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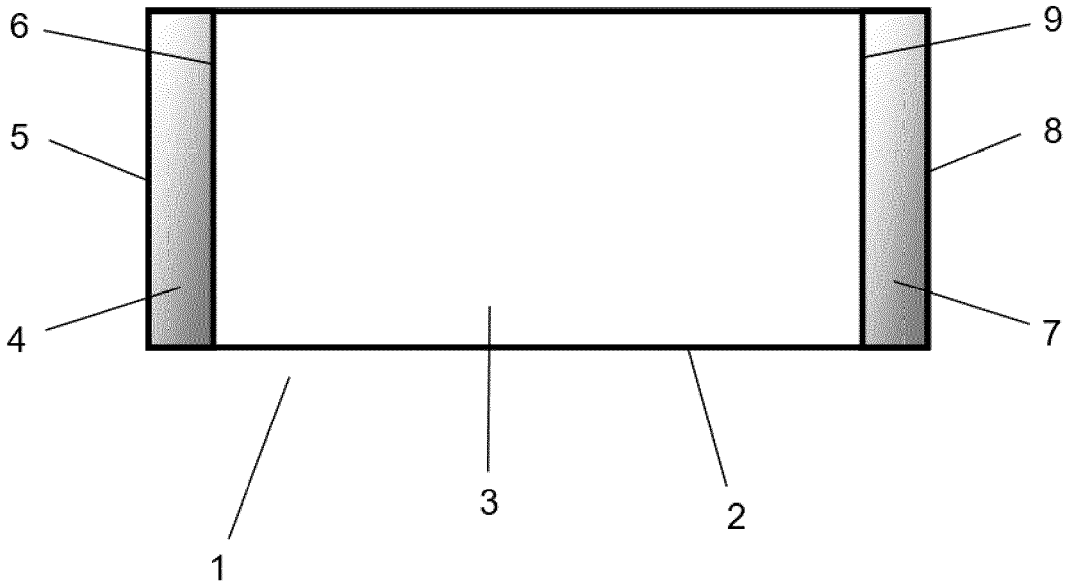
(54) **POUCHED PRODUCT AND METHOD OF MAKING**

(57) The present invention provides a pouched product for oral consumption comprising end seams that are shaped to provide improved user comfort and to have good structural integrity. The pouched product may particularly be a smokeless article. The invention also relates to a method of manufacturing the pouched product.

Figure 1



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Description

Field of the Invention

[0001] The present invention relates to a pouched product for oral consumption, especially a smokeless article, and also relates to a method of making the pouched product. In particular, the invention relates to a pouched product providing improved user comfort and having good structural integrity.

Background

[0002] Smoking is known 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 pre-packaged (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. 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.

[0008] 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 pasteurise 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.

[0009] 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.

[0010] There is a need for improved design of smokeless articles to enhance the user experience. In particular, there is a need for improved comfort for the user when the smokeless article is placed in the oral cavity, particularly in view of the fact that the smokeless article may remain in the oral cavity for extended periods of time. It is also important that any improvements in comfort do not compromise the structural integrity of the smokeless article. It is also desirable to maintain ease of manufacture of the smokeless article.

[0011] The present invention has been devised in light of the above considerations.

Summary of the Invention

[0012] A first aspect of the invention is a pouched product for oral consumption comprising a water-permeable pouch pocket enclosing a content; wherein the pouched product comprises a longitudinal seam, a first end seam and a second end seam, wherein the pouch pocket is sealed at the longitudinal seam, the first end seam and the second end seam; wherein the first end seam and the second end seam are discrete, non-continuous and situated at opposite ends of the pouch pocket; and wherein the first end seam comprises a first end seam inner border proximal to the pouch pocket and a first end seam outer border distal to the pouch pocket, wherein the first end seam inner border and the first end seam outer border each comprise an arcuate portion.

[0013] Suitably, the pouched product is a smokeless

article, e.g. a snus article for oral use.

[0014] The present invention relates to a pouched product that provides improved comfort to the user, by having an end seam outer border that comprises an arcuate portion. Specifically, a portion of the pouched product that contacts the oral cavity of the user, when the user is using the pouched product orally, is arcuate. This provides improved mouthfeel (particularly on the gum of the user) compared with typical known pouched products, which generally have corners that are sharp where straight and/or serrated edges meet. In addition, the pouched product has an end seam inner border that also comprises an arcuate portion. The arcuate portions of the end seam outer border and the end seam inner border provide a more consistent seal strength, ensuring good structural integrity of the pouched product, which is important to prevent leakage of the enclosed content.

[0015] Furthermore, the arcuate portion can have the effect of reducing the area of the end seam, which can beneficially result in the pouched product being able to be used more discreetly, as the user may be able to "hide" the product more readily, e.g. between the gum and lip.

[0016] Moreover, it is believed that the shape of an arcuate portion, such as a rounded edge or corner, provides psychological benefits for the user, being considered to be associated with greater stability and comfort than a typical known pouched product having sharp corners and straight or serrated edges.

[0017] In some embodiments, the content of the pouch pocket comprises an active ingredient. In some embodiments, the active ingredient is selected from nicotine, cocaine, caffeine, an opiate, an opioid, cathine, cathinone, a kavalactone, mysticin, a beta-carboline alkaloid, salvinorin A, or a combination thereof. In some embodiments, the active ingredient is nicotine.

[0018] In some embodiments, the nicotine is provided in a plant material. In some embodiments, the plant material is tobacco.

[0019] In some embodiments, the pouched product is substantially tobacco-free. In some embodiments, the pouched product is tobacco-free. 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).

[0020] In some embodiments, the total nicotine content is from 5 to 15 mg. In some embodiments, the total nicotine content is about 10 mg.

[0021] In some embodiments, greater than 75 wt%, preferably greater than 80 wt%, of the total nicotine content of the pouched product is released from the pouched product after 20 minutes immersed in water.

[0022] A second aspect of the invention provides a method of manufacturing the pouched product of the first aspect, comprising the steps of: (i) forming one or more sheets of pouch material around the content; and (ii) thermally or chemically sealing the pouch material to enclose the content.

[0023] A third aspect of the invention provides a method of improving the comfort of a pouched product, wherein the pouched product is for oral consumption and comprises a water-permeable pouch pocket enclosing a content, the method comprising the provision of a pouched product comprising a longitudinal seam, a first end seam and a second end seam, wherein the pouch pocket is sealed at the longitudinal seam, the first end seam and the second end seam; wherein the first end seam and the second end seam are discrete, non-continuous and situated at opposite ends of the pouch pocket; and wherein the first end seam comprises a first end seam inner border proximal to the pouch pocket and a first end seam outer border distal to the pouch pocket, wherein the first end seam inner border and the first end seam outer border each comprise an arcuate portion.

[0024] The method of the third aspect may also relate to maintaining or improving the structural integrity of the pouched product.

[0025] A fourth aspect of the invention provides a kit comprising a plurality of pouched products according to the first aspect and a container.

[0026] The invention includes the combination of the aspects and preferred features described except where such a combination is clearly impermissible or expressly avoided.

Summary of the Figures

[0027] Embodiments and experiments illustrating the principles of the invention will now be discussed with reference to the accompanying figures in which:

Figure 1 shows a top view of a prior art pouched product;

Figure 2 shows an alternative view of the prior art pouched product, in which the longitudinal seam is visible;

Figure 3 shows a top view of a first embodiment of the pouched product of the invention, in which the first end seam inner border, first end seam outer border, second end seam inner border and second end seam outer border each comprise two arcuate portions;

Figure 4 shows a top view of a second embodiment of the pouched product of the invention, in which the first end seam inner border, first end seam outer border, second end seam inner border and second end seam outer border each comprise one arcuate portion.

Detailed Description of the Invention

[0028] Aspects and embodiments of the present invention will now be discussed with reference to the

accompanying figures. Further aspects and embodiments will be apparent to those skilled in the art. All documents mentioned in this text are incorporated herein by reference.

[0029] 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.

[0030] As used herein, the term "saliva-soluble" is intended to refer to compounds, ingredients or any other substances that can dissolve in saliva present in the oral cavity of the user at physiological temperature. Such substances may include, for example, nicotine and/or flavourants. 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 that can dissolve in water present in the oral cavity of the user at physiological temperature.

[0031] As used herein, the term "oral consumption" is intended to refer to any oral administration route achieved by placing the pouched product into the oral cavity. This includes, but is not limited to, buccal, sublingual, periodontal, gingival and ingestion.

[0032] As used herein, the term "moisture content" may include water, humectants, liquid flavourants and/or other liquid components.

Pouched product

[0033] The pouched product may be described as a smokeless article, such as a snus article.

[0034] The pouched product comprises a pouch pocket having a content, wherein the content is completely enclosed by the pouch pocket. The pouch pocket is sealed to ensure that the content of the pouch pocket does not scatter inside the mouth, when in use.

[0035] The pouched product can be provided in a range of sizes. It is to be understood that dissolution of the enclosed content will change based on size.

[0036] In some embodiments, the pouched product is designed so as to be substantially similar in dimensions, mass and/or size to conventional pouched products (e.g. conventional smokeless articles such as conventional snus articles). As described herein, the shape of the pouched product of the invention may result in beneficially reducing the total area compared with conventional pouched products, whilst otherwise retaining a similar size (e.g. due to rounded corners).

