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(54) **A METHOD FOR PREPARING A HOOKAH CONSUMABLE COMPOSITION**

(57) The present invention relates to a method for preparing a hookah consumable composition. The present invention also relates to the use of such a hookah consumable composition. An object of the present invention is to provide a cellulose based composition which forms an excellent basis for a hookah consumable composition.

EP 4 201 229 A1

Description

[0001] The present invention relates to a method for preparing a hookah consumable composition. The present invention also relates to the use of such a hookah consumable composition.

FIELD OF THE INVENTION

[0002] Shisha may refer to a water pipe, or product consumed in a water pipe. In the context of this application, shisha refers to the product consumed in a hookah or water pipe. Hookahs are traditionally used to smoke shisha tobacco and are configured such that vapour and smoke pass through a water basin before inhalation by a consumer. Typically, the shisha tobacco is placed in a cup which sits on top of a water container. This cup is connected to a pipe of which the other open end is submerged in the water in the container. The cup is sealed with a perforated lid or tin foil. The shisha tobacco is heated by placing hot pieces of charcoal on top of the sealed cup. On the sides of the water container, one or more tubes are connected. The consumer inhales through the tube, which draws the vapours from the heated tobacco through the water to the consumer. Shisha devices may include one outlet or more than one outlet so that the device can be used by more than one consumer at a time. Use of shisha devices is considered by many to be a leisure activity and a social experience. The composition used in shisha devices may be mixed with other ingredients to, for example, increase the volume of the vapour and smoke produced, to alter flavour, or both. Charcoal pellets are typically used to heat the tobacco in a shisha device, which may cause full or partial combustion of the tobacco or other ingredients. Some shisha devices have been proposed that use electrical heat sources to, for example, avoid by-products of burning charcoal or to improve the consistency with which the composition is combusted. Other shisha devices have been proposed that employ e-liquids. A hookah session is meant to be a relaxing and often social event where people come together. A typical hookah session can usually be between 20 and 90 minutes.

[0003] EP 3 442 363 relates to a shisha consumable article for use with a shisha assembly, the shisha consumable article, comprising: a housing defining a first compartment and a second compartment, the second compartment being adjacent to, and sealed or air impermeable from, the first compartment; a combustible heat source contained within the first compartment; and an aerosol-forming substrate contained within the second compartment. The aerosol-forming substrate includes nicotine or a nicotine source, wherein the nicotine comes from tobacco leaf material.

[0004] WO 2020/044179 relates to a shisha cartridge comprising: a body comprising a cavity and an internal cavity surface; an aerosol-forming substrate disposed in the cavity; an absorbent carrier disposed in the cavity; and an aerosol former impregnated into the absorbent carrier, wherein the aerosol former comprises glycerine, propylene glycol, or a combination thereof, wherein the absorbent carrier comprises refined cellulosic material, i.e. paper.

[0005] US 2019/328030 relates to a method of making a nicotine containing sheet, comprising combining a source of nicotine salt having a cellulose content of less than about 5% by weight on a dry weight basis with a separate source of fibrous material having a nicotine salt content of less than about 5% by weight on a dry weight basis to form a mixture; and drying the mixture to form a sheet.

[0006] WO 2020/235112 relates to an aroma-producing body to be heated loaded into an aroma cartridge comprising an aroma-producing substrate to be heated, the aroma-producing substrate to be heated producing smoke and aromas when heated in contact with a heating element; and a packaging material rolling up the aroma-producing substrate to be heated, wherein the aroma-producing substrate to be heated includes at least an aerosol former, non-tobacco plants and/or tobacco plants, and a binding agent.

[0007] WO 2021/170670 relates to an aerosol-generating article comprising an aerosol-generating substrate, the aerosol generating substrate formed of a homogenised plant material comprising: between 1 percent by weight and 65 percent by weight of non-tobacco plant particles, between 15 percent by weight and 55 percent by weight of aerosol former, between 2 percent by weight and 10 percent by weight of cellulose ether, and between 5 percent by weight and 50 percent by weight of additional cellulose.

[0008] US 4,333,484 relates to a process for producing a foamed smoking material comprising: providing an aqueous slurry of cellulosic material, adding from about 5 to 40% by weight, based on the cellulosic material, of a metal salt of an organic or inorganic acid, adding a foaming or blowing agent to the resulting slurry and casting or extruding the slurry and then drying the cast or extruded slurry under such conditions wherein the slurry is foamed during the casting or extruding step or during the drying step.

[0009] US 3 965 911 relates to a smoking mixture comprising a thermally degraded carbohydrate tobacco substitute as the essential smoke-producing fuel, alkali or alkaline earth carbonates, sodium carboxymethyl cellulose, and a protein.

[0010] WO 2021/122583 relates to an aerosol-forming substrate comprising one or both of cellulose and cellulose derivatives, an aerosol-former, tobacco, a nitrogen-containing nucleophilic compound, and a disaccharide.

[0011] WO 2020/012761 relates to a filling for an aroma cartridge, which contains a non-tobacco material and an aerosol former, in the form of a strip or a rod with a length of 10 to 70 mm and contains the aerosol former in an amount of 10 to 40% by mass, wherein said non-tobacco material is black tea or teas.

