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(54) **POUCHED PRODUCT FOR ORAL USE**

(57) The present invention relates to a pouched product (201) for oral use, which comprises a portion of a filling material (202) and a pouch (204) enclosing the filling material. The pouch has a generally rectangular shape with a first pair of opposing side edges (203a, 203b) and a second pair of opposing side edges (205a, 205b). The pouch is formed from a piece of packaging material, which is saliva-permeable and has a pair of opposing side edges. The pouch comprises two seals (209a, 209b) only, each seal being located at or adjacent

to a corresponding one of the second pair of opposing side edges of the pouch. A first edge portion (213a) of the piece of packaging material is arranged in an overlap with another portion (213b) of the piece of packaging material, a major part of the overlapping portions of the piece of packaging material being connected only by surface friction.

The present invention further relates to a method for manufacturing a pouched product for oral use.

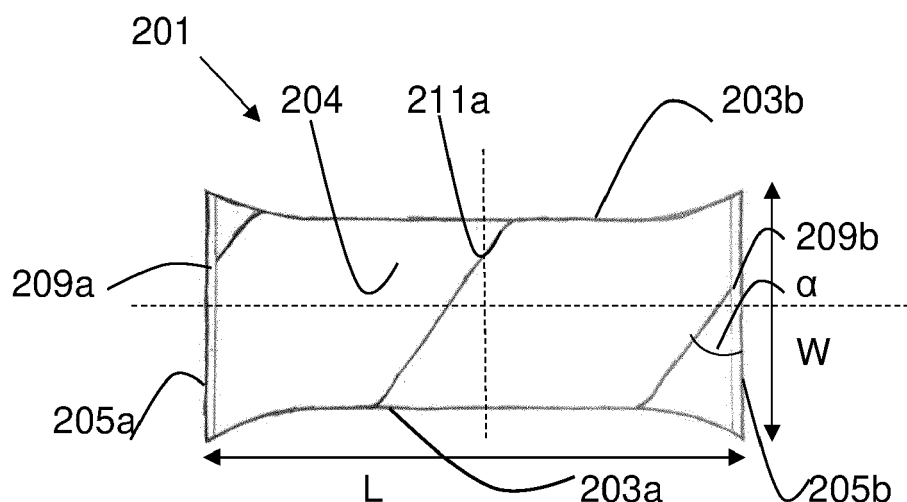


Fig. 2a

Description

TECHNICAL FIELD

[0001] The present invention relates to a pouched product for oral use. The present invention further relates to a method for manufacturing a pouched product for oral use.

BACKGROUND

[0002] A pouched product for oral use may be produced by measuring a portion of a filling material, e.g. a smokeless tobacco composition, and enclosing the portion into a packaging material forming a saliva-permeable pouch enclosing the filling material.

[0003] US 4,703,765 discloses a device and a method for packaging precise amounts of finely divided tobacco products, such as snuff tobacco or the like, in a packaging material into which snuff portions are injected via a fill tube. A flat web of packaging material is formed into a tubular web around the fill tube by means of longitudinal heat-sealing. Downstream from the fill tube, heat-sealing means are positioned for transverse sealing of the packaging material, and also cutting means for severing the packaging material in the area of the transverse seal to thus form discrete or individual portion packages.

[0004] A pouched product made in the device disclosed in US 4,703,765 thus has a longitudinal seal, used to seal the flat web of packaging material in a tubular shape and to hold it there, as well as two transverse seals at a respective transverse edge of the pouched product.

[0005] Pouched products for oral use may alternatively be produced by placing portions of a filling material, such as moist snuff, on a nonwoven web using a pouch packer machine in accordance with the device disclosed in US 6,135,120. This device comprises feeding means for feeding the tobacco material into pockets formed in a rotary portioning wheel for portioning the material into portions, at least one compression means for compressing the tobacco material portions, a unit for advancing a packaging material, such as a nonwoven web, in synchrony with the portions, at least one discharge means for discharging the portions from the pockets to the packaging material, and a forming unit for forming individual portion-packages, i.e. pouched products for oral use, from the discharged portions and the packaging material. At the intended point of discharge of the portions to the packaging material, the packaging material has the form of a tape. The compression means are arranged to compress the portions in a direction which differs from the discharging and the feeding directions. The compression is preferably effected in a direction perpendicular to the discharging and the feeding directions. The compression may be effected in the axial direction of the portioning wheel whereas the feeding and discharging may be effected in the radial direction of the wheel.

[0006] Accordingly, also the pouched product made in

the device disclosed in US 6,135,120 has a longitudinal seal used to form the planar tape of packaging material into a tubular web, as well as a two transverse seals at a respective transverse edge of the pouched product.

[0007] Even if there exist a number of known methods for manufacturing pouched products for oral use, as exemplified above, there is still a need to further improve the method, and thus also the pouched product itself, in order to be able to provide a pouched product for oral use, which is improved in relation to today's products, e.g. regarding mouth feel, visual appearance and/or production cost. In particular, it is desirable to provide a pouched product for oral use, which has a more conformable pouch than previously known pouched products. There is further a need for a method being less complex than prior art methods.

SUMMARY

[0008] The object of the present disclosure is to overcome or ameliorate at least one of the disadvantages of the prior art, or to provide a useful alternative.

[0009] The object above is achieved by the subject-matter of the independent claims. Embodiments are set forth in the appended dependent claims, in the following description and in the drawings.

[0010] The present invention relates to a pouched product for oral use according to claim 1. The pouched product comprises a portion of a filling material and a pouch enclosing the filling material. The pouch has a generally rectangular shape with a first pair of opposing side edges and a second pair of opposing side edges. The pouch is formed from a piece of packaging material, which is saliva-permeable and has a pair of opposing side edges. The pouch comprises two seals only, each seal being located at or adjacent to a corresponding one of the second pair of opposing side edges of the pouch. A first edge portion of the piece of packaging material is arranged in an overlap with another portion of the piece of packaging material, a major part of the overlapping portions of the piece of packaging material being connected only by surface friction.

[0011] As an example, the pouched product may be a pouched nicotine containing product for oral use, a pouched tobacco product for oral use and/or a pouched nicotine free product for oral use.

[0012] The pouched product for oral use is normally sized and configured to fit comfortably and discreetly in a user's mouth between the upper or lower gum and the lip. The pouched product is placed as a whole in the mouth, i.e. not only the filling material but also the enclosing pouch. The pouched product is not intended to be swallowed or eaten. Instead, the pouch is removed from the mouth after the use and disposed of.

[0013] The pouch of the pouched product comprises only two seals, each seal being located at or adjacent to a corresponding one of the second pair of opposing side edges of the pouch. The seals are typically denoted trans-

verse edge seals, since they are made in a cross-machine direction of the apparatus for manufacturing the pouched product, i.e. in the transverse direction of the pouched product. The seals may be made by any method known to the skilled person, e.g. by means of heat-sealing and/or ultrasonic welding. The seals preferably extend all the way out to the respective side edge, but there may also be an interspace between the seals and the respective side edge where the packaging material is unsealed.

[0014] By the term "seal" as used herein is implied a permanent connection between elements such as layers of a pouched product as disclosed herein. The seal is produced by actively connecting the elements in a sealing operation, such as by heat-sealing, also called thermal welding, ultrasonic welding, and/or by means of adhesive.

