produce vapour when heated rather than when burned (as in a traditional cigarette). The tobacco may contain high levels of aerosol formers (carrier), such as vegetable glycerine ("VG") or propylene glycol ("PG").

[0016] Common to both the IQOS™ and Glo™ systems is uneven and incomplete heating of the tobacco, or possible burning of some regions of the tobacco.

[0017] Both devices also fail to conceal the residues which remain in the consumable after heating, these residues being both aesthetically unpleasing and also presenting a contamination risk to the user during removal of the consumable from the device.

[0018] Furthermore, the aerosol formers may leach from the consumable to stain and/or dampen the paper wrapping which is aesthetically unappealing and which can lead to transfer of the aerosol formers to contaminate the user.

[0019] Aspects and embodiments of the disclosure were devised with the foregoing in mind.

Summary

[0020] At its most general, the present disclosure relates to an aerosol-forming article, e.g. a smoking substitute article such as a smoking substitute consumable, having a housing configured to direct aerosol to a mouth of a user.

[0021] In a first aspect, there is provided a heat not burn (HNB) consumable comprising a housing defining a chamber having an upstream portion housing an aerosol-forming substrate and a downstream chimney portion, wherein the chimney portion is tapered for directing aerosol from the substrate towards a downstream aperture.

[0022] In this way, aerosol released from the aerosol-forming substrate may be directed towards the downstream aperture, and therefore the mouth of a user, by the housing of the HNB consumable itself. Accordingly, the flow of aerosol through the consumable may be improved. Furthermore, the number of components of the HNB consumable, and thus its complexity, may be reduced.

[0023] As used herein, the terms "upstream" and "downstream" are intended to refer to the flow direction of the vapour/aerosol i.e. with a downstream end of the consumable comprising a mouthpiece where the aerosol exits the consumable via the downstream aperture for inhalation by the user. An upstream end of the consumable is the opposing end to the downstream end.

[0024] Optional features will now be set out. These are applicable singly or in any combination with any aspect.

[0025] The chimney portion may extend from an upstream end to the downstream aperture in a longitudinal (axial) direction of the consumable. The chimney portion may be axially aligned with the longitudinal axis of the consumable.

[0026] A transverse cross-sectional area of the chimney portion (i.e. the cross sectional area perpendicular to the longitudinal axis of the chimney/consumable) may reduce towards the downstream aperture. In this way, the chimney portion is tapered towards the downstream aperture, such that aerosol released from the aerosol-forming substrate travels through the chimney portion and is directed towards the downstream aperture.

[0027] A transverse cross-sectional area of the upstream end of the chimney portion may be greater than a transverse cross-sectional area of the downstream aperture. The transverse cross-sectional area of the chimney portion may reduce continuously from its upstream end to the downstream aperture. The transverse cross-sectional area of the upstream portion of the chamber may be substantially constant along the length (in a longitudinal axial direction) of the upstream portion.

[0028] The transverse cross-sectional shape of the chimney portion may be uniform along the entire length of the chimney portion (wherein the length of the chimney portion is aligned with the longitudinal axis of the consumable). For example, the chimney portion may have a rectangular, oval, obround, circular, square along its entire length.

[0029] The chimney portion may extend from the upstream portion of the chamber housing the substrate to the downstream aperture. In this embodiment, the upstream end of the chimney portion may be adjacent to (e.g. may abut) the substrate.

[0030] The housing may comprise upper and lower walls spaced by opposing longitudinally-extending transverse walls. The depth of the housing (between the upper and lower walls) and the width of the housing (between the opposing transverse walls) may be unequal e.g. the width may be greater than the depth.

[0031] The housing may have a substantially constant transverse cross-sectional area.

[0032] The downstream aperture may be formed in a downstream longitudinal end wall of the housing. In some embodiments, the downstream aperture may be centred in the downstream longitudinal end wall (i.e. the downstream aperture may be longitudinally aligned with a central axis of the consumable). The housing may comprise an opposing, at least partly open, upstream end face. Alternatively, the housing may have an upstream end

wall that at least partly (and preferably fully) obscures the substrate from view.

[0033] The housing may have a non-circular transverse cross-section. In some embodiments, the upper and lower walls are substantially planar and may be equally spaced by the transverse walls (i.e. the upper and lower walls are parallel to one another) such that the housing forms a planar housing.

[0034] The opposing transverse walls may be planar and substantially parallel to one another. Where the upper and lower walls are planar, the planar transverse walls may be substantially perpendicular to the upper and lower walls such that the planar housing has a substantially rectangular transverse cross section.

[0035] In some embodiments, the housing has at least one curved or rounded wall (e.g. a concave or convex wall) but a non-circular transverse cross section.

[0036] For example, at least one and preferably both of the opposing transverse walls may be a curved or rounded wall (e.g. a concave or convex wall).

[0037] For example, one or both of the opposing transverse walls may be a substantially convex wall (e.g. a semi-circular wall). Accordingly the planar housing may have a substantially obround transverse cross section.

[0038] In some embodiments, one or both of the opposing transverse walls may be a concave wall or may comprise one or more concave portions. For example, the or each curved/rounded opposing transverse wall(s) may each comprise longitudinally-extending upper and lower concave portions which meet at a longitudinally-extending ridge.

[0039] The concave portion(s) may be spaced from the planar upper and lower walls by opposing convex portions such that the transverse cross-section of the housing is a modified obround where the opposing side edges of the cross-section each take the form of a curly brace/bracket i.e. "{" and "}". Hereinafter, a housing having this shape will be referred to as a "modified obround cylindrical housing".

[0040] In other embodiments, the opposing transverse walls of the housing may be as described above (i.e. planar, convex, concave or convex and concave) and one or both of the upper/lower walls may be curved/rounded e.g. they may be convex rounded walls. Where the upper and lower walls are convex walls and the transverse walls are convex, the housing may have an oval transverse cross-section. Where the upper and lower walls are convex walls and the transverse walls are planar, the housing may have a truncated oval transverse cross-section. Where the upper and lower walls are convex walls and the transverse walls comprise two concave portions meeting at a longitudinally extending ridge, the housing may have a modified mandorla transverse cross-section.

[0041] The housing may be self-supporting. The term "self-supporting" is intended to refer to a housing formed of a material that does not flex or bend under its own weight.

[0042] Preferably, the housing is formed of a material that is substantially rigid or semi-rigid i.e. it is not easily flexible.

[0043] The paper wrappers provided on the prior art consumables are relatively thin and flimsy. Whilst physically containing the plant product before and after use of the consumable, they do not effectively contain residues in the spent consumable and handling of the spent consumable can result in residue transfer to the user. By providing a more structurally robust (self-supporting) housing, the consumable becomes more akin to a cartridge or "pod" that effectively contains residue after use to protect a user from contamination.

[0044] At least a portion and preferably the whole of the housing has a wall thickness in the range of 0.8 to 8.0 mm, e.g. 1.5 to 5.0 mm.

[0045] The housing may be formed at least partly and preferably entirely of a biodegradable material such as cornstarch, bamboo, wood, palm, sugarcane, cardboard or paperboard, recycled or recyclable (thermoplastic) polymer material.

[0046] It may be formed of moulded pulp material e.g. natural fibre pulp material. The housing may be at least partly formed of moulded tobacco cellulose pulp, wood pulp, bamboo pump, palm pulp or bagasse pulp. Bagasse pulp is most preferred.

[0047] The housing may have a single heating surface (an outer surface of one of the upper and lower walls) for contact with/for facing a heating element (e.g. a planar heating element) or there may be two opposing surfaces (outer surfaces of both of the upper and lower walls) each for contact with/for facing one of two heating elements (e.g. planar heating elements). The housing, and thus the aerosol-forming substrate contained in the housing, is then heated externally and inwards from the heating surface(s) of the upper and/or lower walls.

[0048] The inner surfaces of the upper, lower and transverse walls of an upstream portion of the housing may define the upstream portion of the chamber.

[0049] In other embodiments, the housing may comprise an inner sleeve which lines the housing walls (as discussed further below) and an upstream portion of the inner sleeve may define the upstream portion of the chamber. The upstream portion of the inner sleeve may conform to the shape of the walls of the upstream portion of the housing i.e. it may define upper and lower upstream inner surfaces spaced by opposing longitudinally-extending transverse upstream inner surfaces.

[0050] Accordingly, the upstream portion of the chamber may have a transverse cross-sectional shape matching the transverse cross-sectional shape of the housing i.e. it may have a substantially rectangular, (modified) obround, oval, truncated oval, or a modified mandorla transverse cross-section.

[0051] The upstream portion of the chamber may be defined by a textured inner surface (on the inner surface of the housing walls or on the inner sleeve), e.g. it may have a mesh texture.

[0052] The chimney portion of the chamber may be partly defined by the inner surfaces of the upper and lower walls of a downstream portion of the housing.

[0053] In other embodiments where the housing comprises an inner sleeve which lines the housing walls, a downstream portion of the inner sleeve may define the chimney portion of the chamber. The downstream portion of the inner sleeve may comprise upper and lower downstream inner surfaces spaced by opposing longitudinally-extending downstream transverse inner surfaces.

[0054] The depth of the chimney portion (i.e. the spacing between the inner surfaces of the upper and lower walls of the downstream portion of the housing or the spacing between the upper and lower downstream surfaces of the inner sleeve) may be substantially constant along the length of the chimney portion. The inner surfaces of the upper and lower walls of the downstream portion of the housing may be planar and substantially parallel to one another or the upper and lower downstream surfaces of the inner sleeve may be planar and substantially parallel to one another.

[0055] In other embodiments, the depth of the chimney portion may reduce towards the downstream aperture.

[0056] The chimney portion of the chamber may be partly defined by longitudinally-extending transverse chimney walls. The transverse chimney walls may extend (in a depth direction perpendicular to the longitudinal axis of the consumable) between the inner surfaces of the upper and lower walls of the downstream portion of the housing or, where the housing comprises an inner sleeve, the transverse chimney walls may form part of the downstream portion of the inner sleeve extending between the upper and lower downstream surfaces of the inner sleeve.

[0057] In embodiments in which the transverse cross-sectional area of the chimney portion reduces towards the downstream aperture, the transverse spacing (width) between the transverse chimney walls defining the chimney portion may reduce towards the downstream aperture. In this way, the width of the chimney portion (between the transverse chimney walls) reduces towards the downstream aperture. The width of the chimney portion may reduce continuously from the upstream end of the chimney portion to the downstream aperture.

[0058] The transverse chimney walls may each comprise a substantially planar surface facing the chimney portion. In other embodiments, the transverse chimney walls may comprise a substantially convex surface facing the chimney portion.

[0059] The angle formed between each transverse chimney wall and its respective transverse housing wall at the upstream end of the chimney portion may be equal to one another. Specifically, this angle may be in the range of 1° to 89°, more preferably 1° to 45°, more preferably 5° to 30°. At the downstream end of the chimney portion, the transverse chimney walls may extend substantially parallel to the transverse walls of the housing.

[0060] In some embodiments, the longitudinally-extending transverse chimney walls may be formed by webbing within the housing. Specifically, the webbing may comprise two webs, each web extending from an inner surface of a respective transverse wall of the housing transversely inwards towards the axial (longitudinal) centre of the housing and longitudinally to the downstream longitudinal end wall of the housing.

[0061] Each web may be nonlinear. Specifically, each web may curve inwardly (i.e. in the transverse direction, into the consumable) from its respective transverse wall of the housing towards the opposing web, and longitudinally to the downstream aperture. The angle formed between each web and its respective transverse wall at the upstream end of the chimney portion may be equal to one another. Specifically, this angle may be in the range of 1° to 89°, more preferably 1° to 45°, more preferably 5° to 30°. At the downstream end of the chimney portion, the webs may extend substantially parallel to the transverse walls. Accordingly, the downstream end of each web is spaced from its respective transverse wall.

[0062] Preferably, each web may have a wall thickness in the range of 0.8 to 8.0 mm, e.g. 1.5 to 5.0 mm. Each web may be formed at least partly and preferably entirely of a biodegradable material such as cornstarch, bamboo, wood, palm, sugarcane, cardboard or paperboard, recycled or recyclable (thermoplastic) polymer material.

[0063] In embodiments comprising the webbing described above, the chimney portion is further defined by the inner surfaces of the upper and lower walls of the housing as described above. Accordingly, the webbing spaces the upper and lower walls of the housing, and is substantially perpendicular to the upper and lower walls of the housing.

[0064] The webbing may be integrally formed with the walls of the housing such that the upper and lower walls, the transverse walls, and the webbing (transverse chimney walls) may be formed or moulded from a single housing component. In this way, the number of components of the HNB consumable may be reduced.

[0065] Alternatively, each of the webs may be attached to the inner surfaces of the upper and lower walls, longitudinal downstream end wall and/or respective transverse wall, for example by an adhesive such as a biodegradable glue.