[0012] WO 2020/044179 relates to a shisha cartridge comprising a body comprising a cavity and an internal cavity surface, an aerosol-forming substrate disposed in the cavity, an absorbent carrier disposed in the cavity, and an aerosol former impregnated into the absorbent carrier, wherein the aerosol former comprises glycerine, propylene glycol, or a combination thereof and the absorbent carrier comprises refined cellulosic material.

[0013] EP 3 351 121 relates to tobacco substitute for use in a hookah apparatus comprising a dry gel flavour formulation comprising from about 55% to about 99% of a syrup comprising from about 1% to about 99% of one or more humectants and from about 1% to about 99% of at least one source of sugar, from about 1.0% to about 45% of one or more flavours, from about 5.0% to about 60% wt./wt. of one or more binder agents relative to the wrt of the syrup comprising the one or more flavours, optionally from about 0.5% to about 2.0% wt./wrt of one or more preservatives, optionally from about 0.01 % to about 10.0% wrt/wt. of one or more ingredients selected from the group consisting of a dye, a colouring agent, a preservative, and combinations thereof, and
optionally one or more of nicotine, a nicotine salt, a nicotine solution, and a tobacco extract.

[0014] Typically, traditional water pipes are used in combination with a substrate, sometimes referred to in that art as hookah tobacco, tobacco molasses, or simply as molasses. Traditional shisha substrates are relatively high in sugar (in some cases, up to -50% vs. the -20% typically found in conventional tobacco substrates, such as in combustible cigarettes). The tobacco used in shisha devices may be mixed with other ingredients to, for example, increase the volume of the vapor and smoke produced, to alter flavour, or both.

[0015] Products very similar to shisha, are the electronic cigarette and the "shisha pen". These are electronic devices which contain a liquid similar in composition to liquids used for tobacco shisha. However, the ratios are significantly different. An electronic cigarette typically contains mostly aerosol generating agent to which a small amount of nicotine and flavour are being added. The term shisha pen usually refers to the same product, but without the nicotine. These products may or may not contain sugar.

[0016] Alternatives for tobacco in shisha can be seen as a combination of a substrate, and a liquid. The currently most used non-tobacco shisha alternatives in the market are, for example, herbal shisha, i.e. basically shisha in which the tobacco leaves are replaced by dried herbs, shisha stones, i.e. stones, or pebbles from a porous minerals like zeolite, e.g. "steam stones" made from volcanic rock, and gel cubes and gel pastes, i.e. premade gels consisting of humectants formed into a gel structure (see US 2018/0199617). On the market there is also paper based shisha, i.e. a paper material impregnated with shisha liquids.

[0017] A disadvantage of herbal shisha is that still plant leaves are being consumed. Several studies have shown that the health risk of herbal shisha is the same, or greater than that of shisha tobacco smoking. A disadvantage of steam stones is not only the mass of the substrate (stone) that is high compared to the liquid, but the high heat capacity of the stones as well. It takes a long time to heat the stones before consumption can start. Also, low vapor production can be seen as a drawback. Furthermore, the pores of the stones get saturated with soot from the charcoal used for the heating and may result in breakdown products of the liquids. A disadvantage of the shisha gel is that the gel is sticky and thus it is not easy to fill the bowl. The result is dirty hands and fouling of the bowl after usage.

[0018] An objective of the present invention is to provide a cellulose based composition which forms an excellent basis for a hookah consumable composition.

[0019] Another objective of the present invention is to provide a cellulose based composition having a behaviour similar to tobacco or herbal material without one or more of the above discussed disadvantages of the shisha products.

[0020] Another objective of the present invention is to provide a cellulose based composition as a material for use as a component in the manufacture of smoking products.

STATEMENTS OF THE INVENTION

[0021] The present invention thus provides in a first aspect a method for preparing a hookah consumable composition, the method comprising the following steps:

a) providing a composition, comprising:

i) 2 to 25 wt.% of one or more binding agents;
ii) 5 to 85 wt.% of an aerosol generating agent, and
iii) 10 to 80 wt.% of powdered cellulose;

wherein the wt.% is based on the total weight of the composition, and the total amount of components taken together is 100%,
b) shredding the composition of a);
c) providing one or more additional components chosen from the group of aerosol generating agents, synthetic sweeteners, natural sugars, and aromas,

d) mixing the shredded composition of b) with one or more additional components of c) for obtaining the hookah consumable composition,

wherein step d) is carried out in such a way that the total amount of aerosol generating agents in the hookah consumable composition thus obtained is in a range of 30 - 85 wt.%, based on the total weight of the hookah consumable composition.

[0022] On basis of the above method one or more objects are achieved. The present inventors found that amount of aerosol generating agent in the composition of a) is limited due the subsequent step of shredding. If the amount of aerosol generating agent is too high, shredding of the composition is difficult. From a view point of durability of the hookah consumable composition, i.e. the smoke duration of a consumer, it is desirable to have a high content of aerosol generating agent in the shredded material and to reach the final content of aerosol generating agent by adding an additional amount of aerosol generating agent in the mixture of step c) thereby further increasing the amount of aerosol generating agent in the final hookah consumable composition.