[0015] As used herein, the term "edge portion" of a piece of packaging material denotes a portion of the piece of packaging material located at or adjacent to one edge of the pair of opposing side edges of the piece of packaging material. The surface of the edge portion may form up to 50% of the whole surface of the piece of packaging material. It may for example form in the range of 2-50% or 5-45% or 10-40% or 20-30% of the whole surface of the piece of packaging material.

[0016] In a major part, i.e. 50% or more, of the overlapping portions of the piece of packaging material, the overlapping portions are connected to each other only by surface friction, i.e. the overlapping portions are not connected by a seal. This implies that a major part of the edge of the first edge portion is free, i.e. not sealed. A minor part, i.e. less than 50%, preferably less than 30%, more preferably less than 10%, most preferably less than 5%, of the overlapping portions of the piece of packaging material may extend into and be included in the transverse edge seals of the pouch. The edge of the first edge portion may then be perpendicular to the transverse edge seals of the pouch or at an angle thereto deviating from 90°, as is further described herein.

[0017] The overlap between the portions is utilized to form a closed circumference of the pouch as seen in a plane being parallel to the transverse edge seals of the pouch and located somewhere between them, e.g. halfway. This plane thus forms a transverse cross-sectional plane of the pouched product. Hence, for pouched products according to the invention, the longitudinal seal or seals used in prior art products can be dispensed with. This saves an operation step in manufacturing of the pouched products, which makes manufacturing less complex. In addition, a seal made by welding or by application of adhesive between layers of material may be perceived by a user as being stiff and chafing against the mucous membranes in the oral cavity. By dispensing with the longitudinally extending seal, it is possible to offer a pouched product having a smoother and more uniform outer surface, as well as being more conformable to the gums of the user.

[0018] The other portion of the piece of packaging material being overlapped by the first edge portion may be a second edge portion and/or any other portion of the piece of packaging material.

5 **[0019]** The pouched product for oral use described herein may be dry, semi-dry or moist. Generally, dry pouched products have a moisture content of less than 10 wt% and moist pouched products have a moisture content of above 40 wt%. Semi-dry pouched products have a moisture content between 10 wt% and 40 wt%.

10 **[0020]** The pouched product may be flavoured by mixing the flavour in the filling material during manufacturing. Additionally or alternatively, the flavour may be added to the pouched product after it has been manufactured.

15 **[0021]** By the term "tobacco" as used herein is meant any part, e.g., leaves, stems, and stalks, of any member of the genus *Nicotiana*. The tobacco may be whole, shredded, threshed, cut, ground, cured, aged, fermented, or treated otherwise, e.g. granulated or encapsulated.

20 **[0022]** The term "tobacco material" is used herein for tobacco leaves or parts of leaves, such as lamina and stem. The leaves and parts of leaves may be finely divided (disintegrated), such as ground, cut, shredded or threshed, and the parts of leaves may be blended in defined proportions in the tobacco material.

25 **[0023]** The filling material may comprise a finely divided tobacco material such as a ground tobacco material or cut tobacco. In addition to the tobacco material, the filling material may further comprise at least one of the following: water, salt (e.g. sodium chloride, potassium chloride, magnesium chloride, and any combinations thereof), pH adjuster, flavouring agent, cooling agent, heating agent, sweetening agent, colorant, humectant (e.g. propylene glycol or glycerol), antioxidant, preservative (e.g. potassium sorbate), binder, disintegration aid. In an example, the filling material comprises or consists of finely divided tobacco material, salt such as sodium chloride, and a pH adjuster.

30 **[0024]** For pouched products with no or low tobacco content, to which nicotine is added, the nicotine of the filling material may be synthetic nicotine and/or nicotine extract from tobacco plants. Further, the nicotine may be present in the form of nicotine base and/or a nicotine salt. The nicotine salt may be free, i.e. it is mixed with the other components of the pouched product without combining chemically with the components. Additionally or alternatively, the nicotine salt may combine chemically with one or more components of the filling material. For instance, the nicotine salt may combine with alginate particles or cellulose.

35 **[0025]** As used herein, the term "moisture content" refers to the total amount of oven volatile ingredients, such as water and other oven volatiles (e.g. propylene glycol) in the preparation, composition or product referred to. The moisture content may be given herein as percent by weight (wt%) of the total weight of the preparation, composition or product referred to. If not stated otherwise, moisture content is herein given in relation to the weight

of the filling material.

[0026] The moisture content as referred to herein may be determined by using a method based on literature references Federal Register/ vol.74, no. 4/712-719/Wednesday, January 7, 2009/Notices "Total moisture determination" and AOAC (Association of Official Analytical Chemists), Official Methods of Analysis 966.02: "Moisture in Tobacco" (1990), Fifth Edition, K. Helrich (ed). In this method, the moisture content is determined gravimetrically by taking 2.5 ± 0.25 g sample and weighing the sample at ambient conditions, herein defined as being at a temperature of 22°C and a relative humidity of 60%, before evaporation of moisture and after completion of dehydration. Mettler Toledo's Moisture Analyzer HB43, a balance with halogen heating technology, is used (instead of an oven and a balance as in the mentioned literature references) in the values described herein. The sample is heated to 105°C (instead of $99.5 \pm 0.5^\circ\text{C}$ as in the mentioned literature references). The measurement is stopped when the weight change is less than 1 mg during a 90 seconds time frame. The moisture content as weight percent of the sample is then calculated automatically by the Moisture Analyzer HB43.

[0027] Pouched products for oral use may or may not be post-moisturized after pouch formation. Pouched products which are not post-moisturized are herein referred to as non-post-moisturized. Post-moisturized pouched products may be produced by spraying water on the pouched product before packaging the pouched products in user containers. Post-moisturized pouches are sometimes referred to as "original" products. Non-post-moisturized pouched products are sometimes referred to as "white" products and are by some consumers considered to have a more appealing visual appearance. The moisture content of the final pouched product comprising a moist or semi-dry snuff or snus product is normally within the range of from 25 to 55 wt% based on the weight of the pouched product.

[0028] The saliva-permeable packaging material, which is used for the pouch, is typically a nonwoven material, such as viscose. It may include a chemical binder. Nonwoven materials are fabrics that are neither woven nor knitted. Methods for the manufacturing nonwoven materials are commonly known in the art. The packaging material is typically provided in a web-shaped or sheet-shaped format.

[0029] Pouched products for oral use are normally sized and configured to fit comfortably and discreetly in a user's mouth between the upper or lower gum and the lip. In general, pouched products for oral use have a generally rectangular shape as seen in a top view, while being pillow-like when seen in a three-dimensional view. Some typical shapes (length x width) of commercially available pouched products for oral use are, for instance, 35 mm x 20 mm, 34/35 mm x 14 mm, 33/34 mm x 18 mm, 27/28 mm x 14 mm, 34 mm x 10 mm and 38 x 14 mm. Typical pouched products for oral use may have a maximum length within the range of from 25 to 40 mm

along the longitudinal direction of the pouched product and a maximum width within the range of from 5 to 20 mm along the transverse direction of the pouched product. The thickness ("height") of the pouched product is normally within the range of from 2 to 8 mm. The total weight of commercially available pouched products for oral use are typically within the range from about 0.3 to about 3.5 g, such as from about 0.5 to 1.7 g, per pouched product.

[0030] A user container typically contains in the range of 10-30 pouched products, such as in the range of 20-25 pouched products. The pouched products may be placed randomly in the user container or in a pattern, for instance as described in WO 2012/069505 A1. The user container as disclosed herein is consumer package having a shape and a size adapted for conveniently carrying the consumer package in a pocket or in a handbag and may be used for packaging any known type of pouched product for oral use.

