



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.06.2022 Bulletin 2022/26

(51) International Patent Classification (IPC):
A24B 13/00 (2006.01) **A24B 15/28** (2006.01)
A24B 15/38 (2006.01)

(21) Application number: **20216488.5**

(52) Cooperative Patent Classification (CPC):
A24B 13/00; A24B 15/285; A24B 15/385

(22) Date of filing: **22.12.2020**

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

(71) Applicant: **Swedish Match North Europe AB**
118 85 Stockholm (SE)

(72) Inventor: **Kindvall, Mårten**
415 24 Göteborg (SE)

(74) Representative: **Valea AB**
Box 1098
405 23 Göteborg (SE)

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

(57) A pouched product (1) for oral use comprising a liquid permeable cover material (2) and a portion sized amount of a filling material (3) comprising a particulate material, the filling material (3) being enclosed by the liquid permeable cover material (2). The particles (4) of the particulate material have an average particle size

within the range of from 0.3 mm to 3.0 mm, a particle density in the range of from 0.8 g/cm³ to 1.7 g/cm³ and a pre-use moisture content of from 1% by weight of the filling material (3) to 35% by weight of the filling material (3).

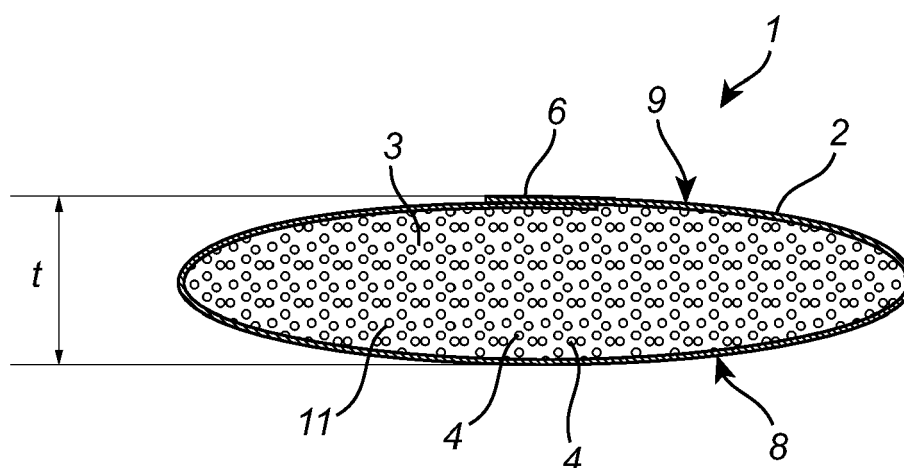


Fig. 2

Description

TECHNICAL FIELD

[0001] The present disclosure relates to a pouched product for oral use comprising a liquid permeable cover material and a portion sized amount of a filling material comprising a particulate material, the filling material being enclosed by the liquid permeable cover material.

BACKGROUND

[0002] An oral pouched product as disclosed herein, is intended for use in the oral cavity, such as by buccal placement e.g., by placing the pouched product between the upper or lower gum and the lip or cheek. A pouched smokeless tobacco product may also be referred to as a portion-packed smokeless tobacco product for oral use. The pouched product is normally sized and configured to fit comfortably and discreetly in a user's mouth between the upper or lower gum and the lip or cheek.

[0003] Traditionally, oral pouched products are used in the oral cavity of a consumer to provide a user with the benefits of an active substance such as nicotine, caffeine, and/or different flavors. A common type of nicotine containing oral pouched products is oral smokeless tobacco products. Such products generally comprise water, salt, pH adjuster(s) and additional components such as flavors and humectants. Commonly, these products are called snuff.

[0004] Oral pouched nicotine containing products comprising no tobacco, or only a small amount of tobacco are now becoming increasingly popular among consumers due to inter alia their appealing appearance, freshness and taste. Moreover, this kind of product allows a user to enjoy nicotine without being exposed to tobacco. The tobacco free or almost tobacco free oral pouched products are usually flavored compositions comprising a filling material which may e.g., comprise particles of microcrystalline cellulose or fiber material derived from plants other than tobacco.

[0005] Further types of oral pouched products are those which only deliver a flavor into the oral cavity and those which are designed for delivering active substances other than nicotine.

[0006] The tobacco free oral pouched products are generally relatively dry products, with a pre-use moisture content below 35% by weight of the filling material and often below 20% by weight of the filling material. Oral pouched products having even lower moisture content, in the order of 4-10 % by weight of the filling material are also known in the art.

[0007] Oral pouched products are typically used by a consumer by placing the pouch between the upper or lower gum and the lip and retaining it there for a limited period of time. The product is configured to fit comfortably and discreetly in the user's mouth. The pouch material holds the filling material in place allowing saliva to pass

into the filling material and allowing flavors and active substances such as nicotine to diffuse from the filling material into the consumer's mouth.

[0008] It has been found that oral pouched products having a relatively dry filling material made up mainly of a powdery or particulate material may be perceived by users as giving a disagreeably dry and gritty mouth feeling especially in an initial phase of use of such products. Such products may also be found by users to have a less malleable consistency than desired.

[0009] An objective with the disclosure herein is to offer an oral pouched product containing a filling material having improved properties, in particular regarding mouthfeel and malleability.

SUMMARY

[0010] The above object may be achieved with an oral pouched product according to claim 1. Variations of the disclosure are set out in the dependent claims and in the following description.

[0011] The pouched product for oral use as disclosed herein comprises a liquid permeable cover material and a portion sized amount of a filling material comprising a particulate material, the filling material being enclosed by the liquid permeable cover material.

[0012] The particles of the particulate material have an average particle size within the range of from 0.3 mm to 3.0 mm, a particle density in the range of from 0.8 g/cm³ to 1.7 g/cm³ and a pre-use moisture content of from 1% by weight of the filling material to 35% by weight of the filling material.