[0023] In an embodiment where the present composition only consists of i) and ii) and iii), it is clear that the total amount of these components taken together must meet 100%. The person skilled in the art is able to choose the correct amount of each component within the disclosed range to arrive at the total sum of 100%. In addition, if the present composition comprises additional components, the total amount of all these components taken together must meet 100%. And in such an embodiment the person skilled in the art is also able to choose the correct amount of each component within the disclosed range to arrive at the total sum of 100%.

[0024] In the description the term "a composition" also includes equivalent terms such as "a mixture" or "a carrier material."

[0025] In an example the composition may further comprise iv) 1 to 80 wt.% of fibrous cellulose, wherein the wt.% is based on the total weight of the composition and the total amount of components taken together is 100%.

[0026] In an example the composition may further comprise 0,01 to 40 wt.% of a sweetening component, chosen from the group of natural sugar and synthetic sweetener, or a combination thereof, wherein the wt.% is based on the total weight of the composition and the total amount of components taken together is 100%.

[0027] The present inventors found a cellulose based composition which is an excellent basis for a hookah consumable composition. The present inventors found that the high absorbing effect of the composition is achieved by using a specific type of cellulose, i.e. powdered cellulose integrated into the sheet.

[0028] The composition lends its structural integrity from the incorporation of binding agents and may further be improved by the addition of cellulose fibres. The binding agents, and in case fibrous cellulose, form a web to capture the cellulose powder. Although fibrous cellulose also contributes to the absorption of glycerol in the sheet, and that it is possible to manufacture a composition as described above, where the cellulose consists only of fibrous cellulose, this material tends to bind less liquid. A further disadvantage of fibrous cellulose is that it strongly reduces the flowability of the slurry which has to be prepared for casting. Because of that, higher contents of fibrous cellulose, result in a lower solids content of said slurry, which strongly increases the processing cost. This can be overcome by using a combination of powdered cellulose and fibrous cellulose, until the desired combination of mechanical strength and absorbing properties has been achieved.

[0029] In an example the sweetening component may also comprise a synthetic sweetener as will be discussed later. The relevant ratio of such a synthetic sweetener may be calculated from the relative sweetness scale which is a common scale in this field.

[0030] The composition is a solid material that is preferably produced in the form of a sheet and the sheet in that form may already be used as a carrier material.

[0031] The present inventors surprisingly found that preloading the composition upon manufacturing with liquid components (e.g. glycerol and sugar) improves the binding of these components in the composition. As a result of this improved binding, the release rate of the volatilized components is reduced, leading to a more homogenous release over time, and prolonged consumption sessions.

[0032] In the composition an aerosol generating agent is incorporated into the sheet. The aerosol generating agent may replace partially or completely the powdered cellulose. Up to 85 wt.% of aerosol generating agent may be incorporated. The aerosol generating agent is chosen from any of the following groups:

- the group of polyols with a boiling point between 150 °C and 350 °C, such as glycerol, propylene glycol, diethylene glycol, triethylene glycol and 1,3 butanediol,
- the group of esters commonly used for flavouring of food and beverages, which esters have a boiling point between 150 and 350 C such as ethyl vanillate, ethyl laurate, benzyl benzoate ,
- the group of esters of glycerol, having a boiling point between 150 and 350 C such as, diacetin, triacetin, tributyrin
- the group of organic acids, having a boiling point between 150 and 350 C, such as dodecanoic acid, arachidic acid, propylene carbonate.

[0033] A combination of different aerosol generating agents, each chosen from any of the above groups, may be used.

[0034] The aerosol generating agent is present in a range of 5 to 85 wt.%, preferably in an amount of at least 10 wt.%, more preferably at least 20 wt.%, even more preferably at least 30 wt.% and preferably in an amount of at most 85 wt.%, more preferably at most 65 wt.%, even more preferably at most 55 wt.%, wherein the wt.% is based on the total weight of the composition and the total amount of components taken together is 100%. Examples of ranges for the aerosol generating agent are 5 - 85 wt.%, preferably 10 - 65 wt.%, more preferably 20 - 55 wt.%, even more preferably 30 - 55 wt.%, wherein the wt.% is based on the total weight of the composition and the total amount of components taken together is 100%. In a preferred composition the aerosol generating agent comprises glycerol, optionally in combination with propylene glycol.

[0035] In an example the composition further comprises v) 1 to15 wt.% of an aroma, wherein the wt.% is based on the total weight of the composition and the total amount of components taken together is 100%. The aroma is preferably chosen from the group of naturally occurring aromas and synthetic aromas, especially aromas used for food preparation. Suitable aromas or flavourings include, but are not limited to, natural or synthetic menthol, peppermint, spearmint, coffee, tea, spices (such as cinnamon, clove, ginger, or combination thereof), cocoa, vanilla, fruit flavours, chocolate, eucalyptus, geranium, eugenol, agave, juniper, anethole, linalool, and any combination thereof.

[0036] In order to achieve a good structural integrity of the composition, and potentially to be able to form a sheet, the composition contains a binding agent in a range between 2% and 25 wt.%, preferably an amount of at least 3 wt.% and an amount of at most 20 wt.%, preferably at most 15 wt.%, even more preferably at most 10 wt.%, wherein the wt.% is based on the total weight of the composition and the total amount of components taken together is 100%. In an example the binding agent is selected from the group of natural binding agents, such as guar, alginate, or selected from the group of cellulose derived binding agents, such a methyl cellulose, carboxy methyl cellulose (CMC).

