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

(57) The present disclosure relates to a pouched product for oral use, comprising a filling material and a saliva-permeable pouch enclosing the filling material, wherein the filling material comprises carrier units and an active agent, wherein the carrier units are constituted by wadding carrier units comprising or consisting of wadding fibers.

EP 4 491 037 A1

Description

TECHNICAL FIELD

[0001] The present disclosure relates to a pouched product for oral use.

BACKGROUND

[0002] Pouched products for oral use may be produced by measuring portions of filling material, such as a smokeless tobacco composition and inserting the portions into a nonwoven tube.

[0003] There are also pouched non-tobacco products for oral use, which may be offered as alternatives to pouched smokeless tobacco products for oral use. The pouched non-tobacco products for oral use do not contain any tobacco material. Instead, the pouched non-tobacco products for oral use comprise non-tobacco plant material and/or a filling material. Examples of non-tobacco plant material includes plant fibers selected from the group consisting of maize fibers, oat fibres, tomato fibers, barley fibers, rye fibers, apple fibres, sugar beet fibres, potato fibres, corn fibres, buckwheat fibres, cocoa fibres, bamboo fibers, citrus fibers and any combinations thereof. Also processed fibers such as Microcrystalline Cellulose (MCC) fibers may be used. The filling material may be present in the form of particles. For instance, the filling material may be a particulate filling material, such as particles of microcrystalline cellulose.

[0004] US 4,703,765 discloses a device for packaging precise amounts of finely divided tobacco products, such as snuff tobacco or the like, in a tubular packaging material into which snuff portions are injected via a fill tube, the tubular packing material thereby having a vertical orientation. Downstream from the tube, welding means are positioned for transverse sealing of the packaging material, as well as cutting means for severing the packaging material in the area of the transverse seal to thus form discrete or individual portion packages.

[0005] The individual portions are sealed and cut apart thereby forming rectangular "pillow shaped" (or any other desired form) pouched products. Generally, each final pouched product includes parallel transverse seams at opposite ends and a longitudinal seam orthogonal to the transverse seams. The seals must be of sufficient strength to preserve the integrity of the pouched product during use while not disturbing the consumer's experience.

[0006] It has been observed that a large proportion of flavour or nicotine in the filling material does not reach the consumer.

SUMMARY

[0007] It is an object of the present disclosure to provide pouched products that are soft and which provide an appealing mouthfeel.

[0008] A further object with the present disclosure is to achieve facilitated transport and handling of the products.

[0009] The environment during production of the pouched products may further be improved.

[0010] There is also an object to allow for a high and/or quick release of active agents.

[0011] There is further an object with the present disclosure to provide a pouched product which may be formed to fit comfortably in the cavity of the user.

[0012] These objects, as well as other objects being apparent to a skilled person studying the present description, are achieved by the pouched product for oral use as set out in the appended claims.

[0013] According to a first aspect, the present disclosure provides a pouched product for oral use, comprising a filling material and a saliva-permeable pouch enclosing the filling material. The filling material comprises carrier units and an active agent. The carrier units are constituted by wadding carrier units comprising or consisting of wadding fibers. A wadding carrier unit as a filling material in a pouched product provides a soft and appealing mouth feeling. The pouched product will be easy to form and shape to conform with the gum of the user.

[0014] The active agent may be applied to the wadding carrier unit by coating, impregnating, spraying for example. The wadding carrier unit may be a carrier for the active agent and possibly additives.

[0015] The filling material may comprise several wadding carrier units. The filling material may for example comprise two or more wadding carrier units, three or more wadding carrier units. Further, a plurality of wadding carrier units may be comprised. For example, a filling material may comprise 2-10 wadding carrier units.

[0016] Optionally, the wadding fibers may have a contact angle with water of 50° and above or preferably 60° and above, preferably 70° and above or most preferably 80° and above, or most preferred 90° and above. The wadding fiber's contact angle with water may be measured according to standard ISO 304:1985. A pouched product is obtained whose weight may be low, it will be soft and the carrier units provide a pouched product which may be easy to form and which fit in the oral cavity of the user, for example between the gum and the upper lip. The carrier units comprising a wadding material comprising fibers having a contact angle with water of 50° and above, which may be measured according to standard ISO 304:1985 may give a pouched product having a structure that do not collapse in any high degree. The carrier units of the wadding material may not collapse since the wadding material will hinder liquid to be absorbed into the carrier units. Wadding fibers having a contact angle with water of 50° and above, which may be measured according to standard ISO 304:1985 may achieve the effect that liquid is not absorbed into the wadding carrier units. The wadding fibers may have a contact angle with water of 50° and above. However, a contact angle of 60° and above, preferably 70° and above

or most preferably 80° and above, and most preferred 90° and above, may enhance the effect of the wadding fibers, by not absorbing liquid in any high degree. Fibers having contact angles above 90° are conventionally considered hydrophobic. However, fibers having contact angle with water of smaller angle may also show hydropobic behaviour. The purpose is to not absorb much water or saliva. By this, the wadding fibers should not collapse in any high degree during use in the cavity of a user.

