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(54) Titre : FEUILLE DE PLANTE RECONSTITUEE POUR DISPOSITIFS QUI CHAUFFENT LE TABAC SANS LE BRULER

(54) Title: RECONSTITUTED PLANT SHEET FOR DEVICES THAT HEAT TOBACCO WITHOUT BURNING IT

(57) Abrégé/Abstract:
The invention relates to a reconstituted plant sheet suitable for devices that heat tobacco without burning it, said reconstituted plant sheet comprising one or two fibrous support(s) obtained by a papermaking process and comprising plant fibres, a plant extract and a solid additive.

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(54) Title: RECONSTITUTED PLANT SHEET FOR DEVICES THAT HEAT TOBACCO WITHOUT BURNING IT

(57) Abstract: The invention relates to a reconstituted plant sheet suitable for devices that heat tobacco without burning it, said reconstituted plant sheet comprising one or two fibrous support(s) obtained by a papermaking process and comprising plant fibres, a plant extract and a solid additive.

RECONSTITUTED PLANT SHEET FOR DEVICES THAT HEAT TOBACCO WITHOUT BURNING IT

Field of the invention

The invention is in the field of devices for heating tobacco without burning it and the subject of said invention is a reconstituted plant sheet obtained by a papermaking process and comprising solid additives.

Context of the invention

A large number of devices for heating tobacco without burning it have been developed for avoiding the formation of harmful constituents during tobacco combustion. By way of example, mention may be made of the applications published under the numbers WO 2016/026810 and WO 2016/207407 which describe such devices. In these devices, the tobacco is heated at a temperature below the combustion temperature without being burnt, which leads to the formation of an aerosol. The aerosol generated during the heating of the tobacco replaces the cigarette smoke, has advantageous organoleptic properties and is inhaled by the user. This thus allows the user to inhale the tobacco aromas while very significantly reducing said user's exposure to the harmful constituents.

Conventional tobacco is not suitable for such devices, since it does not make it possible to generate a large amount of aerosol having advantageous organoleptic properties. Reconstituted tobacco is more suitable for these heating devices, since it makes it possible to generate a large amount of aerosol having advantageous organoleptic properties.

It nevertheless remains important to have good control of the amount of tobacco aromas in the aerosol formed so as not to create frustration in the user of the heating devices. It may also be advantageous to provide the user of said heating devices with aromas other than those of tobacco.

In order to diversify the aromas and to control the amount thereof in the aerosol, it is possible to add solid additives to the reconstituted tobacco. However, this poses the problem of the loss of the solid additives added to the reconstituted tobacco.

The inventors have developed a reconstituted plant sheet comprising:

- 1 or 2 fibrous supports comprising plant fibres,
- a plant extract, and
- a solid additive.

If the reconstituted plant sheet of the invention comprises 1 fibrous support, then the additive is attached to the support via the plant extract. The loss of additive by the reconstituted plant sheet of the invention is therefore advantageously minimized.

If the reconstituted plant sheet of the invention comprises 2 fibrous supports, then the additive is trapped between the 2 fibrous supports and the plant extract makes it possible to attach the 2 fibrous supports to one another. The loss of additive by the reconstituted plant sheet of the invention is more minimized accordingly.

The term "fibrous support" is used herein to denote a base web comprising refined plant fibres, the base web being obtained by a papermaking process. The fibrous support comprises two faces, a front face and a back face.

Typically, each fibre support can comprise fibres of one and the same plant or one fibrous support can comprise fibres of one plant and the other support can comprise fibres of another plant. Typically, each fibrous support can comprise fibres of one or more plants.

Typically, the fibrous support or the 2 fibrous supports comprises or comprise the plant extract.

Typically, the solid additive is in contact with a fibrous support. For example, the solid additive can be on a fibrous support, in a fibrous support, on and in a fibrous support, or between the 2 fibrous supports.

Typically, the solid additive can be plant dust, a diluent, a texturing agent, a powdered or encapsulated flavouring, a dye, a gel or a mixture thereof, in particular plant dust.