[0066] As discussed above, in some embodiments, the housing comprises an inner sleeve which lines the walls of the housing. Accordingly, the inner sleeve may comprise upper and lower walls spaced by opposing longitudinally-extending transverse walls. The inner surfaces of the inner sleeve define the chamber.

[0067] The walls of the housing may substantially surround and enclose the inner sleeve. The inner sleeve may be attached to, and therefore fixed within, the housing walls, for example, by an adhesive such as biodegradable glue.

[0068] As discussed above, the inner sleeve may comprise an upstream portion which substantially conforms to the shape of the upstream portion of the housing i.e.

the upstream portion of the housing and the upstream portion of the inner sleeve have substantially the same transverse cross-sectional shape. Accordingly, the inner sleeve and housing may be contiguous in the upstream portion (i.e. in the portion defining the upstream portion of the chamber).

[0069] In the downstream portion of the housing, the inner sleeve may not be contiguous with the housing. The transverse walls of the inner sleeve (which will define the transverse chimney walls in the chimney portion) may be transversely spaced from the inner surface of the transverse housing walls.

[0070] Specifically, each transverse wall of the inner sleeve in the downstream portion is deflected inwardly (i.e. in the transverse direction, into the consumable) from the respective transverse wall of the housing towards the opposing transverse wall of the inner sleeve.

[0071] Preferably, the inner sleeve has a thickness such that the combined thickness of the housing walls and inner sleeve is in the range of 0.8 to 8.0 mm, e.g. 1.5 to 5.0 mm.

[0072] The inner sleeve may be formed at least partly and preferably entirely of a biodegradable material such as cornstarch, bamboo, wood, palm, sugarcane, cardboard or paperboard, recycled or recyclable (thermoplastic) polymer material.

[0073] At least one (and optionally both) of the opposing transverse walls of the housing may comprise a longitudinally-extending junction such that the housing can be opened to expose the chamber within. The downstream longitudinal end wall of the housing may also comprise a junction.

[0074] For example, both of the opposing transverse housing walls and the downstream longitudinal end wall could comprise a respective junction such that the housing can be split into two opposing parts allowing for easy insertion of the substrate during manufacture.

[0075] Alternatively, one of the opposing transverse housing walls and the upstream longitudinal end wall may contain the junctions and the other transverse housing wall may contain a longitudinally extending hinge portion such that the housing may be opened along the junctions by pivoting of the two opposing parts about the hinge portion.

[0076] The walls(s) comprising a junction may each comprise an affixing portion e.g. respective laterally extending flanges on either side of the junction that face each other to provide an increased surface area for fixing the opposing parts together.

[0077] The opposing housing parts may be attached together (e.g. between respective flanges), for example by an adhesive such as a biodegradable glue.

[0078] In embodiments in which the longitudinally-extending transverse chimney walls are formed by webbing, each of the two webs spacing the upper and lower walls of the housing may comprise a junction. In this way, each web can be split into two opposing webbing parts, which, when the consumable is assembled, align to define the chimney portion.

[0079] In embodiments comprising an inner sleeve within the housing, the inner sleeve may comprise two opposing sleeve parts which, when the consumable is assembled, are brought together to define the downstream chimney portion of the chamber (and optionally to define the upstream portion of the chamber).

[0080] Each part of the inner sleeve may comprise an affixing portion e.g. respective laterally extending flanges that face each other to provide an increased surface area for fixing the opposing sleeve parts together.

[0081] The two opposing sleeve parts may be attached together (e.g. between respective flanges extending at least partly around each sleeve part), for example by an adhesive such as a biodegradable glue.

[0082] The substrate may comprise upper and lower surfaces spaced by opposing longitudinally-extending transverse surfaces wherein the depth of the substrate (between the upper and lower surfaces) and the width of the substrate (between the opposing transverse surfaces) are unequal e.g. the width is greater than the depth.

[0083] In some embodiments, the upper and lower surfaces are substantially planar and may be equally spaced by the transverse surfaces (i.e. the upper and lower surfaces are parallel to one another) such that the substrate is a planar substrate.

[0084] By providing the substrate as a planar substrate rather than as a cylindrical rod (having a substantially circular cross section), the substrate has a greater exposed surface area for contact with a heating element thus allowing quicker and more even heat transfer from the heating element to the substrate. In this manner, heating of the substrate can be effected using a heating element at a lower temperature (e.g. around 250 °C) which reduces the chances of burning of the substrate.

[0085] The opposing transverse surfaces may be planar and substantially parallel to one another. Where the upper and lower surfaces are planar, the planar transverse surfaces may be substantially perpendicular to the upper and lower surfaces such that the planar substrate has a substantially rectangular transverse cross section i.e. the substrate is a cuboid substrate.

[0086] The substrate has opposing longitudinal end faces (an upstream end face and a downstream end face) which will each comprise a transverse cross section.

[0087] In some embodiments, the substrate has at least one curved or rounded surface but a non-circular transverse cross section.

[0088] For example, at least one and preferably both of the opposing transverse surfaces may comprise a curved or rounded surface/surface portion e.g. at least one and preferably both of the opposing transverse surfaces comprises a convex or concave surface/surface portion.

[0089] For example, one or both of the opposing transverse surfaces may comprise a substantially convex surface (e.g. a semi-circular surface). Accordingly the planar substrate has a substantially obround transverse cross

section i.e. the substrate is an obround cylindrical substrate.

[0090] In some embodiments, one or both of the opposing transverse surfaces may be concave or may comprise one or more concave portions. For example, the or each curved/rounded opposing transverse surface(s) may each comprise longitudinally-extending upper and lower concave portions which meet at a longitudinally-extending ridge.

[0091] The concave portion(s) may be spaced from the planar upper and lower surfaces by opposing convex portions such that the transverse cross-section is a modified obround where the opposing side edges of the cross-section each take the form of a curly brace/bracket i.e. "{" and "}". Hereinafter, such a substrate will be referred to as a "modified obround cylindrical substrate".

[0092] In other embodiments, the opposing transverse surfaces may be as described above (i.e. planar, convex, concave or convex and concave) and one or both of the upper/lower surfaces may be curved/rounded e.g. they may be convex rounded surfaces. Where the upper and lower surfaces are convex surfaces and the transverse surfaces are convex, the substrate may have an oval transverse cross-section. Where the upper and lower surfaces are convex surfaces and the transverse surfaces are planar, the substrate may have a truncated oval transverse cross-section. Where the upper and lower surfaces are convex surfaces and the transverse surfaces comprise two concave portions meeting at a longitudinally extending ridge, the substrate may have a modified mandorla transverse cross-section.

[0093] The transverse cross-section of the substrate preferably matches the transverse cross-section of the upstream chamber portion (which may match the transverse cross-section of the upstream portion of the housing (and the upstream portion of the inner sleeve where present).

[0094] The substrate preferably has a greater width and length than depth. The length and width may be equal but, preferably, the length is greater than the width such that the substrate has substantially rectangular upper and lower surfaces. The length of the substrate (between the upstream and downstream end faces) may be between 10 and 20 mm e.g. between 10 and 15 mm. The width of the substrate (between opposing transverse surfaces) may be between 7 and 18 mm e.g. between 8 and 14 mm or 10 and 12 mm. The depth of the substrate (between the upper and lower surfaces) may be between 1 and 8 mm, e.g. between 2 and 7 mm e.g. around 2 mm or around 6 mm.

[0095] In some embodiments, the consumable comprises a single substrate e.g. a single planar substrate as described above. In this case, the depth of the substrate is preferably between 5 and 7 mm e.g. around 6 mm.

[0096] The substrate may have a single heating surface (one of the upper and lower surfaces) for contact with/for facing a heating element (e.g. a planar heating element) or there may be two opposing surfaces (both of the upper and lower surfaces) each for contact with/for facing one of two heating elements (e.g. planar heating elements). The substrate is then heated externally and inwards from the upper and/or lower heating surfaces.

[0097] In other embodiments, the substrate is heated internally and outwards (towards the upper and lower surfaces).

[0098] This may be achieved by providing a penetrable substrate such that a heating element can be inserted into the substrate e.g. into the upstream end face of the substrate.

[0099] Alternatively, the substrate may have a hollow core for releasably and slidably receiving the heating element.

[0100] In use, the hollow core receives a heating element (i.e. by insertion of the heating element into the hollow core) which can contact the internal surfaces defining the core thus allowing quicker and more even heat transfer from the heating element to the substrate. In this manner, heating of the substrate can be effected using a heating element at a lower temperature (e.g. around 250 °C) which reduces the chances of burning of the substrate.

[0101] The hollow core is defined by a longitudinally-extending recess extending from the upstream end face of the substrate. The core recess may extend from the upstream end face to the opposing downstream end face.

[0102] The core recess is defined by upper and lower inner surfaces spaced by opposing longitudinally extending inner transverse surfaces. The upper and lower inner surfaces will face the heating element in use.

[0103] The depth of the core recess (between the upper and lower inner surfaces) and the width of the recess (between the opposing inner transverse surfaces) are unequal.

[0104] In some embodiments, the upper and lower inner surfaces are substantially planar and may be equally spaced by the inner transverse surfaces (i.e. the upper and lower inner surfaces are parallel to one another).

[0105] The opposing inner transverse surfaces may be substantially parallel to one another and substantially perpendicular to the upper and lower inner surfaces such that the core recess has a substantially rectangular transverse cross section i.e. the core recess is a cuboid core recess.

[0106] In other embodiments, at least one and preferably both of the opposing inner transverse surfaces may comprise a curved or rounded (concave or convex) surface.

[0107] For example, one or both of the opposing inner transverse surfaces may comprise a substantially convex surface (e.g. a semi-circular surface) such that the core recess has a substantially obround transverse cross section i.e. the core recess is an obround core recess.

[0108] Where the substrate is a hollow cuboid substrate, it may comprise a cuboid core recess. Where the substrate is an obround cylindrical substrate or a modi-

fied obround cylindrical substrate, it may comprise an obround core recess.

[0109] The recess may have a depth (between the upper and lower inner surfaces) of between 0.5 and 2 mm e.g. around 1 mm. The recess may have a width (between the opposing inner transverse surfaces) of between 7 and 14 mm e.g. between 7 and 12 mm or 8 and 10 mm e.g. around 8 mm. The length of the recess may be between 10 and 20 mm e.g. between 10 and 15 mm.

[0110] In these embodiments, the depth of the hollow substrate may be between 4 and 8 mm, e.g. between In other embodiments, the consumable comprises a plurality of substrates e.g. two planar substrates (which may be as described above). Where there are two planar substrates, the depth of each planar substrate is preferably between 1 and 8 mm, e.g. between 2 and 5 mm e.g. around 2 mm.

[0111] The planar substrates are preferably aligned and spaced from one another to define a planar recess therebetween such that the consumable has a substantially rectangular transverse cross section.

[0112] A heating element can be inserted into the planar recess so as to be releasably housed in the recess. In this way, heat can be transferred quickly and evenly to the two planar substrates via the surfaces defining the planar recess.

[0113] In these embodiments, the substrates will each having an inner heating surface facing the planar recess and an opposing outer surface.

[0114] The two planar substrates are preferably vertically and horizontally aligned. The planar recess is also vertically and horizontally aligned with the planar substrates.

[0115] Where the housing is split into two opposing parts, each of the two planar substrates may be mounted (e.g. glued) into a respective part (e.g. half) of the housing such that when the two opposing parts are brought together, the planar substrates are spaced from one another to define the planar recess therebetween (as discussed above).

[0116] The surfaces defining the core recess or planar recess may be lined with a thermally conductive material. For example, the surface(s) defining the recess may be at least 50% or 60% covered and preferably at least 70 % or 80% or 90% covered. The recess may be fully lined with the thermally conductive material.

[0117] The thermally conductive material may be provided as a foil which may be textured e.g. dimpled.

[0118] The substrate may comprise at least one channel extending into the substrate (i.e. plant product) from either or both of the upstream and downstream longitudinal end faces of the substrate. The thermally conductive material may extend into the at least one channel. For example, the thermally conductive material may extend from the recess to the at least one channel over the upstream/downstream longitudinal end face of the substrate. This helps increase heat transfer from the heating element within the recess into the plant product.

[0119] The consumable may comprise a further layer of the thermally conductive material, or of a further thermally conductive material, on an outer surface of the plant product opposing the recess.

[0120] The thermally conductive material or the further thermally conductive material may be selected from the group consisting of: carbon or metal/metal alloy such as aluminium; brass; copper; gold; steel; silver; an alloy of one of more thereof; or a mixture of two or more thereof.

[0121] In preferred embodiments, there is a constant depth of plant product between the surface that is heated and the opposing surface. Thus the substrate comprises a heating surface (e.g. a substantially planar heating surface) which, in use, faces a heating element (e.g. a planar heating element), and at least one opposing surface, wherein the depth of the plant product between the heating surface and the at least one and opposing surface is substantially constant.