[0017] Optionally, the wadding fibers may be selected from the group consisting of polyolefin fibers, polypropylene (PP) fibers, polyethylene (PE) fibers, polyester fibers, polyethylene terephthalate (PET) fibers, polylactic acid (PLA) fibers, PLA/coPLA fibers (PLA in the core and coPLA in the sheath, coPLA is a low-melt PLA, PLA=-polylactic acid), polyhydroxyalkanoate (PHA) fibers, polyhydroxybutyrate (PHB) fibers, polybutylene succinate (PBS) fibers, regenerated cellulose fibers, lyocell fibers and viscose fibers and combinations thereof. The pouched products may be formed to fit well in the cavity of the user. The wadding fibers of the wadding carrier units, which have a contact angle with water of 50° and above, will hinder that saliva or moisture may be absorbed into the wadding carrier units. By this, the wadding carrier units will not collapse or at least not collapse in any high degree. The content of two or more wadding carrier units makes it possible for the consumer to shape the pouched product in a suitable and comfortable way when placed in the mouth, such as on the gum under the lip. A soft and smooth pouched product is obtained.

[0018] The regenerated cellulose fibers, lyocell fibers and viscose fibers may have a contact angle with water of 50° and above. The fibers may achieve this by treatment with an agent or produced by a method which results in fibers having contact angle with water of 50° and above. The regenerated cellulose fibers, lyocell fibers and viscose fibers may have a contact angle of 60° and above, preferably 70° and above, most preferably 80° and above, and most preferably 90° and above.

[0019] The wadding fibers may be selected from bicomponent fibers selected from sheath/core fibers, such as PLA/coPLA fibers (PLA in the core and coPLA in the sheath, coPLA is a low-melt PLA, PLA=polylactic acid), PP/PE fibers (PP in the core and PE in the sheath, PP=polypropylene, PE=polyethylene).

[0020] The wadding fibers mentioned will not absorb liquid or saliva in any high degree and the carrier units will not collapse in any high degree. Some examples of water contact angles for the fibers are, when considering the contact angle with water, which may be measured according to standard ISO 304:1985: PLA: 60-70°, PHA: 70-90°, PP: 90-110°, PE: 90-110°, PET: 70-90° and PHB:90-110°. Regenerated cellulose fibers, lyocell fibers and viscose fibers may be chosen so that the contact angle with water will be at least 50° and above, or preferably 60° and above, more preferred 70° and above, even more preferred 80° and above and most preferred 90° and above. Those fibers may have some hydrophobic behavior. This may depend on the treatment or manufacturing of the regenerated cellulose fibers, lyocell fibers and viscose fibers, sometimes called to be "hydrophobic".

[0021] Optionally, the wadding fibers may have a linear density of 0.4 to 5.0 decitex.

[0022] Optionally, the wadding fibers may have a linear density ≤ 4.4, ≤ 3.3 decitex, preferably ≤ 2.2 decitex, more preferred ≤ 1.7 decitex, most preferably ≤ 1.3 decitex and even more preferred ≤ 0.9 decitex. The wadding fibers may have a linear density of ≥ 0.4.

[0023] Optionally, the wadding fibers may have an aspect ratio of >100. If the aspect ratio is lower it may be more difficult to achieve any wadding carrier units.

[0024] The wadding carrier units may comprise fibers in the form of staple fibers. The properties of the staple fibers may be as set out herein for the wadding fibers in general.

[0025] Staple fibres may have a length of 6 mm and above. The staple fibers may have a length of 6-50 mm. preferably 6-40 mm, more preferred 8-30 mm and most preferred 10-25 mm.

[0026] Staple fibers may be used for manufacturing wadding carrier units depending on which method which is used for the manufacturing.

[0027] When using staple fibers, for example, the staple fibers will be mixed, entangled or formed in a suitable way to wadding carrier units. Active agents and possibly additives may be added or applied before, during or after the manufacturing of the wadding carrier units.

[0028] Optionally, the wadding fibers may comprise or consist of wadding filaments. Wadding filaments are substantially continuous fibers. Wadding carrier units made of wadding filaments may achieve wadding carrier units which have high porosity. The wadding carrier units may be light in weight. A fibrous carrier unit, comprising a wadding material, may be obtained wherein the wadding filaments have been entangled. When the wadding carrier units comprise wadding filaments, the wadding carrier units may have been produced during the production of the wadding filaments. The wadding filaments obtained in the production may be collected into a wadding carrier unit of fibers. If the wadding filaments have been melted and not solidified, the wadding filaments can be binding together in cross sections where the wadding filaments meet or cross each other. Wadding filaments may also be obtained by that a polymer solution is used for producing wadding filaments. A polymer solution may be extruded through a hole in a spinneret. The obtained wadding carrier units will have an airy structure with a large empty volume in the wadding carrier units. The properties of the filaments may be as set out herein for the wadding fibers in general.

[0029] The wadding carrier units may be considered as scaffolds forming a lofty and airy unit. The wadding carrier units with a high airiness will give a scaffold structure. The airiness makes it possible to have relatively high amount of active agent to be adsorbed onto the wadding carrier

units in comparison with the weight of the pouched product. Further, the airy scaffold will make it possible for the user to form the pouched product when the pouched product is located in the cavity of the user, such as on the gum under the lip. The wadding carrier units will make it possible to shape and form the pouched product during use by the consumer. An appealing feeling will be obtained. Any superfluous conventional filling material is not necessary.

[0030] The wadding carrier units are light in weight. The wadding fibers as disclosed herein will not absorb any high amount of liquid or saliva and the carrier units will not collapse to a high degree. Active agents will be adsorbed to the wadding carrier units and the active agent will be released during use.