The content of solid additive will depend on the solid additive. Typically, the weight content of dry matter of the solid additive in the reconstituted plant sheet can be from 0.1% to 70%, in particular from 5% to 50%, more particularly from 12% to 35%.

For the purposes of the present application, the term "plant dust" denotes a plant particle of which the size is from 0.01 μm to 50 μm, in particular from 0.025 μm to 30 μm, more particularly from 0.05 μm to 20 μm. Typically, the plant dust comprises the aromatic compounds which give the aerosol the plant aromas. Typically, the plant dust can result from various plant parts, the plant parts being the plant parts themselves or the result of the transformation of various plant parts. Typically, the plant dust can be obtained by the treatment of one or more plant parts, such as shredding, threshing or mixing and shredding the plant parts.

The weight content of plant dust is determined by controlling the amount of plant dust incorporated during the manufacturing of the reconstituted plant sheet.

Typically, the weight content of dry matter of the plant dust in the reconstituted plant sheet may be from 1% to 70%, in particular from 5% to 65%, more particularly from 10% to 30%.

Typically, the diluent can be $CaCO_3$.

Typically, the texturing agent can be guar gum, potato starch, agar-agar or a mixture thereof.

Typically, the powdered flavouring can be cocoa powder, tripotassium citrate, or a powdered aromatic preparation.

Typically, the dye can be beta-carotene, sunset yellow, powdered apricot juice or turmeric.

Typically, the gel can be a silica gel, a polysaccharide gel, an alumina gel or a mixture thereof.

Typically, the silica gel can be an amorphous silica gel, a modified silica gel such as an Amino Propyl Silyl (APS) modified silica gel, an Amino Ethyl Amino Propyl Silyl (AEPS) modified silica gel, an Amino Ethyl Amino Ethyl Amino Propyl Silyl (AEAEAPS) modified silica gel, or a mixture thereof.

The plant extract corresponds to all of the water-soluble products of the plant. Advantageously, the plant extract comprises the compounds which give the aerosol organoleptic properties and/or therapeutic properties.

The organoleptic properties and the therapeutic properties of the aerosol formed by heating the reconstituted plant sheet may depend on the weight content of dry matter of the plant extract included in said reconstituted plant sheet of the present invention.

The weight content of dry matter of the plant extract depends on the plant used, and more particularly on the content of aromatic compounds or of compounds having therapeutic properties of the plant used.

Let S_P be the weight content of dry matter of the plant extract included in the reconstituted plant sheet of the present invention. Typically, S_p can be from 5% to 47%, in particular from 25% to 45%.

In order to determine S_P, use may be made of the following method:
The reconstituted plant sheet to be analysed is ground in order to achieve a particle size of less than or equal to 1 mm. The reconstituted plant sheet is then mixed with boiling water for 30 minutes in order to extract the whole of the plant extract. S_P is calculated from the difference between the dry weight of the sample of reconstituted plant sheet to be analysed and the dry weight of the fibrous residue after extraction.

Typically, the fibrous support(s) of the reconstituted plant sheet of the invention can also comprise an aerosol-generating agent.

The aerosol-generating agent is a compound which allows the formation of an aerosol when it is heated, for example in contact with hot air.

Typically, the aerosol-generating agent represents from 8% to 50%, in particular from 10% to 40%, more particularly from 15% to 35% by weight of dry matter of the reconstituted plant sheet.

According to one embodiment, the weight content of dry matter of plant extract and of aerosol-generating agent in the sheet of the invention is from 8% to 55%, in particular from 10% to 46%, more particularly from 20% to 45%.

Typically, the aerosol-generating agent can be a polyol, a non-polyol or a mixture thereof. Typically, a polyol-generating agent can be sorbitol, glycerol, propylene glycol, triethylene glycol or a mixture thereof. Typically, a non-polyol generating agent can be lactic acid, glyceryl diacetate, glyceryl triacetate, triethyl citrate, isopropyl myristate or a mixture thereof.

According to one embodiment, the aerosol-generating agent is glycerol, propylene glycol or a mixture of glycerol and propylene glycol, glycerol being preferred.

