



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.08.2020 Bulletin 2020/35

(51) Int Cl.:
A24B 15/16 (2020.01) A24F 47/00 (2020.01)

(21) Application number: **19020085.7**

(22) Date of filing: **22.02.2019**

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

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

(72) Inventor: **The designation of the inventor has not yet been filed**

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

(54) **SMOKING SUBSTITUTE CONSUMABLE**

(57) An aerosol-forming article (1) comprising an aerosol-forming substrate (2) at least partly formed of extruded cannabinoid-containing (e.g. cannabis) plant ma-

terial. The extruded plant material may comprise a rod having an axial bore (13) or it may comprises chips/pellets/granules.

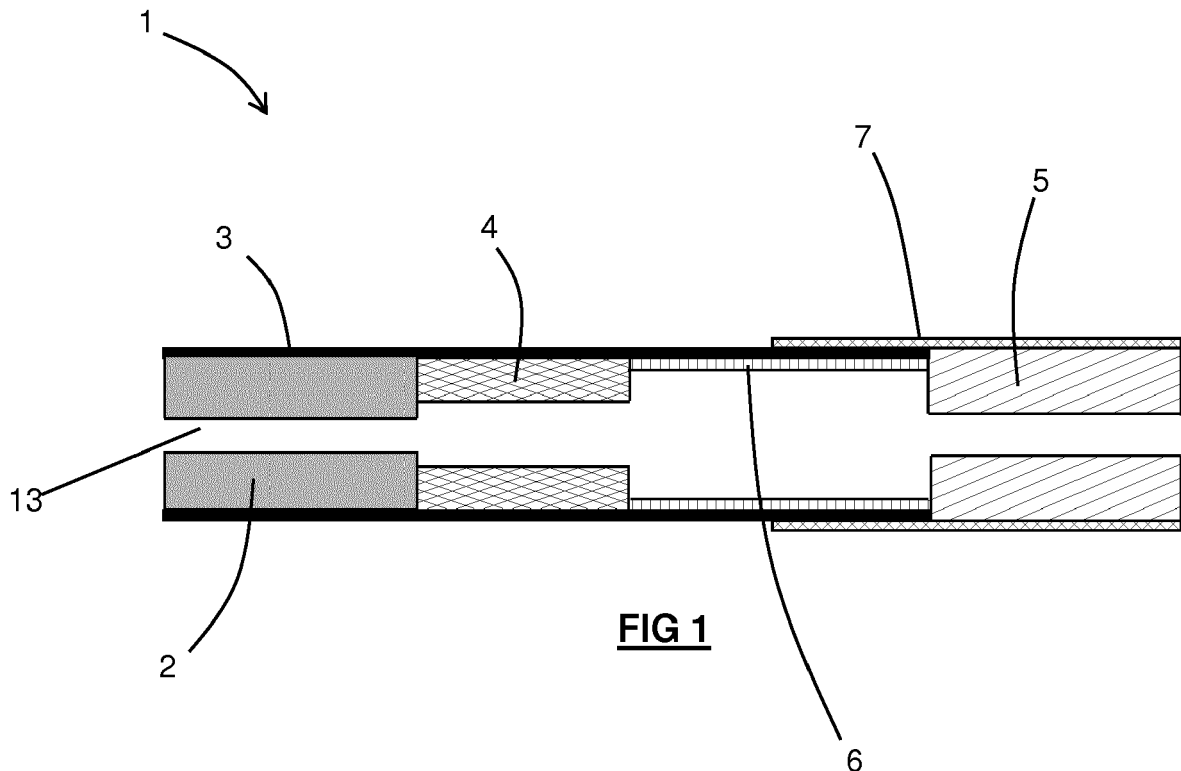


FIG 1

Description

Field of the Disclosure

[0001] The present disclosure relates to an article/consumable for use in a smoking substitute system and particularly, although not exclusively, to a heat-not-burn (HNB) consumable.

Background

[0002] Ingestion of the plant material, cannabis (also known as marijuana or hashish) is widely known for both medicinal and recreational purposes. In some countries, recreational use of cannabis has been legalized, or is officially tolerated.

[0003] Cannabis comprises numerous (phyto-)cannabinoids some of which can act on human cannabinoid receptors (CB₁ and CB₂) to affect physiological processes such as appetite, mood, stress response and muscular/joint pain relief.

[0004] Ingestion of cannabis is typically through smoking (either alone or mixed with tobacco) and is 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 cannabis (and tobacco) and the constituents of the burnt cannabis (and tobacco) in the smoke itself.

[0005] Conventional cannabis smoking articles often referred to as "joints" are typically rolled by hand by the user and comprise a roughly cylindrical wad of dried cannabis leaves/buds/flowers which is surrounded by a paper wrapper. A filter may or may not be included, axially aligned in an abutting relationship with the wrapped cannabis wad. A conventional cannabis smoking article of this type is used by lighting the end opposite to the filter, and burning the cannabis wad. The smoker receives mainstream smoke into their mouth by drawing on the filter end of the article.

[0006] Combustion of organic material such cannabis is known to produce potentially harmful by-products. Furthermore, some medicinal effects of cannabis are decreased by combustion which can deactivate certain cannabinoids. There have been proposed various smoking substitute systems (or "substitute smoking systems") in order to avoid the smoking of cannabis.