[0031] The term "tubular" as used herein refers to any cross-sectional shape; specifically, it is not restricted to a circular tubular web. The piece of tubular web may e.g. have a square, polygonal, elliptical or oval cross-sectional shape. However, the piece of tubular web has a closed circumference, such that the piece of tubular web is able to retain the filling material inside the piece of tubular web.

[0032] The overlap between the portions may have a width in the range of 3-40 mm, preferably 4-30 mm, more preferably 5-25 mm, most preferably 10-20 mm. The width of the overlap is determined as the narrowest width of the overlap. The width of the overlap is typically selected to be sufficiently wide to reduce, or preferably avoid, the risk of filling material leaking out from the pouch.

[0033] The overlap may constitute in the range of 5%-100% of an exterior surface of the pouch, preferably 10%-95%, more preferably 20%-90%, most preferably 25%-80%. There may hence be surface portions of the pouch with no overlap. The exterior surface is the total outer surface of the pouch. Hence, both outer sides of the rectangular pouched product are included.

[0034] The part of the overlapping portions of the piece of packaging material connected only by surface friction may constitute at least 50% of a surface area of the overlap, preferably at least 70%, more preferably at least 90%, most preferably at least 95%. As mentioned above, a minor part of the overlapping portions of the piece of packaging material, i.e. less than 50%, preferably less than 30%, more preferably less than 10%, most preferably less than 5%, may extend into and be included in the transverse edge seals of the pouch.

[0035] The piece of packaging material forming the pouch may comprise or be constituted by at least one web-shaped piece of packaging material being helically wound thereby forming adjacent revolutions, wherein the first edge portion of packaging material in the overlap is an edge portion of one revolution and the other portion in the overlap is an edge portion of an adjacent revolution.

It is also feasible to use more than one web-shaped piece of packaging material, e.g. two, with one of the web-shaped pieces of packaging material being located inside the other. In that case, the two web-shaped pieces of packaging material may be wound in the same helical manner or may be wound in different ways.

[0036] If helically wound, an edge of the first edge portion may have an angle in the range of 5°-85° in relation to an extension direction of the seals, i.e. the transverse edge seals of the pouch, preferably in the range of 10°-75°, more preferably in the range of 15°-65°, most preferably in the range of 20°-50°.

[0037] As an alternative or a complement to the helically wound web-shaped piece of packaging material, the pouch may comprise an edge of the first edge portion being arranged perpendicularly, or substantially perpendicularly, to the two seals of the pouch. Hence, the edge extends in a direction often referred to as a longitudinal direction of the pouched product, since it coincides with a machine direction of the apparatus for manufacturing the pouched product.

[0038] In that case, the piece of packaging material may comprise or be constituted by a single sheet of packaging material formed such that opposite edge portions of the sheet are arranged in the overlap. The sheet may be a cut piece of a web-shaped packaging material. Thereby, the side edges of the web-shaped piece of packaging material may be arranged such that they coincide with the two long side edges of the pouched product. Hence, the width of the respective edge portions each forms about 1/3 of the width of the web-shaped piece of packaging material, such that the overlap forms about half the exterior surface of the pouch.

[0039] As an alternative to using a single sheet, the piece of packaging material may comprise or be constituted by two sheets of the packaging material arranged such that they at least partly overlap, one of the sheets being arranged inside the other sheet, i.e. with an outer surface of the inner sheet facing an inner surface of the outer sheet. As used herein, the outer surface of a pouch material is the surface facing away from the filling material in the pouch and the inner surface of the pouch material is the surface facing towards the filling material in the pouch. The overlap may then constitute in the range of 90%-100% of an exterior surface of the pouch, preferably 95%-100%.

[0040] A degree of filling of the pouch by the portion of the filling material may be in the range of 40%-100%, preferably in the range of 50%-90%, more preferably in the range of 60%-80%. The filling material presses the packaging material of the pouch outwards, which helps the pouch to keep its intended shape. Furthermore, the filling material may thereby help to hold the overlapping portions in contact with each other in the overlap. The degree of filling is measured by comparing the actual amount of filling material enclosed in the pouch with the case when that pouch is maximally filled with that filling material. Hence, the comparison is made for the actual

pouch with the actual filling material. 100% denotes that the pouch is maximally filled. The measurement is made at set ambient conditions, with a temperature of 22°C and a relative humidity of 60%. However, the overlap could be held by surface friction also for a theoretical case with 0% filling material.

[0041] The packaging material may have a kinetic coefficient of friction of at least 0.03, preferably at least 0.05, more preferably at least 0.07 as measured with ASTM D1894. This level of the coefficient of friction has proven to give adequate surface friction in the overlap.

[0042] The present invention also relates to a method for manufacturing a pouched product for oral use. The method comprises:

- a) providing a saliva-permeable web-shaped packaging material, the web-shaped material comprising a first edge portion and a second edge portion located at opposite side edges of the web-shaped packaging material,
- b) forming a tubular web of the web-shaped packaging material by arranging the first edge portion of the web-shaped packaging material in an overlap with another portion of the web-shaped packaging material, the overlap being connected only by surface friction, the tubular web extending in a longitudinal direction,
- c) providing the tubular web with a first transverse seal,
- d) supplying a portion of a filling material into the tubular web,
- e) providing the tubular web with a second transverse seal, thereby forming the pouched product.

[0043] The pouched product which is produced by the method is typically the pouched product for oral use as described herein. Hence, the pouched product for oral use as described herein may be manufactured by the method as described herein. The details described for herein for the pouched product for oral use are valid for the method as well. Further, the effects and advantages described for the pouched product for oral use are valid for the method as well and will not be described again.

[0044] The longitudinal direction of the pouched product typically corresponds to the machine direction of an apparatus for manufacturing the pouched product for oral use. The transverse direction typically corresponds to the cross-machine direction of the apparatus for manufacturing the pouched product. Hence, the transverse seals formed in steps c) and e) are perpendicular to, or at least substantially perpendicular to, the machine direction of the apparatus for manufacturing the pouched product. The transverse seal may be made by any method known to the skilled person, e.g. by means of heat-sealing and/or ultrasonic welding.

[0045] When comparing the method according to the invention with prior art methods, it can be seen that a step of longitudinal sealing has been omitted. This makes

the method less complex. Transvers sealing with heat-sealing is for example described in US 4,703, 765. Ultrasonic sealing is for example described in WO 2017093486 A1.

[0046] The method may further comprise:

f) separating the pouched product from a subsequent pouched product in or at the second transverse seal.

[0047] Separation by cutting is described in US 4,703, 765 and WO 2017093486 A1.

[0048] Typically the separation is made within, preferably close to the centre, of the second transverse seal. Thereby, the second transverse seal is split in two portions, typically halves, wherein one portion forms a transverse edge seal of the pouched product and the other portion forms a transverse edge seal of the subsequent product. Hence, step e) will correspond to step c) when the subsequent pouched product for oral use is manufactured.

[0049] Step b) may comprise winding the web-shaped packaging material in a helical manner to form the tubular web, the edge portions of adjacent revolutions being arranged in the overlap.

[0050] As an alternative, step b) may comprise arranging an edge of the first edge portion in the longitudinal direction of the tubular web. This corresponds to the pouch comprising an edge of the first edge portion arranged perpendicularly, or substantially perpendicularly, to the two seals of the pouch.