An aerosol can be generated during the heating of the reconstituted plant sheet of the invention comprising an aerosol-generating agent. Advantageously, the fibrous support comprises aromatic compounds such that the aerosol generated by the heating of the reconstituted plant sheet has advantageous organoleptic properties for the user. Likewise, the plant extract and, where appropriate, the solid additive give this aerosol aromas of the plant. By simply changing reconstituted plant sheet, the user can easily vary the aromas of the aerosol generated by the heating of said reconstituted plant sheet.

The plant extract and the solid additive are also distributed in a controlled manner in the reconstituted plant sheet of the invention. By virtue of this control, the concentration of aromas in the aerosol is advantageously constant, which does not cause the user any frustration.

The plant fibres, the plant extract and the plant dust can be independently obtained from a plant chosen from spore plants, seed plants or a mixture thereof. In particular, the plant may be a plant chosen from the tobacco plant, food plants, aromatic plants, perfume plants, medicinal plants, plants of the family *Cannabaceae,* or a mixture thereof, more particularly the plant may be the tobacco plant.

If the plant is a medicinal plant, the aerosol generated by the heating of the reconstituted plant sheet can also have therapeutic properties such that the reconstituted plant sheet can be used for a therapeutic treatment.

Advantageously, a plant extract obtained from a mixture of plants makes it possible to offer a broad panel of organoleptic properties and/or therapeutic properties. Advantageously, plant dust obtained from a mixture of plants makes it possible to offer a broad panel of organoleptic properties and/or therapeutic properties. A mixture of plants also makes it possible to counteract the unpleasant organoleptic properties of a plant of the mixture, for example a medicinal plant, with the pleasant organoleptic properties of another plant of the mixture, for example the tobacco plant, an aromatic plant or a fragrant plant.

Typically, the plant fibres can be obtained from a first plant, the plant extract can be obtained from the first plant or from a second plant and the plant dust can be obtained from the first plant, from the second plant or from a third plant. Indeed, the fibres of a plant may not have mechanical properties which allow the formation of a fibrous support; nevertheless, the extract and the dust of this plant can give the aerosol desired organoleptic properties and/or therapeutic properties. Conversely, the fibres of a plant can have mechanical properties which allow the formation of the sheet(s) comprising plant fibres, but the extract and the dust of this plant may not give the aerosol desired organoleptic properties and/or therapeutic properties. Furthermore, by mixing an extract of a plant with dust of another plant, it is possible to obtain a reconstituted plant sheet which generates an aerosol having multiple organoleptic properties and/or therapeutic properties.

Advantageously, mixing plants in order to obtain the plant fibres makes it possible to adjust the mechanical properties of the reconstituted plant sheet and/or the organoleptic or chemical properties of the aerosol.

When the plant is the tobacco plant, then the tobacco fibres, the tobacco extract and the tobacco dust can be obtained from any tobacco plant or type of tobacco, for example Virginia tobacco, Burley tobacco, air-cured tobacco, dark air-cured tobacco, Orient tobacco, sun-cured tobacco, fire-cured tobacco or a mixture thereof.

Typically, the food plants are garlic, coffee, ginger, liquorice, rooibos, Stevia rebaudiana, tea, cacao, camomile, maté.

Typically, the aromatic plants are basil, turmeric, clove, laurel, oregano, mint, rosemary, sage, thyme.

Typically, the perfume plants are lavender, rose, eucalyptus.

Typically, the medicinal plants are those indicated in the document, list A of traditionally used medicinal plants (French pharmacopeia January 2016 published by the Agence Nationale de Sécurité du Médicament (ANSM) [French National Agency for Drug and Health Product Safety]

or plants known to comprise compounds which have therapeutic properties. Typically, the medicinal plants listed are ginkgo, ginseng, sour cherry, peppermint, willow and red vine.

Typically, eucalyptus is among the medicinal plants known to comprise compounds which have therapeutic properties.

Typically, the plant fibres and the plant extract of the reconstituted plant sheet of the present invention can result from various plant parts, the plant parts being plant parts themselves or the result of the transformation of various plant parts. Typically, the plant parts can be whole plant parts or debris originating from the threshing or mixing and shredding of the plant parts.