[0037] Furthermore, to increase tensile strength the amount of fibrous cellulose in the present composition is preferably in a range of 1 - 30 wt.%, more preferably an amount of at least 3 wt.% and more preferably at most 15 wt.%, even more preferably an amount of at most 12 wt.%, wherein the wt.% is based on the total weight of the composition, and the total amount of components taken together is 100%.

[0038] To promote the absorption of the aerosol generating agent, powdered cellulose is preferably added in an amount of at least 15 wt.%, more preferably at least 30 wt.% and even more preferably at least 40 wt.% and preferably in an amount of at most 80 wt.%, more preferably at most 70 wt.%, even more preferably at most 65 wt.%, wherein the wt.% is based on the total weight of the composition, and the total amount of components taken together is 100%.

[0039] The ratios between binding agents, fibrous cellulose, powdered cellulose, and aerosol generating agent are chosen to optimize the absorption of aerosol generating agent, and at the same time to achieve acceptable mechanical properties for the composition. It is to be noted that the total amount of all components taken together is 100%.

[0040] In an example the binding agent is thus chosen from the group of natural binding agents and cellulose-ethers, fibrous cellulose is added to further increase the tensile strength, powdered cellulose is added to absorb and bind the aerosol generating agent, and aerosol generating agent is added in an extent sufficient to generate an aerosol without combusting the composition.

[0041] In another example the composition further comprises vi) 1-15 wt.% of a humectant. The humectant is preferably chosen from the group of glycerol, propylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, 1,3 butanediol and sorbitol, or a combination thereof. The glycerol in the composition serves as an aerosol precursor and facilitates formation of a visible aerosol.

[0042] The fibrous cellulose or cellulose fibers used for the composition is kraft pulp, or sulphate cellulose. The fibers may be refined up to between 30 and 100 SR (Schopper Riegler). Either hardwood or softwood may be used. Both bleached and unbleached kraft are suitable, but acceptable mechanical results have been achieved with bleached softwood kraft. Unbleached kraft may contain impurities that affect taste.

[0043] The Schopper-Riegler test quickly provides an idea of the degree of refining that is related to the drainage rate of a dilute pulp suspension. An applicable standard for Schopper-Riegler test is a test method according to ISO 5267/1.

[0044] The powdered cellulose used for the composition is generally a dry ground bleached cellulose. The material is known as for instance powdered cellulose, ground cellulose, micronized cellulose et cetera. Typically, the powdered cellulose has a cellulose content of 99%. The particle dimensions may vary, but acceptable results were achieved by the inventor using a powdered cellulose with a particle dimension of an average length of 60 μm, and an average cross dimension of 20 μm. Smaller particle sizes result in a more compact and dense composition, whereas larger particle sizes increasingly inhibit the flowability of the slurry required for casting, leading to lower solids contents, and increasing drying cost when producing the composition in sheet form.

[0045] In an example, the composition contains a sweetener or a sugar component. The sweetener may replace partially or completely the microcrystalline cellulose. In an example the sweetener is chosen from the group of natural sugars, i.e. pure sugar, such as invert sugar, saccharose, lactose, galactose, maltose, trehalose, allulose, sugar products, such as caster sugar, cane sugar, brown sugar, and molasses. The amount of natural sugar is preferably in a range of 5 to 40 wt.%, wherein the wt.% is based on the total weight of the composition and the total amount of components

taken together is 100%.

[0046] In an example the sweetener is a synthetic sweetener, chosen from the group of aspartame, saccharin, sucralose, cyclamate, acesulfame and stevia, or a combination thereof. By using the Relative Sweetness Scale, wherein the degree of sweetness for sucrose = 1, the rating for saccharin is 300 X, for cyclamate is 30 X, for aspartame is 180 X, for acesulfame is 200 X, and for sucralose 600 X. This means that for example sucralose is sweet with 600 times as great as sucrose. The amount of synthetic sweetener is preferably in a range of 0.01 to 5 wt.%, wherein the wt.% is based on the total weight of the composition and the total amount of components taken together is 100%. The synthetic sweetener may partly or wholly replace the natural sugars.

[0047] In an example of the present method the composition provided in a) is prepared according to a method comprising the following steps:

A1) preparing an aqueous viscous slurry of the components i)-iii),
A2) casting the slurry of A1) as a thin layer on a support;
A3) reducing the moisture content of the aqueous viscous slurry of A2) by application of heat and/or hot air;
A4) removing the thus formed dried solid material of A3) from the support for obtaining the composition.

[0048] According to an example the shredding step b) is carried out in such a way that strips of composition having the following dimensions are obtained:

a width ranging from about 1 to 5 mm, preferably at least 1 mm, preferably at least 1.5 mm and at most 3 mm, preferable at most 2.2 mm, and
a length ranging from about 10 to about 30 mm, preferably at least 15 mm and at most 25 mm, wherein the strips of composition are preferably in a range of 50 - 250 g/m^2.

