(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 868 222 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
25.08.2021 Bulletin 2021/34

(51) Int Cl.:
A24B 13/00 *(2006.01)* ***A24B 15/16*** *(2020.01)*

(21) Application number: **20158080.0**

(22) Date of filing: **18.02.2020**

(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) SMOKELESS ARTICLE

(57) A smokeless article for oral consumption comprising a pouch is described. The pouch encloses a contents comprising a non-tobacco filler material; wherein the non-tobacco filler material comprises greater than 25 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and a nicotine-dosed non-tobacco plant material. The smokeless article may be used for the oral delivery of nicotine to a consumer.

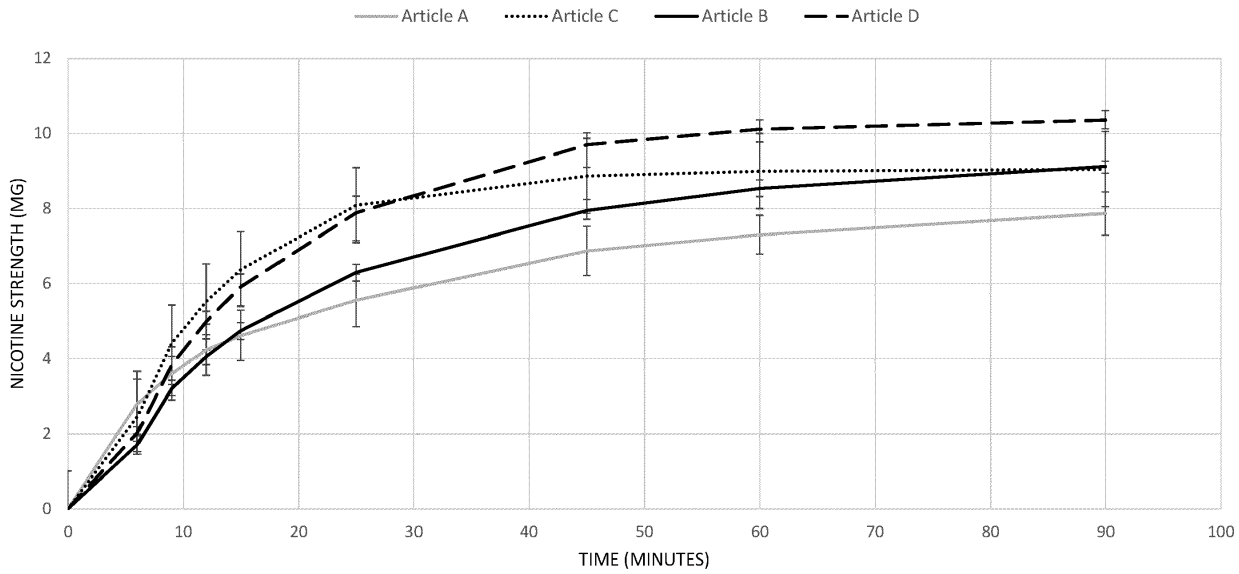


Figure 5

EP 3 868 222 A1

Description

Field of the Disclosure

[0001] The present disclosure relates to a smokeless article. In particular, the disclosure relates to a smokeless article comprising a pouch enclosing a content; the content comprising a non-tobacco filler material; wherein the non-tobacco filler material comprises: greater than 25 wt % of nicotine-dosed cellulose; and a nicotine-dosed non-tobacco plant material.

Background

[0002] Smoking is generally considered to expose a smoker to potentially harmful substances. It is generally thought that the majority of the potentially harmful substances are formed by the heat generated during burning (combustion) of the article. There is interest in so-called heat not burn products, which heat a tobacco or similar substrate at a lower temperature than a conventional cigarette. These products are usually described as less harmful than conventional cigarettes. Both conventional cigarettes and heat not burn products are visible during use and produce smoke or vapour.

[0003] As a result of these considerations and because of consumer preferences, it is desirable to find and improve alternative substance delivery routes that continue to meet user expectations. Smokeless articles are a suitable alternative because they do not require heating for substance delivery to the user. Instead, smokeless articles rely on saliva to extract soluble substances, typically nicotine and/or flavours, from tobacco contained within the smokeless article.

[0004] Conventional smokeless articles have a saliva permeable pouch housing a content. The content is generally in the form of tobacco, said tobacco containing a soluble element, typically nicotine. Such a product may be referred to as portion snus. It is typically provided as prepackaged (traditionally moist) powder in small teabag-like pouches. Each pouch is a single portion or unit. This moistened product may be referred to as original snus.

[0005] Smokeless articles are placed in the mouth where saliva extracts the soluble element from the tobacco contained within. Typically, the smokeless article is placed in the oral cavity, sublingually or in the oral vestibule (between the teeth and lips/cheeks). The user may assist extraction by oral manipulation, such as by chewing and/or sucking or pressing on the outside of the mouth to squeeze the pouch.

[0006] The resulting saliva, which contains extracts, subsequently contacts a mucous membrane in the mouth, or at another point of the gastrointestinal tract, to deliver the soluble element across the membrane and into the bloodstream. The soluble element is then transported by the bloodstream to the site of action. For example, nicotine is delivered to the brain where it acts upon acetylcholine receptors.

[0007] The above described extraction and delivery process continues until the soluble element is depleted from the smokeless article. The smokeless article must then be removed from the mouth and disposed of.

[0008] Some commercially available smokeless articles contain snuff. Snuff is smokeless tobacco made from ground or pulverised tobacco leaves. Snuff is available in dry form or wet (moist) form. Moist snuff may be referred to as snus. Two common varieties of snus are Scandinavian snus and American snus. Both varieties of snus are available in a loose form, but are often contained within a saliva permeable pouch.

[0009] Typically, production of snus is achieved by grinding a blend of leaf tobaccos to specified particle sizes. The ground tobacco is then mixed with water and sodium chloride in closed process blenders. The mixture is subjected to a heat treatment, involving temperatures up to 80 - 100 °C, for several hours to pasteurize the snus. Thereafter, the snus is cooled and other ingredients may be added. Snus is typically manufactured to meet the GothiaTek® standard, as detailed in "Swedish snus and the GothiaTek® standard" (2005), Rutqvist, et al.

[0010] The World Health Organisation states that smokeless articles are considerably less hazardous than cigarettes. Action on Smoking and Health considers smokeless articles to be about one hundred times less harmful than cigarettes. Smokeless articles are therefore thought to provide a healthier alternative for smokers.

[0011] There is a need for improved design of smokeless articles to enhance the user experience and improve the function of its constituent components.

[0012] The present disclosure has been devised in the light of the above considerations.

Summary of the Disclosure

[0013] At its most general, the present disclosure relates to a smokeless article e.g. a snus article for oral use.

[0014] According to a first aspect, there is provided a smokeless article for oral consumption comprising a pouch enclosing a content; the content comprising a non-tobacco filler material; wherein the non-tobacco filler material comprises:

greater than 25 wt % of nicotine-dosed cellulose; and

a nicotine-dosed non-tobacco plant material.