[0007] Smoking substitute systems for cannabis include heat-not-burn (HNB) systems in which a heater heats ground, chopped or loose leaf cannabis plant material contained within a sealed container pod or capsule to produce 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 cannabinoids without, or with fewer of, the odour and health risks associated with traditional cannabis smoking.

[0008] However, these known cannabis smoking sub-

stitute systems do not provide a substitute for the rituals of smoking which is important especially for recreational users.

[0009] There is a need for improved design of cannabis HNB smoking substitute systems to enhance the user experience and/or increase cannabinoid delivery to the user.

[0010] The present disclosure has been devised in light of the above considerations.

Summary of the Disclosure

[0011] At its most general, the present disclosure relates to an aerosol-forming article e.g. a consumable for use in a smoking substitute system and particularly, although not exclusively, to a heat-not-burn (HNB) consumable, wherein the article/consumable comprises a substrate at least partly formed of an extruded plant material.

[0012] Accordingly, in a first aspect, there is provided an aerosol-forming article comprising an aerosol-forming substrate at least partly formed of extruded cannabinoid-containing plant material.

[0013] The aerosol-forming substrate is capable of being heated to release at least one cannabinoid compound (e.g. a mixture of cannabinoid compounds) that can form a vapour/aerosol. Extruded plant material is typically more compacted/more dense than other types of plant material typically used in smoking substitute articles. By providing an article having a substrate formed of extruded plant material, the vapour/aerosol will have a higher cannabinoid content than the ground, chopped or loose leaf plant material used in known articles. In turn, this will provide an increased medicinal or recreational effect to the user.

[0014] Optional features will now be set out. These are applicable singly or in any combination with any aspect.

[0015] Cannabinoid compounds include phyto-cannabinoids which include:

- cannabidiol (CBD) and its derivatives/homologues (e.g. cannabidiol mono(m)ethyl ether, cannabidivarin (CBDV), cannabidiolcol, cannabidiolic acid, cannabidivarinic acid);
- cannabinodiol (CBND) and its derivatives/homologues (e.g. carrabinodivarin);
- cannabigerol (CBG) and its derivatives/homologues (e.g. cannabigerol mono(m)ethyl ether, cannabigerolic acid A, cannabigerovarin, cannabigerolic acid A, cannabigerolic acid A mono(m)ethyl ether, cannabigerovarinic acid A);
- cannabinol (CBN) and its derivatives/homologues (e.g. cannabivarin/cannabivarol (CBV), cannabiorcol, cannabinolic acid, cannabinol (m)ethyl ester);
- tetrahydrocannabinol (THC) and its derivatives/homologues (e.g. tetrahydrocannabivarin (THCV), tetrahydrocannabiorcol, tetrahydrocannabinolic acid A/B, tetrahydrocannabivarinic acid A, tetrahy-

drocannabinorcolic acid A/B, isotetrahydrocannabinol, isotetrahydrocannabivarin);

- cannabicyclol (CBL) and its derivatives/homologues (e.g. cannabicyclolic acid, cannabicyclovarin);
- cannabichromene (CBC) and its derivatives/homologues (e.g. cannabichromenic acid A, cannabichromevarin (CBCV), cannabichromevarinic acid A);
- cannabielsoin (CBE) and its derivatives/homologues (e.g. cannabielsoic acid A/B, cannabiglendol, dehydrocannabifuran, cannabifuran);
- cannabicitran (CBT) and its derivatives/homologues;
- cannabitrinol and its derivatives/homologues (e.g. ethyl cannabitrinol, dihydroxy-tetrahydrocannabinol, cannabidiolic acid A cannabitrinol ester, dihydroxy-hexahydrocannabinol (cannabiripsol), cannabitetrol, oxo-tetrahydrocannabinol); and
- cannabichromanone (CBCN) and its derivatives/homologues (e.g. cannabicumaronone).

[0016] In some embodiments, the cannabinoid compound is selected from at least one of cannabidiol (CBD) and its derivatives/homologues e.g. cannabidiol-Cs (CBD-C₅), cannabidiol-C₄ (CBD-C₄), cannabidiol mono(m)ethyl ether (CBDM-C₅), cannabidivarin (CBDV-C₃), cannabidiocol (CBD-C₁), cannabidiolic acid (CBDA-C₅), cannabidivarinic acid (CBDVA-C₃).

[0017] In some embodiments, the cannabinoid compound is selected from at least one of tetrahydrocannabinol (THC) and its derivatives/homologues, e.g. Δ^9 -tetrahydrocannabinol (Δ^9 -THC-C₅ / *cis*- Δ^9 -THC-C₅), Δ^8 -tetrahydrocannabinol (Δ^8 -THC-C₅), Δ^8 -tetrahydrocannabinolic acid A (Δ^8 -THCA-C₅ A), Δ^9 -tetrahydrocannabinol-C₄ (Δ^9 -THC-C₄), Δ^9 -tetrahydrocannabivarin (Δ^9 -THCV-C₃), Δ^9 -tetrahydrocannabinorcol (Δ^9 -THCO-C₁), Δ^9 -tetrahydrocannabinolic acid A (Δ^9 -THCA-C₅ A), Δ^9 -tetrahydrocannabinolic acid B (Δ^9 -THCA-C₅ B), Δ^9 -tetrahydrocannabinolic acid-C₄ A and/or B (Δ^9 -THCA-C₄ A and/or B), Δ^9 -tetrahydrocannabivarinic acid A (Δ^9 -THCVA-C₃ A), Δ^9 -tetrahydrocannabinorcolic acid A and/or B (Δ^9 -THCOA-C₁ A and/or B), isotetrahydrocannabinol and isotetrahydrocannabivarin.