[0031] Optionally, the wadding fibers may comprise or consist of thermoplastic fibers. When producing pouched products, some filling material may be caught in a seal during the sealing of the pouch. Conventional filling material, such as tobacco material, plant fibers and microcrystalline particles may deteriorate the seal by hindering contact between the parts to be sealed of the pouch material in the seal portion. If a wadding carrier unit is caught in a seal portion during production and if heat is used for the sealing, the wadding carrier unit comprising thermoplastic material will not hinder the sealing of the pouched products since the thermoplastic fibers may melt and may possibly contribute to the sealing effect.

[0032] Optionally, the wadding carrier units may be selected from the group of wadding ball carrier units, wadding cylinder carrier units, wadding circular cylindrical carrier units and wadding nonwoven carrier units. Wadding ball carrier units have a substantially spherical form. Wadding carrier circular cylinder units may have a substantially circular cylindrical form.

[0033] The oral pouched products may be light in weight, which facilitate transport and handling of the pouched products. Further, the pouched products may be shaped easily in the oral cavity of the user. No conventional filling material will be needed which further means that there will not be any spillage or waste of conventional filling material, such as granulates or powder. Possible pear-formations, i.e. when filling material is collected on one edge of the pouched product, of pouched products are avoided. A porous and light weight filling material may be obtained.

[0034] The wadding carrier units may be selected from the group of wadding ball carrier units, wadding carrier cylinder units, wadding circular cylindrical carrier units and wadding carrier nonwoven units.

[0035] Optionally, the wadding carrier units are wadding carrier units with a substantially spherical form.

[0036] The wadding carrier units may be wadding ball carrier units with a substantially spherical form. The wadding ball carrier units may have a diameter extending through the spherical ball carrier unit. The diameter of the wadding ball carrier unit may be 3 to 10 mm, or preferably 4-8 mm.

[0037] Optionally, the wadding carrier units may have a diameter of 3 to 10 mm, preferably 4-8 mm. The diameter is measured before loaded into the pouched product. The diameter may be measured with stereomicroscope. A porous pouched product with a light weight may be obtained and with quite low density. The handling and transport of the pouched products will be facilitated. Further, the wadding carrier units will stay in place and not stray in the pouch, which conventional filling material, such as granulates or powder, may do. The wadding carrier units with a large size will avoid that wadding carrier units are moving around in a pouched product. When filling material of large size is used, such as the wadding carrier units, spill and dusting may be avoided during production and during storage in packages Due to the size of the carrier units, better individual weight control of individual pouches may be obtained.

[0038] When the carrier unit cannot be considered to have a diameter, the carrier units may have a smallest extension, i.e. the shortest distance measured between outer parts of a carrier unit, could be 3 to 10 mm. In such carrier units, the carrier units can have a largest extension, i.e. the largest distance measured between outer parts of a carrier unit, could be 10 mm. For example, when it refers to a circular cylinder form, the diameter of the circular cylindrical part of the circular cylinder may be referred to and the length of the circular cylinder can be referred to as one extension.

[0039] Optionally, the pouched product may have end seals for enclosing the filling material. Optionally, the pouched product may have end seals in a direction which is transversal to the longitudinal direction of the pouched product. The transversal seal or seals may be free from wadding carrier units. The wadding carrier units may thus not be fastened in the end seals.

[0040] Optionally, the active agent may be selected from the group consisting of nicotine, caffeine, taurine, cannabinoids, ginseng and branched-chain amino acids (BCAA) and combinations thereof.

[0041] Optionally, the pouched product may comprise nicotine in an amount of 1 mg to 25 mg, preferably 1 mg to 10 mg, or more preferably 2 mg to 8 mg nicotine.

[0042] The filling material may comprise further additives. Further additives may be any component which may be provided to the filling material as disclosed herein, such as salts (e.g. sodium chloride, potassium chloride, magnesium chloride, calcium chloride and any combinations thereof), pH adjusters (e.g. sodium hydroxide, potassium hydroxide, potassium carbonate, sodium carbonate or sodium bicarbonate), flavouring agents, sweeteners, colorants, humectants (e.g. propylene glycol or glycerol), antioxidants, preservatives (e.g. potassium sorbate), binders, tobacco and non-tobacco plant material. The additive may comprise or consist of flavouring agent, flavour oil, hydrophobic oil, synthetic flavour and nature-identical flavour. The water-soluble component or water-soluble components which are part of the filling material in the oral pouched products as disclosed

herein constitute one or more additional components. Preferably, the filling material may comprise a pH adjuster. The pH adjuster may be selected from the group of sodium hydroxide, potassium hydroxide, potassium carbonate, sodium carbonate or sodium bicarbonate and combinations thereof. A pH adjuster may be added to the filling material together with nicotine so that the nicotine may be released as nicotine base in sufficient amount to allow for satisfactory absorption across the mucosal membranes when the product is placed in the oral cavity of a consumer.

[0043] Optionally, the packaging material may be a single-layer nonwoven material. It is a desire to release active agent in a fast way which may be obtained when the packaging material is a single-layer nonwoven material.

[0044] Optionally, the packaging material may be made of nonwoven layer. The nonwoven layer may have a thickness of at most 0.25 mm. The thickness may be from 0.05 to 0.25 mm. A fast offset of active agent may be obtained with a thin nonwoven layer in the packaging material.