[0015] In some geographical markets for snus, particularly those which are new to the product, there is a desire for a smokeless article which provides a nicotine release profile more suited to new users or those users who wish to control or limit their intake of nicotine. At present, it is only possible to reduce the total level of nicotine in the smokeless article, but there is a need for ways to alter the nicotine release profile.

[0016] The smokeless article of the invention provides a reduced nicotine release rate. Due to the particular combination of greater than 25 wt% nicotine-dosed cellulose and nicotine-dosed non-tobacco plant material, nicotine is released from the smokeless article of the invention over a longer period of time relative to known smokeless articles containing the same total amount of nicotine. The consumer is therefore exposed to a lower level of nicotine when using the product, which may be desirable for e.g. first-time users or those who wish to maintain a lower level of nicotine exposure. This altered release profile offers a means to manufacture a more versatile product providing a tailored rate of nicotine release.

[0017] The reduced nicotine release rate also provides the benefit of extending the usable lifetime of the smokeless article, thereby enhancing the user experience of the product.

[0018] The nicotine-dosed cellulose comprises a cellulose component and a nicotine component. In some embodiments, the nicotine-dosed cellulose consists of a cellulose component and a nicotine component. The cellulose component may comprise or consist of one or more types of cellulose selected from microcrystalline cellulose (MCC), methyl cellulose (MC), ethyl cellulose (EC), hydroxyethyl cellulose (HEC), hydroxypropyl cellulose (HPC) and carboxymethyl cellulose (CMC). The cellulose component may comprise microcrystalline cellulose (MCC). In some embodiments, the cellulose component consists of MCC. MCC is particularly effective when it comes to reducing the rate of nicotine release from the pouch during use. Suitable MCC for use in the invention includes Avicel® PH-102 available from DuPont.

[0019] In some embodiments, the cellulose is in the form of particles having a D_{50} particle size of at least 30 μm, for example at least 40 μm, at least 50 μm, at least 60 μm, at least 70 μm, at least 80 μm, at least 90 μm, at least 100 μm, at least 110 μm, at least 120 μm, at least 130 μm, at least 140 μm, at least 150 μm, at least 160 μm, at least 170 μm or at least 180 μm. In some embodiments, the cellulose is in the form of particles having a D_{50} particle size of up to 500 μm, for example up to 450 μm, up to 400 μm, up to 350 μm, up to 300 μm, up to 290 μm, up to 280 μm, up to 270 μm, up to 260 μm, up to 250 μm, up to 240 μm, up to 230 μm or up to 220 μm.

[0020] In some embodiments, the cellulose is in the form of particles having a D_{50} particle size of from 30 to 500 μm, preferably from 100 to 500 μm or from 150 to 250 μm. In some embodiments, the cellulose is in the form of particles having a D_{50} particle size of about 100 μm. In some embodiments, the cellulose is microcrystalline cellulose type 102 (MCC 102).

[0021] In some embodiments, the cellulose is in the form of particles having a D_{50} particle size of about 200 μm.

[0022] Such particle sizes for the cellulose provide particularly good results with regards to controlling the nicotine release profile.

[0023] In some embodiments, the non-tobacco filler material consists of:

greater than 25 wt % of nicotine-dosed cellulose; and

a nicotine-dosed non-tobacco plant material.

[0024] In some embodiments, the non-tobacco filler material comprises at least 26 wt% of nicotine-dosed cellulose based on the total amount of non-tobacco filler material, for example at least 27 wt%, at least 28 wt%, at least 29 wt%, at least 30 wt%, at least 35 wt%, at least 40 wt%, at least 45 wt%, at least 50 wt%, at least 55 wt% or at least 60 wt%. In some embodiments, the non-tobacco filler material comprises up to 95 wt% of nicotine-dosed cellulose based on the total amount of non-tobacco filler material, for example up to 90 wt%, up to 85 wt%, up to 80 wt%, up to 75 wt%, up to 60 wt%, up to 55 wt% or up to 50 wt%.

[0025] In some embodiments, the non-tobacco filler material comprises from greater than 25 wt% to 95 wt% of nicotine-dosed cellulose based on the total amount of non-tobacco filler material, for example from greater than 25 wt% to 90 wt%, from 30 wt% to 90 wt%, from 30 wt% to 80 wt%, from 30 wt% to 70 wt%, from 35 wt% to 65 wt%, from 40 wt% to 60 wt%, or about 50 wt%.

[0026] In some embodiments, the balance of the weight of the non-tobacco filler material is the nicotine-dosed non-tobacco plant material.

[0027] In some embodiments, the non-tobacco filler material comprises up to 75 wt% nicotine-dosed non-tobacco plant material based on the total amount of non-tobacco filler material, for example up to 74 wt%, up to 73 wt%, up to 72 wt%, up to 71 wt%, up to 70 wt%, up to 65 wt%, up to 60 wt%, up to 55 wt% or up to 50 wt%.

[0028] In some embodiments, the non-tobacco filler material comprises at least 5 wt% nicotine-dosed non-tobacco plant material based on the total amount of non-tobacco filler material, for example at least 10 wt%, at least 15 wt%, at least 20 wt%, at least 25 wt%, at least 30 wt%, at least 35 wt%, at least 40 wt%, at least 45 wt% or at least 50 wt%.

[0029] In some embodiments, the non-tobacco filler material comprises from 5 wt% to 75 wt% nicotine-dosed non-tobacco plant material based on the total amount of non-tobacco filler material, for example from 10 wt% to 75 wt%, from 15 wt% to 75 wt%, from 15 wt% to 70 wt%, from 20 wt% to 70 wt%, from 25 wt% to 70 wt%, from 30 wt% to 70 wt%, from 35 wt% to 65 wt%, from 40 wt% to 60 wt% or about 50 wt%.

[0030] In some embodiments, the non-tobacco filler material comprises greater than 25 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and up to 75 wt% of a nicotine-dosed non-tobacco plant material. In some embodiments, the non-tobacco filler material consists of greater than 25 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and up to 75 wt% of a nicotine-dosed non-tobacco plant material.

[0031] In some embodiments, the non-tobacco filler material comprises greater than 30 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and up to 70 wt% of a nicotine-dosed non-tobacco plant material. In some embodiments, the non-tobacco filler material consists of greater than 30 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and up to 70 wt% of a nicotine-dosed non-tobacco plant material.

[0032] In some embodiments, the non-tobacco filler material comprises greater than 40 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and up to 60 wt% of a nicotine-dosed non-tobacco plant material. In some embodiments, the non-tobacco filler material consists of greater than 40 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and up to 60 wt% of a nicotine-dosed non-tobacco plant material.

[0033] In some embodiments, the non-tobacco filler material comprises greater than 45 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and up to 55 wt% of a nicotine-dosed non-tobacco plant material. In some embodiments, the non-tobacco filler material consists of greater than 45 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and up to 55 wt% of a nicotine-dosed non-tobacco plant material.