[0018] The total amount of cannabinoid compounds in the substrate may be at least 200 mg; for example, it may be at least 250 mg, at least 300 mg, at least 400 mg, at least 500 mg. In some cases, lower amounts may be preferred. The total amount of cannabinoid compounds in the substrate may therefore be at least 10 mg, at least 20 mg, at least 30 mg, at least 40 mg, at least 50 mg, at least 75 mg, at least 100 mg.

[0019] In some cases, it may be desirable to limited the total amount of cannabinoid compounds, which may be not more than 200 mg, not more than 175 mg, not more than 150 mg, not more than 125 mg, not more than 100 mg, not more than 75 mg, not more than 50 mg, not more than 40 mg, not more than 30 mg, not more than 20 mg, not more than 10 mg. In some cases, the total

amount of the cannabinoid compounds may be not more than 5 mg.

[0020] Where THC is included, either as one cannabinoid compound in a mixture or as the only cannabinoid, the total of amount of THC may be limited. In some cases, the total amount of THC in the substrate is not more than 100 mg, not more than 75 mg, not more than 50 mg, not more than 40 mg, not more than 30 mg, not more than 20 mg, not more than 15 mg, not more than 10 mg, not more than 5 mg, not more than 3 mg. In some cases, the amount of THC may be 0.1 to 30 mg, for example 1 to 30 mg, for example 1 to 20 mg, for example 1 to 10 mg, for example 1 to 5 mg, for example 1 to 3 mg.

[0021] The cannabinoid-containing plant material may comprise cannabis plant material including *Cannabis sativa*, *Cannabis indica* and *Cannabis ruderalis*.

[0022] The cannabinoid-containing plant material may comprise *Echinacea purpurea*, *Echinacea angustifolia*, *Acmella oleracea*, *Helichrysum umbraculigerum*, or *Radula marginata*. This also includes blends of the above mentioned plant material.

[0023] Preferably the cannabinoid-containing plant material is cannabis.

[0024] The cannabinoid-containing (e.g. cannabis) plant may be a traditional strain, or may be a strain bred or other modified (e.g. genetically) to produce certain levels of some cannabinoids compounds, e.g. low levels of THC or high levels of THC.

[0025] Any suitable parts of the cannabinoid-containing plant may be used. Thus the cannabinoid-containing plant material may comprise leaves, stems, roots, bark, seeds, buds and flowers (which may be cured).

[0026] The aerosol-forming substrate may comprise at least 50 wt% plant material, e.g. at least 60 wt% plant material e.g. around 65 wt% plant material. The aerosol-forming substrate may comprise 80 wt% or less plant material e.g. 75 or 70 wt% or less plant material.

[0027] The substrate may at least partly comprise a rod of extruded cannabinoid-containing (e.g. cannabis) plant material. The rod of extruded cannabinoid-containing (e.g. cannabis) plant material may comprise an axial bore adapted to receive an external heating element. By providing an aerosol-forming substrate formed of or comprising a rod of extruded cannabinoid-containing plant material having an empty axial bore for receiving an external heating element, the user of a smoking substitute system having an external heater is provided with an aerosol having an increased concentration of cannabinoid compounds and thus an enhanced medicinal/recreational effect.

[0028] The substrate may at least partly comprise pellets/granules/chips of extruded cannabinoid-containing (e.g. cannabis) plant material. In contrast to powdered plant material, each pellet/chip/granule is of a macroscopic size (e.g. having a smallest dimension of greater than 0.5mm or 1mm).

[0029] Extruded cannabinoid-containing (e.g. cannabis) plant material can produced by forming a liquid mix-

ture of powered plant material 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 dried and then may be subsequently cut into pellets, chips or granules.

[0030] The aerosol-forming article is preferably a heat-not-burn (HNB) consumable.

[0031] The aerosol-forming substrate may be located at an upstream axial end of the article/consumable.

[0032] As used herein, the terms "upstream" and "downstream" are intended to refer to the flow direction of the vapour/aerosol i.e. with the downstream end of the article/consumable being the mouth end or outlet where the aerosol exits the article/consumable for inhalation by the user. The upstream end of the article/consumable is the opposing end to the downstream end.

[0033] The aerosol-forming substrate may be at least partly circumscribed by a wrapping layer e.g. a paper wrapping layer.

[0034] The aerosol-forming substrate may be formed in a substantially cylindrical shape such that the article/consumable resembles a conventional cigarette. It may have a diameter of between 5 and 10 mm e.g. between 6 and 9 mm or 6 and 8 mm e.g. around 7 mm. It may have an axial length of between 10 and 15 mm e.g. between 11 and 14 mm such as around 12 or 13 mm.

[0035] The article/consumable may comprise one or more of a hollow bore element, a filter element, a spacer element and/or a cooling element downstream of the substrate.