[0045] Optionally, the pouched product may have a weight of 0.05 to 0.3 g or preferably 0.07 to 0.2 g. The light weight is an advantage when it refers to transport and handling of the pouched products. The content of active agent may be high in relation to the weight of the pouched product.

[0046] Optionally, the pouch of the pouched products may be substantially completely filled with wadding carrier units. The volume of the cavity of the pouch will be substantially filled with wadding carrier units of the disclosure. The carrier units are porous and fluffy, so when using the expression substantially completely filled it means that the peripheries of the carrier units touch each other and are close to the inner walls of the pouch cavity. No conventional filling material of for example granules or natural fibers will be needed in the pouched products as disclosed herein. Any spill, dusting or fuzziness may be avoided when no conventional filling material is used. Dust in the container for enclosing the pouched products is also avoided. Further, since the wadding carrier units are larger than conventional filling material, any risk of spill of wadding carrier units is reduced. The filling material in the form of the wadding carrier units may fill and occupy a high proportion of the volume of the cavity of the pouch, and the pouched product may fit well to the gum of the user.

[0047] Optionally, the pouch may be made of a packaging material of a nonwoven material, wherein the nonwoven material may comprise fibers selected from the group of thermoplastic fibers, cellulose fibers and regenerated cellulose fibers and any combination of them. Further, the nonwoven material may comprise a binder.

[0048] The carrier units may comprise water insoluble fibers or water insoluble foam.

[0049] Optionally, the pouched product may be a biodegradable product. Biodegradable products which are lost or thrown on the ground, may disintegrate over time and eventually be integrated with the soil. There will be less load on the environment.

[0050] Optionally, the pouched product for oral use may be a biodegradable pouched product. Biodegradable products which are lost or thrown on the ground, may disintegrate over time and eventually be integrated with the soil. There will be less load on the environment. A biodegradable product is advantageous for many reasons. It is advantageous for the environment that the product is biodegradable so it can be recycled as compost, preferably in a home-composting environment. The used product is in the form of a soft, pouched product for oral use, which will be spitted out and discarded after use. Biodegradability of the products may mitigate the negative effects of littering in that products which are unintentionally or intentionally dropped on the ground will degrade and disintegrate over time.

[0051] The pouched product as disclosed herein is preferably made from biodegradable and preferably also biobased materials. As set out herein, it may be particularly preferred that the product is degradable under home composting conditions. However, it may be sufficient that the product meets industry compost standards, as a used, discarded product may then be sorted together with other industry compostable materials.

[0052] By biodegradable is herein meant that the material is biodegradable or compostable according to the standard EN13432.

Optionally, the wadding fibers are biodegradable fibers. Optionally the wadding fibers are biodegradable and are selected from the group consisting of regenerated cellulose fibers, viscose fibers, lyocell fibers, polylactic acid (PLA) fibers, PLA/coPLA fibers (PLA in the core and coPLA in the sheath, coPLA is a low-melt PLA, PLA=-polylactic acid), polyhydroxyalkanoate (PHA) fibers and polybutylene succinate (PBS) fibers and combinations thereof.

[0053] PHA fibers include PHBV (Poly(3-hydroxybutyrate-co-3-hydroxyvalerate), PHBH (Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate), PHBO (poly(3-hydroxybutyrate-co-3-hydroxyoctanoate), PHBD (poly(3-hydroxybutyrate-co-3-hydroxydecanoate), P3HB (poly-3-hydroxybutyrate) or P4HB (poly-4-hydroxybutyrate).

[0054] Optionally, regenerated cellulose fibers, viscose fibers and lyocell fibers have a contact angle with water of 50° and above, or preferably of 60° and above, or more preferred of 70° and above, even more preferred of 80° and above and most preferred of 90° and above.

[0055] A viscose fiber which may be used is OLEA viscose fiber which is hydrophobic. The contact angle with water will be 50° and above and preferably 60° and above, more preferred 70° and above, more preferred 80° and above, and most preferred 90° and above. The viscose fiber OLEA is soft and biodegradable.

[0056] Optionally, the saliva-permeable pouch comprises a packaging material of nonwoven material and may comprise biodegradable packaging fibers selected

from the group consisting of cellulose fibers, regenerated cellulose fibers, viscose fibers, lyocell fibers, polylactic acid (PLA) fibers, polyhydroxyalkanoate (PHA) fibers and polybutylene succinate (PBS) fibers and combinations thereof.

[0057] PHA fibers include PHBV (Poly(3-hydroxybutyrate-co-3-hydroxyvalerate), PHBH (Poly(3-hydroxybutyrate-co-3-hydroxyhexanoate), PHBO (poly(3-hydroxybutyrate-co-3-hydroxyoctanoate), PHBD (poly(3-hydroxybutyrate-co-3-hydroxydecanoate), P3HB (poly-3-hydroxybutyrate) or P4HB (poly-4-hydroxybutyrate).

[0058] Optionally, the saliva-permeable pouch comprises a nonwoven layer which may comprise biodegradable packaging fibers selected from the group consisting of cellulose fibers, regenerated cellulose fibers, viscose fibers, lyocell fibers, polylactic acid (PLA) fibers, polyhydroxyalkanoate (PHA) fibers and polybutylene succinate (PBS) fibers and combinations thereof. Optionally, the pouched product may be a non-tobacco pouched product.