[0034] In some embodiments, the non-tobacco filler material comprises about 50 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and about 50 wt % of a nicotine-dosed non-tobacco plant material. In some embodiments, the non-tobacco filler material consists of about 50 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and about 50 wt % of a nicotine-dosed non-tobacco plant material.

[0035] In some embodiments, the smokeless article is tobacco-free.

[0036] In this way, the user may experience a similar or enhanced recreational/pharmaceutical effect as compared to conventional tobacco-containing products without experiencing undesirable components inherent to tobacco (e.g. tobacco flavour).

[0037] The nicotine-dosed non-tobacco plant material comprises a non-tobacco plant material component and a nicotine component. The non-tobacco plant material component may comprise any suitable non-tobacco plant material in any suitable form. The non-tobacco plant material component may be selected from at 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 siphilitica, Nepeta cataria* (Catnip), *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 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.

[0038] In some embodiments, the non-tobacco plant material component comprises wheat. In some embodiments, the non-tobacco plant material component consists of wheat. In some embodiments, the non-tobacco plant material component comprises wheat fibres. In some embodiments, the non-tobacco plant material component consists of wheat fibres. Suitable wheat fibres are include JELUCEL® WF fibres available from Jelu-werk.

[0039] In some embodiments, the wheat fibres have a particle size of 10-450 μm, for example 10-400 μm, 10-350 μm, 10-300 μm, 10-250 μm, 10-200 μm, 10-150 μm, 10-100 μm, 10-50 μm, 15-50 μm, 15-45 μm, 20-50 μm, 20-45 μm, 20-40 μm or 25-35 μm. In some embodiments, the wheat fibres have a particle size of about 30 μm.

[0040] As used herein, the term "particle size" when referring to fibres of the non-tobacco plant material, such as wheat fibres, indicates the maximum size of the longest dimension of the fibres. For example, a particle size of 50 μm indicates that in the population of fibres, the maximum fibre length is 50 μm.

[0041] Particles having the desired particle size may be obtained by passing a population of fibres through a sieve of corresponding mesh size. For example, to obtain fibres of particle size 300 μm (i.e. a maximum fibre length of 300 μm), a population of fibres are passed through a sieve with 300 μm diameter apertures in the mesh. In this way, fibres with a length of 300 μm or less pass through the mesh and fibres longer than 300 μm are retained by the mesh. The fibres which pass through the mesh may then be used in the smokeless article of the invention, having a particle size of 300

μm. Fibres of a desired particle size are also available from commercial suppliers such as Jelu-werk.

[0042] The smokeless article comprises nicotine-dosed cellulose and nicotine-dosed non-tobacco plant material. Each of these components comprises a nicotinic component. In each case the nicotinic component may be independently selected from the group consisting of nicotine salts, nicotine base, stabilized nicotine and mixtures thereof. In each case the nicotinic component may be a nicotinic compound selected from nicotine, nicotine salt(s), nicotine complex(es); and nicotine solvate(s). For example, the nicotinic component may comprise at least one nicotine salt selected from the group consisting of nicotine hydrochloride, nicotine dihydrochloride, nicotine monotartrate, nicotine bitartrate, nicotine bitartrate dihydrate, nicotine sulfate, nicotine zinc chloride monohydrate, nicotine salicylate and mixtures thereof. The nicotine-dosed cellulose may be prepared by combining a cellulose component with a nicotinic component, for example by mixing a powdered cellulose component with a powdered nicotine salt. The nicotine-dosed cellulose may be prepared by suspending a cellulose powder (e.g. MCC powder) in a solution of a nicotine salt and then drying the solution to remove the solvent and dose the cellulose with nicotine. In some embodiments the drying is performed in a fluidised bed dryer.

[0043] The nicotine-dosed non-tobacco plant material may be prepared by combining a non-tobacco plant material with a nicotinic component. In some embodiments, the non-tobacco plant material is sprayed, mixed, coated, extruded, compressed with or dipped in a solution comprising nicotine or a salt thereof.

[0044] The total level of nicotine in the smokeless article may be from 1 wt% to 5 wt% based on the total contents of the pouch, including moisture, for example from 1 wt% to 4 wt%, from 1 wt% to 3 wt%, from 1 wt% to 2 wt%, from 1 wt% to 1.5 wt%, from 1.2 wt% to 1.5 wt%, or about 1.4 wt%.

[0045] In some embodiments, the total nicotine content is from 5 to 15 mg. In some embodiments, the total nicotine content is about 10 mg.

[0046] According to a second aspect, there is provided a method of reducing the rate at which nicotine is released from a smokeless article, the smokeless article comprising a pouch enclosing a contents, the method comprising adapting the contents to comprise:

greater than 25 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and

a nicotine-dosed non-tobacco plant material.

[0047] This provides a straightforward means to reduce the rate of nicotine release from a smokeless article to provide an enhanced experience for the consumer. The rate of release can be reduced without altering the total level of nicotine, such that the total nicotine dose provided by the article over the use of the article may be unaffected.

[0048] According to a third aspect, there is provided the use of nicotine-dosed cellulose in a smokeless article to reduce the rate of nicotine release from the smokeless article, the smokeless article comprising a pouch enclosing a contents. This may comprise using nicotine-dosed cellulose in the smokeless article in an amount of greater than 25 wt % based on the total amount of non-tobacco filler material.

[0049] As used herein, the term "Dso particle size" in the context of cellulose refers to the 50% intercept in the volume distribution of particle size, i.e. the particle size at which 50 vol% of the cellulose particles have a size smaller than this value and 50 vol% of the cellulose particles have a size larger than this value. The Dso particle size may be determined by laser diffraction analysis using an instrument such as a Malvern Mastersizer, applying the Mie scattering theory.

[0050] As used herein, the term "saliva" is intended to refer to the liquid substance formed in the mouth of animals, such as humans, that includes water, electrolytes and enzymes. Other components of saliva may include mucus, white blood cells, epithelial cells and/or antimicrobial agents.

[0051] As used herein, the term "saliva-soluble" is intended to refer to compounds, ingredients, or any other substances which can dissolve in saliva present in the oral cavity of the user at physiological temperature. Such substances may include, for example, nicotine and/or flavours. In some cases a standard commercially available artificial saliva may be used to test saliva solubility. Alternatively, "saliva-soluble" may equate to "water-soluble" and refer to compounds, ingredients, or any other substances which can dissolve in water present in the oral cavity of the user at physiological temperature.

[0052] As used herein, the term "plant material" is intended to refer to a portion and/or part(s) of a plant (e.g. leaf, stem, flower or bud). The plant material may be processed (for example, by shredding, grinding or drying) or it may be non-processed (that is, used whole). The plant material is typically fibrous (comprising or characterised by fibres). For the avoidance of doubt, the term "plant material" is not intended to include pulp and/or paper which is derived from a plant material (typically wood) and chemically and/or mechanically processed to extract fibres before use.