[0036] The hollow bore element comprises a hollow bore which extends the axial length of the hollow bore element.

[0037] The hollow bore element may be a terminal hollow bore element at the downstream/mouth end of the article/consumable. In these embodiments, the hollow bore terminates at the downstream/mouth end of the article/consumable.

[0038] The hollow bore element may be an upstream hollow bore element i.e. upstream of the downstream/mouth end of the article/consumable (but downstream of the substrate).

[0039] The article/consumable may comprise both a terminal and upstream hollow bore element. The terminal and upstream hollow bore elements may be axially adjacent one another or may be axially spaced. The upstream hollow bore element may be axially adjacent i.e. immediately downstream of the substrate.

[0040] The or each hollow bore element may have an axial bore i.e. aligned with the axis of the hollow bore element. The or each hollow bore may have a bore diameter of between 1 and 5 mm, e.g. between 2 and 4 mm or between 2 and 3 mm.

[0041] The or each hollow bore element may be formed of a smoke permeable (porous) material such as cellulose acetate or polypropylene tow, paper or plant material or may be formed of smoke impermeable (non-porous) material e.g. non-porous plastics material.

[0042] The or each hollow bore element may be circumscribed with a plug wrap e.g. a paper plug wrap.

[0043] The upstream hollow bore element may be at least partly (e.g. entirely) circumscribed by the (paper) wrapping layer.

[0044] The terminal hollow bore element (at the downstream end of the article/consumable) may be joined to the adjacent, upstream elements forming the article/consumable by a circumscribing tipping layer e.g. a tipping paper layer. The tipping paper may have an axial length longer than the axial length of the terminal hollow bore element such that the tipping paper completely circumscribes the terminal hollow bore element plus the wrapping layer surrounding any adjacent upstream element.

[0045] The or each hollow bore element may have a substantially cylindrical shape with a diameter substantially matching the diameter of the aerosol-forming substrate (with or without its associated wrapping layer). The axial length of the or each hollow bore element may be less than 20 mm, e.g. between 8 and 15 mm, for example between 9 and 13 mm e.g. between 10 and 12 mm.

[0046] The filter element may be a terminal filter element at the downstream/mouth end of the article/consumable.

[0047] The filter element may be an upstream filter element i.e. upstream of the downstream/mouth end of the article/consumable (but downstream of the substrate).

[0048] The article/consumable may comprise both a terminal and upstream filter element. The terminal and upstream filter elements may be axially adjacent one another or may be axially spaced. The upstream filter element may be axially adjacent i.e. immediately downstream of the substrate.

[0049] The or each filter element is of a smoke permeable (porous) material such as cellulose acetate or polypropylene tow, paper or plant material.

[0050] The or each filter element may be circumscribed with a plug wrap e.g. a paper plug wrap.

[0051] The upstream filter element may be at least partly (e.g. entirely) circumscribed by the (paper) wrapping layer.

[0052] The terminal filter element (at the downstream end of the article/consumable) may be joined to the adjacent, upstream elements forming the article/consumable by a circumscribing tipping layer e.g. a tipping paper layer. The tipping paper may have an axial length longer than the axial length of the terminal filter element such that the tipping paper completely circumscribes the terminal filter element plus the wrapping layer surrounding any adjacent upstream element.

[0053] The or each filter element may have a substantially cylindrical shape with a diameter substantially matching the diameter of the aerosol-forming substrate (with or without its associated wrapping layer). The axial length of the or each filter element may be less than 20 mm, e.g. between 8 and 15 mm, for example between 9 and 13 mm e.g. between 10 and 12 mm.

[0054] In some embodiments, there may be an up-

stream hollow bore element and a terminal filter element.

[0055] In some embodiments, the article/consumable may comprise an aerosol-cooling element which is adapted to cool the aerosol generated from the aerosol-forming substrate (by heat exchange) before being inhaled by the user.

[0056] The aerosol-cooling element will be downstream from the aerosol-forming substrate. For example, it may be between the aerosol-forming substrate and the terminal hollow bore/filter element and/or between the terminal and upstream hollow bore/filter elements. The aerosol cooling element may be at least partly (e.g. completely) circumscribed by the (paper) wrapping layer.

[0057] The aerosol-cooling element may be formed of a plastics material selected from the group consisting of polylactic acid (PLA), polyvinyl chloride (PVC), polyethylene (PE) and polyethylene terephthalate (PET). The aerosol-cooling element may be formed of a crimped/gathered sheet of material to form a structure having a high surface area with a plurality of longitudinal channels to maximise heat exchange and cooling of the aerosol.

[0058] The aerosol cooling element may have an external diameter of between 5 and 10 mm e.g. between 6 and 9 mm or 6 and 8 mm, e.g. around 7 mm. It may have an axial length of between 10 and 15 mm e.g. between 12 and 14 mm or 13 and 14 mm e.g. around 14 mm.

[0059] The article/consumable may comprise a spacer element that defines a space or cavity or chamber between the aerosol-forming substrate and the downstream end of the article/consumable. The spacer acts to allow both cooling and mixing of the aerosol. It may be provided between the aerosol-forming substrate and the terminal hollow bore/filter element and/or between the terminal and upstream hollow bore/filter elements. The spacer element may comprise a tubular element e.g. a cardboard tube. The spacer element may be at least partly (e.g. entirely) circumscribed by the (paper) wrapping layer.