[0037] The pouched product 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.

[0038] In some embodiments, the pouched product has a length (i.e. a largest dimension, such as the largest distance from the first end seam outer border 15 to the second end seam outer border 18 in the embodiment of Figure 3 [as discussed further below]) of about 16 mm to about 40 mm, or about 20 mm to about 40 mm, or about 25 mm to about 40 mm, e.g. about 16 mm, about 17 mm, about 18 mm, about 19 mm, about 20 mm, about 21 mm, about 22 mm, about 23 mm, about 24 mm, about 25 mm, about 26 mm, about 27 mm, about 28 mm, about 29 mm, about 30 mm, about 31 mm, about 32 mm, about 33 mm, about 34 mm, about 35 mm, about 36 mm, about 37 mm, about 38 mm, about 39 mm, or about 40 mm.

[0039] In some embodiments, the pouched product has a length of about 30 mm or about 35 mm.

[0040] In some embodiments, the pouched product has a width (i.e. a largest perpendicular distance to the length) of about 8 mm to about 20 mm, or about 10 mm to about 20 mm, or about 10 mm to about 18 mm, e.g. about 8 mm, about 9 mm, about 10 mm, about 11 mm, about 12 mm, about 13 mm, about 14 mm, about 15 mm, about 16 mm, about 17 mm, about 18 mm, about 19 mm, or about 20 mm.

[0041] In some embodiments, the pouched product has a width of about 12 mm or about 14 mm.

[0042] In some embodiments, the pouched product has approximate largest dimensions of about 25 mm to about 40 mm (length) by about 10 mm to about 18 mm (width).

[0043] In some embodiments, the pouched product has approximate largest dimensions of about 35 mm (length) by about 14 mm (width), or about 30 mm (length) by about 14 mm (width), or about 35 mm (length) by about 12 mm (width), or about 30 mm (length) by about 12 mm (width).

[0044] In some embodiments, the pouched product has an approximate surface area of at most 1500 mm^2, or at most 1250 mm^2, or at most 1100 mm^2, or at most 1000 mm^2, or at most 900 mm^2, or at most 800 mm^2, or at most 700 mm^2, or at most 600 mm^2. In some embodiments, the pouched product has an approximate surface area of at least 200 mm^2, or at least 300 mm^2, or at least 400 mm^2, or at least 500 mm^2, or at least 600 mm^2, or at least 700 mm^2, or at least 800 mm^2. The surface area is defined as the surface area of the top face and bottom face of the pouched product added together (as if the pouched product were flat).

[0045] The third dimension, which represents the depth or thickness of the pouched product, can vary, e.g. based on the packing of content in the pouch pocket. In some embodiments, the pouched product has a depth of about 1 mm to about 20 mm, or about 2 mm to about 10 mm, or about 3 mm to about 8 mm, e.g. about 2 mm, or about 3 mm, or about 4 mm, about 5 mm, about 6 mm, about 7 mm, about 8 mm, about 9 mm, about 10 mm, about 12 mm, about 14 mm, about 16 mm, about 18 mm, or about 20 mm. The depth may be measured at the thickest point of the pouched product and/or the pouch pocket.

[0046] In some embodiments, the pouched product has a depth of about 5 mm.

[0047] Alternatively, the pouched product may be

somewhat larger in size or somewhat smaller in size than typical or conventional pouched products. The design criteria provided herein may provide particularly advantageous characteristics, regardless of size.

[0048] The pouched product preferably has an active lifetime of about 20 minutes to about 60 minutes, such as about 25 minutes to about 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 pouched product provides the user with a perceptible taste and/or physiological experience. For example, for a pouched product containing an active ingredient such as nicotine or other biologically or pharmacologically active compound, the active lifetime may be defined as the in-use period of time in which 90%wt of the available active ingredient 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 or pharmacologically active ingredient that is capable of being released during normal use to dissolve into the user's saliva and/or to 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.

Pouch pocket

[0049] The pouch pocket may be formed from one or more materials. The pouch material may be formed from fibre, paper, cloth and/or 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 gelatine.

[0050] The pouch pocket is typically completely insoluble in saliva. Suitable insoluble pouch materials include, but are not limited to, fibre, 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).

[0051] The pouch pocket 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 may be subsequently placed or may have already been placed, before completely sealing the pouch closed. The sheets may be the same thickness or different thicknesses.

[0052] The pouch pocket 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. In some embodiments, 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 may have such diameters.

[0053] The pouch pocket may be coloured or include markings, such as brand logos and/or text, to improve user perception. The pouch pocket may be partially or completely coloured by a colourant.

[0054] The pouch pocket can be provided in a range of sizes. It is to be understood that dissolution of the enclosed content will change based on size.

[0055] In some embodiments, the pouch pocket is designed so as to be substantially similar in dimensions, mass and/or size to pouch pockets in conventional pouched products (e.g. conventional smokeless articles such as conventional snus articles). As described herein, the pouch pocket of the invention may be shaped (e.g. so as to have rounded corners and/or curved ends) as a result of the shape of the first end seam inner border and optionally the second end seam inner border, which may have beneficial effects in terms of seal strength and structural integrity.

[0056] In some embodiments, the pouch pocket has a length (i.e. a largest dimension, such as the largest distance from the first end seam inner border 16 to the second end seam inner border 19 in the embodiment of Figure 3 [as discussed further below]) of about 10 mm to about 35 mm, or about 15 mm to about 35 mm, or about 20 mm to about 35 mm, e.g. about 10 mm, about 11 mm, about 12 mm, about 13 mm, about 14 mm, about 15 mm, about 16 mm, about 17 mm, about 18 mm, about 19 mm, about 20 mm, about 21 mm, about 22 mm, about 23 mm, about 24 mm, about 25 mm, about 26 mm, about 27 mm, about 28 mm, about 29 mm, about 30 mm, about 31 mm, about 32 mm, about 33 mm, about 34 mm, or about 35 mm.

[0057] In some embodiments, the pouch pocket has a length of about 22 mm or about 27 mm.

[0058] In some embodiments, the pouch pocket has a width (i.e. a largest perpendicular distance to the length) that is approximately the same as or similar to the width of the pouched product as a whole (e.g. see the embodiments of Figures 3 and 4). In alternative embodiments, such as where the first and second end seams extend along the longest sides (i.e. the length) of the pouched product instead of the shortest sides (i.e. the width as in Figures 3 and 4), the pouch pocket may have a length that is approximately the same as or similar to the length of the pouched product as a whole.

[0059] In some embodiments, the pouch pocket has a width of about 8 mm to about 20 mm, or about 10 mm to about 20 mm, or about 10 mm to about 18 mm, e.g. about

8 mm, about 9 mm, about 10 mm, about 11 mm, about 12 mm, about 13 mm, about 14 mm, about 15 mm, about 16 mm, about 17 mm, about 18 mm, about 19 mm, or about 20 mm.

[0060] In some embodiments, the pouch pocket has a width of about 12 mm or about 14 mm.

[0061] In some embodiments, the pouch pocket has approximate largest dimensions of about 20 mm to about 35 mm (length) by about 10 mm to about 18 mm (width).

[0062] In some embodiments, the pouch pocket has approximate largest dimensions of about 27 mm (length) by about 14 mm (width), or about 22 mm (length) by about 14 mm (width), or about 27 mm (length) by about 12 mm (width), or about 22 mm (length) by about 12 mm (width).

[0063] In some embodiments, the pouch pocket has an approximate surface area of at most 1300 mm^2, or at most 1050 mm^2, or at most 900 mm^2, or at most 800 mm^2, or at most 700 mm^2, or at most 600 mm^2, or at most 500 mm^2, or at most 400 mm^2. In some embodiments, the pouch pocket has an approximate surface area of at least 200 mm^2, or at least 300 mm^2, or at least 400 mm^2, or at least 500 mm^2, or at least 600 mm^2. The surface area is defined as the surface area of the top face and bottom face of the pouch pocket added together (as if the pouch pocket were flat).

[0064] The third dimension, which represents the depth or thickness of the pouch pocket, can vary, e.g. based on the packing of content in the pouch pocket. Thus, in some embodiments, the pouch pocket has a depth that is approximately the same as or similar to the depth of the pouched product as a whole.

[0065] In some embodiments, the pouch pocket has a depth of about 1 mm to about 20 mm, or about 2 mm to about 10 mm, or about 3 mm to about 8 mm, e.g. about 2 mm, or about 3 mm, or about 4 mm, about 5 mm, about 6 mm, about 7 mm, about 8 mm, about 9 mm, about 10 mm, about 12 mm, about 14 mm, about 16 mm, about 18 mm, or about 20 mm. The depth may be measured at the thickest point of the pouch pocket.

[0066] In some embodiments, the pouch pocket has a depth of about 5 mm.

[0067] Alternatively, the pouch pocket may be somewhat larger in size or somewhat smaller in size than pouch pockets in typical or conventional pouched products. The design criteria provided herein may provide particularly advantageous characteristics, regardless of size.

Seams

[0068] The pouched product comprises a longitudinal seam, a first end seam and a second end seam. The pouch pocket is sealed at the longitudinal seam, the first end seam and the second end seam.

[0069] The longitudinal seam is a sealed seam that extends lengthwise of the pouched product. It may be formed when lateral edges of a sheet of pouch material are engaged and sealed, which may result in a tubular structure.