[0013] A filling material for oral pouched products having a relatively low moisture content has been found to meet user expectations by providing a pleasant mouthfeel and good malleability when the filling material comprises a particulate material having relatively large particles and a relatively high particle density. The particle size and the particle density of the particulate material combine to provide the material with a low dynamic coefficient of friction as measured according to the method disclosed herein and have been found to characterize a filling material having a high fluidity. A high fluidity implies that the particles of the particulate material in the filling material can easily shift in relation to each other and to the cover material, resulting in the oral pouched products as disclosed herein having an excellent malleability and a fluid mouthfeel. These properties of the oral pouched products as disclosed herein have been found to be highly appreciated by users.

[0014] The filling material in the oral pouched products as disclosed herein may have a pre-use moisture content as determined by the method disclosed herein of from 1% by weight of the filling material to 30% by weight of the filling material, such as from 1% by weight of the filling material to 25% by weight of the filling material, such as from 1% by weight of the filling material to 15% by weight of the filling material, such as from 1% by weight of the

filling material to 7% by weight of the filling material, such as from 5% by weight of the filling material to 30% by weight of the filling material, such as from 5% by weight of the filling material to 25% by weight of the filling material, such as from 5% by weight of the filling material to 15% by weight of the filling material, such as from 10% by weight of the filling material to 20% by weight of the filling material, such as from 10% by weight of the filling material to 15% by weight of the filling material.

[0015] A filling material in an oral pouched product as disclosed herein and having a relatively low pre-use moisture content is perceived by users to be fresh and agreeable to handle when taking it out of a user container and tucking it in, e.g. between the upper or lower lip and the gum of the user.

[0016] It may be preferred that the moisture content of the filling material in the oral pouched products as disclosed herein is less than 20% by weight.

[0017] The malleability of the oral pouched products as disclosed herein may be further enhanced by selecting a particulate material having a low content of small particles and fines. A high content of small particles and fines may detract from the malleability of the filling material by lowering the ability of the particles in the particulate material to move freely in relation to each other. It may be preferred that the particulate material in the filling material as disclosed herein contains less than 0.5% of particles which are small enough to pass through a sieve having a mesh size of 250 μm .

[0018] A mesh size of 250 μm corresponds to a particle size in the order of a small to medium-sized grain of sand. Such particles are extremely unpleasant if they escape out through the cover material into the oral cavity of a user as they give rise to a gritty and dry mouthfeel which may linger for a long time after the product has been placed in the oral cavity, especially if the particles are non-soluble particles.

[0019] Small particles and fines in a filling material may also cause problems with dusting during manufacturing of oral pouched products, as they may impair seal formation and may cause clogging of machine parts. It is also desirable to minimize the amount of dust from a health and hygiene perspective of the manufacturing process.

[0020] The particles of the particulate material may have any useful shape, with regular shapes being preferred over irregular shapes. Furthermore, it may be preferred to use particles having a cylindrical or substantially cylindrical shape, a spherical or substantially spherical shape, or particles having an elongated rounded or substantially rounded shape such as an egg-shape or a grain shape. A particle having a shape being substantially cylindrical, spherical, etc., implies that the overall shape of the particle may be e.g., spherical but that there may be irregularities in the particle surface such as dimples. Irregularly shaped particles having protruding parts, sharp corners and edges are generally less preferred.

[0021] The water insoluble particles may be relatively

dense, non-porous particles having a particle density in the range of from 0.8 g/cm³ to 1.7 g/cm³, such as from 1.0 g/cm³ to 1.5 g/cm³, such as from 1.1 g/cm³ to 1.4 g/cm³. Dense, non-porous particles have a generally less irregular surface on a micro-scale which may contribute to further lower frictional forces between the particles as well as between the particles and the cover material.

[0022] The particles of the particulate material in the filling material as disclosed herein are relatively large particles and may have an average particle size within the range of from 0.4 mm to 3.0 mm, such as from 0.5 mm to 2.5 mm, such as from 0.6 mm to 2.5 mm, such as from 0.7 mm to 2 mm, such as from 0.8 mm to 1.5 mm, such as from 0.85 mm to 1.2 mm.

[0023] The particles of the particulate material in the filling material may be of generally the same size, with a narrow particle size distribution profile.

[0024] The particles of the particulate material in the filling material may have a sphericity within the range of from 0.7 to 1.0, such as from 0.8 to 1.0.

[0025] Sphericity and particle size may be determined with the aid of a QicPic image analysis instrument from 2012, Sympatec GmbH, ID No. 290-D, with Rodos/L dispersion line ID NO 214D and Vibri/L sample feeding ID NO 273, or equivalent equipment. A well dispersed particle flow is led through the image plane of the instrument. The particles are separated from each other by a transportation fluid and overlapping particles are avoided. A high number of particles per image frame may be captured.

[0026] The particulate material in the filling material may comprise or consist of water insoluble particles. The water insoluble particles may be particles of microcrystalline cellulose, water insoluble starch, silica or a mixture thereof.

[0027] The water insoluble particles may constitute 75% by dry weight to 99% by dry weight of the filling material, such as 85% by dry weight to 98% by dry weight of the filling material or 95% by dry weight to 98% by dry weight of the filling material.

[0028] The water permeable outer cover material of the oral pouched products as disclosed herein may have an air permeability of from 4,500 l/m²/s to 10,000 l/m²/s, when measured according to the test method WSP070.1.R3(12) specified by EDANA, i.e. the European Disposables and Nonwovens Association. The air permeability is associated with the porosity of the packaging material and hence also associated with its tendency to leak filling material. A cover material having an air permeability of more than 4,500 l/m²/s is referred to herein as having a high air permeability.

[0029] The water permeable outer cover material may have a basis weight in the range of from 10 g/m² to 30 g/m². A cover material having a relatively low basis weight has a high air permeability and constitutes a minimal barrier to saliva transport into and out of the filling material in the oral pouched product. Such cover materials have also been found to offer sensory benefits, in

particular when combined with particles having a relatively large particle size, as disclosed herein. Larger which are small enough to pass through are freely movable inside the cover and which may be felt through a cover material may contribute to the particulate filling material in the oral pouched product being perceived as having a pleasantly fluid quality.