[0053] As used herein, the term "moisture content" may include water, humectants, liquid flavourants and/or other liquid compounds.

[0054] As used herein, the term "oral consumption" is intended to refer to any oral administration route achieved by placing the smokeless article into the oral cavity. This includes, but is not limited to, buccal, sub-lingual, periodontal,

gingival and ingestion.

[0055] The smokeless article may be described as a snus article.

[0056] The smokeless article comprises a pouch having a contents, wherein the contents (e.g. nicotine-dosed cellulose and nicotine-dosed non-tobacco plant material) is completely enclosed by the pouch. The pouch is sealed to ensure that the contents of the pouch does not scatter inside the mouth.

[0057] The smokeless article preferably has a mass of about 0.1 g to 5.0 g, such as about 0.5 g to about 4.0 g or about 1.0 g to about 3.0 g.

[0058] The smokeless article preferably has a length of about 30 mm, such as about 28 mm or 26 mm, a width of about 12 mm, such as about 10 mm or 8 mm, and a depth of about 5 mm, such as about 4 mm or 3 mm.

[0059] The smokeless article preferably has an active lifetime of about 20 minutes to about 60 minutes, such as about 25 minutes to 50 minutes or about 30 minutes to about 45 minutes, after being placed in the mouth. As used herein, the term "active lifetime" is intended to refer to the amount of time after being placed in the mouth that the smokeless article provides the user with a perceptible taste and/or physiological experience. For example, for an article containing an active ingredient such as nicotine or other pharmacologically active ingredient the active lifetime may be defined as the in use period of time in which 90%wt of the available pharmacologically active is released. In other words, the active lifetime may be the duration of time from insertion into the oral cavity for 90%wt of the total amount of nicotine pharmacologically active ingredient that is capable of being released during normal use to dissolve into the user's saliva and /or enter the user's bloodstream. It will therefore be appreciated that the active lifetime of a product may vary from user to user and for a user based on oral conditions, in particular extent of salivation. Nonetheless, the skilled person is able to mimic oral conditions to determine the active lifetime in one instance, which can be used as a comparison or analysis point.

[0060] The pouch may be formed from one or more materials. The pouch material may be formed from fiber, paper, cloth and fabric. The pouch material may be formed from one or more polymeric materials. The polymeric material may be selected from one or more of hydroxypropyl cellulose (HPC), hydroxypropyl methylcellulose (HPMC), polyvinyl alcohol (PVOH), polyvinylpyrrolidone (PVP), polyethylene oxide (PEO) hydroxyethyl cellulose (HEC), polyethylene glycol (PEG), pullulan, sodium alginate, xanthan gum, tragancanth gum, guar gum, acacia gum, arabic gum, polyacrylic acid, maltodextrin, methylmethacrylate copolymer, carboxyvinyl copolymers, starch and gelatin.

[0061] The pouch is typically completely insoluble in saliva. Suitable insoluble pouch materials include, but are not limited to, fiber, paper, water-insoluble polymers, cloth and fabric. Suitable soluble pouch materials include, but are not limited to, water-soluble polymers such as polyethylene oxide (PEO), hydroxypropyl cellulose (HPC) and hydroxypropyl methylcellulose (HPMC).

[0062] The pouch may be formed by, for example, folding a single sheet on itself or bringing two or more sheets together and sealing the edges. The edges may initially be partially sealed to provide an open pouch in which the content (e.g. nicotine-dosed cellulose and nicotine-dosed non-tobacco plant material) may be placed before completely sealing the pouch closed. The sheets may be the same thickness or different thicknesses.

[0063] The pouch is porous. Preferably, at least 50% of the pores have a diameter of 50 μm to 200 μm, such as 100 μm to 175 μm or 125 μm or 150 μm. at least 50% of the pores have a diameter of at least 100 μm. For example, at least 55%, 60%, 65%, 70%, 75%, 80%, 85%, 90%, 95% or 100% of the pores have such diameters.

[0064] The pouch may be coloured or include markings, such as brand logos and text, to improve user perception. The pouch may be partially or completely coloured by a colourant.

[0065] The contents may comprise one or more substances.

[0066] The or each substance may individually be a biologically/pharmacologically active compound, pH stabilisers or adjusters, humectants, flavourants, fillers, preservatives, aqueous/non-aqueous solvents and binders. The or each substance may be provided for more than one purpose.

[0067] The contents of the pouch (i.e. the ingredients, material and/or substances enclosed within the pouch) preferably occupies substantially all of the internal volume of the pouch. The contents may occupy 80%, 85%, 90%, 95% or 100% of the internal volume of the pouch. The contents may comprise a solid material to provide physical integrity, such as an organic material (e.g. plant material) or an inorganic material. Such solid materials may naturally or inherently contain one or more biologically/pharmacologically active compounds and/or additives.

[0068] **Biologically/pharmacologically active compounds** are provided to produce a pharmacological effect in the user. Suitable biologically/pharmacologically active compounds include the group consisting of: nicotine, cocaine, caffeine, opiates and opioids, cathine and cathinone, kavalactones, mysticin, beta-carboline alkaloids, salvinorin A together with any combinations, functional equivalents to, and/or synthetic alternatives of the foregoing. Biologically/pharmacologically active compounds may also have additive properties.

[0069] In some embodiments the contents include an active compound comprising nicotine and wherein the form of nicotine is selected from the group consisting of nicotine salts, nicotine base, stabilized nicotine and mixtures thereof. For example, the contents may include at least one nicotine salt selected from the group consisting of nicotine hydrochloride, nicotine dihydrochloride, nicotine monotartrate, nicotine bitartrate, nicotine bitartrate dihydrate, nicotine sulfate,

nicotine zinc chloride monohydrate, nicotine salicylate and mixtures thereof.

[0070] **pH stabilisers or adjusters** may be provided to adjust the user experience and/or modify the bioavailability of a pharmacologically active compound. For instance, under acidic conditions, nicotine is protonated and does not readily cross mucous membranes. Examples of suitable pH stabilisers include ammonia, ammonium carbonate, sodium carbonate and calcium carbonate. The overall pH of the smokeless article is preferably pH 7 to pH 9, such as pH 7.25 to pH 8.75 or pH 7.5 to pH 8.5.

[0071] The overall pH of a smokeless article may be determined by, for example, (i) placing the smokeless article in 10 mL of distilled water (ii) agitating the mixture for at least 5 minutes and (iii) measuring the pH of the solution with a pH probe.

[0072] **Fillers** may be provided to increase the volume of the smokeless article (e.g. by increasing the volume contained within the pouch and to strengthen the contents). Suitable fillers include calcium carbonate, calcium phosphate, corn starch, grains, lactose, polysaccharides (e.g. maltodextrin), polyols, sugars (e.g. dextrose, manitol, xylitol, sorbitol), natural fibres (e.g. non-tobacco fibres), microcrystalline cellulose, cellulose and cellulose derivatives (e.g. finely divided cellulose), lignocellulose fibres (e.g. wood fibres), jute fibres and combinations thereof. In some cases, the filler content is 5 to 10 wt% of the contents e.g. around 6 to 9 wt%.