[0122] By providing the substrate with a substantially planar heating surface (for thermal contact with a heating element), the plant product has a greater exposed surface area for contact with a heating element for allowing quicker heating. The constant depth of plant product between the surfaces results in more even heat transfer from the heating element to the plant product. In this manner, heating of the plant product can be effected using a heating element at a lower temperature (e.g. around 250 °C) which reduces the chances of burning of the plant product.

[0123] The depth of the plant product between the heating and opposing surfaces may be between 1 and 8 mm, e.g. between 2 and 7 mm e.g. around 2 mm or around 6 mm.

[0124] The substrate may be dosed with an e-liquid either in its entirety or in selected portions. For example, the substrate may be dosed with e-liquid at or proximal its heating surfaces.

[0125] The substrate may be dosed with e-liquid at its surfaces which face the heating element(s). For example, the substrate may be dosed with e-liquid at or proximal its upper and/or lower surfaces.

[0126] Where the substrate is a hollow substrate and comprises a hollow core defined by a core recess, the plant product at or proximal one or more of the upper/lower/transverse inner surfaces defining the core recess may be dosed with e-liquid.

[0127] Where the consumable comprises a plurality of planar substrates defining a planar recess, the plant product at or proximal one or both of the surfaces of the planar substrates facing the planar recess may be dosed with e-liquid.

[0128] The e-liquid may contain aerosol formers such as polyglycol (PG) and/or vegetable glycerine (VG). It may contain flavourings.

[0129] The substrate may comprise a hydrophobic or liquid-impermeable outer coating (e.g. on at least the upper and lower surfaces) to prevent seepage or transfer of the e-liquid from the substrate.

[0130] The consumable may further comprise a downstream element downstream of the substrate. The downstream element may be positioned upstream or downstream of the chimney portion, or alternatively, the downstream element may be positioned within the chimney portion itself.

[0131] The downstream element may have a non-circular transverse cross-section. The transverse cross-section of the downstream element may match the transverse cross-section of the substrate. The downstream element may have any of the transverse cross-sectional shapes described above for the substrate.

[0132] The downstream element may be a porous element. The porous element may have a porosity such that it at least partly blocks the passage (filters out) at least one of the components of the aerosol/vapour. Thus the downstream porous element may be a filter element. In other embodiments, the porous element may have a density/porosity/permeability such that it is permeable to (allows the passage of) all components of the aerosol/vapour.

[0133] In yet further embodiments, the downstream element may be a solid element having a hollow bore for the passage of the aerosol/vapour.

[0134] The downstream element/filter element may comprise upper and lower surfaces spaced by opposing longitudinally-extending transverse surfaces wherein the depth of the downstream element/filter element (between the upper and lower surfaces) and the width of the downstream element/filter element (between the opposing transverse surfaces) are unequal.

[0135] In some embodiments, the upper and lower surfaces are substantially planar and may be equally spaced by the transverse surfaces (i.e. the upper and lower surfaces are parallel to one another) such that the downstream element/filter element is a planar downstream element/filter element.

[0136] The opposing transverse surfaces may be substantially parallel to one another and substantially perpendicular to the upper and lower surfaces such that the planar downstream element/filter element has a substantially rectangular transverse cross section i.e. the downstream element/filter element is a cuboid downstream element/filter element.

[0137] In other embodiments, at least one and preferably both of the opposing transverse surfaces may comprise a curved or rounded (concave or convex) surface.

[0138] For example, one or both of the opposing transverse surfaces may comprise a substantially convex surface (e.g. a semi-circular surface) such that the downstream element/filter element has a substantially obround transverse cross section i.e. the downstream element/filter element is an obround cylindrical downstream element/filter element.

[0139] In some embodiments, one or both of the opposing transverse surfaces may be concave or may comprise one or more concave portions. For example, the or each curved/rounded opposing transverse surface(s) may each comprise longitudinally-extending upper and lower concave portions which meet at a longitudinally-extending ridge.

[0140] The concave portion(s) may be spaced from the planar upper and lower surfaces by opposing convex portions such that the transverse cross-section is a modified obround where the opposing side edges of the cross-section each take the form of a curly brace/bracket i.e. "{" and "}". Hereinafter, such a downstream element/filter element will be referred to as a "modified obround cylindrical downstream element/filter element".

[0141] In other embodiments, the opposing transverse surfaces may be as described above (i.e. planar, convex, concave or convex and concave) and one or both of the upper/lower surfaces may be curved/rounded e.g. they may be convex rounded surfaces. Where the upper and lower surfaces are convex surfaces and the transverse surfaces are planar, the downstream element/filter element may have a truncated oval transverse cross-section. Where the upper and lower surfaces are convex surfaces and the transverse surfaces are convex, the downstream element/filter element may have an oval transverse cross-section. Where the upper and lower surfaces are convex surfaces and the transverse surfaces comprise two concave portions meeting at a longitudinally extending ridge, the downstream element/filter element may have a modified mandorla transverse cross-section.

[0142] The downstream element/filter element preferably has a greater width and length than depth. The depth of the downstream element/filter element may be between 4 and 8 mm, e.g. between 5 and 7 mm e.g. around 6 mm. The width of the downstream element/filter element may be between 7 and 18 mm e.g. between 8 and 14 mm or 10 and 12 mm. The length of the downstream element/filter element may be between 2mm and 25 mm e.g. between 3mm and 22mm.

[0143] The downstream element/filter element has an upstream longitudinal end face which faces and may abut the downstream longitudinal end face of the substrate.

[0144] The downstream longitudinal end face of the downstream element/filter element may comprises a curved/rounded surface (e.g. a convex surface such as a semi-circular surface).

[0145] The downstream element/filter element may comprise a hollow bore. The hollow bore may extend from the upstream longitudinal end face of the downstream element/filter element to the downstream longitudinal face of the downstream element/filter element.

[0146] The hollow bore may have a circular, rectangular or obround transverse cross sectional area. The bore may have a uniform transverse cross-sectional area.

[0147] The downstream element/filter element may be comprised of cellulose acetate or polypropylene tow. The downstream element/filter element may be comprised of activated charcoal. The downstream element/filter element may be comprised of paper. The downstream element/filter element may be comprised of plant material

e.g. extruded or pressed plant material e.g. extruded/pressed pulp material e.g. bagasse. The downstream element/filter element may be circumscribed with a plug wrap e.g. a paper plug wrap.

[0148] In some embodiments, the downstream element/filter element may comprise at least one liquid release member.

[0149] The liquid release member can comprise an envelope for containing the liquid. The envelope can be rigid and fragmentable under pressure (e.g. upon contact with the heating element). Alternatively, the envelope can be meltable upon application of heat. Alternatively, the envelope can be dissolvable in the aerosol.

[0150] The liquid release member may contain an aerosol former such as vegetable glycerine and/or propylene glycol. By containing the aerosol former within a liquid release member that is configured to release the liquid (e.g. aerosol former) upon use, seepage of the liquid from the consumable to contaminate the user is avoided. The liquid release member may comprise a flavouring.

[0151] The liquid release member may positioned proximal the abutment between the downstream element/filter element (e.g. at the upstream longitudinal end face of the downstream element/filter element) and the substrate (i.e. the downstream longitudinal end face of the downstream element/filter element) so that upon release, the liquid can penetrate the plant product in the substrate.

[0152] The consumable may comprise a spacer e.g. a paper/cardboard spacer interposed between the downstream element/filter element and the substrate. The spacer defines a space or cavity or chamber downstream from the aerosol-forming substrate. For example, it may be provided between the aerosol-forming substrate and the downstream element/filter element. The spacer acts to allow both cooling and mixing of the aerosol.

[0153] The spacer may be a planar spacer e.g. having a substantially rectangular or substantially obround transverse cross section. The spacer may have a transverse cross-section matching the transverse cross section of the substrate and/or downstream element/filter element.

[0154] The spacer preferably has a greater width and length than depth. The length and width may be equal but, preferably, the width is greater than the length. The depth of the spacer may be between 4 and 8 mm, e.g. between 5 and 7 mm e.g. around 6 mm. The width of the spacer may be between 7 and 18 mm e.g. between 8 and 14 mm or 10 and 12 mm.

[0155] The consumable may further comprise a wrapping e.g. a paper or cardboard wrapping that encloses the upper and lower surfaces and the transverse walls of the substrate (and downstream element/filter element and or spacer where present).

[0156] In embodiments where the substrate comprises at least one channel extending into the plant product from the upstream longitudinal end face of the substrate (as described above), the wrapping e.g. the cardboard wrapping may comprise a transverse extension which extends to cover a portion of the upstream longitudinal end face of the substrate. The transverse extension may then comprise an inwardly-depending axial extension extending inwards into the at least one channel in the substrate.

[0157] As discussed above, the downstream longitudinal end of the housing comprises a downstream longitudinal end wall. The downstream element/filter element may be provided adjacent e.g. with its downstream longitudinal end face abutting this longitudinal end wall of the housing. Thus the downstream longitudinal end wall at least partly (and preferably completely) obscures/conceals the downstream element/filter element from view by the user.

[0158] By concealing the downstream element/filter element from view, the user is not exposed to the residues remaining in the consumable after use thus improving the aesthetic appeal of the consumable after use and avoiding transfer of residue to the user.

[0159] Although the downstream longitudinal end wall may comprise one or more mouthpiece aperture(s), this/these are typically small enough that visual inspection of the downstream element/filter element is significantly impeded compared to the prior art consumable where the end face of the downstream element/filter element is completely exposed. Thus whilst the downstream longitudinal wall may be discontinuous, it preferably covers (e.g. overlies or abuts) at least 20% e.g. at least 30 or 40 % and preferably at least 50%, e.g. at least 70% such as at least 80% or 90% of the surface area of the downstream longitudinal end face of the downstream element/filter element.

[0160] Similarly, the upstream longitudinal end face of the housing may comprise an upstream longitudinal end wall that at least partly obscures the substrate from view at least prior to use.

[0161] The upstream longitudinal end face of the housing may comprise an upstream longitudinal end wall for at least partly overlying (e.g. abutting) the upstream longitudinal end face of the substrate. The upstream longitudinal end wall may comprise an aperture (into which the heating element can be inserted).

[0162] The upstream longitudinal end wall may be a perimeter wall i.e. it may extend only around one or more of the edges of the upstream longitudinal end face of the housing. For example, it may extend around all edges to form a frame defining the aperture (into which the heating element can be inserted). The aperture may be dimensioned to match the dimensions of the hollow core recess when the substrate is a hollow core substrate.

[0163] In other embodiments, the upper longitudinal end wall of the housing may extend along the upper and lower edges to form rails defining the aperture therebetween. The aperture may be dimensioned to match the dimensions of the planar recess when the consumable comprises two planar substrates.

[0164] In embodiments where the substrate comprises at least one channel extending into the plant product from

the upstream longitudinal end face of the plant product (as described above), the upstream longitudinal end wall may comprise an inwardly-depending axial extension, extending inwards into the at least one channel in the substrate.

[0165] The upstream longitudinal end face of the housing may additionally or alternatively comprise a pierceable or peelable membrane such as a metallic foil or plastic membrane. The membrane may be mounted across the entire open upstream longitudinal end face of the housing or it may be mounted on the upstream longitudinal end wall across the aperture. The membrane seals the upstream longitudinal end face prior to use and is pierced to mount the consumable on the heating element.

[0166] In order to generate an aerosol, the substrate comprises at least one volatile compound that is intended to be vaporised/aerosolised and that may provide the user with a recreational and/or medicinal effect when inhaled. Suitable chemical and/or physiologically active volatile compounds include the group consisting of: nicotine, cocaine, caffeine, opiates and opoids, cathine and cathinone, kavalactones, mysticin, beta-carboline alkaloids, salvinorin A together with any combinations, functional equivalents to, and/or synthetic alternatives of the foregoing.