[0049] In an example of the present method step c) comprises a step of preparing a premix of one or more additional components chosen from the group of aerosol generating agents, synthetic sweeteners, natural sugars, and aromas and mixing the thus prepared premix with the shredded composition for obtaining the hookah consumable composition.

[0050] According to an example the step of preparing the premix comprises a step of heating a mixture comprising 10 to 40 wt.% sucrose and 60 to 90 wt.% glycerol to a temperature of about 120 °C, wherein the wt.% is based on the total weight of the mixture and the total amount of components taken together is 100%. After the heating step the heated mixture may be cooled to room temperature for further processing. In an example the mixture further comprises 1 to15 wt.% aromas, wherein the wt.% is based on the total weight of the mixture and the total amount of components taken together is 100%.

[0051] In an example of the present method the mixture further comprises 5 - 15 wt.% aromas, wherein the wt.% is based on the total weight of the mixture and the total amount of components taken together is 100%.

[0052] The present invention also provides the use of a hookah consumable composition obtained according to a method as discussed above in a heating device configured to heat the hookah consumable composition to an extent sufficient to generate an aerosol without combusting the hookah consumable composition.

[0053] Reference will now be made to the examples, which depict one or more embodiments described in this disclosure. However, it will be understood that other examples not depicted in the section hereafter fall within the scope and spirit of this disclosure.

Example 1 (all % are wt.%, based on the total weight)

[0054]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Glycerine	35%
Powdered cellulose	45%

Example 2(all % are wt.%, based on the total weight)

[0055]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Powdered cellulose	60%
Glycerol	20 %

Example 3 (all % are wt.%, based on the total weight)

[0056]

Component	Amount (wt.%)
Methyl-cellulose	20%
Glycerol	20%
Powdered cellulose	60%

[0057] Example 3 discloses a composition where no fibrous cellulose is used, and the structural integrity is completely formed by the binding agent

Example 4 (all % are wt.%, based on the total weight)

[0058]

Component	Amount (wt.%)
Methyl-cellulose	20%
Glycerol	20%
Fibrous cellulose	60%

[0059] Each of the compositions according to the Examples 1-4 are manufactured by preparing an aqueous viscous slurry of the components listed, casting the slurry thus prepared as a thin layer on a support and reducing the moisture content of the aqueous viscous slurry of by application of heat and/or hot air. The final composition is obtained by removing the thus formed dried solid material of from the support.

[0060] Example 4 discloses a composition, where no powdered cellulose but fibrous cellulose is used. The absorbing property of such material is less good as a result of the lack of powdered cellulose. The present inventor has found that such material offers no improved suitability for Shisha consumption over regular writing paper.

[0061] The composition according to Examples 1-3 can be used as a basis for a shisha consumption composition. Such a composition is made by combining the composition with ingredients commonly used for shisha preparation.

[0062] A typical combination of the composition with the shisha ingredients is shown in Example 5.

Example 5 (all % are wt.%, based on the total weight)

[0063]

Component	Amount (wt.%)
Carrier of Example 1	23.1 %
Commercially available Shisha Aroma	5.0%
Glycerol	71.9%

[0064] The composition of Example 5 results in a glycerol level in the hookah consumable of 80.0 wt.% The inventors have found that 12 grams of this composition is sufficient to fill a typical home-use hookah device, and will result in a smoking session of approximately 45 minutes. This is in line with the by consumers expected average duration of a hookah session.

[0065] When the aroma is replaced by glycerol, a glycerol level of 85 wt.% may be achieved. This will lead to a neutral tasting material. The inventors have furthermore found that when the carrier is combined with glycerol in an amount whereby 85 wt.% in the finished composition is exceeded, this excess amount of glycerol is not bound by carrier material.

The composition will start to drip, the excess amount of glycerol will be lost, and does no longer contribute to the consumption

[0066] A different combination of composition suitable for hookah consumption can be prepared as follows:

Example 6 (all % are wt.%, based on the total weight)

[0067]

Component	Amount (wt.%)
Carrier of Example 2	85%
Glycerin	10%
Commercially available Shisha Aroma	5%

[0068] The composition of Example 6 will result in a hookah consumable containing 27% of glycerol. As with Example 5, about 12 grams of this composition is suitable for a typical home use hookah bowl. The duration of the session with this composition, however, is reduced to about 15 to 18 minutes. This is below the minimum acceptable duration for a consumer, which is about 20 minutes. This composition is therefore not suitable for a commercial application.

[0069] The compositions mentioned in Examples 5 and 6 are prepared by a step of shredding the mentioned carrier material and then mixing the shredded composition with the other components (glycerol and aroma) in the ratios as shown.

[0070] For the consumption of the material like the compositions shown in Example 5 and Example 6 in a water pipe the material must be placed in a bowl of a hookah or similar device. The method of packing is of great importance for the amount and consistency of aerosol generated. If the packing is too dense, the hot air can't pass through the material well. This leads to a strong draw resistance, and "channeling". When channeling occurs, the air passes through a limited number of channels in the packing, and therefore the material is not completely used. Is the packing too fluffy, then upon consumption the aerosol generating material expands, with an increased risk of the material touching the heating element and charring. This charring leads to an unwanted taste.