[0070] The first end seam and the second end seam are discrete (i.e. they are individually separate and distinct), non-continuous (i.e. there are clear interruptions between the locations of the two end seams with respect to the pouch pocket, such that there are regions of the perimeter of the pouch pocket in which no seam is formed), and situated at opposite ends of the pouch pocket. The first end seam and the second end seam may be formed when the two ends of a tubular structure (which may result from the formation of a longitudinal seam as described above) are sealed.

[0071] The first end seam comprises a first end seam inner border proximal to the pouch pocket and a first end seam outer border distal to the pouch pocket. The inner border may be the boundary where the end seam meets the pouch pocket. The outer border may be the outermost edge of the end seam with respect to the pouch pocket. The outer border may represent an outer side or edge of the pouched product as a whole.

[0072] The second end seam may also comprise a second end seam inner border proximal to the pouch pocket and a second end seam outer border distal to the pouch pocket.

[0073] The first end seam inner border and the first end seam outer border each comprise one or more arcuate portion(s). An arcuate portion may define a portion of the circumference of a circle.

[0074] In some embodiments, the first end seam inner border comprises one arcuate portion.

[0075] In some embodiments, the first end seam inner border comprises a plurality of arcuate portions.

[0076] In some embodiments, the first end seam inner border comprises two arcuate portions.

[0077] In some embodiments, the first end seam outer border comprises one arcuate portion.

[0078] In some embodiments, the first end seam outer border comprises a plurality of arcuate portions.

[0079] In some embodiments, the first end seam outer border comprises two arcuate portions.

[0080] In some embodiments, the first end seam inner border comprises one arcuate portion and the first end seam outer border comprises one arcuate portion.

[0081] In some embodiments, the first end seam inner border comprises two arcuate portions and the first end seam outer border comprises two arcuate portions.

[0082] The second end seam inner border and the second end seam outer border may also each comprise one or more arcuate portion(s).

[0083] In some embodiments, the second end seam inner border comprises one arcuate portion.

[0084] In some embodiments, the second end seam inner border comprises a plurality of arcuate portions.

[0085] In some embodiments, the second end seam inner border comprises two arcuate portions.

[0086] In some embodiments, the second end seam outer border comprises one arcuate portion.

[0087] In some embodiments, the second end seam

outer border comprises a plurality of arcuate portions.

[0088] In some embodiments, the second end seam outer border comprises two arcuate portions.

[0089] In some embodiments, the second end seam inner border comprises one arcuate portion and the second end seam outer border comprises one arcuate portion.

[0090] In some embodiments, the second end seam inner border comprises two arcuate portions and the second end seam outer border comprises two arcuate portions.

[0091] In some embodiments, the first end seam inner border comprises one arcuate portion and the first end seam outer border comprises one arcuate portion, and the second end seam inner border comprises one arcuate portion and the second end seam outer border comprises one arcuate portion.

[0092] In some embodiments, the first end seam inner border comprises two arcuate portions and the first end seam outer border comprises two arcuate portions, and the second end seam inner border comprises one arcuate portion and the second end seam outer border comprises one arcuate portion.

[0093] In some embodiments, the first end seam inner border comprises two arcuate portions and the first end seam outer border comprises two arcuate portions, and the second end seam inner border comprises two arcuate portions and the second end seam outer border comprises two arcuate portions.

[0094] In some embodiments, the arcuate portion of the first end seam inner border approximately corresponds with the arcuate portion of the first end seam outer border. By this, it is meant that the arcuate portion of the inner border and the arcuate portion of the outer border are similar to each other in terms of position and/or extent of curvature - for example, such arcuate portions may both span essentially the same width of the pouched product (e.g. both terminating at a similar lateral extent along the width of the pouched product, or spanning essentially the entire width of the pouched product), or be similar in terms of position (e.g. at the corners of the pouched product), or the inner border and outer border together form a seam that has approximately the same width along the whole length of the seam or along substantially the whole length of the seam. It is found that such correspondence in the arcuate portions can provide additional improvements in seal strength consistency and structural integrity.

[0095] In some embodiments, the arcuate portion of the second end seam inner border approximately corresponds with the arcuate portion of the second end seam outer border.

[0096] In some embodiments, the arcuate portion of the first end seam inner border approximately corresponds with the arcuate portion of the first end seam outer border, and the arcuate portion of the second end seam inner border approximately corresponds with the arcuate portion of the second end seam outer border.

[0097] In some embodiments, the first end seam has approximately the same width along the whole length of the first end seam or along substantially the whole length of the first end seam. In some embodiments, the second end seam has approximately the same width along the whole length of the second end seam or along substantially the whole length of the second end seam. In some embodiments, the first end seam has approximately the same width along the whole length of the first end seam or along substantially the whole length of the first end seam, and the second end seam has approximately the same width along the whole length of the second end seam or along substantially the whole length of the second end seam.

[0098] The first end seam and second end seam may be independently provided in a range of shapes and sizes, which may be dependent on the nature of the arcuate portion(s).

[0099] The first end seam and the second end seams may be of shapes and/or sizes that are approximately the same, similar and/or different. The first end seam may be a mirror image or approximately a mirror image of the second end seam.

[0100] In some embodiments, the first end seam and/or the second end seam is designed so as to be substantially similar in dimensions and/or size to end seams in conventional pouched products (e.g. conventional smokeless articles such as conventional snus articles). As described herein, the first end seam and optionally the second end seam may be particularly shaped (e.g. due to the arcuate portion(s)), which may provide the pouched product with beneficial outcomes. For example, the first end seam and/or the second end seam may have a curved profile. For example, the first end seam and/or the second end seam may be in a shape formed by two lines (which may be the inner and outer border) that are substantially parallel for a portion and converge towards each other at one or both ends of the pair of lines, at which area of convergence the lines may be angled and/or curved towards the opposing end seam (for instance, see the embodiment of Figure 3 [as discussed further below]). For example, the first end seam and/or the second end seam may be crescent-shaped (for instance, see the embodiment of Figure 4 [as discussed further below]).

[0101] The length of an end seam may be described as the largest dimension of the end seam. The length of an end seam may be the approximately the same as or similar to the width of the pouch pocket and/or the pouched product as a whole (e.g. see the embodiments of Figures 3 and 4, in which the length of each of the first and second end seam is the same as the widths of the pouch pocket and the pouched product). In alternative embodiments, such as where the first and second end seams extend along the longest sides (i.e. the length) of the pouched product instead of the shortest sides (i.e. the width as in Figures 3 and 4), an end seam may have a length that is approximately the same as or similar to the

length of the pouched product as a whole.

[0102] The width of an end seam may be described as the largest distance between the end seam outer border and the end seam inner border, which is perpendicular to the length of the end seam.

[0103] In some embodiments, the first end seam and/or the second end seam has a length of about 8 mm to about 20 mm, or about 10 mm to about 20 mm, or about 10 mm to about 18 mm, e.g. about 8 mm, about 9 mm, about 10 mm, about 11 mm, about 12 mm, about 13 mm, about 14 mm, about 15 mm, about 16 mm, about 17 mm, about 18 mm, about 19 mm, or about 20 mm.

[0104] In some embodiments, the first end seam and/or the second end seam has a length of about 12 mm or about 14 mm.

[0105] In some embodiments, the first end seam and/or the second end seam has a width of about 1 mm to about 10 mm, or about 2 mm to about 8 mm, or about 3 mm to about 6 mm, e.g. about 1 mm, about 2 mm, about 3 mm, about 4 mm, about 5 mm, about 6 mm, about 7 mm, about 8 mm, about 9 mm, or about 10 mm.

[0106] In some embodiments, the first end seam and/or the second end seam has a width of about 4 mm.

[0107] In some embodiments, the first end seam and/or the second end seam has an approximate surface area of at most 250 mm^2, or at most 200 mm^2, or at most 150 mm^2, or at most 140 mm^2, or at most 130 mm^2, or at most 120 mm^2, or at most 110 mm^2, or at most 100 mm^2. The surface area is defined as the surface area of the top face and bottom face added together of either the first end seam or the second end seam.

[0108] In some embodiments, the first end seam and/or the second end seam has an approximate surface area of at least 20 mm^2, or at least 30 mm^2, or at least 40 mm^2, or at least 50 mm^2, or at least 60 mm^2, or at least 70 mm^2, or at least 80 mm^2, or at least 90 mm^2, or at least 100 mm^2.

[0109] Alternatively, the first end seam and/or the second end seam may be somewhat larger in size or somewhat smaller in size than end seams in typical or conventional pouched products. The design criteria provided herein may provide particularly advantageous characteristics, regardless of size.

Shape of the pouched product

[0110] The shapes of the pouched product and the pouch pocket are described herein with reference to two-dimensional shapes. It will be appreciated that the pouched product is in fact a three-dimensional object, having a three-dimensional pouch pocket, but the two-dimensional shapes are a convenient way of describing the pouched product and pouch pocket as if they were "flat" and disregarding the longitudinal seam.

[0111] Thus, the two dimensions refer to the length and the width of the pouched product or pouch pocket. The depth (i.e. the third dimension) is generally principally a result of the presence of the content in the pouch pocket of the pouched product.

[0112] In some embodiments, the pouched product is approximately a quadrilateral in shape that is modified.