[0059] Further examples of carrier units may be obtained from woven fabric carrier units or knitted carrier units. Those may be divided to suitable portions of carrier units. Any kind of form may be used of the carrier units as long as they fit a form which may be used and inserted into a pouch. The carrier units of fibers may be in the form of porous units.

[0060] Optionally, the carrier unit may be a foam carrier unit. The foam of the carrier unit may be selected from the group of polyurethane foam, cellulose foam, polyhydroxyalkanoate (PHA) foam, polyhydroxybutyrate (PHB) foam, polylactic acid foam and PLA/coPLA foam. Optionally, the foam carrier unit is biodegradable and is selected from the group of cellulose foam, polyhydroxyalkanoate (PHA) foam, polyhydroxybutyrate (PHB) foam, polylactic acid foam and PLA/coPLA foam.

DEFINITIONS

[0061] A filament is considered as a fiber of indefinite length. A filament may be produced for example by extruding a plastic polymer or polymer solution through a hole in a spinneret.

[0062] By wadding material is herein meant a high-loft material, primarily fibrous. Waddings are not woven or knitted and can be considered a high-loft nonwoven.
A wadding carrier unit comprises wadding material.

[0063] The terms "flavour" or "flavouring agent" are used herein for substances used to influence the aroma and/or taste of the oral pouched product. The flavours may be any food-grade natural or synthetic flavour as known in the art and may include, without limitation, essential oils, single flavour compounds, compounded flavourings, and extracts.

[0064] Here, the term "pouched product for oral use" refers to a smokeless product comprising a packaging material for enclosing a smokeless filling material. The packaging material surrounds the filling material.

[0065] Herein, the term "filling material" refers to the material inside the pouch of an oral pouched product as disclosed herein.

[0066] A "carrier unit" as used herein is a unit which constitutes a structure-providing element, or a scaffold, in the pouched product as disclosed herein. The carrier unit may be loaded with one or more active agents.

[0067] A "wadding carrier unit" is a unit which constitutes a structure-providing element, or a scaffold, in the pouched product as disclosed herein. The wadding carrier unit comprises wadding fibers and may be loaded with one or more active agents.

DETAILED DESCRIPTION

[0068] Pouched products may be produced in the form of rectangular pouches. Pouched products for oral use may lose their form when produced or when used in the cavity of a user. When conventional filling material, such as granulates or powder, is supplied to the pouches, they may obtain a so called pear-form. The filling material may be collected at one of the transversal ends of the pouches. The pouches may also lose their form in the cavity of the user when saliva is absorbed in conventional filling material. This may be avoided with the present disclosure.

[0069] A pouched product for oral use, comprising a filling material and a saliva-permeable pouch enclosing the filling material is provided in the present disclosure. The filling material comprises carrier units and an active agent. The carrier units are constituted by wadding carrier units comprising or consisting of wadding fibers.

[0070] Wadding carrier units may be produced by entangling fibers of suitable linear density and suitable length for obtaining wadding carrier units of for example ball form. Suitable binder may be used for binding wadding fibers together for forming wadding carrier units. Further, nonwoven techniques for producing nonwoven sheets may be used to produce nonwoven material, but with less compression of the sheet so airiness will be obtained in the material. The sheet of an airy nonwoven sheet may be cut or divided in a suitable way to form wadding carrier units.

[0071] A wadding carrier unit in the form of a ball may be produced according to the following. Polymer pellets of suitable polymer are processed into small pellets. The pellets are melted down and fed into an extruder and continuous filaments are produced. The extruded filament exits the die and may be cut to smaller size. The length of the fibers can vary depending on the desired size of the wadding carrier units. The fibres or filaments are entangled to form a wadding carrier unit. The size of the wadding carrier unit may differ and may depend on the length of the fiber. Tumbling or sieving may be used in the end of the process to remove any irregularities or excess mate.

[0072] Waddings may be produced by choosing fibers, carding, the prepared fibers are fed into a carding ma-

chine, the carded web is subjected to a cross-lapping process, and the fibers are bonded together by bonding. Different type of bonding may be used.

[0073] Fiber tow may be used as an example for producing carrier wadding units.

[0074] Wadding carrier units may be produced by felting. Fibers are compressed and tangled together to form a fabric. Wet felting could be used or needle felting could be used. This method makes a more dense wadding carrier unit than some other techniques. From a felted web for example, smaller pieces of the web may be achieved by cutting or punching parts of the web to be used as wadding carrier units in the pouched product as disclosed herein.

[0075] The wadding fibers may comprise or consist of wadding filaments. Wadding filaments are substantially continuous fibers. When the wadding carrier units comprise wadding filaments, the wadding carrier units may have been produced during the production of the wadding filaments. The wadding filaments obtained in the production may be collected into for example a wadding ball carrier of wadding fibers. If the wadding filaments have been melted and not solidified the wadding filaments can be binding together in cross sections where the wadding filaments meet or cross each other.

[0076] The wadding carrier units may comprise or consist of thermoplastic fibers. The wadding fibers may be produced in a suitable way and can form the carrier units in a desired form and shape of the carrier units of fibers.