[0060] The spacer element may have an external diameter of between 5 and 10 mm e.g. between 6 and 9 mm or 6 and 8 mm, e.g. around 7 mm. It may have an axial length of between 10 and 15 mm e.g. between 12 and 14 mm or 13 and 14 mm e.g. around 14 mm.

[0061] In a second aspect, there is provided a smoking substitute system comprising an aerosol-forming article according to the first aspect and a device comprising a heating element.

[0062] The device may be a HNB device i.e. a device adapted to heat but not combust the aerosol-forming substrate.

[0063] The device may comprise a main body for housing the heating element. The heating element may comprise an elongated e.g. rod, tube-shaped or blade heating element. The heating element may project into or surround a cavity within the main body for receiving the article/consumable described above.

[0064] Where present, the diameter of the axial bore

of the extruded rod of cannabinoid-containing (e.g. cannabis) plant material preferably matches the diameter of the elongated rod/tube heater.

[0065] The device (e.g. the main body) may further comprise an electrical power supply e.g. a (rechargeable) battery for powering the heating element. It may further comprise a control unit to control the supply of power to the heating element.

[0066] In a third aspect, there is provided a method of using a smoking substitute system according to the second aspect, the method comprising inserting the article/consumable into the device, and heating the article/consumable using the heating element.

[0067] In some embodiments, the method comprises inserting the article/consumable into a cavity within the main body and penetrating the article/consumable with the heating element upon insertion of the article/consumable. For example, the heating element may penetrate the aerosol-forming substrate in the article/consumable.

[0068] The skilled person will appreciate that except where mutually exclusive, a feature or parameter described in relation to any one of the above aspects may be applied to any other aspect. Furthermore, except where mutually exclusive, any feature or parameter described herein may be applied to any aspect and/or combined with any other feature or parameter described herein.

Summary of the Figures

[0069] So that the invention may be understood, and so that further aspects and features thereof may be appreciated, embodiments illustrating the principles of the invention will now be discussed in further detail with reference to the accompanying figures, in which:

Figure 1 shows a first embodiment of an HNB consumable;

Figure 2 shows a second embodiment of an HNB consumable; and

Figure 3 shows the first embodiment within a device forming an HNB system.

Detailed Description of the Figures

[0070] As shown in Figure 1, the HNB consumable 1 comprises an aerosol-forming substrate 2 at the upstream end of the consumable 1.

[0071] The aerosol-forming substrate 2 comprises a rod-shaped extrudate of cannabis which includes the cannabinoid CBD as a volatile compound.

[0072] The aerosol-forming substrate 2 is formed in a substantially cylindrical shape such that the consumable resembles a conventional cigarette. It has diameter of around 7 mm and an axial length of around 12 mm. The extrudate comprises an axial bore 13 which has its axial

upstream end at the axial upstream end of the aerosol-forming substrate 2. The axial bore 13 extends the entire length of the extrudate and thus has an axial length of 12 mm. It has a bore diameter of around 2mm.

[0073] The aerosol-forming substrate 2 is circumscribed by a paper wrapping layer 3.

[0074] The consumable 1 comprises an upstream hollow bore element 4 and a downstream terminal hollow bore element 5. The two elements 4, 5 are spaced by a cardboard spacer tube 6. Both elements 4, 5 are formed of cellulose acetate tow and wrapped with a respective paper plug layer (not shown).

[0075] Both elements 4, 5 have a substantially cylindrical shape. The diameter of the upstream hollow bore element 4 matches the diameter of the aerosol-forming substrate 2. The diameter of the terminal hollow bore element 5 is slightly larger and matches the combined diameter of the aerosol-forming substrate 2 and the wrapping layer 3. The upstream hollow bore element 4 is slightly shorter in axial length than the terminal hollow bore element 5 at an axial length of 10 mm compared to 12 mm for the terminal hollow bore element 5. The cardboard tube spacer 6 is longer having an axial length of around 14 mm.

[0076] Each hollow bore element 4, 5 has a hollow, longitudinally extending bore. The diameter of the bore in the upstream hollow bore element 4 is slightly larger than the diameter of the bore in the terminal hollow bore element 5 having a diameter of 3 mm compared to 2 mm for the terminal hollow bore element 5.

[0077] The cardboard spacer tube 6 and the upstream hollow bore element 4 are circumscribed by the wrapping layer 3.

[0078] The terminal hollow bore element 5 is joined to the adjacent, upstream elements forming the consumable by a circumscribing paper tipping layer 7. The tipping layer 7 encircles the terminal hollow bore element 5 and has an axial length of around 20 mm such that it overlays a portion of the cardboard tube spacer 6.

[0079] Figure 2 shows a second embodiment of a consumable 1" which is the same as the first embodiment except that the wrapping layer 3 does not completely circumscribe the cardboard spacer tube 6 such that there is an annular gap 9 between the tipping layer 7 and the cardboard spacer tube 6 downstream of the end of the wrapping layer 3.

[0080] Figure 3 shows the first embodiment inserted into an HNB device 10 comprising a rod-shaped heating element 20 (shown in dashed lines). The heating element 20 projects into a cavity 11 within the main body 12 of the device.