[0073] **Flavourants** may be provided in solid or liquid form. Suitable flavourants include coffee, eucalyptus, menthol, liquorice, peppermint, spearmint, 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 contents or may be provided in isolated locations and/or varying concentrations throughout the contents. As used herein, the term "flavourant" denotes a compound having a desirable taste, aroma or both.

[0074] **Humectants** may be provided to control moisture content thereby preventing the smokeless article from drying out during storage and reducing the amount of saliva wetting required before the user experience begins. 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).

[0075] The humectant may have a lower limit of at least 1 % by weight of the contents 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%.

[0076] The humectant may have an upper limit of at most 50% by weight of the contents, such as at most 40 wt%, such as at most 30 wt%, or such as at most 20 wt%, such as at most 10 wt %, such as at most 5 wt %, such as at most 2 wt%..

[0077] Preferably, the amount of humectant is 1 to 40 wt% of the contents, such as 2 to 20 wt% or 5 to 10 wt%.

[0078] Preferably, the contents has an overall amount of water of between 5 and 50 wt% based on the weight of the contents such as between 10 to 20 wt% or 40 to 50 wt%.

[0079] Smokeless articles having a total moisture content of 10% or less are generally considered to be 'dry'. Smokeless articles having a total moisture content of 40% or more are generally considered to be 'wet'.

[0080] **Sweeteners** may be provided to modify the user taste perception and, in particular, overcome bitter flavours that result from other substances. Suitable sweeteners include honey, sugar, brown sugar, glucose, fructose, sucrose, aspartame, xylitol, maltitol, saccharin sodium, glycyrrhizin tripotassium liquorice, jujube or a mixture thereof. The amount of sweetener is in some cases 1 to 20 % by weight of the contents, such as 2 to 15 wt% or 5 to 10 wt%.

[0081] **Stabilisers** are provided to prevent decomposition or degradation overtime during storage by, for example, retarding oxidation or unwanted biological activity. Stabilisers may be selected from the group consisting of antioxidants including vitamin E, such as tocopherole, ascorbic acid, sodium pyrosulfite, butylhydroxytoluene, butylated hydroxyanisole, edetic acid and salts thereof; and preservatives including citric acid, tartaric acid, lactic acid, malic acid, acetic acid, benzoic acid, sorbic acid and salts thereof.

[0082] **Binders** may be provided. Suitable binders include starches and/or cellulosic binders such as methyl cellulose, ethyl cellulose, hydroxypropyl cellulose, hydroxyethyl cellulose and carboxymethyl 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. In some embodiments the binder content is 5 to 10 wt% of the contents e.g. around 6 to 9 wt% or 7 to 8 wt%.

[0083] **Colourants** may be provided to modify the user impression of the smokeless article. Colourants include whitening agents. Colourants may be selected from one or more of common colourants such as curcumin (E100), turmeric (E100(ii)), riboflavin (E101), riboflavin-5'-phosphate (E101(ii)), tartrazine (E102), quinoline yellow (E104), riboflavin-5-sodium phosphate (E106), yellow 2G (E107), sunset yellow FCF (E110), carmine, cochineal (E120), azorubine (E122), amaranth (E123), ponceau 4R (E124), erythrosine (E127), red 2G (E128), allura red AC (E129), patent blue V (E131), indigotine (E132), brilliant blue FCF (E133), chlorophylls (E140), copper complexes of chlorophyll (E141), green S (E142), caramel (E150a-d), brilliant black BN (E151), carbon (E153), brown FK (E154), brown HT (E155), alfa-, beta- and gamma-carotene (E160a), annatto, bixin, norbixin (E160b), bell pepper (Paprika) extract (E160c), lycopene (E160d), beta-apo-8'-carotenal (E160e), ethyl ester of beta-apo-8'-carotenic acid (E160f), flavoxanthin (E161a), lutein (E161b), cryptoxanthin (E161c), rubixanthin (E161d), violaxanthin (E161e), rhodoxanthin (E161f), canthaxanthin (E161g), citranaxanthin (E161h), beetroot extract (E162), anthocyanins (E163), calcium carbonate (E170), titanium dioxide (E171), iron oxides (E172), aluminium (E173), silver (E174), gold (E175), lithol rubine BK (E180), tannins (E181). The amount of colourant

may be up to about 3% by weight of the smokeless article, such as about 0.5% to about 2.5% or about 1% to about 2%.

[0084] **Plant material** may be provided for physical integrity and may function as a natural source of substances such as, for example, biologically/pharmacologically active compounds, flavourants, pH stabilisers etc. The plant material may comprise at 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.

[0085] The plant material may be 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.

[0086] Any suitable parts of the tobacco plant may be used. This includes leaves, stems, roots, bark, seeds and flowers.

[0087] 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).

[0088] The contents may comprise at least 50 wt% plant material based on the weight of the contents, e.g. at least 60 wt% plant material e.g. around 65 wt% plant material. The contents may comprise 80 wt% or less plant material e.g. 75 or 70 wt% or less plant material.

[0089] The contents may comprise a gathered sheet of homogenised (e.g. paper/slurry recon) tobacco or gathered shreds/strips formed from such a sheet.

[0090] The sheet may have a grammage greater than or equal to 100 g/m^2, e.g. greater than or equal to 110 g/m^2 such as greater than or equal to 120 g/m^2. The sheet may have a grammage of less than or equal to 300 g/m^2 e.g. less than or equal to 250 g/m^2 or less than or equal to 200 g/m^2. The sheet may have a grammage of between 120 and 190 g/m^2.

[0091] 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

[0092] 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 cross sectional view of a first embodiment of a smokeless article.

Figure 2 shows a cross sectional view of a second embodiment of a smokeless article.

Figure 3 shows a cross sectional view of a third embodiment of a smokeless article.

Figure 4 shows a cross sectional view of a fourth embodiment of a smokeless article.

Figure 5 is a plot showing the nicotine release rate from smokeless articles according to the invention and comparative smokeless articles over a 90 minute period.

Detailed Description of the Figures

[0093] As shown in Figure 1 there is provided a first embodiment of a smokeless article 10 having a pouch 12 containing contents 14. The pouch 12 is substantially rectangular. The pouch 12 is formed from a single sheet of material and is substantially filled by the contents 14. The pouch 12 has a seal 16 along each of the three edges where the inner face

of the single sheet meets itself to seal the contents 14 in the pouch 12.

[0094] Figure 2 shows a second embodiment of a smokeless article 10' having a pouch 12 containing contents 14. The pouch 12 is substantially circular. The pouch 12 is formed from two opposing sheets of material and is substantially filled by the contents 14. The pouch has a circumferential seal 16 along the edges where the two opposing sheets of material meet to seal the contents 14 in the pouch 12.