[0030] The particles of the particulate material in the filling material of the oral pouched products as disclosed herein may have a relatively large particle size in the range of from 0.3 mm to 3 mm, preferably from 0.5 mm to 3.0 mm, more preferred from 0.6 mm to 3.0 mm, and most preferred from 0.7 mm to 3 mm, in combination with a water permeable cover material having a relatively high porosity in the range of from 4,500 l/m²/s to 10,000 l/m²/s, when measured according to the EDANA test method WSP070.1.R3(12).

[0031] Highly permeable cover materials may be preferred as they allow saliva to readily pass into and out of the filling material and may contribute to a high release rate for active components, flavours, sweeteners etc. from the filling material enclosed by the cover material. A drawback with highly porous cover material may be that there is a risk that also non-soluble substrate materials such as water insoluble particles and powder as well as fibres in the filling material may escape through the pores in the cover material and into the oral cavity of a user of the oral pouched product. By selecting large particles in combination with highly porous cover materials, the risk of escaping particles may be considerably reduced or even eliminated.

[0032] The liquid permeable cover material of the oral pouched product may be a nonwoven material.

[0033] The filling material of the oral pouched product as disclosed herein may comprise nicotine.

[0034] The nicotine may be derived from a nicotine source being a nicotine base and/or being 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.

[0035] The filling material of the oral pouched product as disclosed herein may comprise tobacco material in an amount within the range of from 0.05 wt% to 10 wt%, based on the total weight of said filling material. In such case the tobacco material may be a nicotine source. The tobacco material may be the only nicotine source or may be a nicotine source in addition to one or more of the nicotine sourced disclosed herein.

[0036] The filling material of the oral pouched product as disclosed herein may comprise an additive selected from the group consisting of a flavouring agent, a sweetener, a humectant, and any mixture thereof.

[0037] The additive may comprise or consists of a flavouring agent, such as a flavour oil, such as a hydrophobic flavour oil, such as a synthetic flavour, such as a na-

ture-identical flavour.

[0038] The filling material of the oral pouched product as disclosed herein may be free from tobacco material. A tobacco free filling material may contain material derived from other plant sources such as coffee, tea, herbs, etc., and/or any suitable flavouring agent, sweetener, etc., as known in the art.

[0039] In the pouched product disclosed herein, one or more water soluble component of the filling material may be present on an outer surface of at least some of the particles of the particulate material in the filling material, such as on 20% to 100% of the particles, or 50% to 100% of the particles, or 80% to 100% of the particles.

[0040] In the pouched product disclosed herein, one or more water soluble component of the filling material may be present in interstices between the particles of the particulate material in the filling material.

[0041] One or more water soluble components may be present both on an outer surface of at least some of the particles in the filling material and in interstices between the particles in the filling material.

[0042] It may be preferred that no or substantially no water soluble component of the filling material such as nicotine, flavouring agents, sweeteners, etc., is present in an internal pore structure in the particles of the particulate material of the filling material.

[0043] The filling material of the oral pouched product as disclosed herein may comprise more than one type of particles. A first type of particles, may be water insoluble particles and a second type of particles may be water insoluble particles or fully or partially water soluble particles.

DEFINITIONS

[0044] The terms "*oral*" and "*oral use*" refer to a use of a product in contact with mucous membranes in the oral cavity of a human being, such as buccal placement of the product in the oral cavity. The products for oral use as disclosed herein are intended to be placed in their entirety in the oral cavity and are not intended to be swallowed.

[0045] As used herein the terms "*pouched product for oral use*" or "*oral pouched product*" refer to a portion of a smokeless composition containing saliva extractables and being packed in a saliva-permeable pouch material.

[0046] A "*particle*" as used herein is a three-dimensional piece of material having a maximum dimension of less than 5 mm and an aspect ratio of from 0.3 to 1. The "*aspect ratio*", A_R , as used herein, is calculated as the width, w , of the particle divided by the length l , of the particle where the length is determined as the largest dimension of the particle and the width is determined as the largest dimension orthogonal to the length : $A_R = l / w$. A particle having an aspect ratio of 1 may e.g., be a perfect sphere or cube. The which are small enough to pass through are useful as the particulate material in the filling material of the oral pouched products disclosed

herein may have a regular shape such as a spherical shape, a cubic shape, a cylindrical shape, etc., or may have an irregular shape with regular or near-regular shapes being generally preferred. The particles may have generally smooth outer surfaces or may have small aberrations in the outer surfaces.

[0047] A "*water insoluble particle*" as referred to herein is a particle which does not dissolve when subjected to saliva in the oral cavity of a user and which retains or substantially retains its shape when incorporated in a pouched product for oral use. The water insolubility also means that the particle size of the water insoluble particles as referred to herein does not diminish or at least does not diminish by more than 1% during use of an oral pouched product incorporating the water insoluble particles. The shape and the size of the water insoluble particles may remain substantially unaffected during use. However, a certain amount of swelling of the water insoluble particles may be permitted or even desired. The swelling should preferably be less than 30 % of the pre-use bulk volume of the water insoluble particles and more preferably less than 20 % of the pre-use bulk volume of the water insoluble particles.

[0048] As used herein, the term "*moisture content*" refers to the percent by weight, wt%, of oven volatile substances, such as water and other oven volatiles (e.g. propylene glycol) which is present in a component material, a composition or a product and is determined according to the Loss-On-Drying (LOD) method disclosed herein.

[0049] The "*dry weight*" of a material, a composition, or a product is calculated by deducting the amount of moisture from the total weight of the material, composition or product, the moisture content being determined by the Loss-On-Drying (LOD) method as disclosed herein.

[0050] As used herein, the term "*water content*" refers to the percent by weight, wt%, of water in a component material, a composition, or a product. The water content may be determined by using a standardized method for water analysis, such as Karl Fischer titration or gas chromatography, GC.

[0051] The term "*additional component*" refers to any component except water, which is present in addition to the particles of the particulate material in 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 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.

[0052] 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.

[0053] By "*tobacco*" or "*tobacco material*" is meant any part, e.g., leaves, stems, stalks, and flowers, of any member of the genus *Nicotiana*.