[0081] The consumable 1 is inserted into the cavity 11 of the main body 12 of the device 10 such that the heating rod 20 is received in the axial bore 13 of the aerosol-forming substrate 2. Heating of the cannabis plant material in the aerosol-forming substrate 2 is effected by powering the heating element 20 (e.g. with a rechargeable battery (not shown)). As the cannabis plant material

is heated, moisture and volatile compound (e.g. CBD) within the cannabis plant material is released as a vapour and entrained within an airflow generated by inhalation by the user at the terminal hollow bore element 5.

[0082] As the vapour cools within the upstream hollow bore element 4 and the cardboard spacer tube 6, it condenses to form an aerosol containing the volatile compounds for inhalation by the user.

[0083] The features disclosed in the foregoing description, or in the following claims, or in the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for obtaining the disclosed results, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

[0084] 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.

[0085] For the avoidance of any doubt, any theoretical explanations provided herein are provided for the purposes of improving the understanding of a reader. The inventors do not wish to be bound by any of these theoretical explanations.

[0086] Throughout this specification, including the claims which follow, unless the context requires otherwise, the words "have", "comprise", and "include", and variations such as "having", "comprises", "comprising", and "including" will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

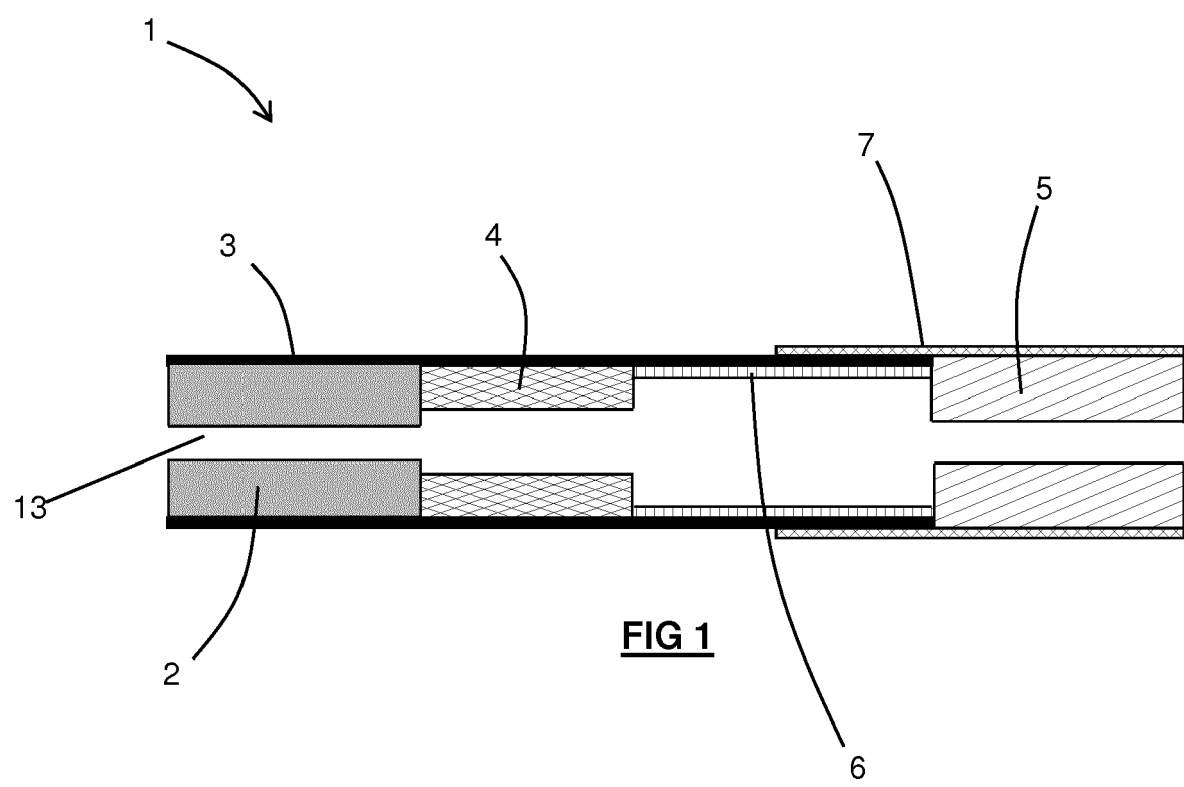
[0087] It must be noted that, as used in the specification and the appended claims, the singular forms "a," "an," and "the" include plural referents unless the context clearly dictates otherwise. Ranges may be expressed herein as from "about" one particular value, and/or to "about" another particular value. When such a range is expressed, another embodiment includes from the one particular value and/or to the other particular value. Similarly, when values are expressed as approximations, by the use of the antecedent "about," it will be understood that the particular value forms another embodiment. The term "about" in relation to a numerical value is optional and means, for example, +/- 10%.