[0113] The quadrilateral may be a square, rectangle, parallelogram, rhombus, trapezium, trapezoid, or other type of quadrilateral.

[0114] Preferably, the quadrilateral is a square or rectangle. More preferably, the quadrilateral is a rectangle. Thus, in some embodiments, the pouched product is approximately a square or rectangle in shape that is modified.

[0115] Such modification may be provided by the presence of the arcuate portion(s) of the first end seam outer border and/or the arcuate portion(s) of the second end seam outer border. Examples of modifications are described as follows.

[0116] In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises a curved end (where an "end" can also be referred to as a "side" of the shape).

[0117] In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises a plurality of curved ends.

[0118] In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises two curved ends. Preferably, the two curved ends are opposing ends of the shape, such as opposing ends of a quadrilateral.

[0119] For example, a curved end may be provided by the first (or second) end seam outer border having an arcuate portion, which may span essentially the entire width of the pouched product.

[0120] In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises a rounded corner.

[0121] For example, a rounded corner may be provided by the first (or second) end seam outer border having an arcuate portion at the corner of the pouched product.

[0122] In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises a plurality of rounded corners.

[0123] In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises two rounded corners.

[0124] In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises four rounded corners.

[0125] In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises all rounded corners.

[0126] In some embodiments, the pouched product is

approximately a quadrilateral in shape (e.g. a square or a rectangle) that comprises four rounded corners (i.e. all corners are rounded).

[0127] In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that does not comprise any pointed corners (i.e. where two straight ends/edges meet at an apex). In some embodiments, the pouched product is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that does not comprise any sharp corners (i.e. where two straight ends/edges meet at an apex that is able to cut or pierce especially the mouth of a user of the pouched product).

[0128] In some embodiments, the pouched product is approximately a quadrilateral in shape, wherein the shape comprises at least one curved end and/or has at least two rounded corners, preferably at least two curved ends and/or four rounded corners. It will be appreciated that a curved end may essentially be formed by the coalescence of two adjacent rounded corners.

[0129] In some embodiments, the pouched product is approximately a square or a rectangle in shape, wherein the shape comprises at least one curved end and/or has at least two rounded corners, preferably at least two curved ends and/or four rounded corners.

[0130] In some embodiments, the pouched product does not comprise any pointed corners. In some embodiments, the pouched product does not comprise any sharp corners.

[0131] In some embodiments, the pouched product is symmetrical. In some embodiments, the pouched product comprises one axis of symmetry. In some embodiments, the pouched product comprises two axes of symmetry. Such measurements of symmetry may disregard the longitudinal seam and/or the content of the pouch pocket, which content may be dispersed in an asymmetrical manner and/or which may be enclosed in a way that allows movement of the content.

Shape of the pouch pocket

[0132] In some embodiments, the pouch pocket is approximately a quadrilateral in shape that is modified.

[0133] The quadrilateral may be a square, rectangle, parallelogram, rhombus, trapezium, trapezoid, or other type of quadrilateral.

[0134] Preferably, the quadrilateral is a square or rectangle. More preferably, the quadrilateral is a rectangle. Thus, in some embodiments, the pouch pocket is approximately a square or rectangle in shape that is modified.

[0135] Such modification may be provided by the presence of the arcuate portion(s) of the first end seam inner border and/or the arcuate portion(s) of the second end seam inner border. Examples of modifications are described as follows.

[0136] In some embodiments, the pouch pocket is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises a curved end (where an "end" can also be referred to as a "side" of the shape).

[0137] In some embodiments, the pouch pocket is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises a plurality of curved ends.

[0138] In some embodiments, the pouch pocket is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises two curved ends. Preferably, the two curved ends are opposing ends of the shape, such as opposing ends of a quadrilateral.

[0139] For example, a curved end may be provided by the first (or second) end seam inner border having an arcuate portion, which may span essentially the entire width of the pouch pocket.

[0140] In some embodiments, the pouch pocket is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises a rounded corner.

[0141] For example, a rounded corner may be provided by the first (or second) end seam inner border having an arcuate portion at the corner of the pouch pocket.

[0142] In some embodiments, the pouch pocket is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises a plurality of rounded corners.

[0143] In some embodiments, the pouch pocket is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises two rounded corners.

[0144] In some embodiments, the pouch pocket is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises four rounded corners.

[0145] In some embodiments, the pouch pocket is of a shape (e.g. approximately a quadrilateral, such as a square or a rectangle) that comprises all rounded corners.

[0146] In some embodiments, the pouch pocket is approximately a quadrilateral in shape (e.g. a square or a rectangle) that comprises four rounded corners (i.e. all corners are rounded).

[0147] In some embodiments, the pouch pocket is approximately a quadrilateral in shape, wherein the shape comprises at least one curved end and/or has at least two rounded corners, preferably at least two curved ends and/or four rounded corners. It will be appreciated that a curved end may essentially be formed by the coalescence of two adjacent rounded corners.

[0148] In some embodiments, the pouch pocket is approximately a square or a rectangle in shape, wherein the shape comprises at least one curved end and/or has at least two rounded corners, preferably at least two curved ends and/or four rounded corners.

[0149] In some embodiments, the pouch pocket does not comprise any pointed corners (i.e. where two straight ends/edges meet at an apex).

[0150] In some embodiments, the pouch pocket is symmetrical. In some embodiments, the pouch pocket comprises one axis of symmetry. In some embodiments, the pouch pocket comprises two axes of symmetry. In some embodiments, the pouch pocket comprises four axes of symmetry. Such measurements of symmetry may disregard the content of the pouch pocket, which may be dispersed in an asymmetrical manner and/or which may be enclosed in a way that allows movement of the content.

[0151] In some embodiments, the pouch pocket is of a similar shape and/or has a similar shape modification (e.g. one or more rounded corners and/or one or more curved ends) to the pouched product (i.e. as a whole). It will of course be appreciated that, as the pouch pocket is a feature that the pouched product comprises, the pouch pocket will be smaller than the pouched product as a whole. Such similarity may be provided by the arcuate portion(s) of the first end seam inner border approximately corresponding with the arcuate portion(s) of the first end seam outer border, and/or the arcuate portion(s) of the second end seam inner border approximately corresponding with the arcuate portion(s) of the second end seam outer border (as described herein).

Size of arcuate portions

[0152] One or more of the following preferences in this sub-section may apply to one or more of the arcuate portions of a pouched product, i.e. to one or more arcuate portions of the first end seam outer border, and/or to one or more arcuate portions of the first end seam inner border, and/or (where present) to one or more arcuate portions of the second end seam outer border, and/or (where present) to one or more arcuate portions of the second end seam inner border. The preferences may apply independently to said arcuate portions.

[0153] In some embodiments, one or more of the following preferences applies to an arcuate portion of the first end seam outer border.

[0154] In some embodiments, one or more of the following preferences applies to a plurality of arcuate portions of the first end seam outer border.

[0155] In some embodiments, one or more of the following preferences applies to an arcuate portion of the first end seam inner border.

[0156] In some embodiments, one or more of the following preferences applies to a plurality of arcuate portions of the first end seam inner border.

[0157] In some embodiments, one or more of the following preferences applies to one or more arcuate portions of the first end seam outer border and one or more arcuate portions of the first end seam inner border.

[0158] In some embodiments, one or more of the following preferences applies to an arcuate portion of the second end seam outer border.

[0159] In some embodiments, one or more of the following preferences applies to a plurality of arcuate portions of the second end seam outer border.

[0160] In some embodiments, one or more of the following preferences applies to an arcuate portion of the second end seam inner border.

[0161] In some embodiments, one or more of the following preferences applies to a plurality of arcuate portions of the second end seam inner border.

[0162] In some embodiments, one or more of the following preferences applies to one or more arcuate portions of the second end seam outer border and one or more arcuate portions of the second end seam inner border.

[0163] In some embodiments, one or more of the following preferences applies to one or more arcuate portions of the first end seam outer border and one or more arcuate portions of the second end seam outer border.

[0164] In some embodiments, one or more of the following preferences applies to one or more arcuate portions of the first end seam inner border and one or more arcuate portions of the second end seam inner border.

[0165] In some embodiments, one or more of the following preferences applies to one or more arcuate portions of the first end seam outer border, one or more arcuate portions of the first end seam inner border, one or more arcuate portions of the second end seam outer border, and one or more arcuate portions of the second end seam inner border.

[0166] Such preferences are as follows.

[0167] An arcuate portion may define a portion of the circumference of a circle. Hence, where there is a plurality of arcuate portions, each arcuate portion may define a portion of the circumference of a different circle.

[0168] In some embodiments, the diameter of the circle is at least 10%, or at least 20%, or at least 30%, or at least 40%, or at least 50%, or at least 60%, or at least 70%, or at least 80%, or at least 90%, or at least 100%, or at least 125%, or at least 150%, or at least 200% of the width of the pouched product and/or the pouch pocket.

[0169] In some embodiments, the diameter of the circle is at least 20% of the width of the pouched product and/or the pouch pocket. In some embodiments, the diameter of the circle is at least 90% of the width of the pouched product and/or the pouch pocket.

[0170] In some embodiments, the diameter of the circle is at most 400%, or at most 350%, or at most 300%, or at most 250%, or at most 200%, or at most 175%, or at most 150%, or at most 125%, or at most 100%, or at most 80%, or at most 60%, or at most 40% of the width of the pouched product and/or the pouch pocket.