[0054] By a "*cover material*" as used herein is implied any suitable saliva permeable packaging material as known in the art. The cover material may also be referred to as "*pouch material*" and may be a nonwoven material, a material made by conventional textile production methods such as weaving or knitting or may be an apertured plastic film or netting. A nonwoven material suitable for use as cover material may be a nonwoven material comprising staple fibres, such as staple fibres of regenerated cellulose e.g., viscose rayon staple fibres and a binder, such as a polyacrylate binder. Alternatively, the nonwoven material may comprise fibres which are formed into a nonwoven web by spunbonding, hydroentangling, meltblowing, etc. The fibres used in such processes are generally thermoplastic fibres which are thermally bonded to form a coherent nonwoven web. The covering material may optionally comprise additional components such as flavouring agents and/or colorants.

[0055] 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. 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 mm to 40 mm along the longitudinal direction of the product and a maximum width within the range of from 5 mm to 20 mm along the transverse direction of the product. The pre-use thickness of the pouched product is normally within the range of from 2 mm to 8 mm. The total weight of commercially available pouched products for oral use is typically within the range from about 0.3 g to about 3.5 g, such as from about 0.5 g to 1.7 g, per pouched product. The volume of a portion of filling material in a pouch may be in the range of from 0.5 cm³ to 1.5 cm³, depending on the size of the pouch.

[0056] 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 a 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. The user container may include a disposal compartment for storage of used oral pouched

products. The disposal compartment is separated from the compartment in the container where the fresh oral pouched products are stored up until use.

BRIEF DESCRIPTION OF THE DRAWINGS

[0057] The present invention will be further explained hereinafter by means of non-limiting examples and with reference to the appended drawings wherein:

- Figure 1 shows a pouched product for oral use;
 Figure 2 shows a cross-section taken along the line II-II through the pouched product of Fig. 1;
 Figure 3 shows generally spherical particles suitable for use in the oral pouched products as disclosed herein; and
 Figures 4a-4d show examples of alternative particle shapes.

DETAILED DESCRIPTION

[0058] It is to be understood that the drawings are schematic and that individual components are not necessarily drawn to scale.

[0059] The pouched product 1 for oral use which is shown in Figs. 1 and 2 comprises a liquid permeable cover material 2 and a portion sized amount of a filling material 3 comprising a particulate material constituted by a plurality of particles 4 enclosed by the liquid permeable cover material 2. The cover material 2 may be any suitable type of cover material as disclosed herein and is formed into a generally rectangular pouch into which the filling material 3 has been inserted. The particulate material is preferably, but not necessarily constituted by water insoluble particles.

[0060] A common way of making a pouched product having a generally rectangular pillow-like shape, such as the pouched product 1 shown in Figs. 1 and 2, is either to provide the cover material as a seamless and endless tube or to form a flat web of cover material into an endless tube which is provided with a continuous seal in the longitudinal direction of the endless tube. The endless tube is subsequently intermittently sealed in the transverse direction of the endless tube while filling the endless tube with filling material into pockets which are created between the transverse seals. Individual pouched products are severed from the filled and sealed tube of cover material and are usually packed in user containers. Sealing of the cover material may be made with any suitable method or combination of methods, such as by means of adhesive, heat sealing, ultrasonic welding, needling, etc. Heat sealing and ultrasonic welding require the cover material to contain at least a functional amount of thermoplastic material, such as thermoplastic fibres or thermoplastic binders.

[0061] The longitudinal seal created during manufacturing appears as a longitudinal seal 6 extending along

the length l of the pouched product 1 shown in Figs. 1 and 2. No such seal will be present if the cover material is provided in the form of an endless seam-less tube. The transverse seals form end seals 7 which define the width w of the pouched product 1. The pouched product 1 has a first main surface 8 and a second main surface 9 and a thickness t being defined as the greatest perpendicular distance between the first main surface 8 and the second main surface 9.

[0062] The particles 4 of the particulate material may constitute a very high proportion of the total dry weight of the filling material 3, such as 75% by dry weight to 99% by dry weight of the filling material, as set out herein.

[0063] The filling material 3 further comprises one or more water soluble components 11, such as flavours, sweeteners, active ingredients such as nicotine, etc. as disclosed herein.

[0064] A part of a filling material 3 for an oral pouched product as disclosed herein is shown in Fig. 3, the filling material 3 comprising a plurality of generally spherical, preferably water insoluble particles 4.

[0065] The particles 4 of the filling material have a relatively large average particle size within the range of from 0.3 mm to 3.0 mm. By using large water insoluble particles for the particles 4 of the particulate material in the filling material 3, a major part of the water soluble components 11, i.e. components which are soluble in water and saliva, may to a large extent be present in the filling material 3 on surfaces of the particles 4 which are facing interstices 12 between the particles 4. In this manner, any water soluble components 12 may be substantially "concealed" within the mass of the filling material 3 where they do not add or do not substantially add to the volume of the filling material 3.

[0066] Fig. 3 shows only a very small number of particles 4. In a full portion of filling material 3 for an oral pouched product 1, the number of particles 4 in the particulate material is considerably higher, such as in the order of 150 particles or more which means that a large majority of the particle surfaces will be facing into the filling material 3.

[0067] As disclosed herein, the particles 4 of the particulate material may be dense, non-porous particles having a particle density in the range of from 0.8 g/cm³ to 1.7 g/cm³, such as from 1.0 g/cm³ to 1.5 g/cm³, such as from 1.1 g/cm³ to 1.4 g/cm³. In such dense non-porous particles, no, or substantially no water soluble components 11 are present within the particles 4 themselves.

[0068] Figs. 4a, 4b, 4c and 4d illustrate some alternative shapes for the particles 4 of the filling materials 3 as disclosed herein.

[0069] The particles 4 which are shown in Fig. 4a have a substantially cubic shape, the particles 4 which are shown in Fig. 4b are grain-shaped, the particles 4 which are shown in Fig. 4c have a substantially cylindrical shape and the particles 4 which are shown in Fig. 4d have an irregular shape. The particles 4 in Fig. 4a, has an aspect ratio w/l which is approximately 1, while the particles 4

shown in Figs. 4b-4d have a smaller aspect ratio.

[0070] For the oral pouched products 1 as disclosed herein, particle shapes having circular or oval cross-sections such as those shown in Figs. 3, 4b, and 4c may be particularly preferred. Irregular smoothly curved shapes such as shown in Fig. 4d are generally preferred over irregular shapes having sharp protrusions.