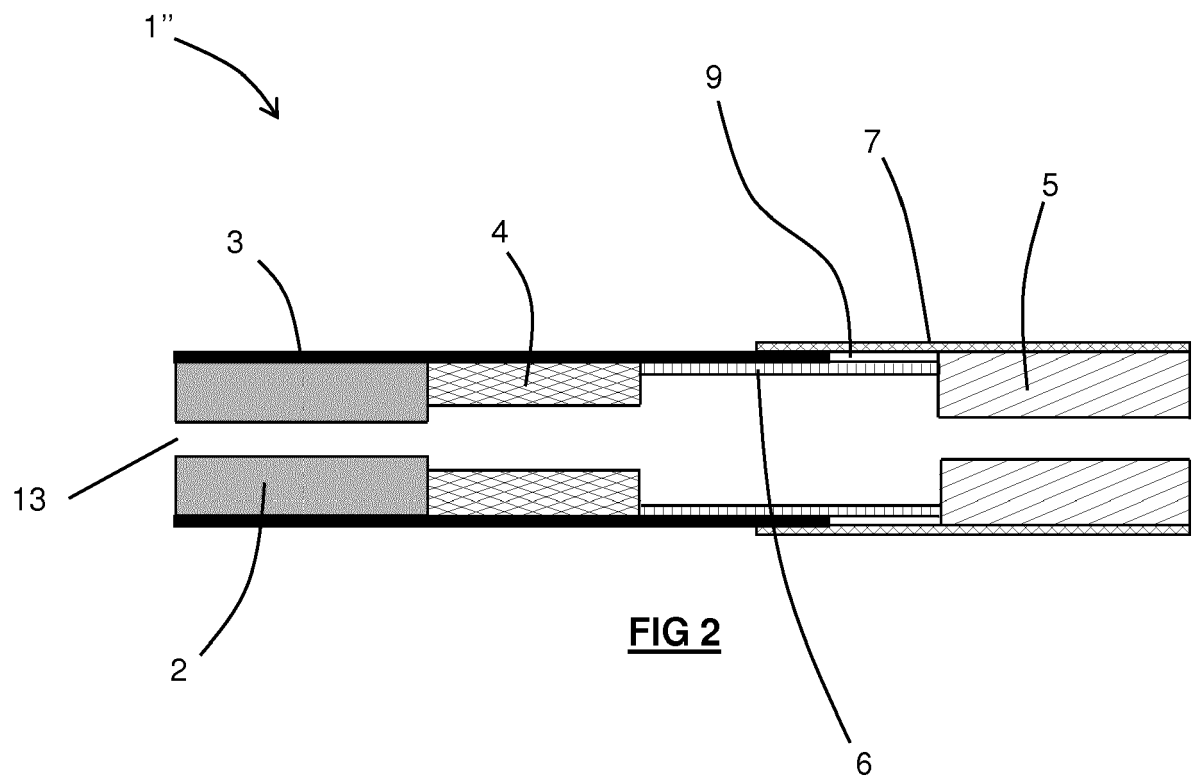
[0088] The words "preferred" and "preferably" are used herein refer to embodiments of the invention that may provide certain benefits under some circumstances. It is to be appreciated, however, that other embodiments may also be preferred under the same or different circumstances. The recitation of one or more preferred embodiments therefore does not mean or imply that other em-

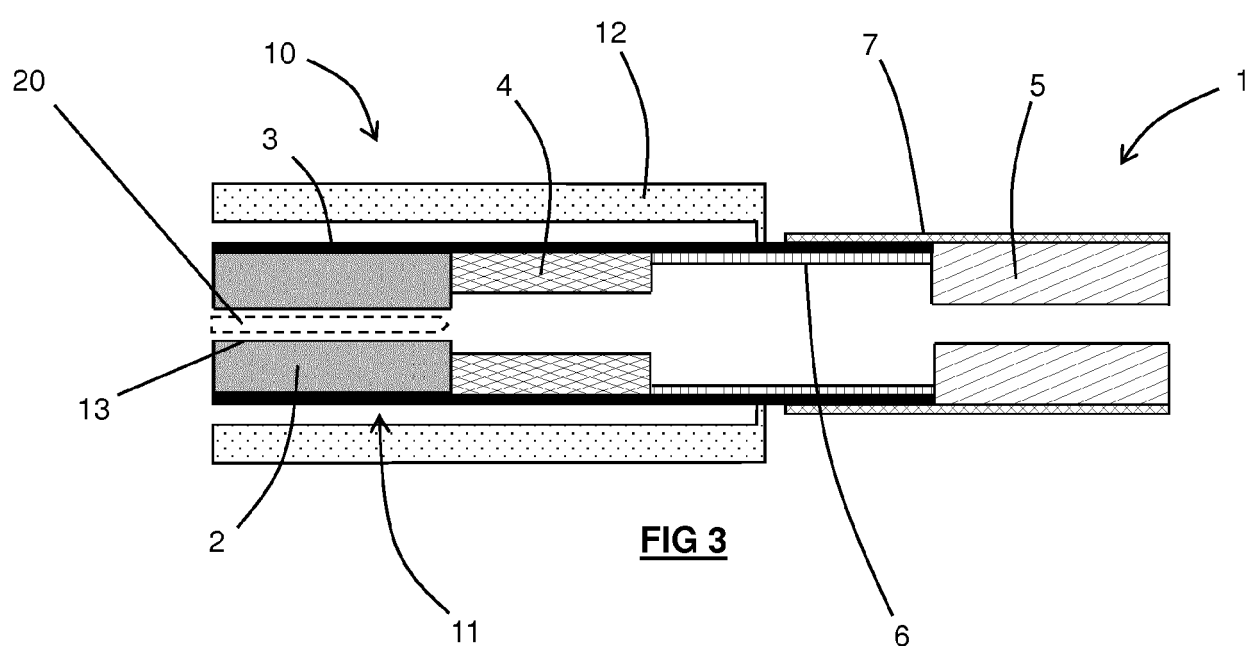
bodiments are not useful, and is not intended to exclude other embodiments from the scope of the disclosure, or from the scope of the claims.