[0171] In some embodiments, the diameter of the circle is at most 300% of the width of the pouched product and/or the pouch pocket. In some embodiments, the diameter of the circle is at most 150% of the width of the pouched product and/or the pouch pocket.

[0172] In some embodiments, the diameter of the circle is about 100% of the width of the pouched product and/or the pouch pocket.

[0173] In some embodiments, the portion of the cir-

cumference of the circle is at least 5%, or at least 10%, or at least 20%, or at least 25%, or at least 30%, or at least 40%, or at least 45%, or at least 50% of the circumference.

[0174] In some embodiments, the portion of the circumference of the circle is at most 75%, or at most 60%, or at most 55%, or at most 50%, or at most 40%, or at most 30%, or at most 25%, or at most 20% of the circumference.

[0175] In some embodiments, the portion of the circumference of the circle is between 20% and 55% of the circumference. In some embodiments, the portion of the circumference of the circle is between 20% and 30% of the circumference. In some embodiments, the portion of the circumference of the circle is about 25% of the circumference. In some embodiments, the portion of the circumference of the circle is between 45% and 55% of the circumference. In some embodiments, the portion of the circumference of the circle is about 50% of the circumference.

[0176] Alternatively, an arcuate portion may define a portion of the circumference of an ellipse or an oval.

Content

[0177] The content of the pouch pocket refers to the ingredients, material and/or substances enclosed within the pouch pocket.

[0178] The content may comprise one or more components.

[0179] In some embodiments, the content comprises one or more components selected from a plant material, an active ingredient, a pH stabiliser or adjuster, a humectant, a flavourant, a filler, a preservative, an aqueous or non-aqueous solvent, a binder, or a combination thereof. Each component may be provided for more than one purpose.

[0180] The content preferably occupies substantially all of the internal volume of the pouch pocket. The content may occupy at least 80%, at least 85%, at least 90%, at least 95% or about 100% of the internal volume of the pouch pocket.

[0181] The content may comprise a solid material to provide physical integrity, such as an organic material (e.g. plant material) or an inorganic material. Such a solid material may naturally or inherently contain one or more active ingredients and/or additives.

[0182] 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.

[0183] **Active ingredients,** such as biologically or pharmacologically active compounds, may be provided to produce a biological or pharmacological effect in the user. Suitable active ingredients 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. Active ingredients may also have additive properties.

[0184] In some embodiments, the content includes an active ingredient comprising nicotine. In some embodiments, the form of the nicotine is selected from the group consisting of nicotine salts, nicotine base, stabilised nicotine and mixtures thereof. For example, the content 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. Alternatively or additionally, the nicotine may be present within a plant material, such as tobacco.

[0185] In some embodiments, the content comprises tobacco. In some embodiments, the content comprises at most 5 wt%, or at most 3 wt%, or at most 1 wt%, or at most 0.5 wt% tobacco. In some embodiments, the content comprises at least 0.1 wt%, or at least 0.5 wt% tobacco.

[0186] In some embodiments, the content does not contain tobacco.

[0187] **pH stabilisers or adjusters** may be provided to adjust the user experience and/or to 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 pouched product is preferably pH 7 to pH 9, such as pH 7.25 to pH 8.75 or pH 7.5 to pH 8.5.

[0188] The overall pH of a pouched product may be determined by, for example, (i) placing the pouched product 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.

[0189] **Fillers** may be provided to increase the volume of the pouched product (e.g. by increasing the volume contained within the pouch pocket and to strengthen the content). 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%.

[0190] **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 content or may be provided in isolated locations and/or varying concentrations throughout the content. As used herein, the term "flavourant" denotes a compound (which may be a natural or synthetic material) that is added to a pouched product to impart the product with a flavour to enhance the user experience, for example due to having a desirable taste, aroma or both.

[0191] **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).

[0192] The humectant may have a lower limit of at least 1% by weight of the content, such as at least 2 wt% or at least 5 wt% or at least 10 wt% or at least 20 wt% or at least 30 wt% or at least 40 wt%.

[0193] The humectant may have an upper limit of at most 50% by weight of the content, such as at most 40 wt% or at most 30 wt% or at most 20 wt% or at most 10 wt % or at most 5 wt % or at most 2 wt%.

[0194] Preferably, the amount of humectant is 1 to 40 wt% of the content, such as 2 to 20 wt% or 5 to 10 wt%.

[0195] Preferably, the content has an overall amount of water of between 5 and 50 wt% based on the weight of the content, such as 10 to 20 wt% or 40 to 50 wt%.

[0196] 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".

[0197] **Stabilisers** are provided to prevent decomposition or degradation over time 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.

[0198] **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 content, e.g. around 6 to 9 wt% or 7 to 8 wt%.

[0199] **Colourants** may be provided to modify the user impression of the pouched product. 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).

[0200] The amount of colourant may be up to about 3% by weight of the pouched product, such as about 0.5% to about 2.5% or about 1% to about 2%.

[0201] **Plant material** may be provided for physical integrity and may function as a natural source of substances, such as biologically or pharmacologically active compounds, flavourants, pH stabilisers, etc. The plant material may comprise least one plant material selected from the list including Amaranthus dubius, Arctostaphylos uva-ursi (Bearberry), Argemone mexicana, Amica, Artemisia vulgaris, bamboo, Calea 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.

[0202] 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.

[0203] Any suitable parts of the tobacco plant may be used. This includes leaves, stems, roots, bark, seeds and flowers.

[0204] 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).

[0205] The content may comprise at least 50 wt% plant material based on the weight of the content, e.g. at least 60 wt% plant material or at least 65 wt% plant material. The content may comprise at most 80 wt% plant material, e.g. at most 75 wt% or at most 70 wt% plant material.

[0206] The content may comprise a gathered sheet of homogenised (e.g. paper/slurry recon) tobacco or gathered shreds/strips formed from such a sheet.

[0207] The sheet may have a grammage greater than or equal to 100 g/m^2, e.g. at least 110 g/m^2 or at least 120 g/m^2. The sheet may have a grammage of less than or equal to 300 g/m^2, e.g. at most 250 g/m^2 or at most 200 g/m^2. The sheet may have a grammage of between 120 and 190 g/m^2.

[0208] 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.

Method of manufacture

[0209] The invention also relates to a method of manufacturing the pouched product.

[0210] In some embodiments, the method comprises the steps of: (i) forming one or more sheets of pouch material around the content; and (ii) sealing the pouch material to enclose the content.

[0211] In some embodiments, the method uses a single sheet of pouch material.

[0212] In some embodiments, the method uses a plurality of sheets of pouch material.

[0213] The longitudinal seam, as described herein, may be formed by engaging and sealing lateral edges of one or more sheets of pouch material. The formation of the longitudinal seam may result in the production of a tubular structure. The formation of the longitudinal seam may take place as part of step (i) or step (ii). For example, where a tubular structure is formed, the formation of the tubular structure may occur either before the addition of the content into the pouch material (i.e. the formation of the longitudinal seam is part of step (i), before the sealing of the pouch material to enclose the content), or alternatively the formation of the tubular structure may occur after the addition of the content into the pouch material (in which case, the formation of the longitudinal seam may be considered to be part of step (i) or step (ii) as appropriate).

[0214] In some embodiments, the sealing of step (ii) comprises the formation of the first end seam.

[0215] In some embodiments, the sealing of step (ii) comprises the formation of the first end seam, wherein the sealing produces a first end seam inner border comprising an arcuate portion.

[0216] In some embodiments, the sealing of step (ii) comprises the formation of the second end seam.

[0217] In some embodiments, the sealing of step (ii) comprises the formation of the second end seam, wherein the sealing produces a second end seam inner border comprising an arcuate portion.

[0218] In some embodiments, the sealing of step (ii) comprises the formation of the first end seam and the second end seam, optionally wherein the sealing produces a first end seam inner border comprising an arcuate portion, and optionally wherein the sealing produces a second end seam inner border comprising an arcuate portion.

[0219] In some embodiments, the sealing of step (ii) comprises the formation of the longitudinal seam and the first end seam, optionally wherein the sealing produces a first end seam inner border comprising an arcuate portion.

[0220] In some embodiments, the sealing of step (ii) comprises the formation of the longitudinal seam followed by the first end seam, optionally wherein the sealing produces a first end seam inner border comprising an arcuate portion. For example, the longitudinal seam may first be formed by engaging and sealing lateral edges of a sheet of pouch material. The formation of the longitudinal seam may result in the production of a tubular structure. An end of the tubular structure may then be sealed, resulting in the formation of the first end seam.

[0221] In some embodiments, the sealing of step (ii) comprises the formation of the longitudinal seam, the first end seam and the second end seam, optionally wherein the sealing produces a first end seam inner border comprising an arcuate portion and a second end seam inner border comprising an arcuate portion.

[0222] In some embodiments, the sealing of step (ii) comprises the formation of the longitudinal seam followed by the first end seam and the second end seam, optionally wherein the sealing produces a first end seam inner border comprising an arcuate portion, and optionally wherein the sealing produces a second end seam inner border comprising an arcuate portion. For example, the longitudinal seam may first be formed by engaging and sealing lateral edges of a sheet of pouch material. The formation of the longitudinal seam may result in the

product of a tubular structure. The two ends of the tubular structure may then each be sealed, resulting in the formation of the first end seam and the second end seam.