[0051] In an embodiment,

step a) may comprise providing an additional saliva-permeable web-shaped packaging material comprising two edge portions located at opposite edges of the additional web-shaped packaging material, and

step b) may comprise forming a tubular web of the web-shaped packaging material by arranging the web-shaped packaging material and the additional web-shaped packaging material such that they at least partly overlap, the additional web-shaped packaging material thereby being arranged inside the web-shaped packaging material.

[0052] This corresponds to a pouched product, in which the piece of packaging material comprises or is constituted by two sheets of the packaging material arranged such that they at least partly overlap, one of the sheets being arranged inside the other sheet. The overlap may constitute in the range of 90%-100% of an exterior surface of the pouch, preferably 95%-100%.

BRIEF DESCRIPTION OF THE DRAWINGS

[0053] The present invention will hereinafter be further explained by means of non-limiting examples with reference to the appended drawings wherein:

Fig. 1a-b illustrate a pouched product for oral use according to prior art,

Fig. 2a-c illustrate a pouched product for oral use according to a first embodiment of the invention,

Fig. 3a-b illustrate helical winding,

Fig. 4a-b illustrate a pouched product for oral use according to a second embodiment of the invention,

Fig. 5a-b illustrate a pouched product for oral use according to a third embodiment of the invention, and

Fig. 6 illustrates a method for manufacturing a pouched product for oral use according to the invention.

[0054] It should be noted that the appended drawings are not necessarily drawn to scale and that the dimensions of some features of the present invention may have been exaggerated for the sake of clarity. The drawings are schematic.

DETAILED DESCRIPTION

[0055] The invention will in the following be exemplified by embodiments. It should however be realized that the embodiments are included in order to explain principles of the invention and not to limit the scope of the invention, defined by the appended claims. Details from two or more of the embodiments may be combined with each other.

[0056] Fig. 1a and 1b schematically illustrate a pouched product 101 for oral use according to prior art, with Fig. 1a showing a top view and Fig. 1b showing a transverse cross-section taken along the dashed line in Fig. 1a. The prior art product 101 has a rectangular shape with a maximum length L_0 extending in a length direction, also referred to herein as a longitudinal direction, and a maximum width W_0 extending in a width direction, also referred to herein as a transverse direction, whereby the maximum length L_0 is greater than the maximum width W_0 . The prior art pouched product 101 comprises a filling material 102 and a saliva-permeable pouch 104 enclosing the filling material 102. The prior art product 101 comprises two long side edges 103a, 103b and two short side edges 105a, 105b. The prior art product 101 also has a maximum height H_0 extending in a height direction, being perpendicular to the length direction and to the width direction, not seen in the top view of Fig. 1a, but indicated in Fig. 1b.

[0057] The prior art pouched product 101 comprises at least one seal 107 extending in the length direction. Typically, and as illustrated in Fig. 1a, there is a single seal 107 extending in the length direction. This seal is often called a longitudinal seal, since, when manufacturing the prior art product 101, this seal is made along the direction of travel of the web forming the pouch 104. The longitudinal seal is often positioned spaced apart from the long side edges 103a, 103b. Thereby it is often pre-

ferred to position it at or close to the longitudinal centre-line, as is illustrated in Fig. 1a. The longitudinal seal 107 may be made by any method known to the skilled person, e.g. by means of heat-sealing and/or ultrasonic welding. In a commonly used method, the longitudinal seal 107 is formed as a fin seal, which is folded down upon the packaging material, such that the pouch 104 locally comprises three plies of packaging material on top of the filling material. See the cross-sectional view in Fig. 1b, where the three plies on top of each other are illustrated in an exaggerated way to make the three plies visible.

[0058] The prior art pouched product 101 further comprises two seals 109a, 109b extending in the width direction. The two seals 109a, 109b seal the two short side edges 105a, 105b and thus form edge seals. These seals 109a, 109b are often called transverse edge seals, since, when manufacturing the prior art product 101, these edge seals are made transverse to the direction of travel of the web forming the pouch. In the transverse seals, the packaging material forming the saliva-permeable pouch is double. The transverse edge seals 109a, 109b may be made by any method known to the skilled person, e.g. by means of heat-sealing and/or ultrasonic welding. Since the transverse edge seals 109a, 109b are made after the longitudinal seal 107, i.e. downstream in the manufacturing apparatus, the longitudinal seal 107 is included in the transverse edge seals 109a, 109b, i.e. the longitudinal seal 107 forms part of the transverse edge seals 109a, 109b. The longitudinal seal 107 may e.g. be welded into the transverse edge seals 109a, 109b. There will then locally be four plies of packaging material on top of each other.

[0059] Fig. 2a-c schematically illustrate a pouched product 201 for oral use according to the invention, with Fig. 2a showing a top view, Fig. 2b showing a transverse cross-section and Fig. 2c showing a longitudinal cross-section, with the cross-sections taken along the dashed lines of Fig. 2a. The pouched product 201 comprises a filling material 202 and a saliva-permeable pouch 204 enclosing the filling material 202. The pouch 204 is formed by a web-shaped piece of packaging material being helically wound.

[0060] The pouched product 201 according to the invention has a rectangular shape and comprises two long side edges 203a, 203b and two short side edges 205a, 205b. Similar to the prior art pouched product 101, the pouched product 201 according to the invention comprises two transverse seals but, contrary to prior art, it has no longitudinal seal. The transverse seals form a first transverse edge seal 209a and a second transverse edge seal 209b sealing along the two short side edges 205a, 205b of the pouched product 201. The transverse edge seals 209a, 209b preferably extend all the way out to the respective short side edge 205a, 205b, but there may also be an interspace between the transverse edge seal 209a, 209b and the short side edge 205a, 205b where the packaging material is left un-sealed. The transverse seals 209a, 209b may be made by any method known to the skilled person, e.g.

by means of heat-sealing, and/or ultrasonic welding, with ultrasonic welded seals shown in the illustrated embodiment.

[0061] The pouch 204 has a maximum length L extending in a length direction and a maximum width W extending in a width direction, whereby the maximum length L is greater than the maximum width W. The pouched product 201 also has a maximum height H extending in a height direction, being perpendicular to the length direction and to the width direction, not seen in the top view of Fig. 2a, but seen in the views of Fig. 2b and 2c. The maximum width W is measured at the short side edge 205a, 205b where the pouched product 201 only has the height of twice the thickness of the packaging material.

[0062] The principle of helical winding is schematically illustrated with the help of Fig. 3a and 3b. A web-shaped piece 301 of packaging material has a narrowest width a and a pair of opposing side edges, with a first side edge 311a and a second side edge 311b, see Fig. 3a. A first edge portion 313a and a second edge portion 313b of the web-shaped piece 301 of packaging material are located at the edge of the respective side edges. In the illustrative example of Fig. 3a and 3b, each edge portion 313a, 313b extends about 20% of the whole surface of the web-shaped piece 301 of packaging material.