Typically, the plant parts can be selected from the plant parts that are richest in aromatic compounds giving the aerosol its organoleptic properties. Typically, these parts may be the whole plant, the aerial plant parts such as the flower bud, the branch bark, the stem bark, the leaves, the flower, the fruit and its peduncle, the seed, the petal or the flower head, or the underground parts, for example the bulb, the roots, the root bark, the rhizome, or a mixture thereof. The plant part may also be the result of mechanical, chemical or mechanical-chemical transformation of one or more plant parts, for instance the shell protecting the cacao bean resulting from the bean dehulling process.

Typically, the parts of the tobacco plant may be the parts that are richest in aromatic compounds giving the aerosol its organoleptic properties. Typically, the parts of the tobacco plant may be the parenchyma (lamina) optionally with stems of the tobacco plant added thereto. Typically, the parts of the tobacco plant may be the leaves of the tobacco plant or the fragments originating from the threshing, or the mixing and shredding, of the leaves and ribs of the tobacco plant.

Among the food plants, the garlic bulb, the coffee cherry, the rhizome of ginger, the liquorice root and the leaves of rooibos, Stevia rebaudiana, or tea may for example be selected as parts.

Among the aromatic plants, clove flower buds (the cloves), basil, laurel and sage leaves, mint, oregano, rosemary and thyme leaves and flower head, or the rhizome of turmeric may for example be selected as parts.

Typically, among the perfume plants, lavender flower and flower head, or rose flower bud and petals may be selected.

Among the medicinal plants listed in the French pharmacopeia, gingko leaf, the underground part of ginseng, the peduncle of the sour cherry fruit (cherry stalk), the leaves and the flower head of peppermint, the stem bark and the leaves of willow, or the leaves of red vine may for example be selected.

Typically, the weight content of dry matter of the plant fibres included in the reconstituted plant sheet is from 20% to 92%, in particular from 25% to 75%, more particularly from 30% to 45%.

Typically, the fibrous support(s) of the reconstituted plant sheet may also comprise cellulosic plant fibres.

The cellulosic plant fibres are fibres obtained by a chemical or mechanical or thermomechanical cooking process, such as wood pulp, hemp, or annual plants such as flax for example. A mixture of these cellulosic plant fibres may also be used.

Advantageously, these cellulosic plant fibres can improve the mechanical strength properties of the reconstituted plant sheet.

Typically, the cellulosic plant fibres can represent from 0.5% to 15%, in particular from 5% to 10%, more particularly 8% by weight of dry matter of the reconstituted plant sheet.

Typically, the reconstituted plant sheet comprising 1 fibrous support can have a basis weight of from 20 g/m² to 150 g/m², in particular from 50 g/m² to 100 g/m², more particularly from 62 g/m² to 68 g/m².

Typically, the reconstituted plant sheet comprising 2 fibrous supports can have a basis weight of from 50 g/m² to 250 g/m², in particular from 100 g/m² to 150 g/m², more particularly from 110 g/m² to 115 g/m².

Advantageously, the basis weight of the sheet of the invention makes it possible to obtain a breaking up strength which allows the sheet to be used in a heating device.

Typically, the water content in the reconstituted plant sheet of the invention is less than 20%, in particular from 3% to 15%, more particularly from 5% to 12%.

According to one particular embodiment, the reconstituted plant sheet comprises:

- 1 fibrous support comprising a plant extract and an aerosol-generating agent, and
- plant dust in contact with the fibrous support,

in which:

- the weight content of dry matter of the plant fibres in said reconstituted plant sheet is from 5% to 92%, in particular from 10% to 70%, more particularly from 30% to 35%,
- the aerosol-generating agent represents from 0% to 50%, in particular from 8% to 40%, more particularly from 15% to 35% by weight of dry matter of said reconstituted plant sheet,
- the weight content of dry matter of the plant dust in said reconstituted plant sheet may be from 10% to 70%, in particular from 15% to 65%, more particularly from 25% to 35% by dry weight relative to the total weight of said reconstituted plant sheet, and

- the weight content of dry matter of the plant extract in said reconstituted plant sheet is from 5% to 47%, in particular from 35% to 45%.