[0223] The formation of the longitudinal seam and/or the first end seam and/or the second end seam may be performed thermally and/or chemically. By "thermally", it is meant that heat is applied to seal two parts of the pouch material together to form a seam. By "chemically", it is meant that a particular chemical is used that results in the sealing together of two parts of the pouch material to form a seam. In some embodiments, a heat sealable binder coating or a binder material (e.g. a coating or other additive) may be added to the pouch material before forming a sealed seam. As used herein, a "heat sealable binder coating" refers to a coating material, such as acrylic polymer compositions, applied to a substrate and which is capable of sealing seams upon heating. In some embodiments, a "binder material" may be in the form of a liquid or powder coating. For example, powdered polyethylene may be used as a binder material. A short exposure in an oven is generally sufficient to melt and fuse the binder material.

[0224] In some embodiments, sealing of step (ii) is carried out thermally or chemically.

[0225] In some embodiments, the formation of a seam may be performed via application of radio frequency (RF) energy, optionally in the range of about 1 MHz to about 100 MHz. In some embodiments, the pouch material comprises an RF-sealable material.

[0226] In some embodiments, the method includes a cooling step after the formation of a sealed seam.

[0227] In some embodiments, during and/or after the formation of the longitudinal seam and/or the first end seam and/or the second end seam, the method includes the application of pressure to the pouch material. In some embodiments, the amount of pressure applied is in the range of about 20 psi to about 200 psi. In some embodiments, pressure is applied via mechanical press, hydraulic press, pneumatic press, or any combination thereof.

[0228] In some embodiments, the method further comprises the step of: (iii) cutting the pouch material to produce the first end seam outer border comprising an arcuate portion.

[0229] In some embodiments, the cutting of step (iii) produces the first end seam outer border comprising two or more arcuate portions.

[0230] In some embodiments, the cutting of step (iii) is performed using a blade.

[0231] In some embodiments, the cutting of step (iii) is performed using a curved blade.

[0232] In some embodiments, the method further comprises the step of: (iv) cutting the pouch material to produce the second end seam outer border comprising an arcuate portion.

[0233] In some embodiments, the cutting of step (iv) produces the second end seam outer border comprising two or more arcuate portions.

[0234] In some embodiments, the cutting of step (iv) is performed using a blade.

[0235] In some embodiments, the cutting of step (iv) is performed using a curved blade.

[0236] In some embodiments, the method comprises steps (iii) and (iv). In some embodiments, the cutting of each of steps (iii) and (iv) is performed using a curved blade.

[0237] Where a curved blade is used in step (iii) and/or step (iv) as disclosed herein, suitably the sharp edge of the blade defines a curve in the plane of the pouch material to be cut, thus producing an arcuate cut.

[0238] 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.

[0239] 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 spirit and scope of the invention.

[0240] 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.

[0241] Any section headings used herein are for organisational purposes only and are not to be construed as limiting the subject matter described.

[0242] Throughout this specification, including the claims which follow, unless the context requires otherwise, the words "comprise" and "include", and variations such as "comprises", "comprising", and "including" will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

[0243] 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%.

[0244] A number of publications are cited above in order to more fully describe and disclose the invention

and the state of the art to which the invention pertains. The entirety of each of these references is incorporated herein.

Examples

Comparative Example

[0245] As shown in Figure 1, there is provided (as a comparative example) a top view of a prior art pouched product 1, which is a smokeless article for oral consumption, specifically a snus article. The pouched product 1 has a water-permeable pouch pocket 2 containing a content 3. The pouch pocket 2 is formed from a single sheet of material and is substantially filled by the content 3. Lateral edges of the sheet of material are engaged and sealed (such as by one of the sealing techniques described herein), such that a longitudinally extending seam is formed, resulting in a tubular structure. The ends of the tubular structure are then sealed (such as by one of the sealing techniques described herein), resulting in the formation of a first end seam 4 and a second end seam 7. The first end seam 4 and the second end seam 7 are discrete (namely they are individually separate and distinct), non-continuous (namely there are clear interruptions between the locations of the two end seams with respect to the pouch pocket) and situated at opposite ends of the pouch pocket 2.

[0246] The first end seam 4 can be described as having a first end seam inner border 6 that is proximal to the pouch pocket 2, and a first end seam outer border 5 that is distal to the pouch pocket 2. Similarly, the second end seam 7 can be described as having a second end seam inner border 9 that is proximal to the pouch pocket 2, and a second end seam outer border 8 that is distal to the pouch pocket 2.

[0247] The longitudinal seam 10 is not shown in Figure 1, but is visible in Figure 2, which depicts an alternative (i.e. bottom) view of the prior art pouched product 1.

[0248] The pouched product 1 and the pouch pocket 2 are each substantially rectangular in shape, with essentially straight edges. The first end seam 4 and the second end seam 8 are also substantially rectangular in shape. As a guide (although it will be appreciated that variations in size of the pouched product are possible), the pouched product has a width of approximately 14 mm and a length of approximately 35 mm (of which length approximately 27 mm is the pouch pocket, approximately 4 mm is the first end seam and approximately 4 mm is the second end seam). Thus, pouched product has an approximate "flat" total surface area of about 980 mm^2 (top face and bottom face of 490 mm^2 each), of which the first end seam and the second end seam each have a surface area of about 112 mm^2 (top face and bottom face of 56 mm^2 each).

[0249] The outer corners of the pouched product (i.e. of the first and second end seam) are formed where the essentially straight edges meet, and these corners are pointed (i.e. not rounded or smoothed) and may be sharp. These corners contact the oral cavity of the user when the user is using the product orally, which can result in discomfort experienced by the user.

Inventive Example 1

[0250] Meanwhile, the present invention provides improved comfort to the user, by having an end seam outer border that comprises an arcuate portion, as well as an end seam inner border that also comprises an arcuate portion to provide a more consistent seal strength.

[0251] A first embodiment of the present invention (Inventive Example 1) is shown in Figure 3, which depicts a top view of a pouched product 11, which is a smokeless article for oral consumption, specifically a snus article. The pouched product 11 has a water-permeable pouch pocket 12 containing a content 13. The pouch pocket 12 is formed from a single sheet of material in a similar way to the Comparative Example (the prior art embodiment of Figures 1 and 2), which allows for a simple method of manufacture. The pouch pocket 12 is substantially filled by the content 13. Lateral edges of the sheet of material are engaged and sealed (such as by one of the sealing techniques described herein), such that a longitudinally extending seam (not shown but equivalent to that depicted in Figure 2) is formed, resulting in a tubular structure. The ends of the tubular structure are then sealed, resulting in the formation of a first end seam 14 and a second end seam 17.

[0252] As in the Comparative Example, the first end seam 14 and the second end seam 17 of Inventive Example 1 are discrete (namely they are individually separate and distinct), non-continuous (namely there are clear interruptions between the locations of the two end seams with respect to the pouch pocket, such that there are regions of the perimeter of the pouch pocket as "flat" in which no seam is formed), and situated at opposite ends of the pouch pocket 12, as shown in Figure 3.

[0253] The ends of the tubular structure may be cut (for example by using a curved blade), either before or after sealing, in such a way to form a first end seam outer border 15 and a second end seam outer border 18 that each comprise an arcuate portion.

[0254] Indeed, in Inventive Example 1, the first end seam outer border 15 has two arcuate portions 20 and 22, and the second end seam outer border 18 also has two arcuate portions 24 and 26.

[0255] Moreover, the sealing of the ends of the tubular structure is performed (for example by one of the sealing techniques described herein) in such a manner to produce a first end seam inner border 16 and a second end seam inner border 19 that each comprise an arcuate portion.

[0256] Indeed, in Inventive Example 1, the first end seam inner border 16 has two arcuate portions 21 and 23, and the second end seam inner border 19 also has two arcuate portions 25 and 27.

[0257] In Inventive Example 1, the pouched product 11

and pouch pocket 12 are each approximately a rectangle in shape, wherein the rectangles are modified to have all (i.e. four) rounded corners.

[0258] The arcuate portions 20 and 22 of the first end seam outer border 15 and the arcuate portions 24 and 26 of the second end seam outer border 18 provide the rounded corners of the pouched product 11. By having corners that are rounded instead of pointed or sharp, improved comfort and mouthfeel (particularly on the gum of the user) is experienced by the user compared with the prior art embodiment of Figures 1 and 2. Specifically, in Inventive Example 1, all the corners of the pouched product are rounded (as shown in Figure 3).

[0259] The pouched product of Inventive Example 1 has a similar total length and width to that of the Comparative Example. However, the rounded corners have the effect of reducing the total area of the pouched product, providing the additional benefit of making the product able to be used more discreetly.

[0260] The arcuate portions 21 and 23 of the first end seam inner border 16 and the arcuate portions 25 and 27 of second end seam inner border 19 provide the rounded corners of the pouch pocket 12. As a result, the first end seam 14 and second end seam 17 are not linear or rectangular (unlike the Comparative Example), and instead have a somewhat curved profile.