[0071] The present inventors found that when the composition according to any of the Examples 1 to 4 is present in sheet form, optimal dimensions for the material exist. The optimal dimensions for the sheet form composition are as follows:

Width:	1 to 5 mm, preferably about 2 mm
Length:	10 to 30 mm, preferably about 20 mm

[0072] A smaller width, i.e. a width below 1 mm, will lead to a more compact packing in the Shisha bowl. The same applies for a length below 10 mm. The present inventors found that a sheet like composition having a larger width (i.e. larger than about 5mm) and/or length (i.e. larger than about 30mm) will lead to too open structure of the packing, which promotes rapid evaporation, expansion of the packing, and potentially the packing touching the heating element, leading to burning of the material.

[0073] In practice one may shredder the sheet like composition with a device that is the same device as or similar to an office paper shredder. The shredded material may then be mixed with additional amounts of aroma, sweetener and aerosol generating agent. The mixed material is ready for consumption.

[0074] When preparing a shisha composition, a composition is mixed with a liquid. An example of such a liquid is a combination of glycerol and a sugar containing component. An example of such a sugar containing component is honey, or even an invert sugar may be used. Caster sugar is typically not being used [in shisha], as it does not dissolve in glycerol. However, the present inventor found that a liquid mixture of glycerol and caster sugar is obtained when glycerol and caster sugar are mixed at a temperature of about 120 °C. Even at a concentration of about 25 wt.% caster sugar, based on the total weight of the mixture, this mixture remains liquid at room temperature, and even at a temperature of about 7 °C.

[0075] Without wishing to be bound by theory, it is believed that at this temperature, the sucrose, i.e. the caster sugar composition, is split into its mono sugars glucose and fructose. This is a well-known chemical reaction, i.e. hydrolysis of sugar, but this hydrolysis reaction normally requires the presence of water molecules. The water concentration of the glycerol used in these experiments is only about 0.3 wt.% of water, which concentration is not enough to hydrolyze the amount of sucrose in the mixture. The inventor assumes that the OH groups of the glycerol perform the same function as that of the water normally used, and/or that glycerol serves as a donor of the water normally required for hydrolysis.

Claims

1. A method for preparing a hookah consumable composition, the method comprising the following steps:

   a) providing a composition, comprising:

      i) 2 to 25 wt.% of one or more binding agents;
      ii) 5 to 85 wt.% of an aerosol generating agent, and
      iii) 10 to 80 wt.% of powdered cellulose;

   wherein the wt.% is based on the total weight of the composition, and the total amount of components taken together is 100%,
   b) shredding the composition of a);
   c) providing one or more additional components chosen from the group of aerosol generating agents, synthetic sweeteners, natural sugars, and aromas,
   d) mixing the shredded composition of b) with one or more additional components of c) for obtaining the hookah consumable composition, ,

   wherein step d) is carried out in such a way that the total amount of aerosol generating agents in the hookah consumable composition thus obtained is in a range of 30 - 85 wt.%, based on the total weight of the hookah consumable composition.

2. A method according to claim 1, wherein the composition provided in a) is prepared according to a method comprising the following steps:

   A1) preparing an aqueous viscous slurry of the components i)-iii),
   A2) casting the slurry of A1) as a thin layer on a support;
   A3) reducing the moisture content of the aqueous viscous slurry of A2) by application of heat and/or hot air;
   A4) removing the thus formed dried solid material of A3) from the support for obtaining the composition.

3. A method according to any one or more of claims 1-2, wherein shredding step b) is carried out in such a way that strips of composition having the following dimensions are obtained:

   a width ranging from about 1 to 5 mm, preferably at least 1 mm, preferably at least 1.5 mm and at most 3 mm, preferable at most 2.2 mm, and
   a length ranging from about 10 to about 30 mm, preferably at least 15 mm and at most 25 mm.

4. A method according to claim 3, wherein the strips of composition are in a range of 50 - 250 g/m^2.

5. A method according to any one or more of claims 1-4, wherein step c) comprises a step of preparing a premix of one or more additional components chosen from the group of aerosol generating agents, synthetic sweeteners, natural sugars, and aromas and mixing the thus prepared premix with the shredded composition for obtaining the hookah consumable composition.

6. A method according to claim 5, wherein the step of preparing the premix comprises a step of heating a mixture comprising 10 to 40 wt.% sucrose and 60 to 90 wt.% glycerol to a temperature of about 120 °C, wherein the wt.% is based on the total weight of the mixture and the total amount of components taken together is 100%.

7. A method according to claim 6, wherein the mixture further comprises 5 - 15 wt.% aromas, wherein the wt.% is based on the total weight of the mixture and the total amount of components taken together is 100%.

8. A method according to any one or more of claims 1-7, wherein the composition further comprises:
   iv) 1 to 80 wt.% of fibrous cellulose, wherein the wt.% is based on the total weight of the composition, and the total amount of components taken together is 100%.

9. A method according to any one or more of claims 1-8, wherein the composition further comprises:
   v) 0,01 to 40 wt.% of a sweetening component, chosen from the group of natural sugar and synthetic sweetener, or a combination thereof, wherein the wt.% is based on the total weight of the composition, and the total amount of

components taken together is 100%.