According to one particular embodiment, the reconstituted plant sheet comprises:

- at least one of the 2 fibrous supports comprising a plant extract and an aerosol-generating agent, and
- plant dust in contact with the fibrous support,

in which:

- the weight content of dry matter of the plant fibres in said reconstituted plant sheet is from 5% to 92%, in particular from 10% to 70%, more particularly from 35% to 45%,
- the aerosol-generating agent represents from 0% to 50%, in particular from 8% to 40%, more particularly from 15% to 35% by weight of dry matter of said reconstituted plant sheet,
- the weight content of dry matter of the plant dust in said reconstituted plant sheet may be from 5% to 70%, in particular from 10% to 65%, more particularly from 11% to 13% by dry weight relative to the total weight of said reconstituted plant sheet, and
- the weight content of dry matter of the plant extract in said reconstituted plant sheet is from 5% to 47%, in particular from 20% to 45%.

Typically, the reconstituted plant sheet of the present invention comprising 1 fibrous support can be manufactured according to a process comprising the following steps:

a_1) providing the fibrous support,

b_1) bringing the plant extract into contact with the fibrous support, and

c_1) bringing the solid additive into contact with the fibrous support,

step b_1) possibly being carried out at the same time as step c_1),

said process also comprising a step:

s_1) of drying after step c_1) of bringing the solid additive into contact with the fibrous support.

Typically, the reconstituted plant sheet of the present invention comprising 2 fibrous supports can be manufactured according to a process comprising the following steps:

a_2) providing the 2 fibrous supports,

b_2) bringing the plant extract into contact with at least one of the 2 fibrous supports,

c_2) bringing the solid additive into contact with at least one of the 2 fibrous supports, and

d_2) stacking the 2 fibrous supports such that the solid additive is between the 2 fibrous supports,

step b_2) possibly being carried out at the same time as step c_2),

said process also comprising a step:

s_2) of drying after step d_2) of stacking the 2 fibrous supports.

According to the invention, the fibrous support(s) are manufactured using a papermaking process. Typically, the fibrous support(s) provided during step a_1) or a_2) may be obtained by passing the refined plant fibres into a papermaking machine. According to one preferred mode of the invention, a papermaking process will be used. According to this embodiment, a reconstituted plant sheet according to the invention is a reconstituted plant sheet capable of being obtained by a papermaking process.

Typically, the fibrous support(s) provided during step a_1) or a_2) may be wet and therefore have at least one wet face. The fibrous support(s) may typically have a water content of from 20% to 80%, in particular from 25% to 70%, more particularly from 30% to 60%.

Typically, the fibrous support(s) provided during step a_1) or a_2) may have a basis weight of from 10 g/m² to 60 g/m², in particular from 20 g/m² to 55 g/m², more particularly from 32 g/m² to 62 g/m².

According to one embodiment, the plant fibres of the fibrous support and the plant extract are obtained according to the following steps:

e) mixing one or more plant parts with a solvent in order to extract the plant extract of the plant fibres,

f) separating the plant extract from the plant fibres.

The plant extract and the plant fibres are therefore typically obtained by a dissociation process. During step e), one or more plant parts are mixed with a solvent, for example in a digester, in order to extract the plant extract of the plant fibres. During step f), the plant extract is separated from the plant fibres, for example by passing through a screw press, in order to isolate and obtain, on the one hand, the plant fibres and, on the other hand, the plant extract.

Typically, the solvent may be a apolar solvent, an aprotic polar solvent, a protic polar solvent or a mixture thereof, in particular the solvent may be methanol, dichloromethane, ethanol, acetone, butanol, water or a mixture thereof, more particularly the solvent is ethanol, acetone, water or a mixture thereof.

According to one particular embodiment, the solvent is an aqueous solvent, more particularly the solvent is water.