[0095] Figure 3 shows a third embodiment of a smokeless article 10" that, like the first embodiment, has a pouch 12 made from a single sheet of material. However, one of the three seals 16' is formed by an overlap of the inner face and the outer face of the single sheet meet to seal the contents 14 in the pouch 12. The remaining two seals at opposing ends of the pouch 12 are formed where the inner face of the single sheet meets itself.

[0096] Figure 4 shows a fourth embodiment of a smokeless article 10'" that comprises the third embodiment enclosed by outer pouch 12" having an outer contents 14" positioned in the space between the inner pouch 12' and the outer pouch 12". The outer pouch 12" also has a circumferential seal 16'" to seal the outer contents 14" and inner pouch 12' in the outer pouch 12".

[0097] Use of the fourth embodiment begins when the smokeless article 10'" is placed in the user's mouth where it is exposed to saliva. Saliva first permeates outer pouch 12" and dissolves and extracts the saliva soluble substances of outer contents 14". Upon leaving the outer pouch 12", the saliva soluble substances of outer contents 14" therefore provide the user with a first experience. Saliva subsequently further permeates the inner pouch 12' where it dissolves and extracts the saliva soluble substances of inner contents 14'. The saliva soluble substances of inner contents 14' therefore provide the user with a complimentary and secondary experience. When the extractable amount of saliva soluble substances in the inner contents 14' and outer contents 14" drops below perceivable levels the active lifetime of the smokeless article 10'" has ended.

Examples

[0098] Various snus samples were prepared and tested for nicotine release rate.

[0099] Two smokeless articles according to the invention were prepared and tested: the first containing 50 wt% nicotine-dosed wheat and 50 wt% nicotine-dosed MCC (Article A), and the second containing 100 wt% nicotine-dosed MCC (Article B).

[0100] Two comparative articles were also prepared and tested, the first containing 100 wt% nicotine-dosed wheat (Article C) and the second containing 75 wt% nicotine-dosed wheat and 25 wt% nicotine-dosed MCC (Article D).

[0101] For each Article, 100 g of master batch contents was prepared with ingredients according to the following table:

Ingredient content / g	**Article A**	**Article B**	**Article C**	**Article D**
Nicotine ditartarate dihydrate	1.40	1.40	1.40	1.40
Wheat fibres (JELUCEL WF-30)	28.01	0	28.01	42.02
Microcrystalline cellulose (Avicel PH-102)	28.01	56.02	0	14.00
Salt	4.20	4.20	4.20	4.20
Water	30.00	30.00	30.00	30.00
Ammonium chloride solution	2.03	2.03	2.03	2.03
Propylene glycol	3.65	3.65	3.65	3.65
Sodium carbonate solution	0.41	0.41	0.41	0.41
Flavour	2.30	2.30	2.30	2.30
Total	100	100	100	100

[0102] Portions of the master batch were then added to pouches to form the articles for testing. Each of Articles A-D contained the same total nicotine content (10 mg) and were tested for nicotine release rate under identical conditions.

[0103] The samples were tested by immersing each of the samples in the same model solution representing human saliva. The model solution was made with deionised water containing the following ingredients:

Ingredient	**Content (g/1000mL)**
Magnesium chloride hexahydrate	0.17

(continued)

Ingredient	Content (g/1000mL)
Potassium hydrogen phosphate anhydrous	0.68
Sodium chloride	0.33
Potassium chloride	0.75
Calcium chloride dehydrate	0.15
Potassium carbonate	0.53
Hydrochloric acid	to pH 6.8 ± 0.1

[0104] The model solution was prepared by mixing all ingredients in the table except hydrochloric acid and transferring to a 2 L glass reservoir. 500 mL of deionised water was added and the solution was mixed well to dissolve. Further deionised water was added to bring the total amount of deionised water added to 1 L. The reservoir was sealed and mixed well. The pH was then adjusted to 6.8 by the addition of HCl. The solution was used within 2 days of preparation.

[0105] Nicotine concentration in the model solution was determined at certain time intervals by an optimised HPLC method using USP 4 flow-through dissolution apparatus with online UV system, thereby providing an indication of the rate of release of nicotine from the immersed pouch.

[0106] Figure 5 shows the nicotine release rate from smokeless articles according to the invention and comparative smokeless articles over a 90 minute period.

[0107] The smokeless articles A and B according to the invention displayed a slower nicotine release rate over the period from 10-50 minutes of product use relative to the comparative articles C and D, which corresponds to the period of time for which the product would be used by a consumer before disposal. After 15 minutes, Articles A and B had each released approximately 4.5 mg of nicotine compared with 6 mg released from Articles C and D. After 50 minutes, Articles A and B had each released around 7-8 mg of nicotine compared with around 9-10 mg released from Articles C and D. Thus the invention provides a means to reduce the rate of nicotine release from a smokeless article such that nicotine is released more gradually over a longer period of time.

[0108] 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.

[0109] 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.

[0110] 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.

[0111] Any section headings used herein are for organizational purposes only and are not to be construed as limiting the subject matter described.

[0112] 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.

[0113] 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%.

[0114] 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 embodiments 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. A smokeless article for oral consumption comprising a pouch enclosing a contents; the contents comprising a non-tobacco filler material; wherein the non-tobacco filler material comprises:

   greater than 25 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and a nicotine-dosed non-tobacco plant material.

2. The smokeless article according to claim 1, wherein the nicotine-dosed cellulose comprises nicotine-dosed micro-crystalline cellulose.

3. The smokeless article according to claim 1 or 2, wherein the non-tobacco filler material comprises at least 50 wt% of nicotine-dosed cellulose based on the total amount of non-tobacco filler material.

4. The smokeless article according to any one of claims 1 to 3, wherein the non-tobacco filler material comprises up to 75 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material.

5. The smokeless article according to any one of claims 1 to 4, wherein the non-tobacco filler material comprises about 50 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material.

6. The smokeless article according to any one of claims 1 to 5, wherein the nicotine-dosed non-tobacco plant material comprises wheat.

7. The smokeless article according to any one of claims 1 to 6, wherein the cellulose is in the form of particles having a Dso particle size of from 100 to 500 μm, preferably from 150 to 250 μm.

8. The smokeless article according to claim 7, wherein the cellulose is in the form of particles having a Dso particle size of about 200 μm.

9. The smokeless article according to any one of claims 1 to 8, wherein the total level of nicotine in is from 1 wt% to 5 wt% based on the total amount of non-tobacco filler material.

10. The smokeless article according to any one of claims 1 to 9, wherein each of the nicotine-dosed cellulose and nicotine-dosed non-tobacco plant material contain a nicotinic component independently selected from the group consisting of nicotine salts, nicotine base, stabilized nicotine and mixtures thereof.

11. A method of reducing the rate at which nicotine is released from a smokeless article, the smokeless article comprising a pouch enclosing a contents, the method comprising adapting the contents to comprise:

    greater than 25 wt % of nicotine-dosed cellulose based on the total amount of non-tobacco filler material; and a nicotine-dosed non-tobacco plant material.