Claims

1. An aerosol-forming article comprising an aerosol-forming substrate at least partly formed of extruded cannabinoid-containing plant material.
2. An article according to claim 1 wherein the cannabinoid containing plant material comprises one or more cannabinoids selected from cannabidiol (CBD) and its derivatives/homologues, cannabinodiol (CBND) and its derivatives/homologues, cannabigerol (CBG) and its derivatives/homologues, cannabinol (CBN) and its derivatives/homologues, tetrahydrocannabinol (THC) and its derivatives/homologues, cannabicyclol (CBL) and its derivatives/homologues, cannabichromene (CBC) and its derivatives/homologues, cannabielsoin (CBE) and its derivatives/homologues, cannabicitran (CBT) and its derivatives/homologues, cannabitriol and its derivatives/homologues and cannabichromanone (CBCN) and its derivatives/homologues.
3. An article according to claim 1 or 2 wherein the plant material is cannabis plant material.
4. An article according to any one of the preceding claims wherein the substrate at least partly comprises a rod of extruded cannabinoid-containing plant material.
5. An article according to claim 4 wherein the rod of extruded cannabinoid-containing plant material may comprise an axial bore adapted to receive an external heating element.
6. An article according to any one of claims 1 to 3 wherein the substrate at least partly comprises pellets/granules/chips of extruded cannabinoid-containing plant material.
7. An article according to any one of the preceding claims wherein the aerosol-forming article is a heat-not-burn (HNB) consumable.
8. An article according to any one of the preceding claims wherein the article comprises a terminal hollow bore element or terminal filter element at the downstream/mouth end of the article/consumable.
9. An article according to claim 8 further comprising an upstream hollow bore element or upstream filter element axially spaced from the terminal element.
10. An article according to claim 8 or 9 further comprising one or more of a spacer element and an aerosol-cooling element.
11. A smoking substitute system comprising an aerosol-forming article according to any one of claims 1 to 10 and a device comprising a heating element.
12. A system according to claim 11 wherein the device comprises a main body for housing the heating element and the heating element comprises an elongated heating element.
13. A method of using a smoking substitute system according to claim 11 or 12, the method comprising inserting the article into the device, and heating the article/consumable using the heating element.
14. A method according to claim 13 comprising inserting the article into a cavity within a main body of the device and penetrating the substrate with the heating element upon insertion of the article.
15. A method according to claim 14 wherein the substrate comprises a rod of extruded cannabinoid-containing plant material having an axial bore and wherein the heating element is inserted into the axial bore.









EUROPEAN SEARCH REPORT

 Application Number
 EP 19 02 0085

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2019/038853 A1 (EYAL AHARON M [IL] ET AL) 7 February 2019 (2019-02-07) * paragraph [0027]; claims *	1-15	INV. A24B15/16 A24F47/00
A	US 2015/136158 A1 (STEVENS RICK [US] ET AL) 21 May 2015 (2015-05-21) * paragraph [0002]; claims *	1-15	
A	WO 2018/228131 A1 (CHINA HEALTH AND WELLNESS GROUP LTD [CN]) 20 December 2018 (2018-12-20) * paragraph [0009]; claims *	1-15	
E	WO 2019/115409 A1 (NERUDIA LTD [GB]) 20 June 2019 (2019-06-20) * page 16, line 5 - page 17, line 37; claims *	1,2,4,5, 7-15	
X	US 2006/257463 A1 (ELSOHLY MAHMOUD [US] ET AL) 16 November 2006 (2006-11-16) * claims; examples *	1,2	TECHNICAL FIELDS SEARCHED (IPC) A24B A24F A23F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 9 August 2019	Examiner Leprêtre, François
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

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

EP 19 02 0085

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-08-2019

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2019038853 A1	07-02-2019	CA 3020066 A1	19-10-2017
		EP 3442626 A1	20-02-2019
		US 2019038853 A1	07-02-2019
		WO 2017178958 A1	19-10-2017

US 2015136158 A1	21-05-2015	CA 2925018 A1	21-05-2015
		CN 105792687 A	20-07-2016
		HK 1222098 A1	23-06-2017
		US 2015136158 A1	21-05-2015
		US 2016211693 A1	21-07-2016
		WO 2015073854 A2	21-05-2015

WO 2018228131 A1	20-12-2018	NONE	

WO 2019115409 A1	20-06-2019	GB 2569367 A	19-06-2019
		WO 2019115409 A1	20-06-2019

US 2006257463 A1	16-11-2006	AU 2003240824 A1	19-12-2003
		CA 2487882 A1	11-12-2003
		EP 1539069 A1	15-06-2005
		MX PA04011808 A	12-09-2005
		US 2006257463 A1	16-11-2006
		WO 03101357 A1	11-12-2003