Those skilled in the art will know how to adapt the temperature of the solvent during step e) to the plant, to the plant parts and to the plant parts to be treated. Typically, the temperature of the

solvent during the treatment of a root or of a bark will be higher than the temperature of the solvent during the treatment of a leaf or of a petal.

Typically, the temperature of the solvent during step e) may be from 10°C to 100°C, in particular from 30°C to 90°C, more particularly from 50°C to 80°C.

According to the embodiment in which the solvent is water and the plant is tobacco, the temperature of the water may typically be from 30°C to 80°C. Typically, for the treatment of the stems of a tobacco plant, the temperature of the water may be from 50°C to 80°C. Typically, for the treatment of the parenchymas of a tobacco plant, the temperature of the water may be from 30°C to 70°C.

Typically, the plant fibres are refined in a refiner and can then be passed into the papermaking machine in order to form the fibrous support.

Typically, the plant fibres may originate from various plants.

The fibres of each plant may be obtained separately according to the dissociation process described above. They may then be mixed such that this mixture of fibres of various plants passes into the papermaking machine in order to form the fibrous support. It is also possible to obtain fibres from various plants together by combining one or more parts of the various plants and then subjecting them to the dissociation process described above. The temperature of the water will then be adapted to the plants to be treated and, in particular, to the plant requiring the highest temperature of the water for extracting the extract of this plant. This alternative embodiment is very advantageous since it makes it possible to obtain the fibres of the various plants without carrying out several dissociation processes in parallel.

Typically, the plant extract may be an extract of various plants.

The extract of various plants may be obtained by mixing various plant extracts obtained separately according to the dissociation process described above. It is also possible to obtain the extract of various plants by combining one or more parts of the various plants and then subjecting them to the dissociation process described above. The temperature of the water will then be adapted to the plants to be treated and, in particular, to the plant requiring the highest temperature of the water for extracting the extract of this water-soluble plant. This alternative embodiment is very advantageous since it makes it possible to obtain the extract of various plants without carrying out several processes in parallel. In these two situations, the extract of various plants is brought into contact with the fibrous support during steps b_1) and b_2).

Typically, various plant extracts, obtained according to the dissociation process described above, may also be brought into contact with the fibrous support(s) separately during steps b_1) and b_2).

Typically, during step b_2), the plant extract may be brought into contact with one fibrous support or the two fibrous supports.

Typically, during step b_1) or b_2), the plant extract may be brought into contact with one face of the fibrous support(s) or with the two faces of the fibrous support(s).

Typically, steps b_1) and b_2) of bringing the plant extract into contact may be carried out by impregnation or by spraying, in particular by impregnation. Typically, the impregnation may be carried out using a size press.

Typically, the plant extract may be concentrated before being brought into contact with the fibrous support(s) during steps b_1) and b_2). A device such as a vacuum evaporation device may be used for concentrating the plant extract.

Steps c_1) and c_2) make it possible to bring the solid additive into contact with at least one of the two faces of the fibrous support(s), in particular a wet face of the support(s), more particularly the face of the fibrous support(s) that is brought into contact with the plant extract. Typically, this step makes it possible to disperse the solid additive on and/or in the fibrous support(s).

Typically, steps c_1) and c_2) of bringing the solid additive into contact can be carried out by dispersion or by sprinkling, in particular by sprinkling.

When steps b_1) and b_2) are carried out at the same time as steps c_1) and c_2), then the plant extract may typically be mixed with the solid additive and this mixture is brought into contact with the fibrous support(s). Typically, the bringing into contact of this mixture can be carried out by impregnation or by spraying, in particular by impregnation. Typically, the impregnation can be carried out using a size press.

When the reconstituted plant sheet of the present invention comprises an aerosol-generating agent, then said aerosol-generating agent is brought into contact with the fibrous support(s) before, after or at the same time as the plant extract, as the solid additive or as the mixture of plant extract and solid additive, in particular at the same time as the plant extract.

Typically, step d_2) can have the objective of covering the face of the fibrous support in contact with the solid additive, with the other fibrous support. When the two fibrous supports have one face in contact with the solid additive, then step d_2) typically has the objective of bringing these two faces into contact such that the solid additive is between the two fibrous supports.