[0077] The wadding carrier units, may be produced by spinning, spin laying, melt spinning, electrospinning, spunlace, hydroentangling, drylaying, spunbond, meltblowing and spraying a polymer solution to fibers. Units or balls may be produced when filaments are produced. Strings of entangled filaments may be produced and then the strings of filaments may be cut to suitable size for use as carrier units in pouched products. In such a case, a wadding carrier cylinder unit may be obtained and divided from a string of entangled fibers. Wadding circular cylindrical carriers can then be achieved. Further, webs of entangled filaments may be produced and further divided into suitable size to be used as wadding carrier units in pouched products. Nonwoven techniques for producing nonwoven webs may be used to produce nonwoven material, but with less compression of the web so the airiness will be obtained in the material. The web of an airy nonwoven web may be cut or divided in suitable way to form wadding carrier units.

[0078] The carrier units may be for examples ball carriers of fibers, of wadding. The carrier unit may be a wadding carrier unit. The fibers will be kept together and could be kept together by binding. The binding may be thermo-binding or mechanical bonding. The thermo-binding may be achieved by melting thermoplastic material and producing fibers which bind to each other. Mechanical bonding may be spunlace or tumbling. A solution may be applied to bind the fibers together where the fibers cross.

[0079] In some of the methods for producing the wadding carrier units, it may be required that the fibers are made of thermoplastic material, so that thermoplastic fibers are produced and thus forming the wadding carrier units. Examples of methods that produce thermoplastic fibers are spinning, spin laying, meltspinning for example.

[0080] Regenerated cellulose fibers, such as rayon fibers, lyocell fibers or viscose fibers may be produced by spinning dissolved wood pulp in a solution and extruding the solution through spinnerets into a chemical bath that regenerates the fibers. The regenerated cellulose fibers, rayon fibers, lyocell fibers or viscose fibers may have a contact angle with water of 50° and above, or preferably 60° and above, preferably 70° and above, preferably 80° and above and more preferred preferably 90° and above, which may be measured according to standard ISO 304:1985.

[0081] Hydrophobic regenerated fibers may be produced by treating the fiber surface of regenerated fibers with a hydrophobic agent. Further, surface active agents may be used to obtain hydrophobicityof the regenerated cellulose fibers. Further, when the fibers are produced in the spinning process, a hydrophobic finish may be used to obtain hydrophobicity. Hydrophobic regenerated cellulose fibers may be soft and are water repellent. The fibers may add bulk, softness and may be biodegradable. The production of regenerated cellulose fibers having a contact angle to water of 50° and above, or preferably 60° and above, may be treated in the similar way as the hydrophobic regenerated fibers, but with another amount of any agent which is provided.

[0082] The carrier units may comprise water insoluble fibers or water insoluble foam.

[0083] The nicotine may be comprised in the filling material in the form of a nicotine compound. The nicotine compound may be a nicotine base and/or may be selected from the group consisting of nicotine hydrochloride, nicotine dihydrochloride, nicotine monotartrate, nicotine bitartrate, nicotine bitartrate dihydrate, nicotine sulphate, nicotine zinc chloride monohydrate and nicotine salicylate, nicotine benzoate, nicotine polacrilex and any combination thereof. The nicotine may be added to the wadding carrier unit by for example impregnating, spraying or coating.

[0084] The filling material may comprise a binder. Advantageously, the binder is saliva-soluble thereby allowing the nicotine source to be released when contacted with saliva such as human saliva. The binder may be selected from the group consisting of hydroxypropyl methylcellulose (HPMC), hydroxypropyl cellulose (HPC), methyl cellulose (MC), polyvinylpyrrolidone (PVP) and any mixture thereof. The binder may further comprise Kollidon, i.e. polyvinylpyrrolidine, and/or polyethylene glycol (PEG). In addition to functioning as a binder, the binder allows for protecting the nicotine source from being degraded, imparting a desired release

rate of the nicotine source and/or ensuring that the nicotine source is placed in a desired location

[0085] The active agent and possibly additives may be added to the wadding carrier unit by for example impregnation, spraying or coating.

[0086] The wadding carrier units may be impregnated with active agent and possibly with additives or flavour. It is also contemplated to apply active agent and additives as a coating on the wadding carrier units. Further, spraying of the active agent on the wadding carrier units may be used. Combinations of impregnation and coating are also contemplated for the wadding carrier unit as disclosed herein. By way of example, a wadding carrier unit as disclosed herein may be impregnated with a first active agent followed by coating with a second active agent or a flavour, such that an initial active agent release may be subsequently followed from a second active agent release. Binders may be applied to improve the binding of the active agent to the wadding fibers. The active agent and additives may be mixed with a liquid and may be applied as a solution to the wadding carrier unit. The solution may be applied by spraying on the wadding carrier unit, dropping on the wadding carrier unit, dipping in the solution. Additives may be added as a powder.

[0087] When fibers are manufactured before carrier units are manufactured, the fibers may be impregnated with active agent before forming the carrier units of fibers.

[0088] The carrier units may be foam carrier units. The foam carrier units may be considered as scaffolds forming a lofty or airy unit. The carrier units with a high airiness will give a scaffold structure for giving the pouched product an increased volume. The airiness may make it possible to have relatively high amount of active agent to be adsorbed onto the carrier units in comparison with the weight of the pouched product. Further, the soft and airy scaffold will make it possible for the user to form the pouched product when the pouched product is located on the gum. The carrier units will make it possible to shape and form the pouched product even. An appealing feeling will be obtained. Any superfluous conventional filling material is not necessary.

[0089] Foam carrier units may be filled into the pouched product and the pouched product may be formed and shaped to fit well in the cavity of the user. Further, the active agent may be added to the foam carrier unit to which the active agent may be adhered. The foam carrier unit may have open cells, in which active agent may be adhered.