EXAMPLES AND DESCRIPTION OF TEST METHODS

Method for determining moisture content, Loss on Drying (LOD)

[0071] 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 Chemistry), 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 experiments 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.

Method for determining dynamic friction between particles and cover material

[0072] The measurements were performed according to ASTM1894 using an Instron Coefficient of Friction Fixture.

[0073] The tests were carried out by applying a sample cover material on a test area of the horizontal test plate of the test apparatus having an extension of 215x130 mm. A sample of 40 g of the filling material to be tested was applied on the cover material and was distributed evenly in the test area. A three-walled enclosure of plastic bars was used to prevent spilling over of the filling material at the sides and rear of the test plate, while allowing motion of the test sled in the motion direction of the tow line. The same cover material as the cover material on the horizontal plate of the test apparatus was applied to the friction sled and the sled was slid across the filling material yielding the dynamic coefficient of friction.

[0074] The tested filling materials were:

Reference 1 was the filling material from the com-

mercial product sold under the name ZYN Slim from Swedish Match North Europe AB. The moisture content in the filling material was approximately 39%, the filling material containing MCC particles having an average particle size of 180 μm and bamboo fibres in a 50/50 mix.

Reference 2 was the filling material from the commercial product sold under the name ZYN Dry citrus 3 mg from Swedish Match North Europe AB. The filling material was constituted by approximately 84% by dry weight of a combination of granules of microcrystalline cellulose and maltitol. The moisture content in the filling material was approximately 3 %.

[0075] Example 1 was a filling material constituted by approximately 78% by weight of the total weight of the filling material of particles of microcrystalline cellulose having an average particle size of 945 μm , a particle density of 1.3 g/cm³ and a bulk density of 0.78 g/cm³, and approximately 9% by weight of additional components based on the total weight of the filling material. The moisture content in the filling material was 13% by weight of the filling material.

[0076] The cover material used in all three tests was a viscose nonwoven web comprising 40 wt% binder. 100% of the fibres in the cover material were viscose fibres having a linear density of 1.7 decitex and a basis weight of 29 g/m².

Table 1

	Dynamic coefficient of friction
Reference 1	0.23
Reference 2	0.19
Example 1	0.10

[0077] As is evident from Table 1, the large, dense particles of the Example 1 material according to the invention had a considerably lower coefficient of friction than the prior art filling material when measured against the same cover material.

Claims

1. A pouched product (1) for oral use comprising a liquid permeable cover material (2) and a portion sized amount of a filling material (3) comprising a particulate material, the filling material (3) being enclosed by the liquid permeable cover material (2), **characterized in that**, the particles (4) of the particulate material have an average particle size within the range of from 0.3 mm to 3.0 mm, a particle density in the range of from 0.8 g/cm³ to 1.7 g/cm³ and a pre-use moisture content of from 1% by weight of

the filling material (3) to 35% by weight of the filling material (3).

2. A pouched product (1) according to claim 1, wherein the particulate material contains less than 0.5% of particles which are small enough to pass through a sieve having a mesh size of 250 μm . 5
3. A pouched product (1) according to claim 1 or 2, wherein the particles (4) of the particulate material are particles having a cylindrical or substantially cylindrical shape, a spherical or substantially spherical shape, or are particles having an elongated rounded or substantially rounded shape such as an egg-shape or a grain shape. 10
4. A pouched product (1) according to any one of the preceding claims, wherein the particles (4) of the particulate material have a spherical or substantially spherical shape and a sphericity in the range of from 0.7 to 1.0. 20
5. A pouched product (1) according to any one of the preceding claims, wherein the particulate material comprises or consists of water insoluble particles, such as water insoluble particles (4) of microcrystalline cellulose, water insoluble starch, silica or a mixture thereof. 25
6. A pouched product (1) according to claim 5, wherein the water insoluble particles constitute 75% by dry weight to 99% by dry weight of the filling material (3). 30
7. A pouched product (1) according to any one of the preceding claims, wherein the water permeable outer cover material (2) has an air permeability of from 4,000 $\text{l/m}^2/\text{s}$ to 10,000 $\text{l/m}^2/\text{s}$, when measured according to the EDANA test method WSP070.1.R3(12). 35
8. A pouched product (1) according to any one of the preceding claims, wherein the water permeable outer cover material (2) has a basis weight in the range of from 10 g/m^2 to 30 g/m^2 . 40
9. A pouched product (1) according to any one of the preceding claims, wherein the liquid permeable cover material (2) is a nonwoven material. 45
10. A pouched product (1) according to any one of the preceding claims, wherein the particles (4) of the particulate material have a sphericity within the range of from 0.7 to 1.0, such as from 0.8 to 1.0 and a diameter of from 0.3 mm to 3 mm, such as from 0.7 mm to 3 mm. 50
11. A pouched product (1) according to any one of the preceding claims, wherein the filling material (3) 55

comprises nicotine.

12. A pouched product (1) according to claim 11, wherein nicotine is derived from a nicotine source being a nicotine base and/or being 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.
13. A pouched product (1) according to any one of the preceding claims, wherein the filling material (3) comprises an additive selected from the group consisting of a flavouring agent, a sweetener, a humectant, and any mixture thereof.
14. A pouched product (1) according to claim 13, wherein the additive comprises or consists of a flavouring agent, such as a flavour oil, such as a hydrophobic flavour oil, such as a synthetic flavour, such as a nature-identical flavour.
15. A pouched product (1) according to any one of the preceding claims, wherein the filling material (3) is free from tobacco material.
16. A pouched product (1) according to any one of the preceding claims, wherein one or more water soluble component (11) of the filling material (3) is present on an outer surface of at least some of the particles (4) of the particulate material, such as on 20% to 100% of the particles (4) of the particulate material, or 50% to 100% of the particles (4) of the particulate material, or 80% to 100% of the particles (4) of the particulate material.
17. A pouched product (1) according to any one of the preceding claims, wherein one or more water soluble component (11) of the filling material (3) is present in interstices (12) between the particles (4) of the particulate material.