[0167] The plant material may comprise least one plant material selected from the list including *Amaranthus dubius, Arctostaphylos uva-ursi* (Bearberry), *Argemone mexicana, Amica, Artemisia vulgaris,* Yellow Tees, *Galea zacatechichi, Canavalia maritima* (Baybean), *Cecropia mexicana* (Guamura), *Cestrum noctumum, Cynoglossum virginianum* (wild comfrey), *Cytisus scoparius, Damiana, Entada rheedii, Eschscholzia califomica* (California Poppy), *Fittonia albivenis, Hippobroma longiflora, Humulus japonica* (Japanese Hops), *Humulus lupulus* (Hops), *Lactuca virosa* (Lettuce Opium), *Laggera alata, Leonotis leonurus, Leonurus cardiaca* (Motherwort), *Leonurus sibiricus* (Honeyweed), *Lobelia cardinalis, Lobelia inflata* (Indian-tobacco), *Lobelia siphilitica, Nepeta cataria* (Catnip), *Nicotiana species* (Tobacco), *Nymphaea alba* (White Lily), *Nymphaea caerulea* (Blue Lily), Opium poppy, *Passiflora incamata* (Passionflower), *Pedicularis densiflora* (Indian Warrior), *Pedicularis groenlandica* (Elephant's Head), *Salvia divinorum, Salvia dorrii* (Tobacco Sage), Salvia species (Sage), *Scutellaria galericulata, Scutellaria lateriflora, Scutellaria nana, Scutellaria* species (Skullcap), *Sida acuta* (Wireweed), *Sida rhombifolia, Silene capensis, Syzygium aromaticum* (Clove), *Tagetes lucida* (Mexican Tarragon), *Tarchonanthus camphoratus, Tumera diffusa* (Damiana), *Verbascum* (Mullein), *Zamia latifolia* (Maconha Brava) together with any combinations, functional equivalents to, and/or synthetic alternatives of the foregoing.

[0168] Preferably, the plant material is tobacco. Any type of tobacco may be used. This includes, but is not limited to, flue-cured tobacco, burley tobacco, Maryland Tobacco, dark-air cured tobacco, oriental tobacco, dark-fired tobacco, perique tobacco and rustica tobacco. This also includes blends of the above mentioned tobaccos.

[0169] Any suitable parts of the tobacco plant may be used. This includes leaves, stems, roots, bark, seeds and flowers.

[0170] The tobacco may comprise one or more of leaf tobacco, stem tobacco, tobacco powder, tobacco dust, tobacco derivatives, expanded tobacco, homogenised tobacco, shredded tobacco, extruded tobacco, cut rag tobacco and/or reconstituted tobacco (e.g. slurry recon or paper recon).

[0171] The aerosol-forming substrate may comprise reconstituted tobacco. The substrate, especially the hollow core substrate may be formed by extrusion.

[0172] Extruded tobacco can produced by forming a liquid mixture of powered tobacco and a binding agent such as a gum (e.g. xanthan, guar, arabic and/or locust bean gum). The liquid mixture is heated and then extruded through a die. The extrudate is then dried. Flavouring may be added to the liquid mixture prior to extrusion to provide a flavoured extruded substrate e.g. a flavoured extruded hollow core substrate.

[0173] The flavourant may be provided in solid or liquid form. It may include menthol, liquorice, chocolate, fruit flavour (including e.g. citrus, cherry etc.), vanilla, spice (e.g. ginger, cinnamon) and tobacco flavour.

[0174] The aerosol-forming substrate may comprise one or more additives selected from humectants, flavourants, fillers, aqueous/non-aqueous solvents and binders.

[0175] Humectants are provided as vapour generators - the resulting vapour helps carry the volatile active compounds and increases visible vapour. Suitable humectants include polyhydric alcohols (e.g. propylene glycol (PG), triethylene glycol, 1,2-butane diol and vegetable glycerine (VG)) and their esters (e.g. glycerol mono-, di- or tri-acetate). They may be present in the aerosol-forming substrate in an amount between 1 and 50 wt%.

[0176] The humectant content of the aerosol-forming substrate may have a lower limit of at least 1 % by weight of the plant material, such as at least 2 wt %, such as at least 5 wt %, such as at least 10 wt %, such as at least 20 wt %, such as at least 30 wt %, or such as least 40 wt %.

[0177] The humectant content of the aerosol-forming substrate may have an upper limit of at most 50 % by weight of the plant material, such as at most 40 wt %, such as at most 30 wt %, or such as at most 20 wt %.

[0178] Preferably, the humectant content is 1 to 40 wt % of the aerosol-forming substrate, such as 1 to 20 wt %.

[0179] Suitable binders are known in the art and may act to bind together the components forming the aerosol-forming substrate. Binders may comprise starches and/or cellulosic binders such as methyl cellulose, ethyl cellulose, hydroxypropyl cellulose, hydroxyethyl cellulose and methyl cellulose, gums such as xanthan, guar, arabic and/or locust bean gum, organic acids and their salts such as alginic acid/ sodium alginate, agar and pectins.

[0180] Preferably the binder content is 5 to 10 wt% of the aerosol-forming substrate e.g. around 6 to 8 wt%.

[0181] Suitable fillers are known in the art and may act to strengthen the aerosol-forming substrate. Fillers may comprise fibrous (non-tobacco) fillers such as cellulose fibres, lignocellulose fibres (e.g. wood fibres), jute fibres and combinations thereof.

[0182] Preferably, the filler content is 5 to 10 wt% of the aerosol-forming substrate e.g. around 6 to 9 wt%.

[0183] The aerosol-forming substrate may comprise an aqueous and/or non-aqueous solvent. In some embodiments, the aerosol forming substrate has a water content of between 5 and 10 wt% e.g. between 6-9 wt% such as between 7-9 wt%.

[0184] The flavourant may be provided in solid or liquid form. It may include menthol, liquorice, chocolate, fruit flavour (including e.g. citrus, cherry etc.), vanilla, spice (e.g. ginger, cinnamon) and tobacco flavour. The flavourant may be evenly dispersed throughout the aerosol-forming substrate or may be provided in isolated locations and/or varying concentrations throughout the aerosol-forming substrate.

[0185] The consumable described above may be coupled with a heating element in a heat not burn (HNB) device.

[0186] Accordingly in a second aspect, there is provided a heat not burn (HNB) system comprising:

a heat not burn consumable as described above in the first aspect; and
a device comprising at least one heating element.

[0187] The device may be a HNB device i.e. a device adapted to heat but not combust the aerosol-forming substrate.

[0188] The device may comprise a device housing for housing the heating element(s). The heating element(s) may comprise an elongated e.g. rod, tube-shaped or blade heating element. The heating element(s) may project into or surround a cavity within the device housing for receiving the consumable described above.

[0189] The device may further comprise a PCB connected to the heating element(s) for controlling the temperature of the heating element(s). It may further comprise a battery e.g. a recyclable battery such as a 2000mAh battery.

[0190] In some embodiments, the device comprises a first heating element for facing/abutting/overlying the upper or lower surface of the substrate. The device may comprise a second heating element which, when the consumable is engaged, faces/abuts/overlies the other of the upper and lower surface of the substrate.

[0191] Alternatively, the device may comprise a first heating element for facing/abutting/overlying an outer surface of the upper or lower wall of the consumable housing. The device may comprise a second heating element which, when the consumable is engaged, faces/abuts/overlies an outer surface of other of the upper and lower walls of the consumable housing.

[0192] In some embodiments, the device comprises a core heating element for penetrating the substrate or for being received in the hollow core recess of the substrate.

[0193] The at least one heating element (e.g. first/second/core heating element) may be a planar heating element. It may have a greater width and length than depth. The length and width may be equal but, preferably, the length is greater than the width such that the planar heating element is a rectangular element i.e. has a substantially rectangular upper and lower planar surfaces. The length of the planar heating element may be between 10 and 20 mm e.g. between 10 and 15 mm. The width of the planar heating element may be between 7 and 14 mm e.g. between 7 and 12 mm or 7 and 10 mm e.g. around 8 mm. The depth of the planar heating element may be between 0.5 and 2 mm, e.g. around 1 mm.

[0194] The first/second/core heating element may be a ceramic heating element.

[0195] The heat not burn (HNB) device may comprise:

a device housing; and
at least one heating element, the at least one heating element being housed within a cavity at a first longitudinal end of the device housing, the device housing have a first longitudinal end face defining an aperture in communication with said cavity,

wherein the device further comprises a sealing plate movable from a first position in which the aperture is open to a second position in which the aperture is at least partially sealed by the sealing plate.

[0196] The sealing plate may be slidable (e.g. slidable in an axial direction) from the first position to the second position.

[0197] In the first position, the sealing plate forms a base of the cavity with the at least one heating element extending towards the aperture through the sealing plate. The sealing plate may be an apertured plate, so that as the sealing plate moves from the first to the second position, the at least one heating element passes through the aperture.

[0198] The device housing may comprise at least one channel and the sealing plate may comprise at least one transverse tab extending from the sealing plate through the channel to rest on an exterior of the device housing. The device housing may comprise two opposing channels and the sealing plate may comprise two opposing transverse tabs. The transverse tab(s) may be used to manually move the sealing plate between the first and second positions.

[0199] The device housing (and the cavity) may have a substantially rectangular or obround transverse cross-section.

[0200] The device is adapted to receive a consumable (which is as described above) and which is insertable into the device housing for engagement with the at least one heating element (which may be a first/second/core heating element as described above). The consumable is inserted with the downstream longitudinal end wall of

the housing protruding from the device housing.

[0201] The consumable is inserted when the sealing plate is in its first position. After use, the sealing plate is moved to its second position which forces the consumable from the chamber and, ultimately blocks the aperture at the first longitudinal end face of the device housing so that the user is prevent from contacting the hot heating element.

[0202] In a third aspect, there is provided a method of using a heat not burn system according to the second aspect, the method comprising:

inserting the consumable into the device; and
heating the consumable using the heating element.

[0203] In some embodiments, the method comprises inserting the consumable into a cavity within the device housing and penetrating the consumable with a core heating element upon insertion of the consumable. For example, the core heating element (e.g. the planar core heating element) may penetrate the aerosol-forming substrate in the consumable e.g. by being received within the hollow core recess/planar recess of the substrate.

[0204] The core heating element may be received in the housing through the upstream longitudinal end face of the housing. Where there is an upstream longitudinal end wall, the core heating element may be received in the housing through the aperture. Where there is a membrane/foil sealing the upstream longitudinal end face of the housing or the aperture, the membrane is removed or pierced to allow insertion of the core heating element into the housing.

[0205] In other embodiments, the method comprises inserting the consumable into the cavity within the device housing so that the first heating element overlies the upper surface of the substrate e.g. in abutment with the upper wall of the housing. The method may further comprise inserting the consumable into the cavity so that the second heating element overlies the lower surface of the substrate e.g. in abutment with the lower wall of the housing.

[0206] Once consumed the consumable may be released from the or each heating element and a further consumable may subsequently be (releasably) engaged with the or each heating element of the device for heating.

[0207] The disclosure includes the combination of the aspects and preferred features described except where such a combination is clearly impermissible or expressly avoided.

Summary of the figures

[0208] So that the disclosure may be more readily understood, and so that further features thereof may be appreciated, embodiments and experiments illustrating the principles of the disclosure will now be described by way of example with reference to the accompanying figures in which:

Figure 1 shows a housing for a heat not burn (HNB) consumable;

Figure 2 shows a cuboid substrate;

Figure 3 shows a consumable with a core heating element inserted;

Figure 4 shows a longitudinal cross section through a consumable;

Figure 5 shows a longitudinal cross section through a consumable;

Figures 6-8 show a system comprising a consumable and a device;

Figures 9a - 9h show alternative transverse cross sections of an aerosol-forming substrate, housing or downstream/filter element;

Figure 10 shows an expanded view of a housing of a consumable;

Figure 11 shows a part of the housing of Figure 10;

Figures 12a and 12b illustrate a method of manufacturing the housing of Figure 10;

Figure 13 shows an expanded view of a housing of a consumable; and

Figure 14 shows a part of the housing of Figure 13.

Detailed Description

[0209] Aspects and embodiments of the disclosure will now be discussed with reference to the accompanying figures. Further aspects and embodiments will be apparent to those skilled in the art.

[0210] Figure 1 shows a housing 16 for a heat not burn (HNB) consumable 1. The housing 16 has an open upstream longitudinal end face 19 and a rounded opposing downstream longitudinal end wall 21 which has at least one mouthpiece aperture (not visible). The housing 16 comprises an upper wall 22 and lower wall 23 equally spaced by opposing transverse walls 24 (i.e. the upper and lower walls are parallel to one another). The housing 16 is a rigid, self-supporting bagasse housing, wherein an outer surface 18 of the housing 16 is substantially smooth.

[0211] The housing 16 may have a length of around 42mm, a height of around 6mm and a width of around 15mm.

[0212] Although not shown, a substrate 9 is housed in the housing 16. A planar substrate 9 is shown in Figure 2. By providing the reconstituted tobacco as a planar substrate (having a substantially rectangular transverse

cross section) rather than as a cylindrical rod (having a substantially circular cross section), the reconstituted tobacco has a greater exposed surface area for contact with a heating element thus allowing quicker and more even heat transfer from the heating element to the reconstituted tobacco. In this manner, heating of the reconstituted tobacco can be effected using a heating element at a lower temperature (e.g. around 250°C) which reduces the chances of burning of the reconstituted tobacco.

[0213] The substrate 9 is a cuboid brick of reconstituted tobacco, having an upper surface 3 and a lower surface (not visible) spaced by opposing transverse surfaces 15 (only one visible). The outer surfaces of the substrate 9 are coated with a hydrophobic/liquid impermeable coating.