[0090] By biodegradable is herein meant that the material is biodegradable or compostable according to the standard EN13432.

[0091] According to another aspect a pouched product for oral use is provided herein as disclosed in item 1.

[0092] Item 1 A pouched product for oral use is, wherein the pouched product comprises a filling material and a saliva-permeable pouch enclosing the filling material, wherein the filling material comprises carrier units and an active agent, wherein the carrier units are constituted by a foam carrier unit comprising or consisting of a foam.

[0093] Item 2 The pouched product for oral use according to item 1, wherein the foam has a contact angle with water of 50° and above, preferably 60° and above, more preferred 70° and above, even more preferred 80° and above and most preferred 90° and above.

[0094] Item 3 The pouched product for oral use according to item 1 or item 2, wherein the foam is selected from the group of polyurethane foam, cellulose foam, polyhydroxyalkanoate (PHA) foam, polyhydroxybutyrate (PHB) foam, polylactic acid (PLA) foam and PLA/coPLA foam and combinations thereof.

[0095] Item 4 The pouched product according to any of items 1-3, wherein the active agent is selected from the group comprising nicotine, caffeine, taurine, cannabinoids, ginseng and branched-chain acids (BSAA) and combinations thereof.

[0096] Item 5 The pouched product according to any items 1-4, wherein the packaging material is a single-layer nonwoven material.

[0097] Item 6 The pouched product according to any of items 1-5, wherein the pouched product has a weight of 0.05 to 0.3 g, preferably 0.07 to 0.2 g.

[0098] Item 7 The pouched product according to any of items 1-6, wherein the pouched product is a biodegradable product.

[0099] Item 8 The pouched product according to any of items 1-7, wherein the foam is biodegradable.

[0100] Item 9 The pouched product according to any of items 1-8, wherein the foam is biodegradable and is selected from the group of cellulose foam, polyhydroxyalkanoate (PHA) foam, polyhydroxybutyrate (PHB) foam polylactic acid foam, and PLA/coPLA foam.

[0101] Item 10 The pouched product according to any of items 1-9, wherein the active agent is nicotine and the product comprises nicotine in an amount of 1 mg to 25 mg, preferably 1 mg to 10 mg, or more preferably 2 mg to 8 mg nicotine.

[0102] Item 11 The pouched product according to any of items 1-10, wherein pouched the product has a thickness of 3 to 10 mm.

[0103] In other regards, the features and description for the wadding, as disclosed herein, is applicable to the foam carrier units.

[0104] Further, the carrier units may be woven fabric carrier units or knitted carrier units. A woven fabric carrier unit may be cut and divided to portions to be used a woven fabric carrier units. Further, a knitted carrier unit may be provided by cutting and dividing a knitted fabric to portions to be used as knitted carrier units. The fibers may have the features as otherwise disclosed herein.

[0105] Any kind of form may be used of the carrier units as long as they fit a form which may be used and inserted into a pouch. The carrier units of fibers may be in the form of porous units. The carrier units will be light in weight, and the fibers may give a high free area for active agents to adsorb onto or into the carrier units or pores of the carrier units. The carrier units of fibers may be networks of

fibers.

[0106] According to another aspect a pouched product for oral use is provided herein as disclosed in item 12.

[0107] Item 12 A pouched product for oral use, wherein the pouched product comprises a filling material and a saliva-permeable pouch enclosing the filling material, wherein the filling material comprises carrier units and an active agent, wherein the carrier units are constituted of woven fabric carrier units or knitted fabric carrier units, wherein the woven fabric carrier units or the knitted fabric carrier units comprise or consist of fabric fibers.

[0108] Item 13 The pouched product according to item 12, wherein the fabric fibers have a contact angle with water of 50° and above, or preferably 60° and above, preferably 70° and above, most preferably 80° and above, and most preferably 90° and above, .

[0109] Item 14 The pouched product according to item 12 or 13, wherein the fabric fibers are selected from the group consisting of polyolefin fibers, polypropylene (PP) fibers, polyethylene (PE) fibers, polyester fibers, polyethylene terephthalate (PET) fibers, polylactic acid (PLA) fibers, PLA/coPLA fibers (PLA in the core and coPLA in the sheath, coPLA is a low-melt PLA, PLA=polylactic acid), polyhydroxyalkanoate (PHA) fibers, polybutylene succinate (PBS) fibers, regenerated cellulose fibers, lyocell fibers and viscose fibers and combinations thereof.

[0110] Item 15 The pouched product according to any of items 12-14, wherein the fabric fibers have a linear density of 0.4 to 5.0 decitex.

[0111] Item 16 The pouched product according to any of items 12-15, wherein the fabric fibers have an aspect ratio of >100.

[0112] Item 17 The pouched product according to any of items 12-16, wherein the fabric fibers comprise or consist of fabric filaments or staple fibers.

[0113] Item 18 The pouched product according to any of items 12-17, wherein the fabric fibers comprise or consist of thermoplastic fibers.

[0114] Item 19 The pouched product according to any of items 12-18, wherein the woven fabric carrier units or knitted fabric carrier units are selected from the group of fabric ball carrier units, fabric cylinder carrier units, fabric circular cylindrical carrier units.