[0063] The web-shaped piece 301 of packaging material is helically wound, e.g. around a tube 305 having a diameter d, see Fig. 3b, such that a tubular web 307 is formed. The tube 305 may e.g. be a fill tube of an apparatus for manufacturing oral pouched products. A centre axis A of the tube 305 extends in a longitudinal direction of the tubular web 307. The tubular web 307 has a circumference being given by the outer circumference of the tube 305, i.e. πd . The web-shaped piece 301 of packaging material forms adjacent revolutions, which overlap with each other. Thereby, the first edge portion of packaging material in the overlap is a first edge portion 313a of one revolution and the other portion in the overlap is a second edge portion 313b of an adjacent revolution. The width b of the overlap between adjacent revolutions is about 20% of the width a of the web-shaped piece 301 of packaging material in the illustrated embodiment. Since there is an overlap of about 20% for both the preceding and the subsequent revolutions, the total overlap in relation to the width a of the web-shaped piece of packaging material is $b+b$, i.e. about 40%. An edge of the first edge portion 313a, i.e. the first side edge 311a of the web-shaped piece 301 of packaging material, has an angle α in the range of 5° - 85° in relation to an extension direction of the transverse edge seals to be made when forming the pouch, preferably in the range of 10° - 75° , more preferably in the range of 15° - 65° , most preferably in the range of 20° - 50° , in Fig. 3b illustrated as 40° .

[0064] In the embodiment of the pouched product for oral use illustrated in Fig. 2a-2c, the overlap between adjacent revolutions is close to 50% of the width of the web-shaped piece of packaging material. Since there is

an overlap of close to 50% for both the preceding and the subsequent revolutions, the total overlap in relation to the web-shaped piece of packaging material is close to 100%. One of the side edges 211a of the web-shaped piece of packaging material can be seen on the outside of the pouch 204, while the other side edge 211b is located inside the pouch 204, see Fig. 2c. The first edge portion 213a adjacent to the first side edge 211a overlaps with the second edge portion 213b of the adjacent revolution. The first side edge 211a has an angle α in the range of 5° - 85° in relation to an extension direction of the transverse edge seals of the pouch, preferably in the range of 10° - 75°, more preferably in the range of 15° - 65°, most preferably in the range of 20° - 50°, see Fig. 2a wherein it is illustrated as 45°. The maximum width W of the pouched product 201 is half the circumference of the tubular web, e.g. $\pi d/2$ if the tubular web of Fig. 3b is used.

[0065] The filling material 202 presses the packaging material of the pouch outwards, which helps the pouch 204 to keep its intended shape. The filling material 202 may further help to hold the overlapping portions 231a, 213b in contact with each other in the overlap by expanding the pouch 204 from the inside. A degree of filling of the pouch by the portion of the filling material may in the range of 40%-100%, preferably in the range of 50%-90%, more preferably in the range of 60%-80%. However, the overlap could be held by surface friction also for a theoretical case with 0% filling material.

[0066] The packaging material may be selected to have a kinetic coefficient of friction of at least 0.03, preferably at least 0.05, more preferably at least 0.07 as measured with ASTM D1894. This level of the coefficient of friction has proven to give adequate surface friction to hold the overlapping portions in the overlap. Further, the width of the overlap will influence the ability to hold the overlapping portions in the overlap. Hence, it may be appropriate to use a material with a higher coefficient of friction if the overlap is narrow as compared to a pouched product with a wider overlap.

[0067] When comparing the pouched product 201 according to the invention and the prior art pouched product 101, it can be seen that they may have similar generally rectangular shapes. However, they differ from each other regarding the presence or absence of the at least one longitudinal seal 107. They may also differ as regards size and/or length to width ratio. They may also differ as regards the widths of the transverse seals. Both Fig. 1a and Fig. 2a show a typical width for transverse edge seals made with ultrasonic welding, which may have a width of less than 2 mm, preferably less than 1 mm, more preferably less than 0.5 mm. If instead using the commonly known technology of heat-sealing, the seal would typically be wider, e.g. in the range of 2-5 mm, which can be seen for the longitudinal seal 107 of the prior art product 101.

[0068] In a filling material leakage test, a reference product made according to prior art, looking like the prior art embodiment illustrated in Fig. 1a and 1b, was com-

pared to a sample product made according to the first embodiment of the invention illustrated in Fig. 2a-2c. The reference product was ZYN Spearmint Mini Dry, which is a commercially available product, having article no 7909. The reference product comprised a longitudinal seal made by heat-sealing. Both the reference product and the sample product comprised transverse edge seals made by ultrasonic welding.

[0069] The pouch of the sample product consisted of the same type of packaging material as the pouch of the reference product. The packaging material of the sample product was helically wound with an overlap of close to 50% for both the preceding and subsequent revolution, see Fig. 2a-c. Further, the filling material, i.e. the content enclosed by the pouch, being a granulate in this example, was of the same type for the sample product as for the reference product. The degree of filling of the pouch by the portion of the filling material was about 70% for both the reference product and the sample product. The moisture content of the filling material was 1,57% for both the reference product and the sample product.

[0070] The weight of both the reference product and the sample product was 0.40 g. It then turned out that the reference product comprised in average 0.37 g filling material per pouch and the sample product 0.33 g filling material per pouch.

[0071] Test procedure: The filling material leakage test was performed on a Retsch/ AS 200 control vibrating sieve with a mesh size of 1.7 mm. First 20 pouches of the reference product were placed on the sieve and vibrated for 1 minute with an amplitude of 1 mm, then 20 pouches of the sample product were placed on the sieve and vibrated for 1 minute with an amplitude of 1 mm.

[0072] The weight of any filling material potentially having leaked out from the 20 pouches was checked, but was, if any, for both the reference product and the sample product below the detection limit of 0.01g of the scale.

[0073] Fig. 4a-b schematically illustrate a pouched product 401 for oral use according to another embodiment of the invention, with Fig. 4a showing a top view and Fig. 4b a transverse cross-section taken along the dashed line. The pouch 404 is formed by a single sheet, the sheet being a cut-off portion of the web-shaped piece of packaging material. Opposite edge portions 413a, 413b of the sheet are arranged in the overlap, as can be seen in the cross-sectional view of Fig. 4b, with the first edge portion being outside the second edge portion 413b. The pouch 404 comprises two transverse edge seals 409a, 409b, but no longitudinal seal.

[0074] In the illustrated embodiment, the side edges 411a, 411b of the web-shaped piece of packaging material are arranged such that they coincide with the two long side edges 403a, 403b of the pouched product. Hence, the side edges 411a, 411b are perpendicular to the transverse edge seals 409a, 409b. The widths of the respective edge portions 413a, 413b each forms about 1/3 of the width of the sheet, such that the overlap forms about half the exterior surface of the pouch 404.

[0075] Fig. 5a-b schematically illustrate a pouched product 501 for oral use according to another embodiment of the invention, with Fig. 5a showing a top view and Fig. 5b a transverse cross-section taken along the dashed line. The pouch 504 is formed by a first sheet 515 of packaging material and a second sheet 517 of packaging material arranged such that they at least partly overlap, the second sheet 517 being arranged inside the first sheet 515. The first sheet 515 comprises two edge portions 513a, 513b located at a respective side edge 511a, 511b of the sheet. The second sheet 517 comprises two edge portions 521a, 521b located at a respective side edge 519a, 519b of the sheet. The pouch 504 further comprises two transverse edge seals 509a, 509b, but no longitudinal seal.

[0076] In the illustrated embodiment, the width of each sheet 515, 517 is about as large as the circumference of the pouch 504. The side edges 511a, 511b of the first sheet 515 are arranged such that they almost meet each other. Also the side edges 519a, 519b of the second sheet 517 are arranged such that they almost meet each other. Further, the side edges 511a, 511b, 519a, 519b are perpendicular to the transverse edge seals 509a, 509b. The widths of the respective edge portions 513a, 513b; 521a, 521b each forms about 50% of the width of the sheets 515, 517, such that the overlap forms about 100% of the exterior surface of the pouch 504.