[0214] The depth of the substrate 9 (between the upper and lower surfaces) and the width of the substrate 9 (between the opposing transverse surfaces 15) are unequal with the width being greater than the depth.

[0215] The length of the substrate 9 is typically around 12mm, with a depth of around 6mm and width of around 10mm.

[0216] The substrate 9 is formed of cast leaf slurry recon tobacco. It may alternatively be formed as extruded tobacco e.g. with added flavouring.

[0217] The substrate 9 has a hollow core defined by a cuboid recess 10 extending in a length direction from an upstream longitudinal end face 11 of the cuboid brick 9 to an opposing downstream longitudinal end face 12.

[0218] The cuboid recess 10 is defined by upper and lower inner surfaces 13a, 13b and opposing inner transverse surfaces 14a, 14b. The cuboid recess has a depth of around 1 mm, a width of around 8 mm and a length of around 12 mm.

[0219] The reconstituted tobacco at or proximal one or more of the upper/lower/transverse inner surfaces 13a, 13b, 14a, 14b defining the cuboid recess 10 may be dosed with an e-liquid which may contain aerosol formers such as polyglycol (PG) and/or vegetable glycerine (VG).

[0220] The substrate 9 can be inserted and glued into the housing 16 shown in Figure 1 to form a consumable. An inner surface of the housing 16 is a textured e.g. meshed inner surface facing the reconstituted tobacco substrate 9. With the substrate 9 enclosed in the housing 16, the consumable becomes more akin to a cartridge or "pod" that effectively contains reside after use to protect a user from contamination.

[0221] Figure 3 shows a planar ceramic heating element 28 inserted into the recess 10 of the substrate 9. As can be seen, when inserted into the recess 10, the heating element can contact the surfaces of the recess 10 thus allowing quicker heating. The depth of the reconstituted tobacco between the heating surface(s) and the opposing surfaces is substantially constant in the depth direction which results in a more even heat transfer from the heating element 28 to the reconstituted tobacco. In this manner, heating of the tobacco can be effected using a heating element 28 at a lower temperature (e.g. around 250°C) which reduces the chances of burning of the plant product.

[0222] Alternatively, the substrate 9 may be heated using a first heating element in abutment with the upper surface 3 and/or a second heating element in abutment with the lower surface. The substrate 9 is then heated externally and inwards from the upper and/or lower surfaces.

[0223] Figures 4 and 5 show further examples where the recess 10 is fully lined with a thermally conductive material such as aluminium foil 47. The aluminium foil 47 fully lines the recess 10 and overlies the plant product which may be in the form of two planar substrates 9', 9" (as shown in Figure 4) or may be a cuboid brick 9 (as shown in Figure 5).

[0224] In Figure 4, the opposing outer surfaces of the planar substrates 9', 9" are further lined with a dimpled foil 42 (which is liquid impermeable). The plant product and foil layers 47, 42 are enclosed with a cardboard wrapper 43 (although it may also be formed of moulded pulp, e.g. moulded bagasse pulp).

[0225] The heating element 28 is received within the recess 10 and the aluminium foil 47 increases heat transfer to the plant product. The dimpled foil 42 forms a liquid impermeable barrier to prevent seepage of any e-liquid dosed into the plant product into the cardboard wrapper, the dimples acting to increase air flow (and aerosol flow) through the consumable upon inhalation by the user.

[0226] In Figure 5, the aluminium foil 47 fully lines the cuboid recess 10 and then extends over the downstream longitudinal end face 12 of the cuboid brick 9 and axially into channels 44a, 44b formed within the downstream longitudinal end face 12. Thus the aluminium foil 47 partly covers the downstream longitudinal end face 12 of the cuboid brick.

[0227] The cuboid brick 9 and foil layers 47, 42 are enclosed with a cardboard wrapper 43 (although it may also be formed of moulded pulp, e.g. moulded bagasse pulp). The wrapper 43 comprises a transverse extension 45 which extends to cover a portion of the downstream longitudinal end face 12 of the cuboid brick 9. The transverse extension 45 comprises an inwardly-depending axial extension 46 extending inwards into the channels 44a, 44b in the plant product in abutment with the aluminium foil 47.

[0228] The heating element 28 is received within the cuboid recess 10 and the aluminium foil 47 increases heat transfer to the plant product.

[0229] Although not shown in the figures, the upstream longitudinal end face 19 of the housing 16 is provided with a pierceable or peelable membrane such as a metallic foil or plastic membrane. Such a membrane is provided to at least partly obscure the reconstituted tobacco from view by a user prior to use. When the consumable is used, the membrane can be removed or pierced to insert the heating element 28.

[0230] The heating element could be a heating blade that pierces the planar substrate 9.

[0231] Figure 6 shows a heat not burn (HNB) device 30 comprising the heating element 28 which is mounted on and controlled by a PCB 31 connected to a battery 32, the PCB 31 and battery 32 being housed within an electrical sleeve 33. In turn electrical sleeve 33 and heating element 28 are housed within (and fully enclosed by) a device housing 34. The device housing 34 has a chamber 35 (see e.g. Figure 7) at its first longitudinal end which has an aperture at its first longitudinal end face and which houses the heating element 28.

[0232] The consumable 1 is insertable into the chamber 35 within the device housing 34 such that the heating element 28 is received in the housing 16 (e.g. within cuboid recess 10 within the reconstituted tobacco) via the upstream longitudinal end face 19 of the housing 16. The downstream longitudinal end wall 21 of the housing 16 protrudes from the device housing 34.

[0233] The device 30 further comprises a sealing plate 36 movable (slidable in a axial direction) from a first position (shown in Figure 7) in which the aperture at the upstream longitudinal end face of the device housing 34 is open, to a second position (shown in Figure 8) in which the aperture is at least partially sealed by the sealing plate 36.

[0234] In the first position, the sealing plate 36 forms a base of the chamber 35 with the heating element 28 extending towards the aperture through the sealing plate 36. The sealing plate 36 has a slit 37, so that as it moves from the first to the second position, the heating element 28 passes through the slit.

[0235] The device housing 34 has two opposing channels 38, 38' and the sealing plate 36 comprises two opposing transverse tabs 39, 39' extending from the sealing plate 36 through the channels 38, 38' to rest on an exterior of the device housing 34. The transverse tabs 39, 39' may be used to manually move the sealing plate 36 between the first and second positions.

[0236] The consumable 1 is inserted when the sealing plate 36 is in its first position. The heating element 28 lies within the cuboid recess 10 and the user activates the heating element 28 e.g. by an actuator button located on the device housing 34. The device housing 34 may also comprise an indicator showing when the heating element 28 had reached the correct temperature (250°C).

[0237] The user then places the downstream longitudinal end wall 21 of the consumable 1 into their mouth and draws on the consumable 1 in order to inhale an aerosol containing nicotine.

[0238] After use, the sealing plate 36 is moved to its second position which forces the consumable 1 from the chamber 35 and ultimately blocks the aperture at the upstream longitudinal end face of the device housing 34 so that the user is prevent from contacting the hot heating element 28.

[0239] The device 30 may further comprise a cap 40 e.g. a magnetic cap for sealing the aperture at the upstream longitudinal end face of the device housing e.g. when the device is not in use for an extended period. The cap 40 may have a recess on its underside such that the aperture can be sealed with a consumable 1 in situ.

[0240] Figures 9a-9h show various alternative transverse cross sections of the substrate 9. Although they are shown without a hollow core recess, they could each comprise a hollow core recess which could have the same or different transverse cross section.

[0241] Figure 9a shows a substrate with planar upper and lower surfaces and convex (semi-circular) transverse surfaces such that the substrate has an obround transverse cross-section. The housing may have the same shape.

[0242] Figure 9b shows a substrate with planar upper and lower surfaces and concave (semi-circular) transverse surfaces. The housing may have the same shape.

[0243] Figure 9c shows a substrate with planar upper and lower surfaces. The opposing transverse surfaces each comprise a longitudinally-extending upper concave portion and lower concave portion which meet at a longitudinally-extending ridge. The concave portions are spaced from the upper surface and lower surface by opposing convex portions such that the transverse cross-section through the substrate is a modified obround where the opposing transverse surfaces each take the form of a curly brace/bracket i.e. "{" and "}". The housing may have the same shape.

[0244] Figure 9d shows a substrate which is similar to the substrate shown in Figure 9c except that there are no convex portions joining the upper and lower surfaces and the concave portions. The housing may have the same shape.

[0245] Figure 9e shows a substrate which has an oval transverse cross-sectional area. The housing may have the same shape.

[0246] Figure 9f shows a substrate with curved (convex) upper and lower surfaces and planar transverse surfaces such that the substrate has a truncated oval transverse cross-sectional area. The housing may have the same shape.

[0247] Figure 9g shows a substrate the same as Figure 17d except with curved (convex) upper and lower surfaces. The housing may have the same shape.

[0248] Figure 9h shows a substrate the same as Figure 9b except with curved (convex) upper and lower surfaces. The housing may have the same shape.

[0249] Figure 10 shows an expanded view of a housing 116 of a consumable. The housing 116 may be shaped as described with reference to any of Figures 9a-h. In the example shown in Figure 10, the transverse cross-sectional shape of the housing 116 is a modified obround, as described with reference to Figure 9c.

[0250] The housing 116 comprises an upper wall 122 and a lower wall 123 spaced by opposing transverse walls 124. The housing 116 also comprises a downstream longitudinal end wall 121 having a downstream aperture 169 for the flow of aerosol therethrough. The opposing transverse walls 124 and the downstream longitudinal end wall 121 comprise a longitudinally extend-

ing junction 125 such that the housing can be opened to expose a chamber 150 within (Figure 10 shows the housing 116 in an open position).

[0251] In Figure 10, the housing 116 is split into a pair of housing sections 116a, 116b, which are attached to one another to form the housing of the consumable (as shown by the arrows in Figure 10). The pair of housing sections 116a, 116b may be attached to one another by an adhesive, such as a biodegradable glue, for example.

[0252] Only one of the housing sections 116b is shown in Figures 11, 12a and 12b. Each of the pair of housing sections 116a, 116b comprises an inner sleeve part 151a, 151b, and an outer housing part 152a, 152b. When the pair of housing sections 116a, 116b are brought together to form the housing of the consumable (as in Figure 10), the pair of inner sleeve parts 151a, 151b together form an inner sleeve, and the pair of outer housing parts 152a, 152b together form the walls of the housing. The walls of the housing enclose the inner sleeve.

[0253] Each inner sleeve part 151a, 151b may be attached to its respective outer housing part 152a, 152b by an adhesive such as biodegradable glue. This is illustrated by the arrow in Figure 12b.

[0254] The inner sleeve and the walls of the housing may be formed from the same material, preferably bagasse pulp.

[0255] The inner sleeve defines a chamber 150 within the housing 116. Although not shown in Figures 10 - 12b, a substrate as described with reference to any of Figures 2 and 9a-h may be enclosed within an upstream portion of the chamber 150, and therefore an upstream portion of the inner sleeve and an upstream portion 156 of the housing 116. The substrate is affixed within the upstream portion of the inner sleeve with biodegradable glue. The upstream portion of the inner sleeve has a transverse cross-sectional shape matching the transverse cross-sectional shape of the housing 116. Specifically, the transverse cross-sectional shape of the upstream portion of the inner sleeve is a modified obround.

[0256] The inner sleeve lines the walls of the housing 116. The upstream portion of the inner sleeve may conform to the shape of the walls of the upstream portion 156 of the housing.

[0257] A downstream chimney portion 170 of the chamber 150 is defined by a downstream portion of the inner sleeve when the pair of inner sleeve parts 151a, 151b are attached to one another. The chimney portion 170 extends from a downstream portion of the substrate to the downstream aperture 169. In the downstream portion of the housing 116, the inner sleeve is not contiguous with the housing 116, and the inner sleeve is transversely spaced from the transverse walls 124 of the housing 116.

[0258] As best shown in Figure 11, the transverse cross-sectional area of the chimney portion 170 reduces towards the downstream aperture 169 to direct aerosol formed at the substrate to the downstream aperture 169 and therefore to the mouth of a user. A transverse cross-sectional area of an upstream end 190 of the chimney portion 170 is greater than a cross-sectional area of a downstream end 191 of the chimney portion 170. The upstream end 190 of the chimney portion 170 is adjacent to a downstream end of the substrate.

[0259] The depth of the chimney portion 170 is substantially constant along the length of the chimney portion 170. The width of the chimney portion 170 reduces continuously from the upstream end 190 of the chimney portion 170 towards the downstream aperture 169. Transverse walls of the chimney portion 170 comprise a substantially convex surface facing the chimney portion 170.

[0260] As shown in Figure 11, each of the transverse walls of the chimney portion 190 are non-linear curved walls, which deflect inwardly towards the opposing transverse wall of the chimney portion 190 before extending to the downstream aperture 169.