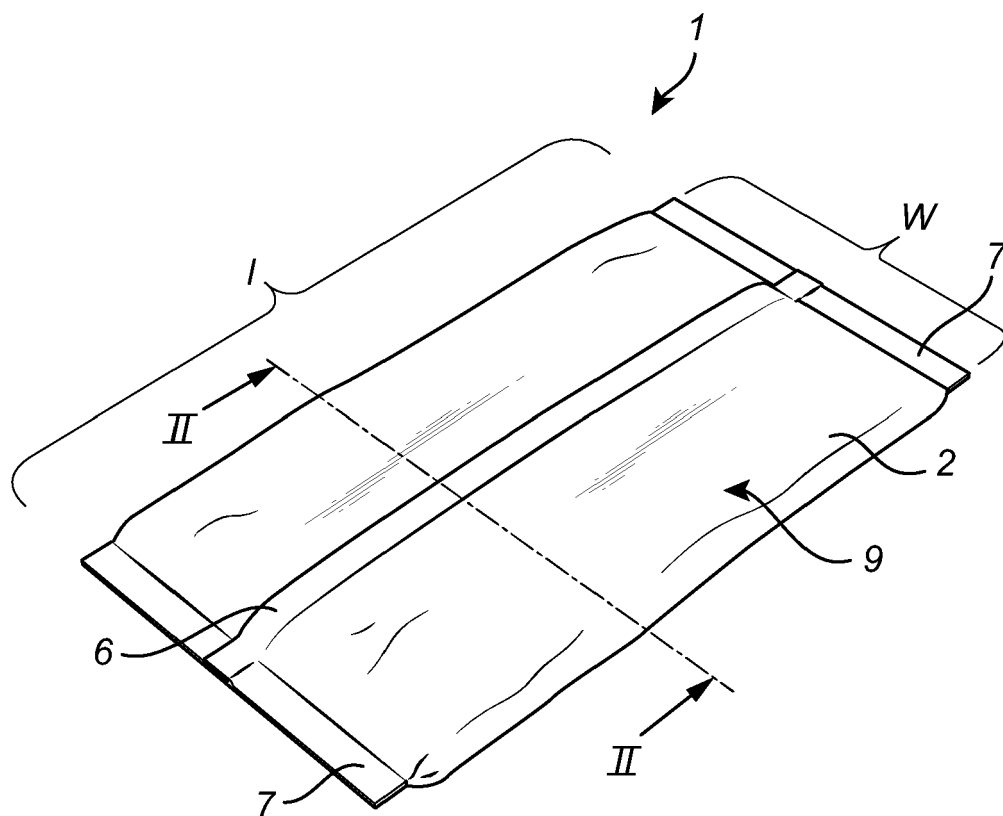


Fig. 1

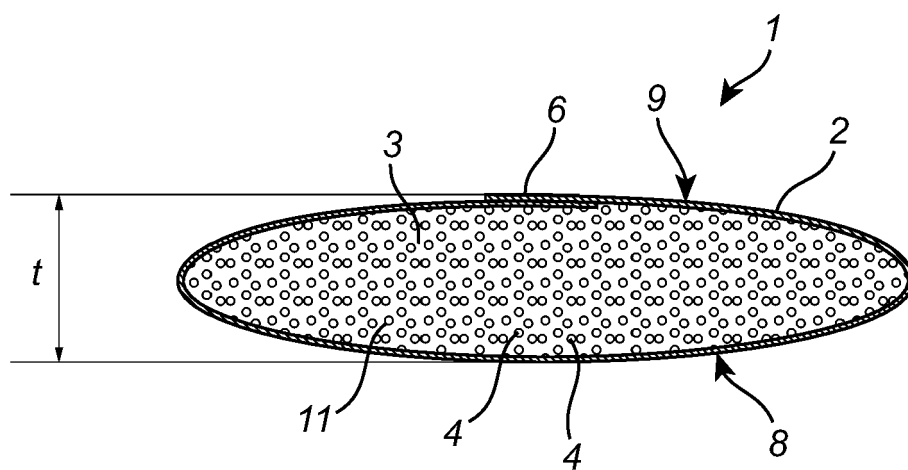


Fig. 2

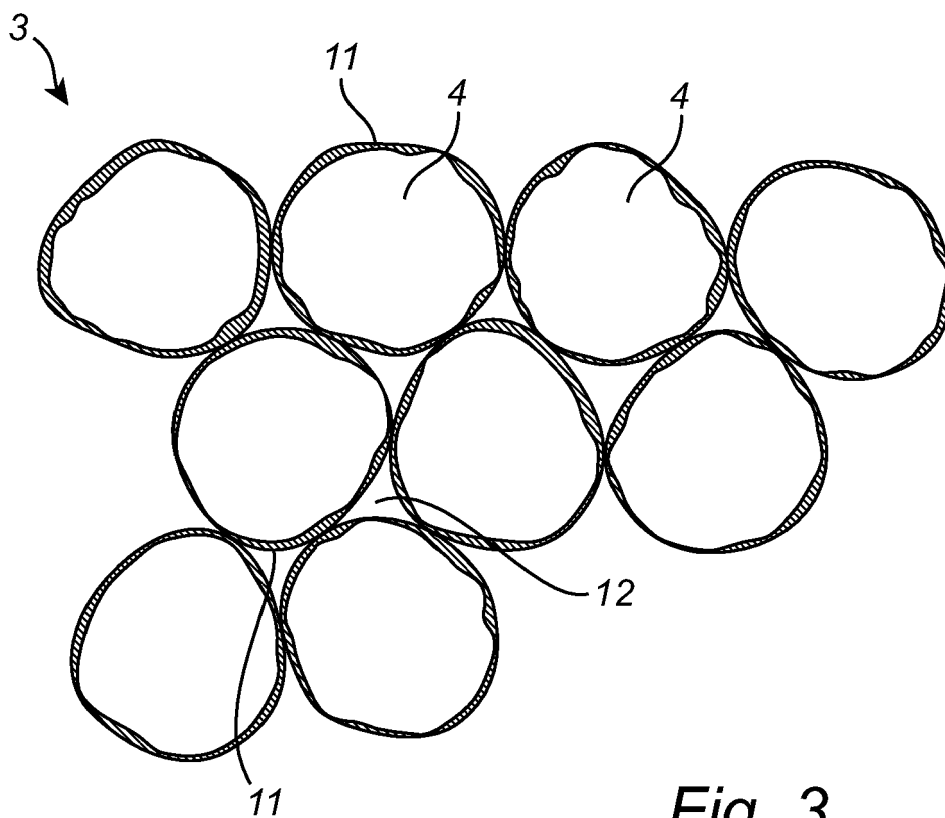


Fig. 3

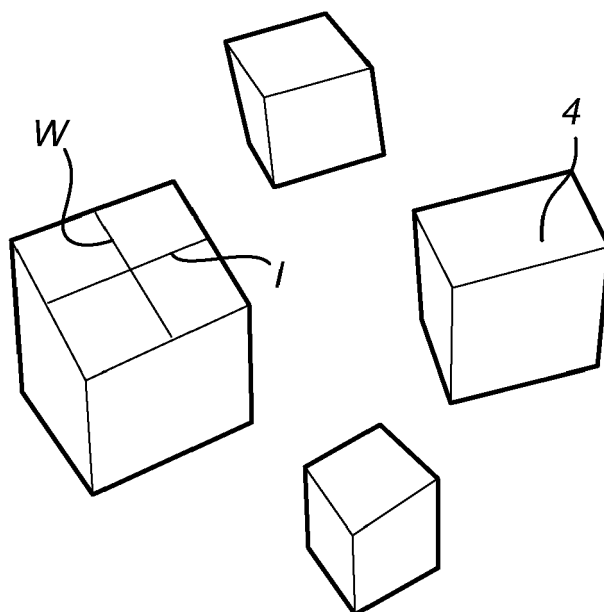


Fig. 4a

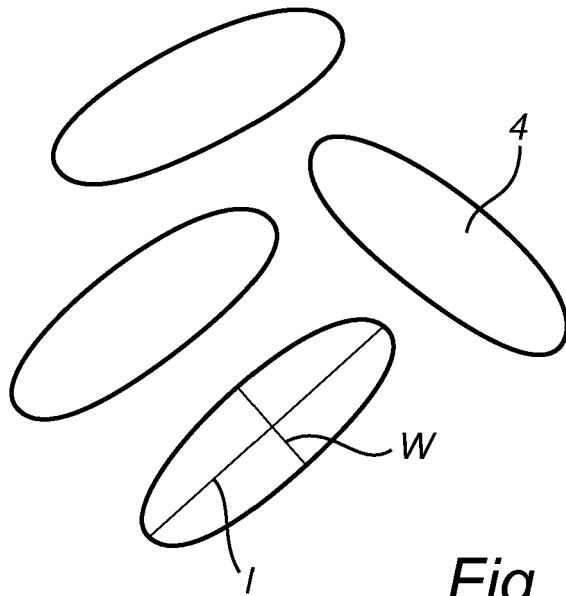


Fig. 4b

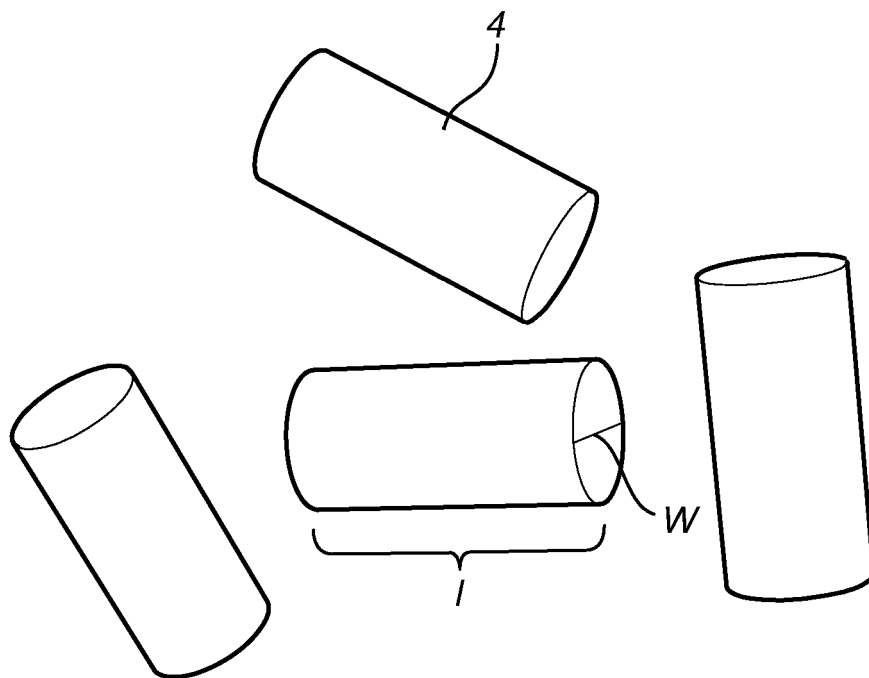


Fig. 4c

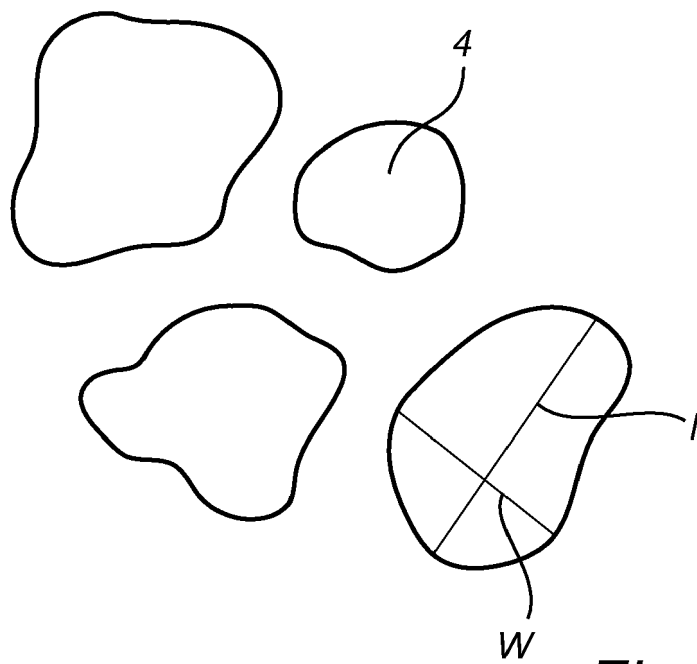


Fig. 4d



EUROPEAN SEARCH REPORT

 Application Number
 EP 20 21 6488

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2011/083680 A1 (MISHRA MUNMAYA K [US] ET AL) 14 April 2011 (2011-04-14) * claims; figure 1; examples 1,2 *	1-17	INV. A24B13/00 A24B15/28 A24B15/38
X	WO 2017/153718 A1 (BRITISH AMERICAN TOBACCO LTD [GB]; FIEDLER & LUNDGREN [SE]) 14 September 2017 (2017-09-14) * pages 3-22; claims; examples *	1-17	
X	US 2010/218779 A1 (ZHUANG SHUZHONG [US] ET AL) 2 September 2010 (2010-09-02) * pages 1-58; claims; examples *	1-17	
X	WO 2014/096816 A1 (BRITISH AMERICAN TOBACCO CO [GB]) 26 June 2014 (2014-06-26) * pages 1-21; claims; examples *	1-17	
A	US 2010/300465 A1 (ZIMMERMANN STEPHEN G [US]) 2 December 2010 (2010-12-02) * paragraphs [0007] - [0063]; claims *	1-17	TECHNICAL FIELDS SEARCHED (IPC) A24B A61K D04H
A	US 2010/300464 A1 (GEE DIANE L [US] ET AL) 2 December 2010 (2010-12-02) * the whole document *	1-17	
A	WO 2010/104464 A1 (EXCELLENS TECH PRODUCTS APS [DK]; HUEBINETTE FREDRIK [SE] ET AL.) 16 September 2010 (2010-09-16) * pages 4-18; claims; figures 1,2; examples *	1-17	
A	US 2008/308115 A1 (ZIMMERMANN STEPHEN G [US]) 18 December 2008 (2008-12-18) * the whole document *	1-17	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 8 June 2021	Examiner Boddaert, Peter