[0077] Fig. 6 illustrates a method 601 for manufacturing a pouched product for oral use. The pouched product of the method typically is the pouched product 201, 401, 501 for oral use as described herein. Hence, the pouched product 201, 401, 501 for oral use as described herein may be manufactured by the method 601 as described herein. The details for the pouched product 201, 401, 501 for oral use, e.g. described in conjunction with Fig. 2-5 are valid for the method as well.

[0078] The method 601 comprises:

- a) providing a saliva-permeable web-shaped packaging material 301, the web-shaped material 301 comprising a first edge portion 313a and a second edge portion 313b located at opposite side edges of the web-shaped packaging material 301,
- b) forming a tubular web 307 of the web-shaped packaging material 301 by arranging the first edge portion 313a of the web-shaped packaging material 301 in an overlap with another portion 313b of the web-shaped packaging material 301, the overlap being connected only by surface friction, the tubular web 307 extending in a longitudinal direction,
- c) providing the tubular web 307 with a first transverse seal,
- d) supplying a portion of a filling material 202 into the tubular web 307,
- e) providing the tubular web 307 with a second transverse seal, thereby forming the pouched product.

[0079] The longitudinal direction of the pouched prod-

uct 201, 401, 501 typically corresponds to the machine direction of an apparatus for manufacturing the pouched product for oral use, in Figure 3b illustrated by the longitudinal direction along the central axis A of the tube 305.

The transverse direction typically corresponds to the cross-machine direction of the apparatus for manufacturing the pouched product. Hence, the transverse seals formed in steps c) and e) are perpendicular to, or at least substantially perpendicular to, the machine direction of the apparatus for manufacturing the pouched product. The transverse seal may be made by any method known to the skilled person, e.g. by means of heat-sealing and/or ultrasonic welding.

[0080] The method may further comprise:

- f) separating the pouched product from a subsequent pouched product in or at the second transverse seal.

[0081] Typically the separation is made within, preferably close to the centre, of the second transverse seal. Thereby, the second transverse seal is split in two portions, typically halves, wherein one portion forms a transverse edge seal 209b of the pouched product and the other portion forms a transverse edge seal 209a of the subsequent product. Hence, step e) will correspond to step c) when the subsequent pouched product for oral use is manufactured.

[0082] Step b) may comprise winding the web-shaped packaging material 301 in a helical manner to form the tubular web 307, the edge portions 313a, 313b of adjacent revolutions being arranged in the overlap. Reference is thereby made to the helical winding shown in Fig. 3a-3b and the text describing those figures. The resulting pouched product may look like the pouched product 201 illustrated in Fig. 2a-c.

[0083] As an alternative, step b) may comprise arranging an edge 411a; 511a of the first edge portion 413a; 513a in the longitudinal direction of the tubular web. The resulting pouched product may look like the pouched products 401, 501 illustrated in Fig. 4a-5b. The method step b) then corresponds to the pouch 404, 504 comprising an edge 411a, 511a of the first edge portion 413a, 513 being arranged perpendicularly to, or substantially perpendicularly to, the two seals 409a, 409b; 509a, 509b of the pouch 404, 504.

[0084] In an embodiment,

- step a) comprises providing an additional saliva-permeable web-shaped packaging material comprising two edge portions 521a, 521b located at opposite edges 519a, 519b of the additional web-shaped packaging material, and
- step b) comprises forming a tubular web of the web-shaped packaging material by arranging the web-shaped packaging material and the additional web-shaped packaging material such that they at least partly overlap, the additional web-shaped packaging material thereby being arranged inside the web-

shaped packaging material.

[0085] This corresponds to a pouched product, in which the piece of packaging material comprises or is constituted by two sheets of the packaging material arranged such that they at least partly overlap, one of the sheets being arranged inside the other sheet. The overlap may constitute in the range of 90%-100% of an exterior surface of the pouch, preferably 95%-100%.

[0086] An example of such a product is illustrated in Fig. 5a-b, wherein the saliva-permeable web-shaped packaging material corresponds to the first sheet 515 and the additional saliva-permeable web-shaped packaging material corresponds to the second sheet 517.

[0087] Further modifications of the invention within the scope of the appended claims are feasible. As such, the present invention should not be considered as limited by the embodiments and figures described herein. Rather, the full scope of the invention should be determined by the appended claims, with reference to the description and drawings.

Claims

1. A pouched product (201) for oral use, the pouched product (201) comprising a portion of a filling material (202) and a pouch (204) enclosing the filling material (202), the pouch (204) having a generally rectangular shape with a first pair of opposing side edges (203a, 203b) and a second pair of opposing side edges (205a, 205b), the pouch (204) being formed from a piece of packaging material (301), the packaging material (301) being saliva-permeable and having a pair of opposing side edges (311a, 311b), **characterized in that** the pouch (204) comprises two seals (209a, 209b) only, each seal (209a, 209b) being located at or adjacent to a corresponding one of the second pair of opposing side edges (205a, 205b) of the pouch (204), and a first edge portion (213a) of the piece of packaging material is arranged in an overlap with another portion (213b) of the piece of packaging material, a major part of the overlapping portions (213a, 213b) of the piece of packaging material being connected only by surface friction.
2. The pouched product (201) for oral use according to claim 1, wherein the overlap has a width (b) in the range of 3-40 mm, preferably 4-30 mm, more preferably 5-25 mm, most preferably 10-20 mm.
3. The pouched product (201) for oral use according to claim 1 or 2, wherein the overlap constitutes in the range of 5%-100% of an exterior surface of the pouch (204), preferably 10%-95%, more preferably 20%-

90%, most preferably 25%-80%.

4. The pouched product (201) for oral use according to any one of claims 1-3, wherein the part of the overlapping portions of the piece of packaging material connected only by surface friction constitutes at least 50% of a surface area of the overlap, preferably at least 70%, more preferably at least 90%, most preferably at least 95%.
5. The pouched product (201) for oral use according to any one of claims 1-4, wherein the piece of packaging material forming the pouch (204) comprises or is constituted by at least one web-shaped piece of packaging material (301) being helically wound thereby forming adjacent revolutions, wherein the first edge portion (213a) of packaging material in the overlap is an edge portion of one revolution and the other portion in the overlap is an edge portion (213b) of an adjacent revolution.
6. The pouched product (201) for oral use according to claim 5, wherein an edge (211a) of the first edge portion (213a) has an angle (α) in the range of 5°-85° in relation to an extension direction of the seals (209a, 209b), preferably in the range of 10°-75°, more preferably in the range of 15°-65°, most preferably in the range of 20°-50°.
7. The pouched product (201) for oral use according to any one of claims 1-4, wherein an edge (221a) of the first edge portion (213a) is arranged perpendicularly, or substantially perpendicularly to the two seals (209a, 209b) of the pouch (201).
8. The pouched product (401) for oral use according to any one of claims 1-4 or 7, wherein the piece of packaging material comprises or is constituted by a single sheet formed such that opposite edge portions (413a, 413b) of the sheet are arranged in the overlap.
9. The pouched product (501) for oral use according to any one of claims 1-4 or 7, wherein the piece of packaging material comprises or is constituted by two sheets (515, 517) of the packaging material arranged such that they at least partly overlap, one of the sheets being arranged inside the other sheet.
10. The pouched product (201) for oral use according to any one of the preceding claims, wherein a degree of filling of the pouch (204) by the portion of the filling material (202) is in the range of 40%-100%, preferably in the range of 50%-90%, more preferably in the range of 60%-80%.
11. The pouched product (201) for oral use according to any one of the preceding claims, wherein the packaging material has a kinetic coefficient of friction of

at least 0.03, preferably at least 0.05, more preferably at least 0.07 as measured with ASTM D1894.