[0261] A method of making the housing 116 according to the first embodiment will now be described with reference to Figures 18-20b.

[0262] Firstly, each of the pair of insert parts 151a, 151b is mounted to a respective outer housing part 152a, 152b to form a respective housing section 116a, 116b. This step is illustrated by the arrow in Figure 20b. Each of the outer housing parts 152a, 152b comprises an indentation 158, into which the respective insert part 151a, 151b is mounted. Each insert part 151a, 151b is glued to the respective outer housing part 152a, 152b using a biodegradable adhesive. An example of a resulting housing section 116b is shown in Figure 19. Each housing section 116a, 116b may form a half of the housing 116 of the consumable.

[0263] Next, the aerosol forming substrate (as described with reference to any of Figures 2 and 9a-h) is mounted to either of the two housing sections 116a, 116b (not shown in the figures) at an upstream portion 156 of the housing section 116a, 116b.

[0264] Finally, the housing sections are attached together (by a biodegradable glue) around their periphery, thereby forming the chamber 150 therein. This is illustrated by the arrows shown in Figure 18. The resultant housing 116 encloses the substrate in the upstream portion of the chamber 150, and defines the tapered chimney portion extending from the substrate to the mouthpiece aperture 169.

[0265] Figure 13 shows an expanded view of a housing 216 for a consumable. The housing 216 may be shaped as described with reference to any of Figures 9a-h. In the example shown in Figure 13, the transverse cross-sectional shape of the housing 216 is generally rectangular.

[0266] The housing comprises an upper outer 222 and a lower wall 223 spaced by opposing transverse walls 224. The housing 216 also comprises a downstream longitudinal end wall 221 having a downstream aperture 269 for the flow of aerosol therethrough. The opposing transverse walls 224 and the downstream longitudinal end wall 221 comprise a longitudinally extending junction 225 such that the housing can be opened to expose a cham-

ber 250 within (Figure 13 shows the housing 216 in an open position).

[0267] The upper and lower walls 222, 223 are substantially planar and are equally spaced by the transverse walls 224, such that the housing 216 is a substantially planar housing. The opposing transverse walls 224 are also planar and substantially parallel to one another, and substantially perpendicular to the upper and lower walls 222, 223. The downstream longitudinal end wall 221 is rounded (i.e. convex). An opposing open upstream longitudinal end face 219 has a substantially rectangular transverse cross-section.

[0268] In Figure 13, the housing 216 is split into a pair of housing sections 216a, 216b, which are attached to one another to form the housing 216 (as shown by the arrows in Figure 13). The pair of housing sections 216a, 216b may be attached to one another by an adhesive, such as biodegradable glue. Figure 14 shows one of the pair of housing sections 216b.

[0269] Although not shown in Figures 13 and 14, a substrate as described with reference to any of Figures 2 and 9a-h may be enclosed within an upstream portion of the chamber 250, and therefore an upstream portion 256 of the housing 216. The substrate is affixed within the upstream portion of the chamber 250 by a biodegradable glue.

[0270] As shown in Figures 13 and 14, the housing 216 further comprises webbing 272 defining a downstream chimney portion 270 of the chamber 250. The webbing 272 is formed in a downstream portion 257 of the housing 216. Specifically, the webbing 272 extends from a downstream portion of the substrate to the mouthpiece aperture 269.

[0271] The webbing 272 comprises two curved webs 272a and 272b. Each web 272a, 272b extends from a respective transverse wall 224 of the housing 216 adjacent to the substrate, transversely inwards towards the opposing web 272a, 272b and longitudinally to the downstream aperture 269. The webs 272a, 272b are bow-shaped.

[0272] The transverse cross-sectional area of the chimney portion 270 in Figure 14 reduces towards the downstream aperture 269 to direct aerosol formed at the substrate to the downstream aperture 269 and therefore to the mouth of a user. A transverse cross-sectional area of an upstream end 290 of the chimney portion 270 is greater than a cross-sectional area of a downstream end 291 of the chimney portion 270.

[0273] The transverse cross-sectional area of the chimney portion 270 has a generally rectangular cross-section along its entire length. It is defined by the two longitudinally-extending webs 272a, 272b, and the upper and lower walls 222, 223 of the housing 216. Therefore, the webs 272a, 272b are spaced from one another by a greater distance at the upstream end 290 of the chimney portion 270 than at the downstream end 291 of the chimney portion 270. Thus, the width of the chimney portion 270 reduces towards the downstream aperture 269, but the depth of the chimney portion 270 remains substantially constant along its length.

[0274] In the example shown in Figures 13 and 14, the webbing 272 is integrally formed with the walls of the housing 216. The webs 272a, 272b extend from a respective transverse wall 224 of the housing 216 at a position adjacent to a downstream end of the substrate, transversely inwards into the chamber 250, and longitudinally to the mouthpiece aperture 269. The webs 272a, 272b also extends between the upper and lower walls 222, 223 such that the upper and lower walls of the housing are spaced by both the webs 272a, 72b and the transverse walls 224 of the housing 216. The webs 272a, 272b extend between the upper and lower walls 222, 223 of the housing 216 in a direction substantially perpendicular to the upper and lower walls. Accordingly, when the pair of housing sections 216a, 216b are brought together (as illustrated in Figure 13), the webs 272a, 272b and the upper and lower walls 222, 223 of the housing define the downstream chimney portion 270.

[0275] While the invention has been described in conjunction with the exemplary embodiments described above, many equivalent modifications and variations will be apparent to those skilled in the art when given this disclosure. Accordingly, the exemplary embodiments of the invention set forth above are considered to be illustrative and not limiting. Various changes to the described embodiments may be made without departing from the scope of the invention.

[0276] Throughout this specification, including the claims which follow, unless the context requires otherwise, the word "comprise" and "include", and variations such as "comprises", "comprising", and "including" will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

Claims

1. A heat not burn (HNB) consumable comprising a housing defining a chamber having an upstream portion housing an aerosol-forming substrate and a downstream chimney portion, wherein the chimney portion is tapered for directing aerosol from the substrate towards a downstream aperture.

2. A heat not burn (HNB) consumable according to claim 1, wherein the chimney portion extends in a longitudinal direction of the consumable.

3. A heat not burn (HNB) consumable according to claim 1 or claim 2, wherein a transverse cross-sectional area of the chimney portion reduces towards the downstream aperture.

4. A heat not burn (HNB) consumable accordingly to any preceding claim, wherein a width of the chimney

portion reduces towards the downstream aperture.

5. A heat not burn (HNB) consumable according to any preceding claim, wherein a depth of the chimney portion is substantially constant along its length.

6. A heat not burn (HNB) consumable according to any preceding claim, wherein the chimney portion is partly defined by longitudinally-extending transverse chimney walls, and wherein at least one of the transverse chimney walls comprises a substantially convex surface facing the chimney portion.

7. A heat not burn (HNB) consumable according to claim 6, wherein the longitudinally-extending transverse chimney walls are formed by webbing within the housing.

8. A heat not burn (HNB) consumable according any of claims 1-6, wherein the consumable comprises an inner sleeve, and wherein a downstream portion of the inner sleeve defines the chimney portion.

9. A heat not burn (HNB) consumable according to claim 8, wherein an upstream portion of the inner sleeve defines the upstream portion of the chamber.

10. A heat not burn (HNB) consumable according to any preceding claim, wherein the housing is formed of bagasse pulp.

11. A heat not burn (HNB) system comprising:

a heat not burn consumable according to any one of claims 1 to 10; and
a device comprising at least one heating element.

12. A system according to claim 11 wherein the device comprises a device housing having a cavity for receiving the consumable wherein the at least one heating element projects into or surrounds the cavity.

13. A method of using a heat not burn system according to claim 11 or 12, the method comprising:

inserting the consumable into the device; and
heating the consumable using the heating element.