[0261] Specifically, in Inventive Example 1, the arcuate portions 21 and 23 of the first end seam inner border 16 approximately correspond with the arcuate portions 20 and 22 of the first end seam outer border 15. Moreover, in this embodiment, the arcuate portions 25 and 27 of the second end seam inner border 19 approximately correspond with the arcuate portions 24 and 26 of the second end seam outer border 18. By this, it is meant that the arcuate portions of the inner and outer borders are similar to each other in terms of position (at the corners in this embodiment) and/or extent of curvature (in this embodiment, it can be seen that the arcuate portions of an inner border terminate at a similar lateral extent along the width of the pouched product as the arcuate portions of an outer border).

[0262] It is surprisingly observed that providing a first end seam 14 with arcuate portions 20 and 22 in its outer border and with arcuate portions 21 and 23 in its inner border beneficially results in a more consistent seal strength, as shown by tensile measurements, resulting in good structural integrity and reduced risk of leakage of the enclosed content. The same applies for the second end seam 17 with the arcuate portions 24 and 26 in its outer border, as well as the arcuate portions 25 and 27 in its inner border.

Inventive Example 2

[0263] A second embodiment of the present invention (Inventive Example 2) is shown in Figure 4, which depicts a top view of a pouched product 31, which is a smokeless article for oral consumption, specifically a snus article.

[0264] While the pouched product of Inventive Example 1 comprises two arcuate portions in each of the first and second end seam inner borders and two arcuate portions in each of the first and second end seam outer borders, the pouched product of Inventive Example 2 differs in that it comprises one arcuate portion in each of the first and second end seam inner borders and one arcuate portion in each of the first and second end seam outer borders.

[0265] The pouched product 31 of Inventive Example 2 has a water-permeable pouch pocket 32 containing a content 33. The pouch pocket 32 is formed from a single sheet of material in a similar way to the

[0266] Comparative Example and Inventive Example 1, which allows for a simple method of manufacture. The pouch pocket 32 is substantially filled by the content 33. Lateral edges of the sheet of material are engaged and sealed (such as by one of the sealing techniques described herein), such that a longitudinally extending seam (not shown but equivalent to that depicted in Figure 2) is formed, resulting in a tubular structure. The ends of the tubular structure are then sealed, resulting in the formation of a first end seam 34 and a second end seam 37.

[0267] As in the Comparative Example and Inventive Example 1, the first end seam 34 and the second end seam 37 of Inventive Example 2 are discrete (namely they are individually separate and distinct), non-continuous (namely there are clear interruptions between the locations of the two end seams with respect to the pouch pocket) and situated at opposite ends of the pouch pocket 32, as shown in Figure 4.

[0268] The ends of the tubular structure may be cut (for example by using a curved blade), either before or after sealing, in such a way to form a first end seam outer border 35 and a second end seam outer border 38 that each comprise an arcuate portion.

[0269] Indeed, in Inventive Example 2, the first end seam outer border 35 has one arcuate portion 40, and the second end seam outer border 38 also has one arcuate portion 42. These arcuate portions span essentially the entire width of the pouched product 31. The arcuate portions each define a portion of the circumference of different circles, said circles having a diameter that is similar to the width of the pouched product 31 (i.e. having a radius that is similar to half the width of the pouched product).

[0270] Moreover, the sealing of the ends of the tubular structure is performed (for example by one of the sealing techniques described herein) in such a manner to produce a first end seam inner border 36 and a second end seam inner border 39 that each comprise an arcuate portion.

[0271] Indeed, in Inventive Example 2, the first end seam inner border 36 has one arcuate portion 41, and the second end seam inner border 39 also has one arcuate portion 43. These arcuate portions span essentially the entire width of the pouched product 31. The arcuate

portions each define a portion of the circumference of different circles, said circles having a diameter that is similar to the width of the pouched product 31 (i.e. having a radius that is similar to half the width of the pouched product).

[0272] In Inventive Example 2, the pouched product 31 and pouch pocket 32 are each approximately a rectangle in shape, wherein the rectangles are modified to have two curved sides. These sides are the shorter parallel sides of each rectangle. These sides can also be referred to as "ends". Thus, it can be said that said rectangles are modified to have two curved ends. Alternatively, it can be said that the rectangles are modified to have all (i.e. four) rounded corners, where the rounding of two pairs of two corners essentially coalesces to form two curved ends.

[0273] The arcuate portion 40 of the first end seam outer border 35 and the arcuate portion 42 of the second end seam outer border 38 provide the curved ends of the pouched product 31. By having opposing ends that are curved (i.e. rounded), the pouched product 31 has no corners that are pointed or sharp, resulting in improved comfort and mouthfeel for the user (particularly on the gum of the user) compared with the prior art embodiment of Figures 1 and 2.

[0274] The pouched product of Inventive Example 2 has a similar total length and width to that of the Comparative Example. However, the rounded corners have the effect of reducing the total area of the pouched product, providing the additional benefit of making the product able to be used more discreetly.

[0275] The arcuate portion 41 of the first end seam inner border 36 and the arcuate portion 43 of second end seam inner border 39 provide the curved ends of the pouch pocket 32. As a result, the first end seam 34 and second end seam 37 are not linear or rectangular (unlike the Comparative Example), and instead have a somewhat curved profile, namely crescent-shaped.

[0276] Specifically, in Inventive Example 2, the arcuate portion 41 of the first end seam inner border 36 approximately corresponds with the arcuate portion 40 of the first end seam outer border 35. Moreover, in this embodiment, the arcuate portion 43 of the second end seam inner border 39 approximately corresponds with the arcuate portion 42 of the second end seam outer border 38. By this, it is meant that the arcuate portion of the inner and outer borders are similar to each other in terms of position and/or extent of curvature (in this embodiment, it can be seen that the arcuate portion of an inner border and of an outer border both span essentially the entire width of the pouched product).

[0277] It is surprisingly observed that providing a first end seam 34 with an arcuate portion 40 in its outer border and with an arcuate portion 41 in its inner border beneficially results in a more consistent seal strength, as shown by tensile measurements, resulting in good structural integrity and reduced risk of leakage of the enclosed content. The same applies for the second end seam 37 with the arcuate portion 42 in its outer border, as well as the arcuate portion 43 in its inner border.

Claims

1. A pouched product (11) for oral consumption comprising a water-permeable pouch pocket (12) enclosing a content (13);

   wherein the pouched product (11) comprises a longitudinal seam, a first end seam (14) and a second end seam (17), wherein the pouch pocket (12) is sealed at the longitudinal seam, the first end seam (14) and the second end seam (17);
   wherein the first end seam (14) and the second end seam (17) are discrete, non-continuous and situated at opposite ends of the pouch pocket (12);
   and wherein the first end seam (14) comprises a first end seam inner border (16) proximal to the pouch pocket (12) and a first end seam outer border (15) distal to the pouch pocket (12), wherein the first end seam inner border (16) and the first end seam outer border (15) each comprise an arcuate portion (20, 21, 22, 23).

2. The pouched product of claim 1, wherein the content (13) comprises an active ingredient, optionally selected from nicotine, cocaine, caffeine, an opiate, an opioid, cathine, cathinone, a kavalactone, mysticin, a beta-carboline alkaloid, salvinorin A, or a combination thereof.

3. The pouched product of claim 2, wherein the active ingredient is nicotine.

4. The pouched product of claim 3, wherein the nicotine is provided in a plant material, optionally
   wherein the plant material is tobacco.

5. The pouched product of any one of claims 1 to 4, wherein the pouched product (11) is tobacco-free.

6. The pouched product of any one of claims 1 to 5, wherein the arcuate portion (21, 23) of the first end seam inner border (16) approximately corresponds with the arcuate portion (20, 22) of the first end seam outer border (15), optionally such that the first end seam (14) has approximately the same width along the whole length of the first end seam (14).

7. The pouched product of any one of claims 1 to 6, wherein the second end seam (17) comprises a second end seam inner border (19) proximal to the pouch pocket (12) and a second end seam outer border (18) distal to the pouch pocket (12), wherein the second end seam inner border (19) and the

second end seam outer border (18) each comprise an arcuate portion (24, 25, 26, 27).

8. The pouched product of any one of claims 1 to 7, wherein the arcuate portion (25, 27) of the second end seam inner border (19) approximately corresponds with the arcuate portion (24, 26) of the second end seam outer border (18), optionally such that the second end seam (17) has approximately the same width along the whole length of the second end seam (17).

9. The pouched product of any one of claims 1 to 8, wherein the pouched product (11) is a modified quadrilateral in shape, wherein the modified quadrilateral comprises at least one curved end and/or comprises at least two rounded corners.

10. The pouched product of any one of claims 1 to 9, wherein the pouched product (11) is a modified square or a modified rectangle in shape, wherein the modified square or the modified rectangle comprises at least one curved end and/or comprises at least two rounded corners.

11. The pouched product of either claim 9 or claim 10, wherein the modified shape comprises at least two curved ends and/or has four rounded corners.

12. The pouched product of any one of claims 1 to 11, wherein the pouched product (11) does not comprise any pointed corners.

13. A method of manufacturing the pouched product (11) according to any one of claims 1 to 12, comprising the steps of:

(i) forming one or more sheets of pouch material around the content (13); and
(ii) thermally or chemically sealing the pouch material to enclose the content (13).

14. The method of claim 13, further comprising the step of:
(iii) cutting the pouch material to produce the first end seam outer border (15) comprising an arcuate portion (20, 22), optionally using a curved blade.