10. A method according to any one or more of claims 1-9, wherein the composition further comprises:
vi) 1 to 15 wt.% of one or more aromas, wherein the wt.% is based on the total weight of the composition, and the total amount of components taken together is 100%.

11. A method according to any one or more of the preceding claims, wherein the amount of powdered cellulose iii) is at least 15 wt.%, preferably at least 30 wt.%, more preferably at least 40 wt.% and at most 80 wt.%, preferably at most 70 wt.%, more preferably at most 65 wt.%, wherein the wt.% is based on the total weight of the composition, and the total amount of components taken together is 100%.

12. A method according to any one or more of the preceding claims, wherein the amount of aerosol generating agent ii) is at least 5 wt.%, preferably at least 10 wt.%, more preferably at least 20 wt.%, even more preferably at least 30 wt.% and at most 85 wt.%, preferably at most 65 wt.% and more preferably at most 55 wt.%, wherein the wt.% is based on the total weight of the composition, and the total amount of components taken together is 100%.

13. A method according to any one or more of claims 9-12, wherein the natural sugar is chosen from the group of pure sugar, such as invert sugar, saccharose, lactose, galactose, maltose, trehalose, allulose, sugar products, such as caster sugar, cane sugar, browns sugar and molasses, or a combination thereof, preferably in an amount of 5 to 40 wt.%, wherein the wt.% is based on the total weight of the composition and the total amount of components taken together is 100%.

14. A method according to any one or more of claims 9-12, wherein the synthetic sweetener is chosen from the group of aspartame, saccharin, sucralose, cyclamate, acesulfame and stevia, or a combination thereof, preferably in an amount of 0.01 to 5 wt.%, wherein the wt.% is based on the total weight of the composition and the total amount of components taken together is 100%.

15. The use of a hookah consumable composition obtained according to a method according to any one or more of claims 1-14 in a heating device configured to heat the hookah consumable composition to an extent sufficient to generate an aerosol without combusting the hookah consumable composition.

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EUROPEAN SEARCH REPORT

Application Number
EP 22 21 4279

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y,D	EP 3 442 363 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 20 February 2019 (2019-02-20) * the whole document *	1-15	INV. A24B15/16 A24B15/167 A24B15/30
Y,D	US 2018/199617 A1 (IODICE BIANCA [US]) 19 July 2018 (2018-07-19) * the whole document *	1-15	
Y,D	US 2019/328030 A1 (DEFOREL CORINNE [CH] ET AL) 31 October 2019 (2019-10-31) * paragraph [0191]; claims; example; table 1 *	1-15	
Y,D	WO 2020/235112 A1 (TOA IND CO LTD [JP]) 26 November 2020 (2020-11-26) * pages 1-37; claims; examples *	1-15	
Y,D	WO 2021/170670 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 2 September 2021 (2021-09-02) * pages 1-57; claims; examples *	1-15	
Y	CN 110 236 218 A (PHILIP MORRIS PRODUCTS SA) 17 September 2019 (2019-09-17) * the whole document *	1-15	TECHNICAL FIELDS SEARCHED (IPC) A24B A24F
Y,D	US 4 333 484 A (KERITSIS GUS D) 8 June 1982 (1982-06-08) * claims; examples *	1-15	
Y,D	US 3 965 911 A (ANDERSON ROBERT CRAIG ET AL) 29 June 1976 (1976-06-29) * examples *	1-15	
Y,D	WO 2021/122583 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 24 June 2021 (2021-06-24) * the whole document *	1-15	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 April 2023	Boddaert, Peter

CATEGORY OF CITED DOCUMENTS

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EUROPEAN SEARCH REPORT

Application Number
EP 22 21 4279

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y,D	WO 2020/012761 A1 (TOA IND CO LTD [JP]) 16 January 2020 (2020-01-16) * claims; example 1 *	1-15	
Y,D	WO 2020/044179 A1 (PHILIP MORRIS PRODUCTS SA [CH]) 5 March 2020 (2020-03-05) * the whole document *	1-15	
Y,D	EP 3 351 121 A1 (IODICE BIANCA [US]) 25 July 2018 (2018-07-25) * the whole document *	1-15	
Y	US 2021/259307 A1 (PIJNENBURG JOHANNES PETRUS MARIA [CH] ET AL) 26 August 2021 (2021-08-26) * the whole document *	1-15	
Y	DE 20 2020 002254 U1 (SHLSHAVAPING LTD [GB]) 28 May 2021 (2021-05-28) * the whole document *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 April 2023	Boddaert, Peter

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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& : 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 22 21 4279