12. Use of nicotine-dosed cellulose in a smokeless article to reduce the rate of nicotine release from the smokeless article, the smokeless article comprising a pouch enclosing a contents.

13. The use according to claim 12 wherein the smokeless article is according to any one of claims 1 to 10.

14. A method of manufacturing a smokeless article according to any one of the preceding claims comprising the steps of;

    (i) forming one or more sheets of pouch material around the contents; and
    (ii) thermally or chemically sealing the pouch material to enclose the contents.

15. A kit comprising a plurality of smokeless articles according to any one of claims 1 to 10 and a container.

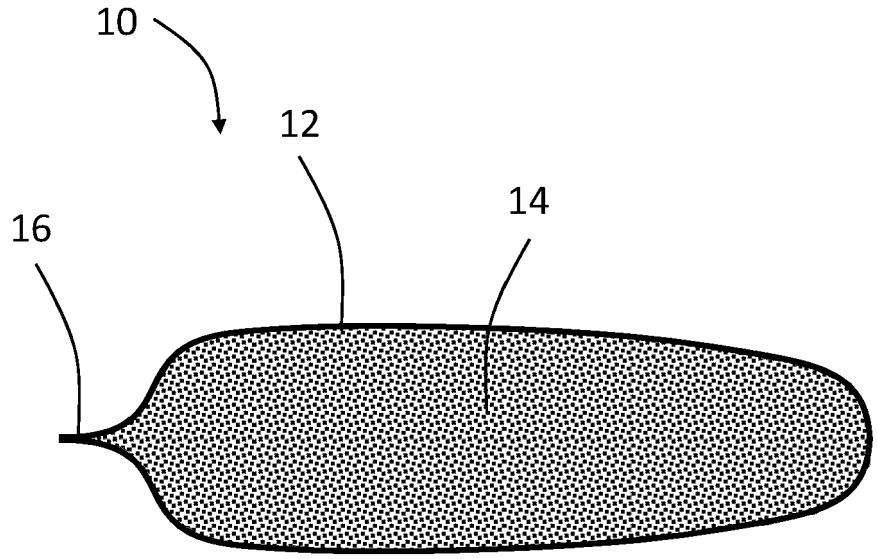


Figure 1

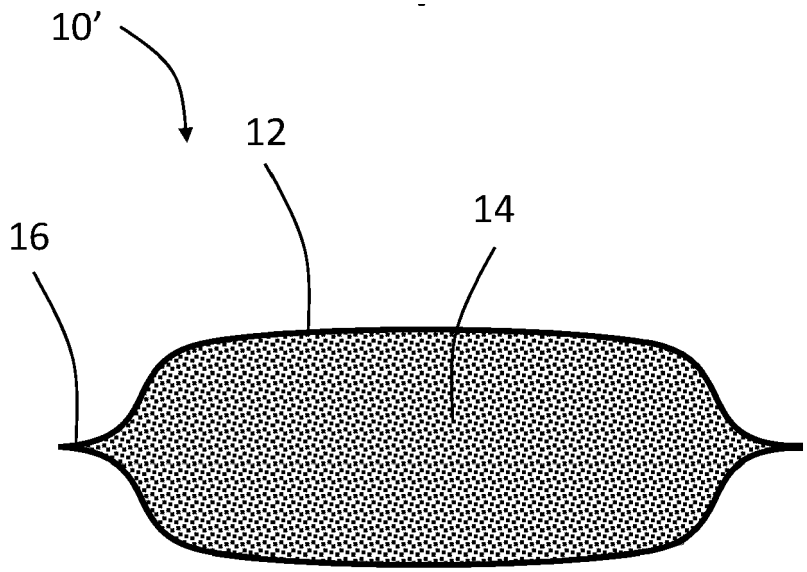


Figure 2

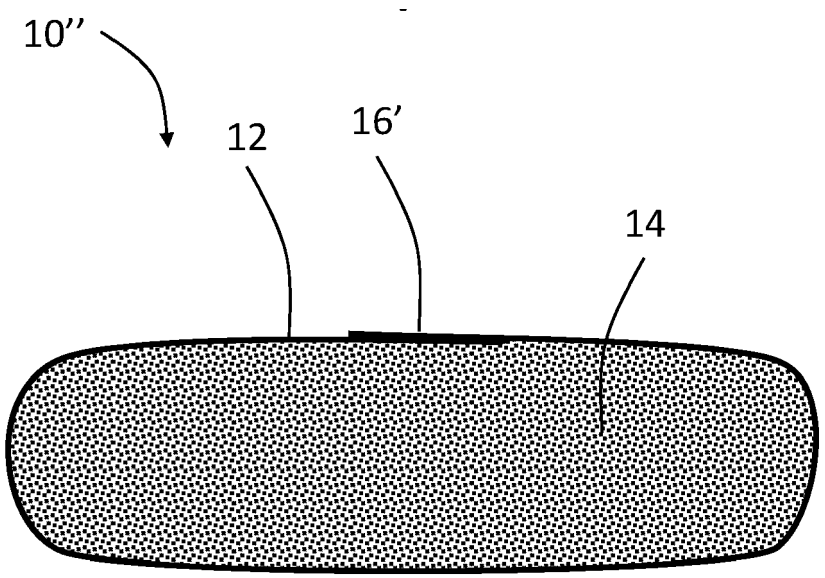


Figure 3

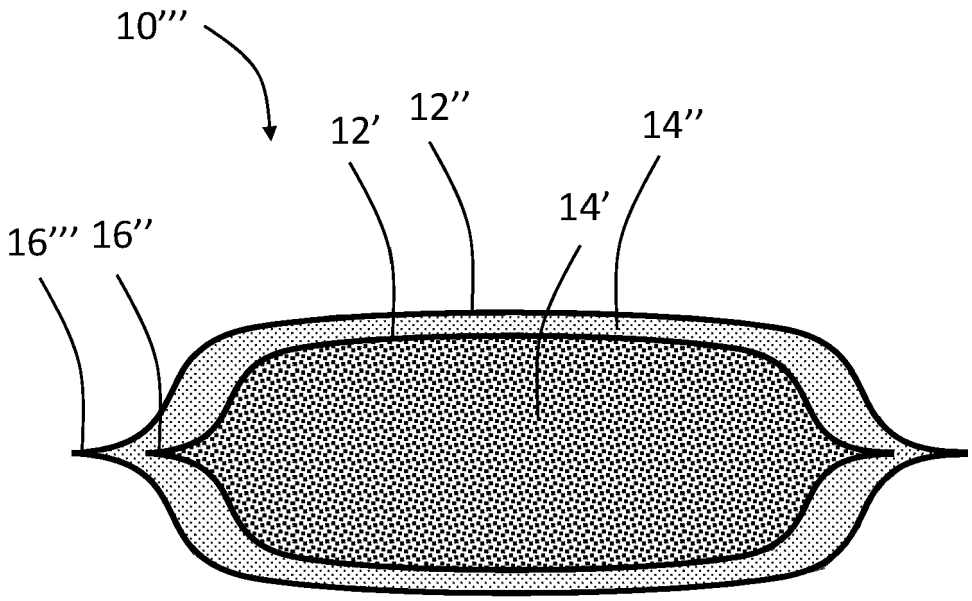


Figure 4

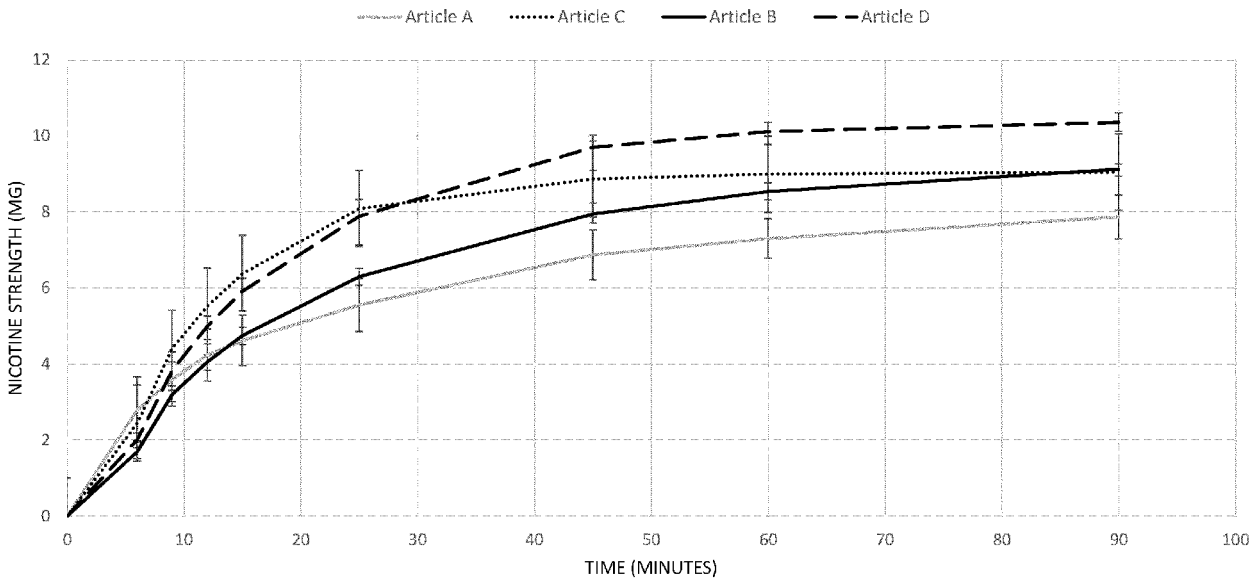

Article A
Article C
Article B
Article D
NICOTINE STRENGTH (MG)
TIME (MINUTES)
0
2
4
6
8
10
12
0
10
20
30
40
50
60
70
80
90
100

Figure 5

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 20 15 8080

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 3 491 940 A1 (REEMTSMA CIGARETTENFABRIKEN GMBH [DE]) 5 June 2019 (2019-06-05) * paragraph [0006]; claim 5; example 1 *	1-4,6, 9-14	INV. A24B13/00 A24B15/16
X	WO 2019/115778 A1 (SWEDISH MATCH NORTH EUROPE AB [SE]) 20 June 2019 (2019-06-20) * page 8, line 13 - line 19; claims 1, 2, 20, 21, 28, 29, 33, 42 * * page 7, line 22 - line 24 *	1-4,6,15	
X	NO 343 402 B1 (SWEDISH MATCH NORTH EUROPE AB [SE]) 25 February 2019 (2019-02-25) * page 6, line 7 - line 9; claims 1, 8 *	1-4,6,15	
X	SE 540 813 C2 (SWEDISH MATCH NORTH EUROPE AB [SE]) 20 November 2018 (2018-11-20) * page 6, line 7 - line 9; claims 1,8 * * page 2, line 1 - line 4 *	1-4,6,15	
X	WO 2015/067372 A1 (SWEDISH MATCH NORTH EUROPE AB [SE]) 14 May 2015 (2015-05-14) * examples *	1,3,4,6, 7,10-14	TECHNICAL FIELDS SEARCHED (IPC) A24B
X	WO 2013/152918 A1 (SWEDISH MATCH NORTH EUROPE AB [SE]) 17 October 2013 (2013-10-17) * examples; claim 1 *	1,3-5,7, 8,10-14	