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 20 21 6488

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2018/271139 A1 (ASPGREN THOM [SE] ET AL) 27 September 2018 (2018-09-27) * paragraphs [0051] - [0083]; claims; examples *	1-17	
A	----- WO 2008/056135 A2 (BRITISH AMERICAN TOBACCO CO [GB]; ONNO GAEL [GB]) 15 May 2008 (2008-05-15) * the whole document * -----	1-17	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
Place of search The Hague		Date of completion of the search 8 June 2021	Examiner Boddaert, Peter
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P04C01)

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

EP 20 21 6488

5

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

08-06-2021

10

15

20

25

30

35

40

45

50

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2011083680 A1	14-04-2011	BR 112012008263 A2	20-04-2021
		CA 2776820 A1	14-04-2011
		DK 2485610 T3	14-03-2016
		EC SP12011873 A	31-07-2012
		EP 2485610 A1	15-08-2012
		JP 5866289 B2	17-02-2016
		JP 2013507109 A	04-03-2013
		KR 20120087934 A	07-08-2012
		MY 163966 A	15-11-2017
		PL 2485610 T3	31-08-2016
		RU 2012118587 A	20-11-2013
		UA 108482 C2	12-05-2015
		US 2011083680 A1	14-04-2011
		US 2014261506 A1	18-09-2014
		US 2019059438 A1	28-02-2019
		WO 2011042206 A1	14-04-2011

WO 2017153718 A1	14-09-2017	CA 3016766 A1	14-09-2017
		EP 3426064 A1	16-01-2019
		JP 6725164 B2	15-07-2020
		JP 2019512219 A	16-05-2019
		JP 2020162618 A	08-10-2020
		US 2019124971 A1	02-05-2019
		WO 2017153718 A1	14-09-2017

US 2010218779 A1	02-09-2010	NONE	

WO 2014096816 A1	26-06-2014	EP 2934197 A1	28-10-2015
		JP 6064053 B2	18-01-2017
		JP 2015536688 A	24-12-2015