[0115] Item 20 The pouched product according to any of items 12-19, wherein the fabric woven fabric carrier units or knitted fabric carrier units are woven fabric carrier ball units or knitted fabric carrier ball units with a substantially spherical form and have a diameter of 3 to 10 mm, preferably 4-8 mm.

[0116] Item 21 The pouched product according to any of items 12-20, wherein the active agent is selected from the group comprising nicotine, caffeine, taurine, cannabinoids, ginseng and branched-chain acids (BSAA) and combinations thereof.

[0117] Item 22 The pouched product according to any of items 12-21, wherein the packaging material is a single-layer nonwoven material.

[0118] Item 23 The pouched product according to any of items 12-22, wherein the pouched product has a weight of 0.05 to 0.3 g, preferably 0.07 to 0.2 g.

[0119] Item 24 The pouched product according to any of items 12-23, wherein the pouched product is a biodegradable product.

[0120] Item 25 The pouched product according to any of items 12-24, wherein the fabric fibers are biodegradable.

[0121] Item 26 The pouched product according to any of items 12-25, wherein the fabric fibers are biodegradable and selected from the group of regenerated cellulose fibers, viscose fibers, lyocell fibers, polylactic acid (PLA) fibers, polyhydroxyalkanoate (PHA) fibers and polybutylene succinate (PBS) fibers and combinations thereof.

[0122] Item 27 The pouched product according to any of items 12-26, wherein the saliva-permeable pouch comprises a nonwoven layer comprising biodegradable packaging fibers selected from the group of cellulose fibers, regenerated cellulose fibers, viscose fibers, lyocell fibers, polylactic acid (PLA) fibers, polyhydroxyalkanoate (PHA) fibers and polybutylene succinate (PBS) fibers and any combination thereof.

[0123] Item 28 The pouched product according to any of items 21-27, wherein the active agent is nicotine and the product comprises nicotine in an amount of 1 mg to 25 mg, preferably 1 mg to 10 mg, or more preferably 2 mg to 8 mg nicotine.

[0124] Item 29 The pouched product according to item 13, wherein the fabric fibers have a contact angle with water of 50° and above, or preferably 60° and above, preferably 70° and above, most preferably 80° and above, and most preferably 90° and above, measured according to standard ISO 304:1985.

[0125] In other regards, the features and description for the wadding as disclosed herein is applicable to the fabric woven fabric carrier units or knitted fabric carrier units.

Claims

1. A pouched product for oral use, comprising a filling material and a saliva-permeable pouch enclosing the filling material, wherein the filling material comprises carrier units and an active agent, wherein the carrier units are constituted by wadding carrier units comprising or consisting of wadding fibers.

2. The pouched product according to claim 1, wherein the wadding fibers have a contact angle with water of 50° and above, or preferably 60° and above, preferably 70° and above or most preferably 80° and above, or most preferred 90° and above.

3. The pouched product according to any of the preceding claims, wherein the wadding fibers are selected from the group consisting of polyolefin fibers,

polypropylene (PP) fibers, polyethylene (PE) fibers, polyester fibers, polyethylene terephthalate (PET) fibers, polylactic acid (PLA) fibers, polyhydroxyalkanoate (PHA) fibers, polybutylene succinate (PBS) fibers, PLA/coPLA fibers (PLA in the core and coPLA in the sheath, coPLA is a low-melt PLA, PLA=polylactic acid), regenerated cellulose fibers, lyocell fibers and viscose fibers and combinations thereof.

4. The pouched product according to any of the preceding claims, wherein the wadding fibers have a linear density of 0.4 to 5.0 decitex.

5. The pouched product according to any of the preceding claims, wherein the wadding fibers have an aspect ratio of >100.

6. The pouched product according to any of the preceding claims, wherein the wadding fibers comprise or consist of thermoplastic fibers.

7. The pouched product according to any of the preceding claims, wherein the wadding carrier units are selected from the group of wadding ball carrier units, wadding cylinder carrier units, wadding circular cylindrical carrier units, wadding nonwoven carrier units.

8. The pouched product according to any of the preceding claims, wherein the wadding carrier units are wadding ball carrier units with a substantially spherical form.

9. The pouched product according to claim 8, wherein the diameter of the wadding ball carrier unit is 3 to 10 mm, or preferably 4-8 mm.

10. The pouched product according to any of the preceding claims, wherein the active agent is selected from the group comprising nicotine, caffeine, taurine, cannabinoids, ginseng and branched-chain acids (BSAA).

11. The pouched product according to any of the preceding claims, wherein the packaging material is a single-layer nonwoven material.

12. The pouched product according to any of the preceding claims, wherein the pouched product has a weight of 0.05 to 0.3 g, preferably 0.07 to 0.2 g.

13. The pouched product according to any of the preceding claims, wherein the pouched product is a biodegradable product.

14. The pouched product according to any of the preceding claims, wherein the wadding fibers are biodegradable.

15. The pouched product according to any of the preceding claims, wherein the wadding fibers are biodegradable and selected from the group of regenerated cellulose fibers, viscose fibers, lyocell fibers, polylactic acid (PLA) fibers, PLA/coPLA fibers, polyhydroxyalkanoate (PHA) fibers and polybutylene succinate (PBS) fibers and combinations thereof.

16. The pouched product according to any of the preceding claims, wherein the filling material comprises a pH adjuster.

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EUROPEAN SEARCH REPORT

Application Number
EP 23 18 4766

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The Hague	31 October 2023	Dimoula, Kerasina

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