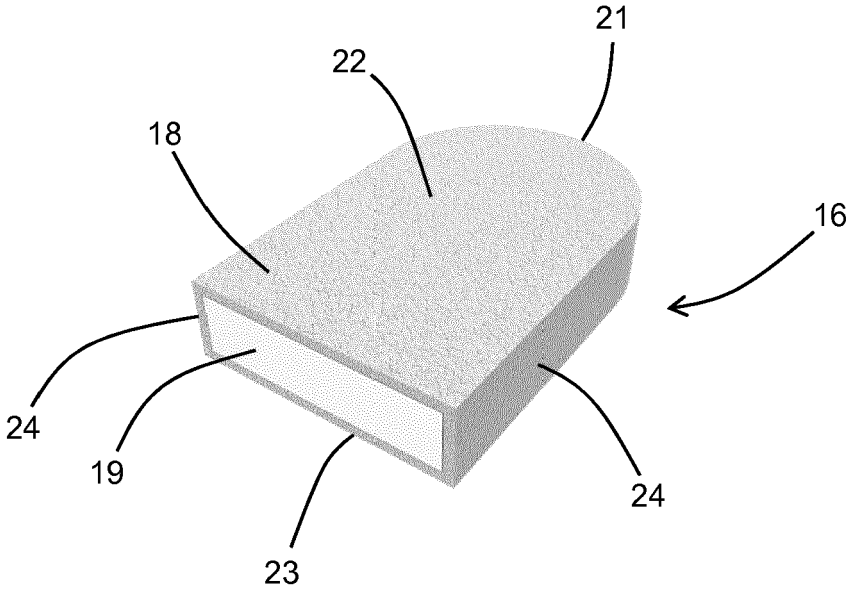

Figure 1

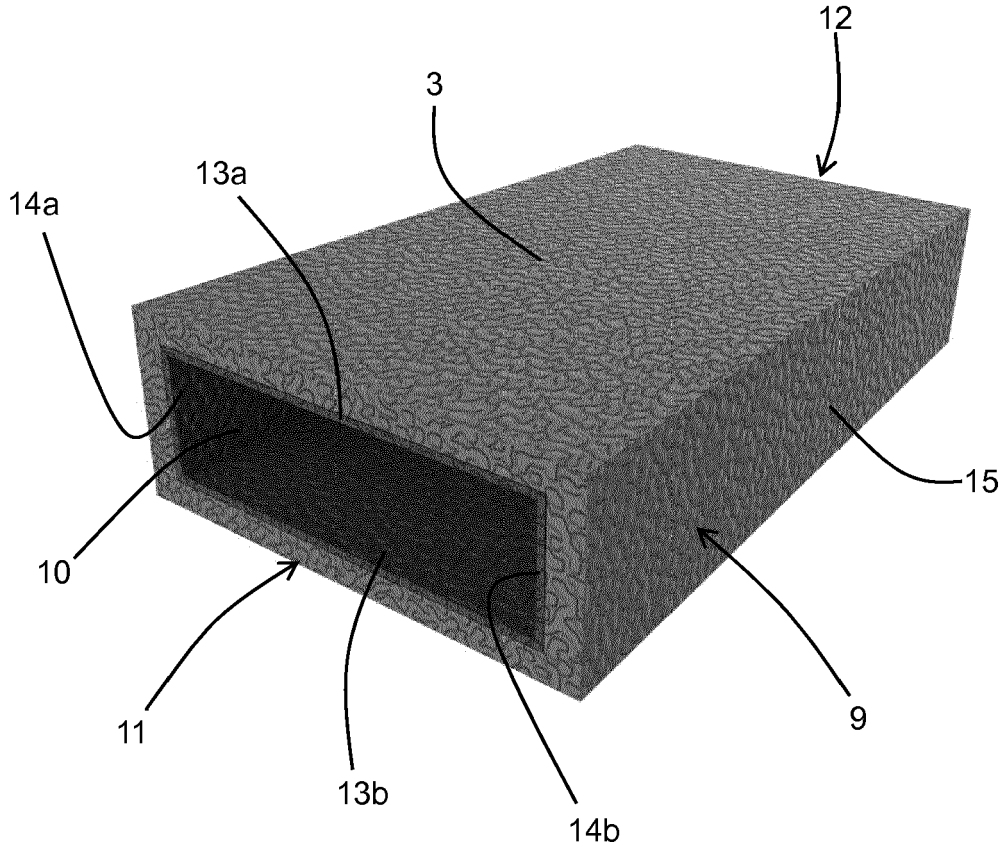

Figure 2

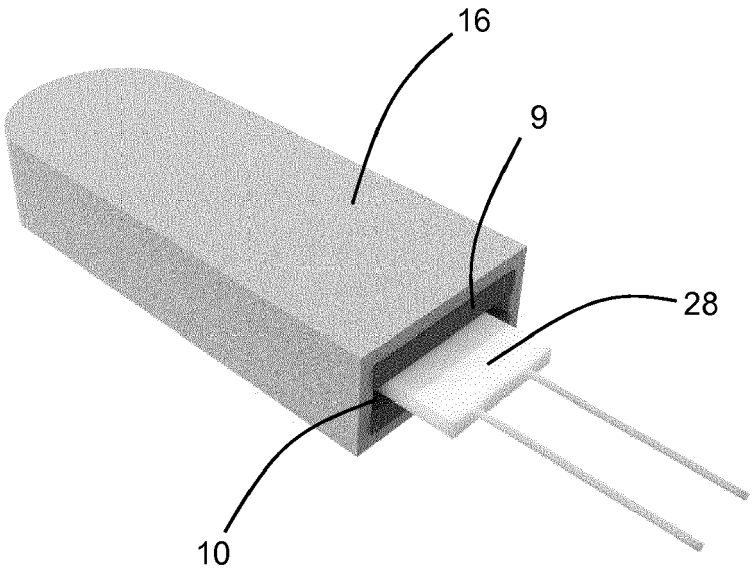

Figure 3

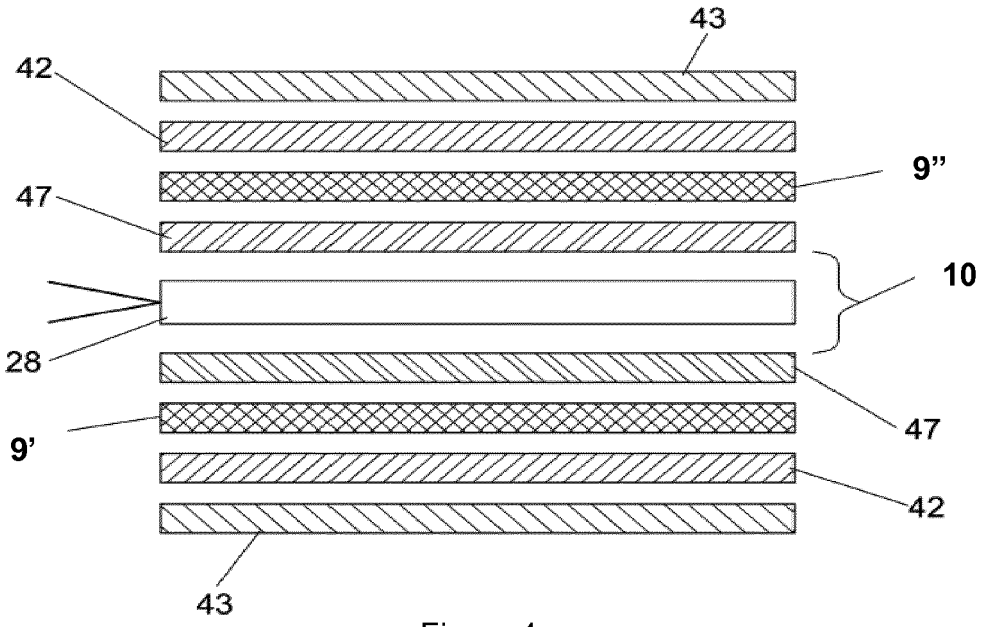

Figure 4

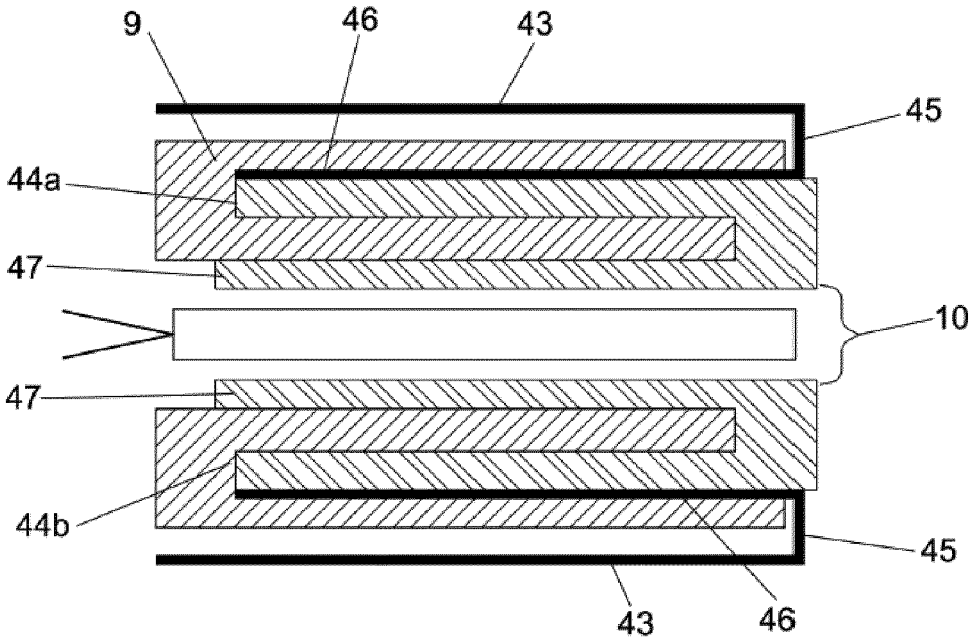

Figure 5

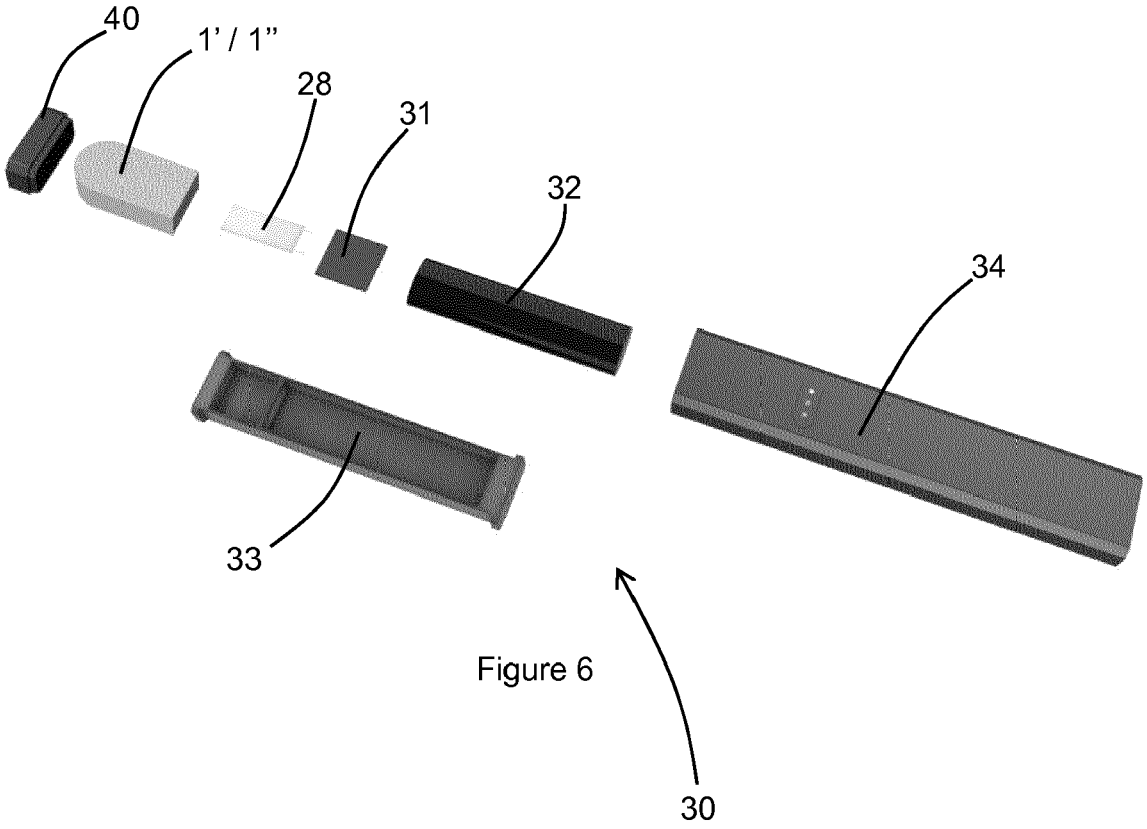

Figure 6

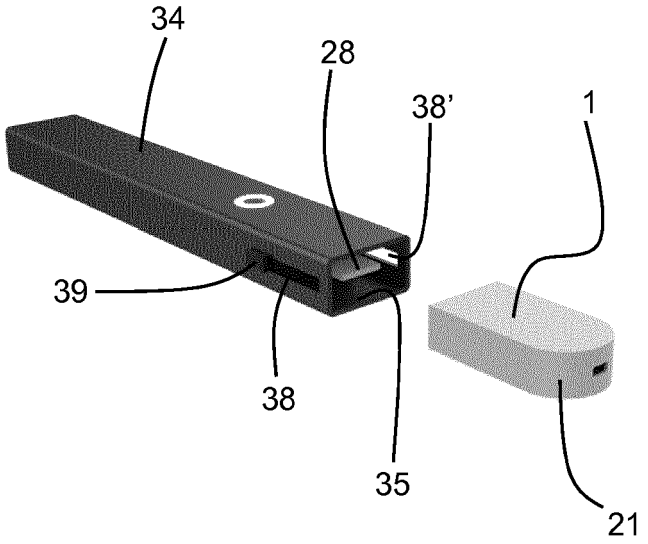

Figure 7

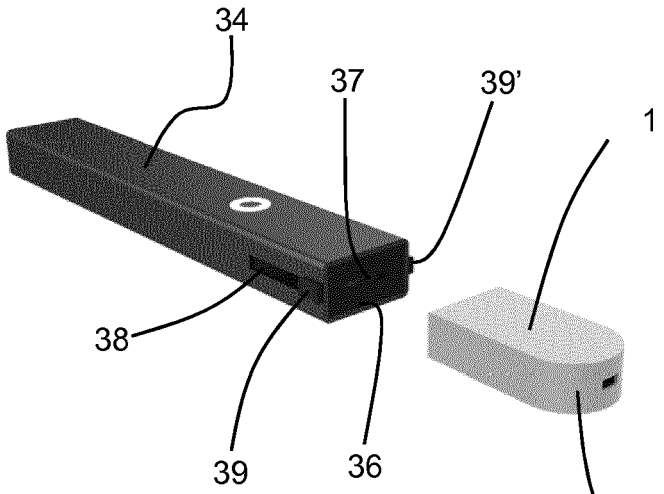

Figure 8

Figure 9a

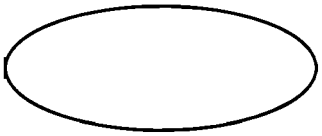

Figure 9e

Figure 9b

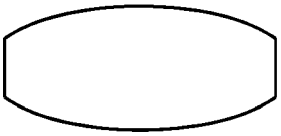

Figure 9f

Figure 9c

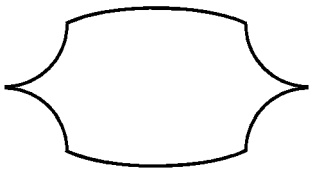

Figure 9g

Figure 9d

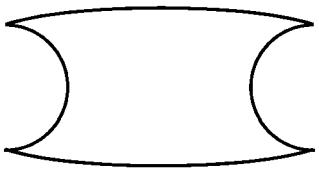

Figure 9h

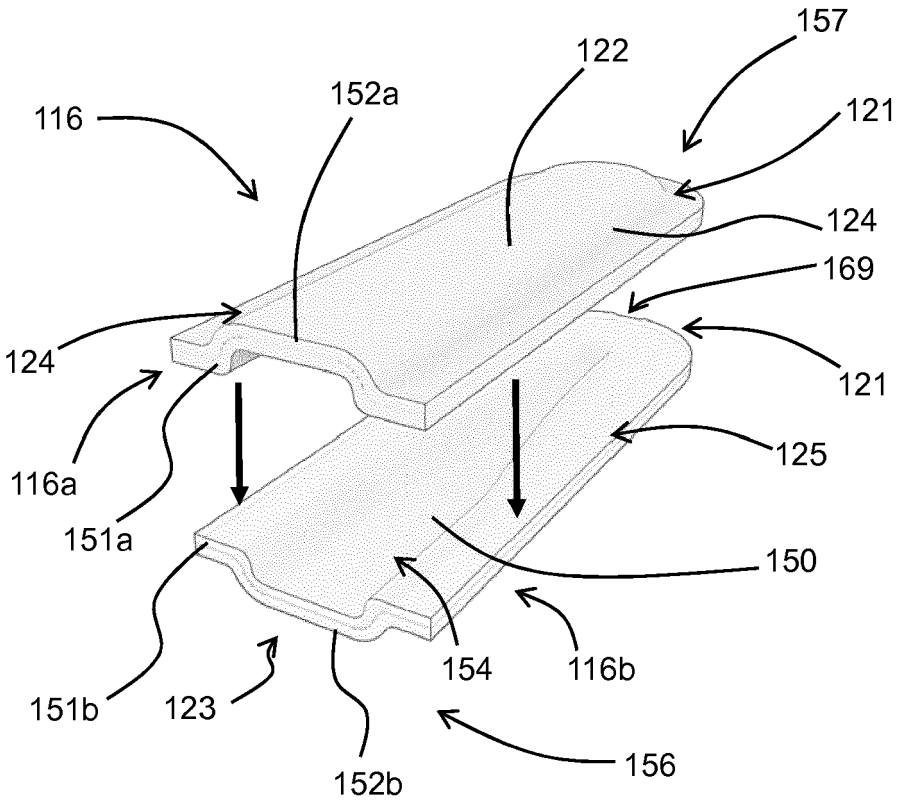

Figure 10

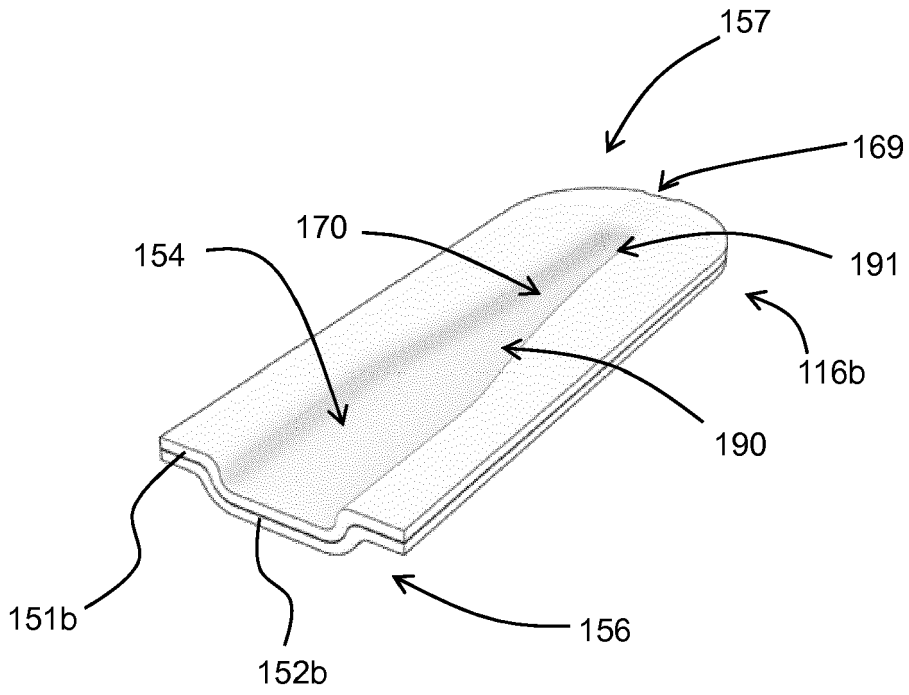

Figure 11

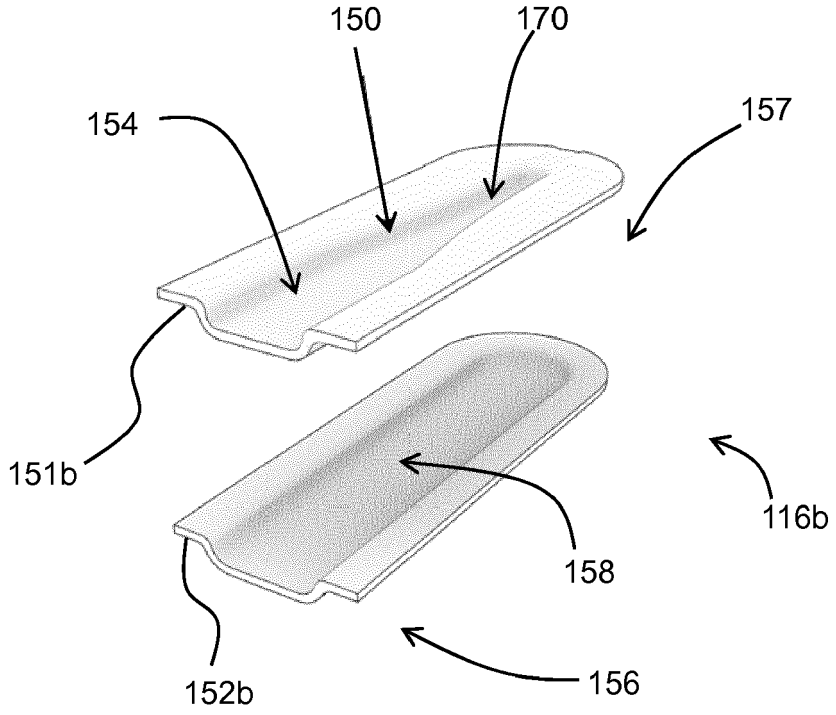

Figure 12a

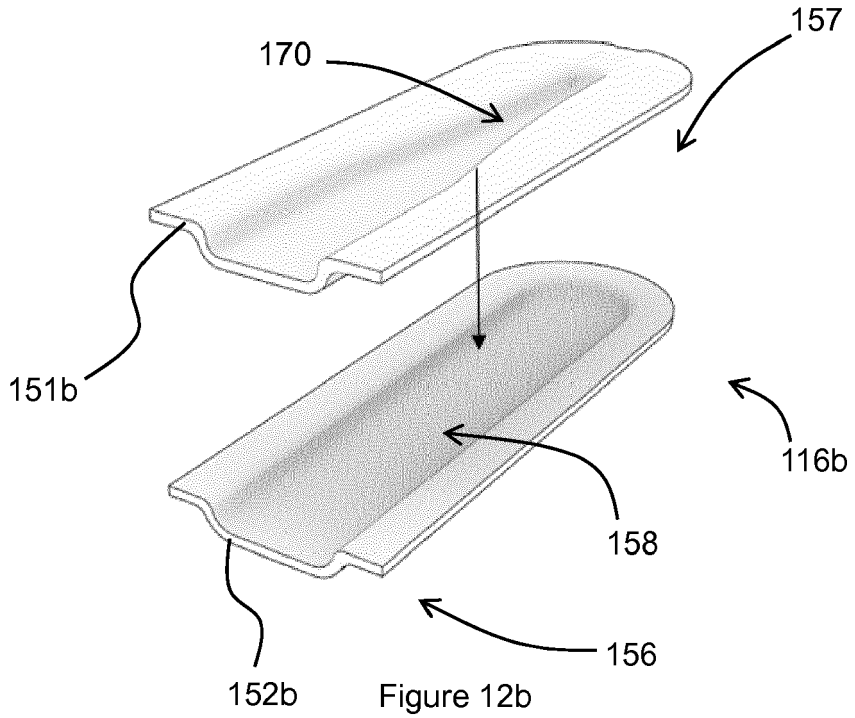

Figure 12b

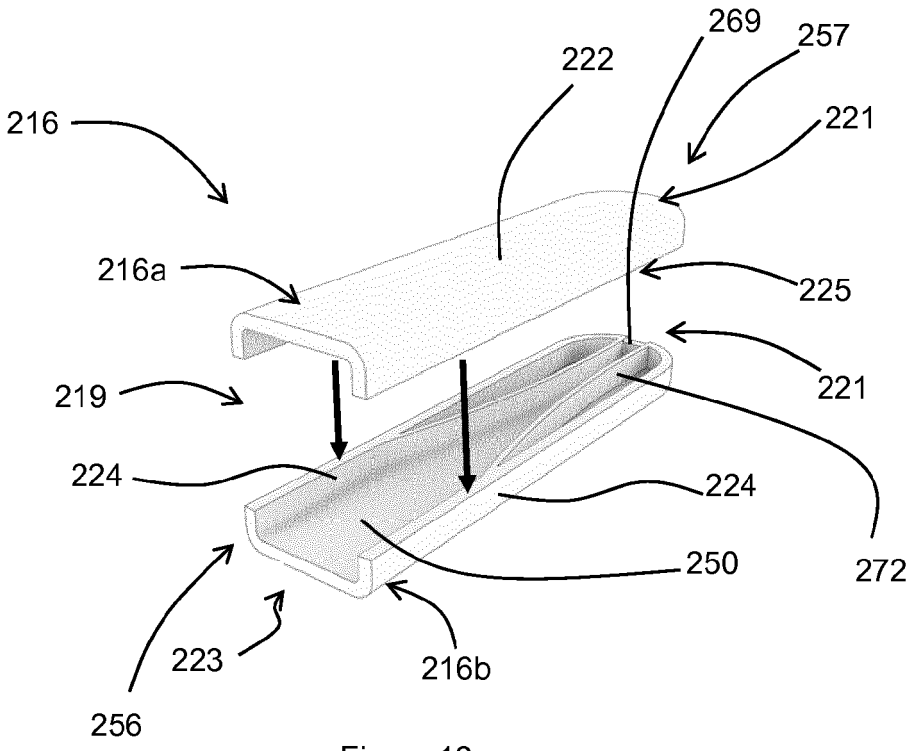

Figure 13

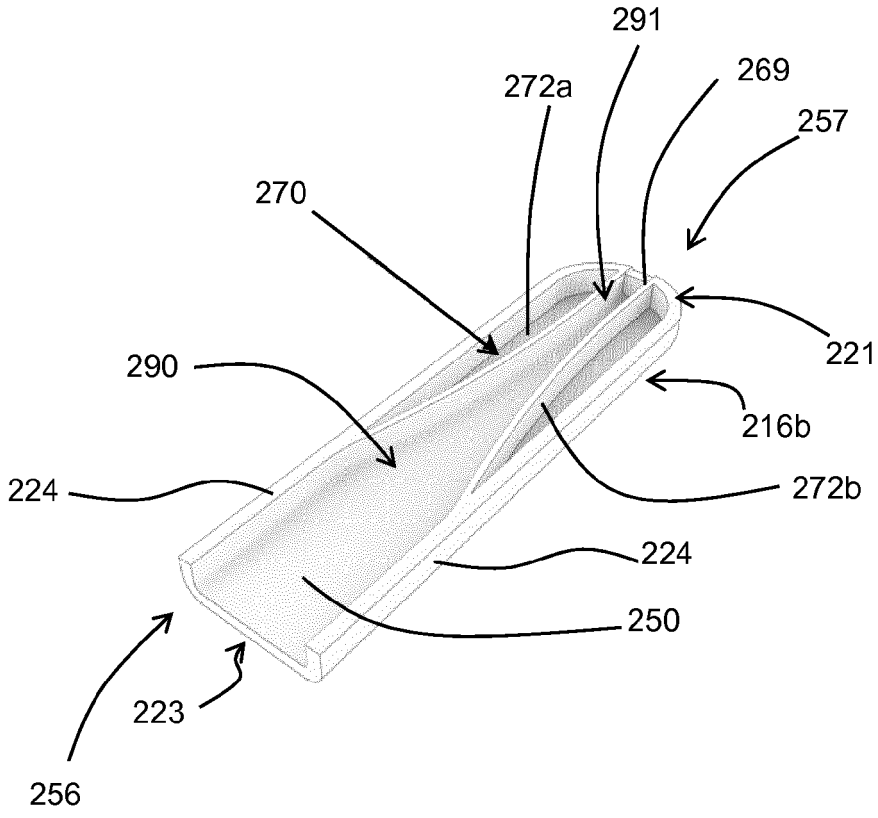

Figure 14

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EUROPEAN SEARCH REPORT

Application Number
EP 19 19 3270