12. The pouched product (201) for oral use according to any one of the preceding claims, wherein the pouched product (201) is a pouched nicotine containing product for oral use, a pouched tobacco product for oral use and/or a pouched nicotine free product for oral use. 5
13. A method (601) for manufacturing a pouched product (201) for oral use, the method comprising: 10
 - a) providing a saliva-permeable web-shaped packaging material (301), the web-shaped material (301) comprising a first edge portion (313a) and a second edge portion (313b) located at opposite side edges of the web-shaped packaging material (301), 15
 - b) forming a tubular web (307) of the web-shaped packaging material by arranging the first edge portion (313a) of the web-shaped packaging material in an overlap with another portion (313b) of the web-shaped packaging material, the overlap being connected only by surface friction, the tubular web (307) extending in a longitudinal direction (A), 20
 - c) providing the tubular web (307) with a first transverse seal, 25
 - d) supplying a portion of a filling material (202) into the tubular web (307), 30
 - e) providing the tubular web (307) with a second transverse seal, thereby forming the pouched product (201). 35
14. The method according to claim 13, wherein step b) comprises winding the web-shaped packaging material (301) in a helical manner to form the tubular web (307), the edge portions (313a, 313b) of adjacent revolutions being arranged in the overlap. 40
15. The method according to claim 13, wherein step b) comprises arranging an edge (411a, 511a) of the first edge portion (413a, 513a) in the longitudinal direction of the tubular web. 45
16. The method according to any one of claims 13-15, wherein
 - step a) comprises providing an additional saliva-permeable web-shaped packaging material comprising two edge portions (521a, 521b) located at opposite edges (519a, 519b) of the additional web-shaped packaging material, and 50
 - step b) comprises forming a tubular web of the web-shaped packaging material by arranging the web-shaped packaging material and the additional web-shaped packaging material such 55

that they at least partly overlap, the additional web-shaped packaging material thereby being arranged inside the web-shaped packaging material.

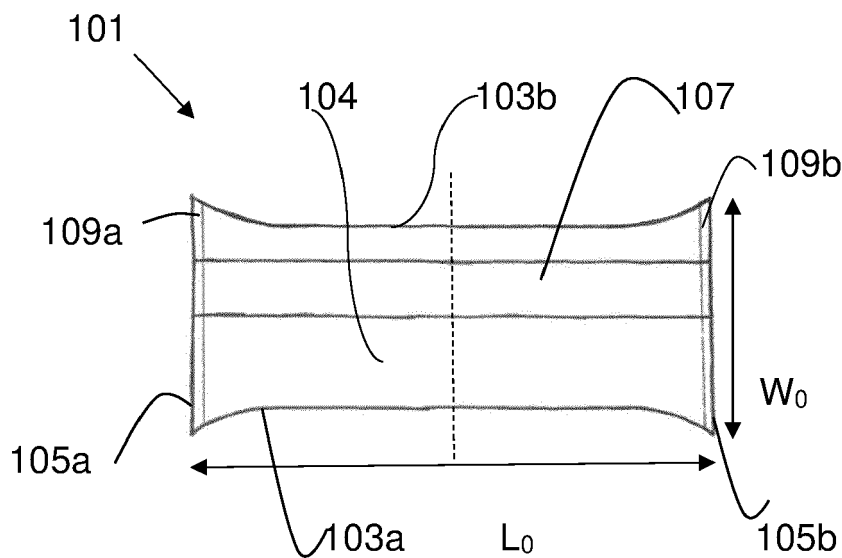


Fig. 1a (prior art)

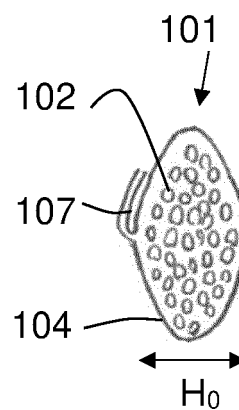


Fig. 1b (prior art)