Typically, step d_2) of stacking the fibrous supports can be carried out by adhesion of the face of the fibrous support(s) that is in contact with the solid additive, with the face of the other fibrous

support. In order to facilitate the adhesion of the two faces, the face of the other fibrous support may be wet.

Typically, the drying step s_1) makes it possible to attach the solid additives to the fibrous supports in order to form the reconstituted plant sheet.

Typically, the drying step s_2) makes it possible to attach the fibrous supports to one another and to trap the solid additive between the fibrous supports in order to form the reconstituted plant sheet.

Those skilled in the art will know how to adjust the parameters of the drying steps s_1) and s_2) so as to allow the attachment of the solid additive to the fibrous support(s).

Typically, during drying steps s_1) and s_2), the drying temperature may be from 90°C to 130°C, in particular from 70°C to 110°C when the reconstituted plant sheet comprises an aerosol-generating agent.

Typically, steps s_1) and s_2) may be carried out by infrared lamp, American battery drying drums, hot-air drying in a tunnel dryer, a vertical dryer, a fluidized-bed dryer, a pneumatic dryer, in particular in a tunnel dryer.

The reconstituted plant sheet of the invention may then be cut into sheets, leaves similar to strips of tobacco or rolled into a roll. Several sheets may be assembled in order to form a mixture of sheets.

The reconstituted plant sheet of the invention comprising the aerosol-generating agent may be used in a device for heating tobacco without burning it.

For the purposes of the present invention, the term “device for heating tobacco without burning it” denotes any device which allows the formation of an aerosol intended to be inhaled by a consumer. The aerosol replaces the smoke, thus allowing the user to inhale the plant aromas while at the same time very significantly reducing said user’s exposure to the harmful constituents.

Typically, a heating device comprises, in the direction of the airflow, an air inlet, a heating element, a chamber intended to put in place and hold the reconstituted plant sheet of the invention comprising the aerosol-generating agent, and an air outlet intended to be put in the user’s mouth. The air inlet, the heating element, the chamber and the air outlet are typically connected together at least fluidically.

Typically, when the heating device is used, air is aspirated by the user into the heating device via the air inlet; the aspirated air then passes through the heated portion in order to obtain heated air;

in contact with the reconstituted plant sheet of the invention comprising the aerosol-generating agent, held in the chamber, an aerosol is formed by the heated air and is then inhaled by the user. If the plant is a medicinal plant, then the aerosol formed has therapeutic properties.

Furthermore, by virtue of the heating device, there is no combustion of the sheet. The user can therefore take advantage of the organoleptic properties of the plant, and optionally of the tobacco, while at the same time very significantly reducing his or her exposure to the harmful constituents.

Examples

Example 1: Reconstituted tobacco sheet with n = 1

1) Obtaining of the reconstituted tobacco sheet

A fibrous support comprising tobacco fibres and having a basis weight of 62 g/m² is impregnated with 7.5 g of tobacco extract. After impregnation, the fibrous support weighs 9 g and has a basis weight of 108 g/m². Once the impregnation has been carried out, 1.4 g of tobacco dust is sprinkled onto one face of the fibrous support. The impregnated and sprinkled sheet is then dried at 95°C for 540 seconds.

2) Characterizations of the reconstituted tobacco sheet

The weight contents of dry matter of the plant fibres, of the plant extract and of plant dust in the reconstituted plant sheet are indicated in the table below.

Contents		
Plant fibres	Plant extract	Plant dust
31%	39%	30%

The reconstituted plant sheet is subjected to a Buroma cutting test.

The loss of plant dust is 2.6%, which is very low.

The reconstituted tobacco sheet obtained is then shredded in order to be smoked without combustion. The organoleptic properties of the aerosol thus generated are satisfactory for the user.

Example 2: Reconstituted tobacco sheet with n = 2

1) Obtaining of the reconstituted tobacco sheet

Two fibrous supports having a basis weight of 32 g/m^2 are obtained by passing plant fibres into a papermaking machine.