15. A kit comprising a plurality of pouched products (11) according to any one of claims 1 to 12 and a container.

Figure 1

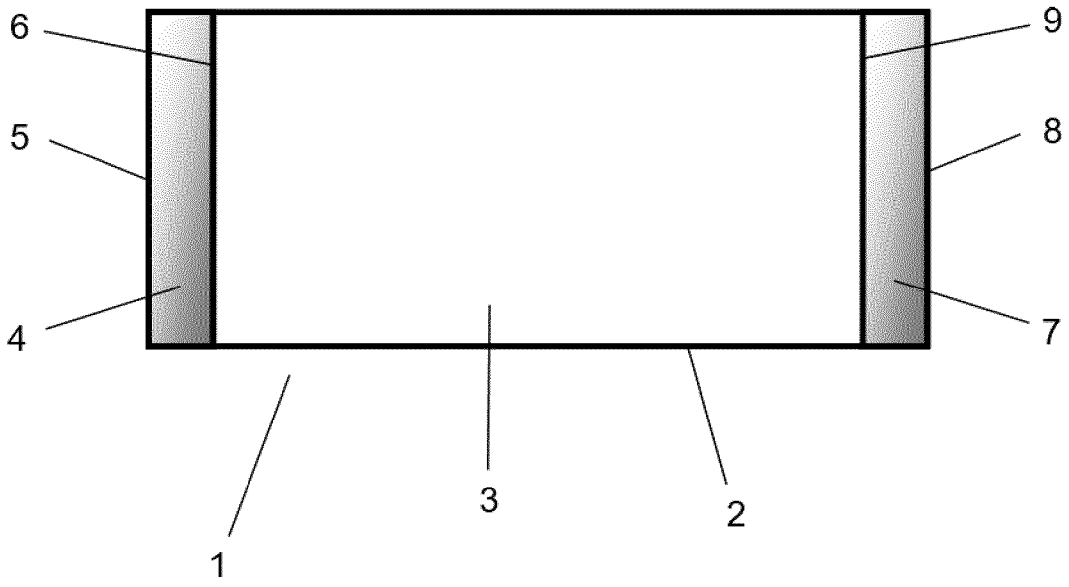


Figure 2

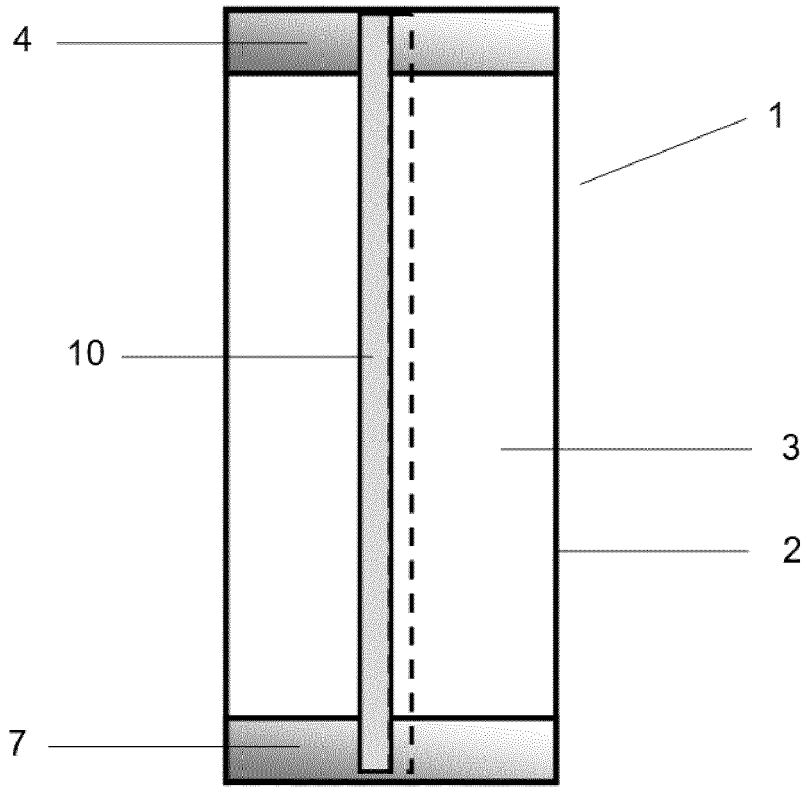


Figure 3

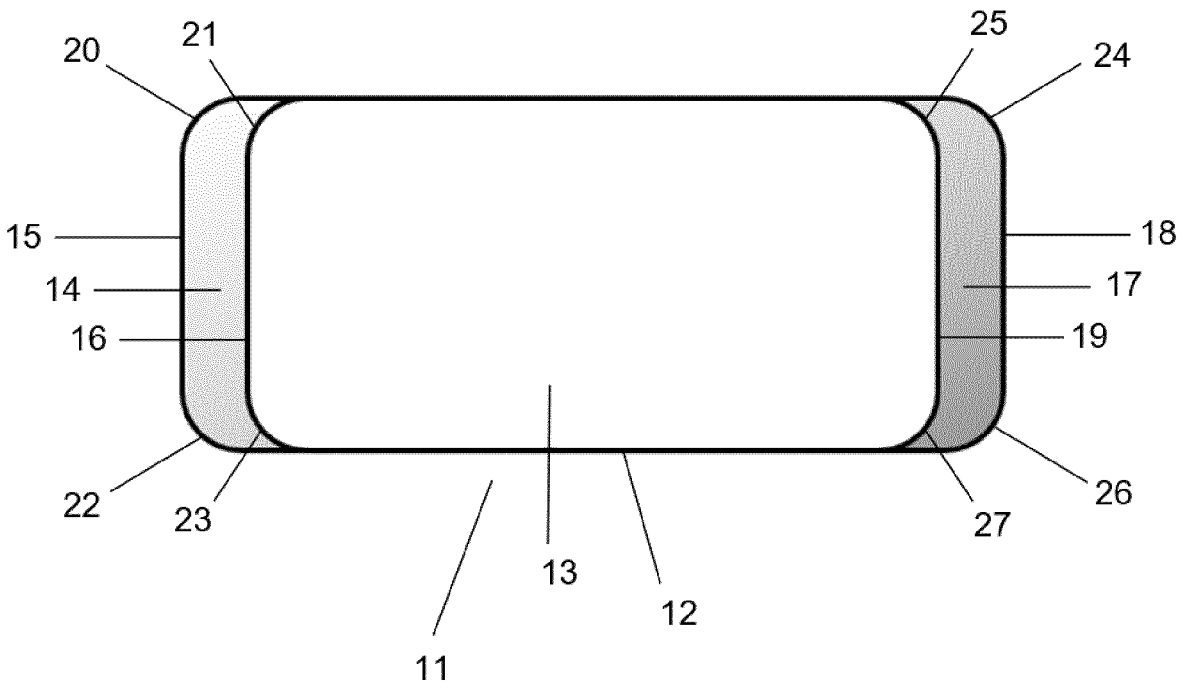
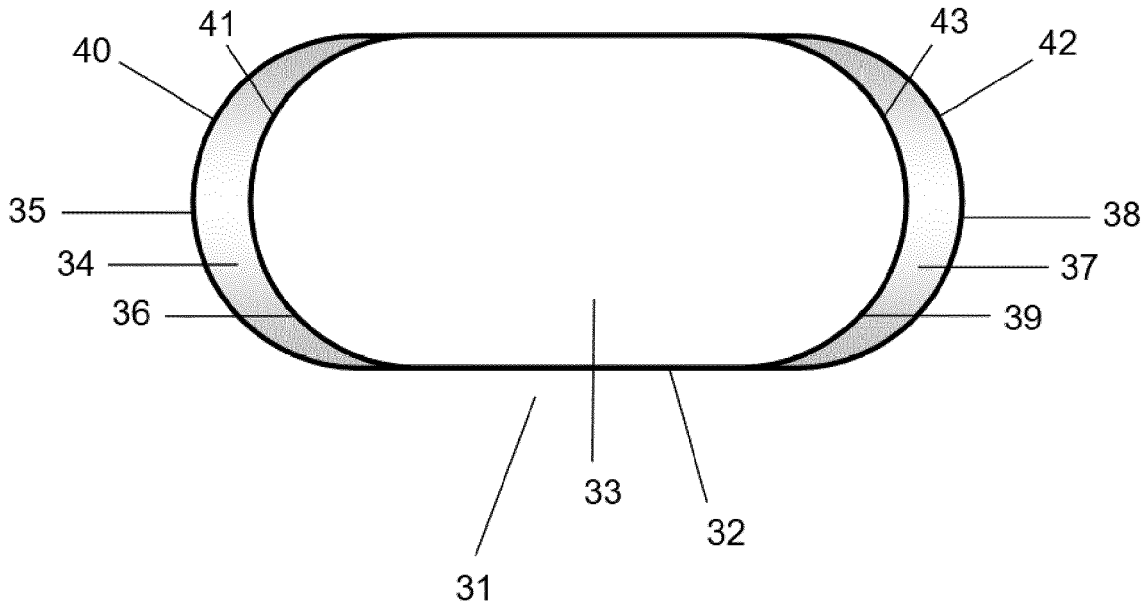


Figure 4



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EUROPEAN SEARCH REPORT

Application Number
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A24B
A24F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 November 2023	Gzil, Piotr

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