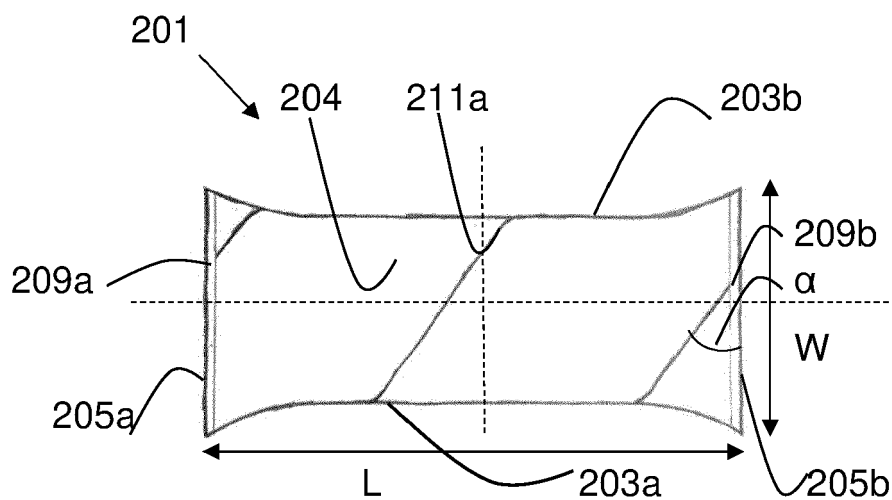


Fig. 2a

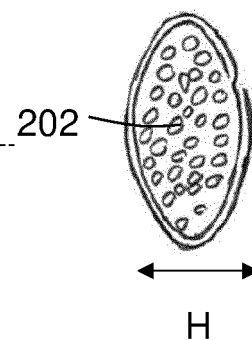


Fig. 2b

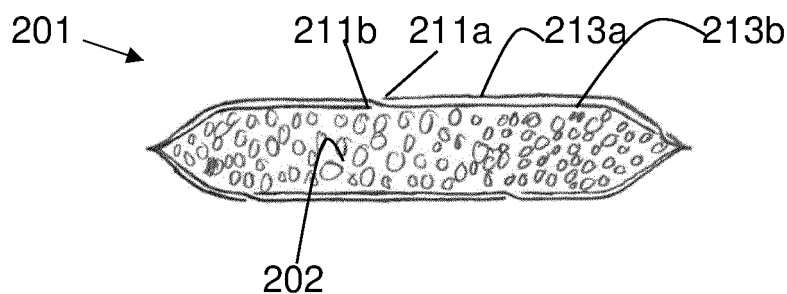


Fig. 2c

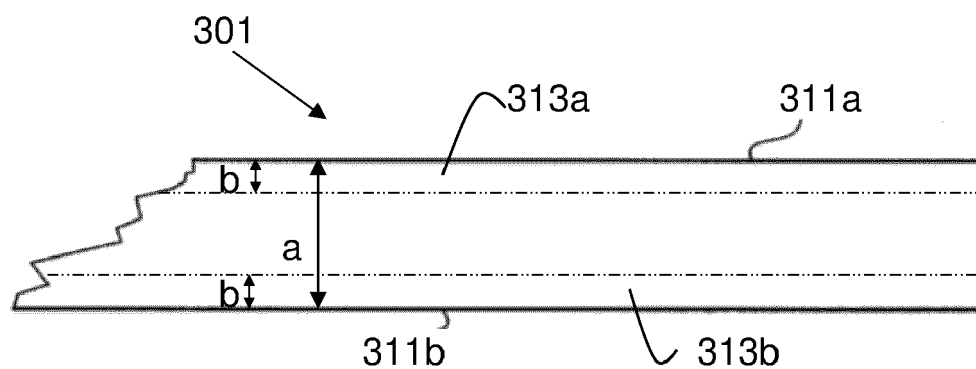


Fig. 3a

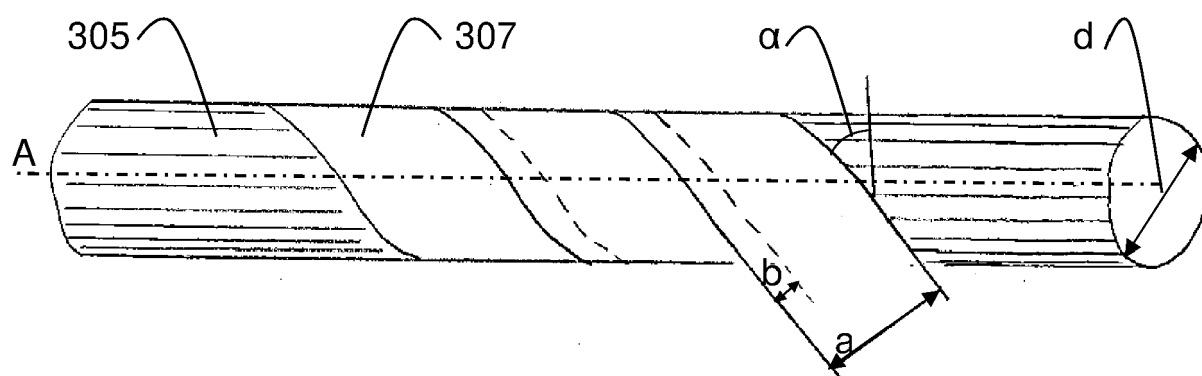


Fig. 3b

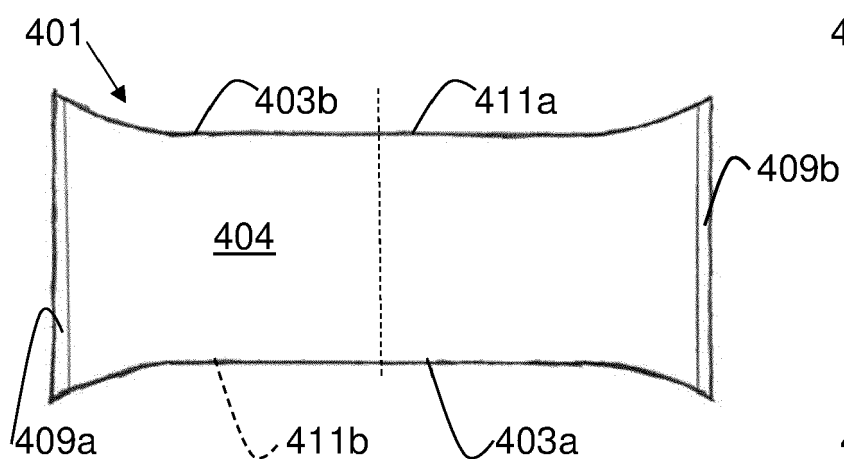


Fig. 4a

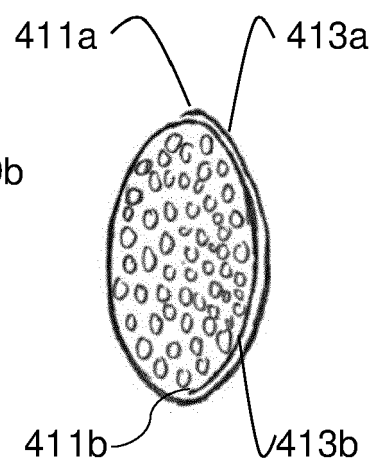


Fig. 4b

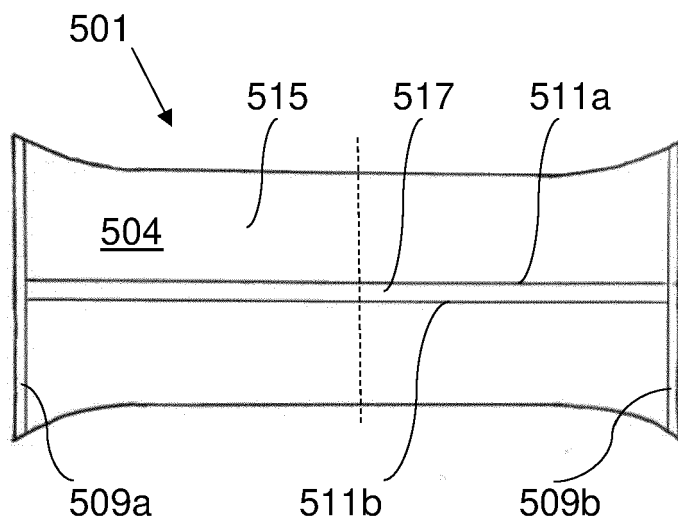


Fig. 5a

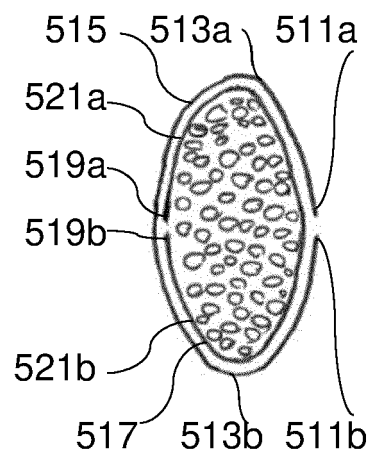


Fig. 5b

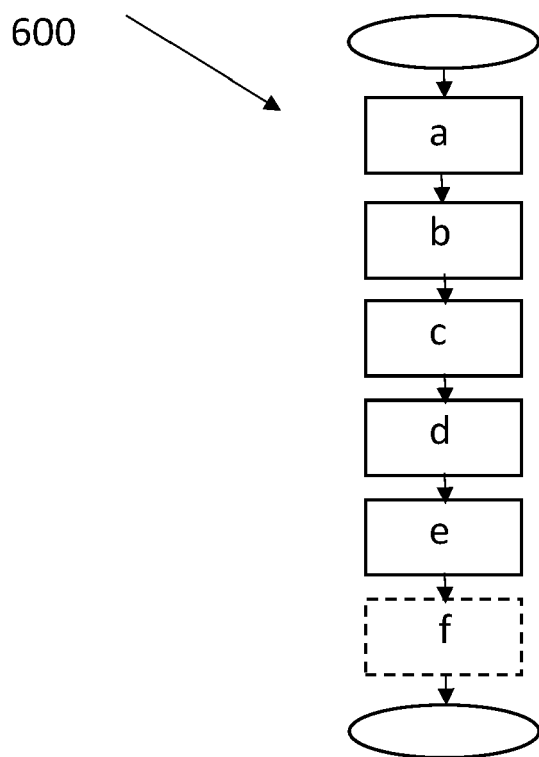


Fig. 6



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Application Number
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