X	US 2013/152953 A1 (MUA JOHN-PAUL [US] ET AL) 20 June 2013 (2013-06-20) * paragraph [0083] - paragraph [0084]; examples 3,4 *	1-5, 10-15	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 August 2020	Villányi Kelemen, K

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)

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 20 15 8080

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	WO 2018/197454 A1 (SWEDISH MATCH NORTH EUROPE AB [SE]) 1 November 2018 (2018-11-01) * page 7, line 1 - line 7; claims 1,12,16 * -----	1-4,6,15	

TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 August 2020	Villányi Kelemen, K

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 20 15 8080

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

20-08-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3491940 A1	05-06-2019	CA 3085367 A1	06-06-2019
		EP 3491940 A1	05-06-2019
		WO 2019105960 A1	06-06-2019
WO 2019115778 A1	20-06-2019	CA 3085204 A1	20-06-2019
		WO 2019115778 A1	20-06-2019
NO 343402 B1	25-02-2019	NONE	
SE 540813 C2	20-11-2018	SE 540813 C2	20-11-2018
		SE 1750488 A1	25-10-2018
WO 2015067372 A1	14-05-2015	DK 3065578 T3	01-04-2019
		EP 3065578 A1	14-09-2016
		SI 3065578 T1	31-05-2019
		WO 2015067372 A1	14-05-2015
WO 2013152918 A1	17-10-2013	CA 2865683 A1	17-10-2013
		DK 2649888 T3	27-04-2020
		DK 2836088 T3	06-06-2016
		EP 2649888 A1	16-10-2013
		EP 2836088 A1	18-02-2015
		RU 2014142551 A	10-06-2016
		US 2015075543 A1	19-03-2015
		WO 2013152918 A1	17-10-2013
US 2013152953 A1	20-06-2013	CN 104039178 A	10-09-2014
		EP 2790535 A2	22-10-2014
		ES 2566019 T3	08-04-2016
		JP 6154399 B2	28-06-2017
		JP 2015504658 A	16-02-2015
		US 2013152953 A1	20-06-2013
		WO 2013090366 A2	20-06-2013
WO 2018197454 A1	01-11-2018	EP 3614869 A1	04-03-2020
		US 2020128870 A1	30-04-2020
		WO 2018197454 A1	01-11-2018

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Non-patent literature cited in the description

- **RUTQVIST.** *Swedish snus and the GothiaTek® standard,* 2005 **[0009]**