		US 2015296868 A1	22-10-2015
		WO 2014096816 A1	26-06-2014

US 2010300465 A1	02-12-2010	US 2010300465 A1	02-12-2010
		US 2018132521 A1	17-05-2018

US 2010300464 A1	02-12-2010	US 2010300464 A1	02-12-2010
		US 2013152955 A1	20-06-2013
		US 2017049144 A1	23-02-2017
		US 2020085093 A1	19-03-2020

WO 2010104464 A1	16-09-2010	CY 1120230 T1	12-12-2018
		DK 2405942 T3	05-02-2018
		EP 2405942 A1	18-01-2012
		ES 2658166 T3	08-03-2018
		HR P20180177 T1	23-03-2018

EPO FORM P0459

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

55

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

EP 20 21 6488

5

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

08-06-2021

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		HU E038093 T2	28-09-2018
		LT 2405942 T	26-02-2018
		NO 2405942 T3	31-03-2018
		PL 2405942 T3	30-04-2018
		PT 2405942 T	07-02-2018
		SI 2405942 T1	30-04-2018
		US 2012128734 A1	24-05-2012
		US 2018193272 A1	12-07-2018
		WO 2010104464 A1	16-09-2010

US 2008308115 A1	18-12-2008	US 2008308115 A1	18-12-2008
		WO 2009004487 A2	08-01-2009

US 2018271139 A1	27-09-2018	NONE	

WO 2008056135 A2	15-05-2008	NONE	

EPO FORM P0459

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

REFERENCES CITED IN THE DESCRIPTION

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

Patent documents cited in the description

- WO 2012069505 A1 **[0056]**

Non-patent literature cited in the description

- Total moisture determination. *Federal Register*, 07 January 2009, vol. 74 (4), 712-719 **[0071]**
- Moisture in Tobacco. Official Methods of Analysis 966.02. AOAC (Association of Official Analytical Chemists), 1990 **[0071]**