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

20-04-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 3442363 A1	20-02-2019	CA 3014568 A1	19-10-2017
		CN 108778009 A	09-11-2018
		EP 3442363 A1	20-02-2019
		IL 261722 A	31-10-2018
		JP 7009383 B2	25-01-2022
		JP 2019515665 A	13-06-2019
		KR 20180125500 A	23-11-2018
		RU 2018135970 A	13-05-2020
		US 2019124977 A1	02-05-2019
		WO 2017178930 A1	19-10-2017
US 2018199617 A1	19-07-2018	EP 3351121 A1	25-07-2018
		US 2018199617 A1	19-07-2018
US 2019328030 A1	31-10-2019	BR 112019011289 A2	15-10-2019
		CN 110325057 A	11-10-2019
		EP 3562330 A1	06-11-2019
		JP 7146758 B2	04-10-2022
		JP 2020503007 A	30-01-2020
		KR 20190098157 A	21-08-2019
		RU 2019123593 A	01-02-2021
		US 2019328030 A1	31-10-2019
		WO 2018122097 A1	05-07-2018
WO 2020235112 A1	26-11-2020	CN 112384088 A	19-02-2021
		EP 3964089 A1	09-03-2022
		JP WO2020235112 A1	26-11-2020
		KR 20220006602 A	17-01-2022
		US 2022071305 A1	10-03-2022
		WO 2020235112 A1	26-11-2020
WO 2021170670 A1	02-09-2021	BR 112022014988 A2	20-09-2022
		CN 115666278 A	31-01-2023
		EP 4110093 A1	04-01-2023
		KR 20220146551 A	01-11-2022
		WO 2021170670 A1	02-09-2021
CN 110236218 A	17-09-2019	AU 2015327280 A1	19-01-2017
		BR 112017003732 A2	05-12-2017
		CA 2955568 A1	07-04-2016
		CN 106714590 A	24-05-2017
		CN 110236218 A	17-09-2019
		EP 3200625 A1	09-08-2017
		EP 3760056 A1	06-01-2021
		ES 2919873 T3	28-07-2022
		HU E059096 T2	28-10-2022

EPO FORM P0459

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

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 22 21 4279

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

20-04-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		JP 6751387 B2	02-09-2020
		JP 7250732 B2	03-04-2023
		JP 2017529848 A	12-10-2017
		JP 2020146071 A	17-09-2020
		KR 20170062443 A	07-06-2017
		KR 20220162857 A	08-12-2022
		MY 188589 A	22-12-2021
		PH 12016502578 A1	24-04-2017
		PL 3200625 T3	19-09-2022
		RU 2017115095 A	02-11-2018
		RU 2019114703 A	24-05-2019
		SG 11201701283T A	30-03-2017
		US 2017258126 A1	14-09-2017
		WO 2016050470 A1	07-04-2016
US 4333484 A	08-06-1982	CA 1135949 A	23-11-1982
		DE 2931088 A1	14-02-1980
		GB 2028096 A	05-03-1980
		US 4333484 A	08-06-1982
US 3965911 A	29-06-1976	BE 764734 A	23-09-1971
		CA 980652 A	30-12-1975
		CH 569431 A5	28-11-1975
		CS 154324 B4	29-03-1974
		DE 2113971 A1	04-11-1971
		DK 132155 B	03-11-1975
		FI 50925 B	31-05-1976
		FR 2085039 A5	17-12-1971
		GB 1312483 A	04-04-1973
		HU 162266 B	29-01-1973
		IE 35238 B1	24-12-1975
		IL 36453 A	14-03-1974
		IT 1037027 B	10-11-1979
		LU 62836 A1	24-08-1971
		NL 7103866 A	27-09-1971
		NO 127732 B	13-08-1973
		PL 83132 B1	31-12-1975
		SE 370610 B	28-10-1974
		TR 17009 A	11-04-1974
		US 3965911 A	29-06-1976
		ZA 711891 B	29-11-1972
WO 2021122583 A1	24-06-2021	AU 2020405996 A1	14-04-2022
		BR 112022009253 A2	02-08-2022
		CA 3154417 A1	24-06-2021
		CN 114745972 A	12-07-2022

EPO FORM P0459

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

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 22 21 4279

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

20-04-2023

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		EP 4076017 A1	26-10-2022
		IL 293887 A	01-08-2022
		JP 2023505449 A	09-02-2023
		KR 20220092568 A	01-07-2022
		US 2023034625 A1	02-02-2023
		WO 2021122583 A1	24-06-2021
WO 2020012761 A1	16-01-2020	NONE	
WO 2020044179 A1	05-03-2020	CN 112533497 A	19-03-2021
		EP 3843564 A1	07-07-2021
		IL 280887 A	29-04-2021
		JP 2021536233 A	27-12-2021
		US 2021321662 A1	21-10-2021
		WO 2020044179 A1	05-03-2020
EP 3351121 A1	25-07-2018	EP 3351121 A1	25-07-2018
		US 2018199617 A1	19-07-2018
US 2021259307 A1	26-08-2021	CN 112312779 A	02-02-2021
		EP 3820313 A1	19-05-2021
		IL 278838 A	31-01-2021
		JP 2021530972 A	18-11-2021
		US 2021259307 A1	26-08-2021
		WO 2020012330 A1	16-01-2020
DE 202020002254 U1	28-05-2021	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

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Patent documents cited in the description

- EP 3442363 A **[0003]**
- WO 2020044179 A **[0004] [0012]**
- US 2019328030 A **[0005]**
- WO 2020235112 A **[0006]**
- WO 2021170670 A **[0007]**
- US 4333484 A **[0008]**
- US 3965911 A **[0009]**
- WO 2021122583 A **[0010]**
- WO 2020012761 A **[0011]**
- EP 3351121 A **[0013]**
- US 20180199617 A **[0016]**