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	WO 2019/011937 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 17 January 2019 (2019-01-17) * abstract * * page 12, lines 8-13 * * page 12, lines 27-32 * * figures 1-3 *	1-6, 10-13 7	INV. A24F40/42
X A	WO 2017/129615 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 3 August 2017 (2017-08-03) * abstract * * page 18, lines 9-15 * * page 19, lines 16-22 * * page 20, lines 4-11 * * figures 1-3 *	1-4,6, 10-13 7	
X A	WO 2017/163051 A1 (NICOVENTURES HOLDINGS LTD [GB]) 28 September 2017 (2017-09-28) * abstract * * page 2, lines 6-22 * * figures 1-10 *	1-6,10 7	
X A	US 2015/351455 A1 (LIU QIUMING [CN]) 10 December 2015 (2015-12-10) * abstract * * paragraph [0042] * * figures 1-7 *	1,8-10 7	TECHNICAL FIELDS SEARCHED (IPC) A24F
X A	WO 2015/107552 A1 (GODFREY PHILLIPS INDIA LTD [IN]) 23 July 2015 (2015-07-23) * abstract * * page 11, paragraph 3 * * figure 6 *	1,8-10 7	
A	US 2011/192408 A1 (INAGAKI MICHIHIRO [JP] ET AL) 11 August 2011 (2011-08-11) * abstract * * paragraphs [0056] - [0065] * * figure 8 *	7	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	28 January 2020	Cabrele, Silvio

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 19 3270

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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