2.7 g of mint dust are then sprinkled onto a wet face of one of the two fibrous supports. The sprinkled fibrous support thus obtained is then dried.

The stacking of the second fibrous support and of the sprinkled and dried fibrous support is then carried out by adhesion of a wet face of the second fibrous support with the face of the sprinkled and dried fibrous support in contact with the plant dust in order to form a sandwich of fibrous supports, in which the dust is trapped between the two fibrous supports.

The sandwich of fibrous supports is then dried using a device of Rapid Köthen type.

The dried sandwich of fibrous supports is then impregnated with 3.64 g of tobacco extracts and glycerol in order to obtain a sandwich of impregnated fibrous supports.

The sandwich of the impregnated fibrous supports is then dried at 90°C for 540 seconds.

2) Characterizations of the reconstituted plant sheet

The weight contents of dry matter of the plant fibres, of the plant extract and of plant dust in the reconstituted plant sheet are indicated in the table below.

Contents		
Plant fibres	Tobacco extracts + aerosol-generating agent	Mint dust extracts
42%	46%	12%

The reconstituted plant sheet is subjected to the same Buroma cutting test as the reconstituted plant sheet of Example 1.

The loss of dust is 4.9%, which is very low.

The reconstituted plant sheet obtained is then shredded in order to be smoked without combustion. The organoleptic properties of the aerosol thus generated are satisfactory for the user.

CLAIMS

1. Reconstituted plant sheet comprising:
   - 1 or 2 fibrous supports comprising plant fibres,
   - a plant extract, and
   - a solid additive.

2. Reconstituted plant sheet according to Claim 1, also comprising an aerosol-generating agent, said aerosol-generating agent representing from 8% to 50%, in particular from 10% to 40%, more particularly from 15% to 35% by dry weight of the reconstituted plant sheet.

3. Reconstituted plant sheet according to Claim 1 or Claim 2, in which the aerosol-generating agent is sorbitol, glycerol, propylene glycol, triethylene glycol, lactic acid, glyceryl diacetate, glyceryl triacetate, triethyl citrate or isopropyl myristate, or a mixture thereof.

4. Reconstituted plant sheet according to any one of Claims 1 to 3, in which the weight content of dry matter of the plant fibres is from 20% to 92%, in particular from 25% to 75%, more particularly from 30% to 45%.

5. Reconstituted plant sheet according to any one of Claims 1 to 4, in which the weight content of dry matter of the plant extract included in the reconstituted plant sheet is from 5% to 47%, in particular from 25% to 45%.

6. Reconstituted plant sheet according to any one of Claims 1 to 5, in which the solid additive is chosen from plant dust, a diluent, a texturing agent, powdered or encapsulated flavourings or a mixture thereof.

7. Reconstituted plant sheet according to any one of Claims 1 to 6, in which the solid additive is plant dust and the plant dust content is from 1% to 70% by dry weight relative to the total weight of said reconstituted plant sheet, in particular from 5% to 65%, more particularly from 10% to 30%.

8. Reconstituted plant sheet according to any one of Claims 1 to 7, in which the plant is chosen from spore plants, seed plants or a mixture thereof, in particular the plant is chosen from the tobacco plant, food plants, aromatic plants, perfume plants, medicinal plants or a mixture thereof, more particularly the plant is the tobacco plant.

9. Process for manufacturing a reconstituted plant sheet as defined in Claims 1 to 8 and comprising 1 fibrous support, said process comprising the following steps:

a_1) providing the fibrous support,

b_1) bringing the plant extract into contact with the fibrous support, and

c_1) bringing the solid additive into contact with the fibrous support,

step b_1) possibly being carried out at the same time as step c_1),

said process also comprising a step:

s_1) of drying after step c_1) of bringing the solid additive into contact with the fibrous support.

10. Process for manufacturing a reconstituted plant sheet as defined in Claims 1 to 8 and comprising 2 fibrous supports, said process comprising the following steps:

a_2) providing the 2 fibrous supports,

b_2) bringing the plant extract into contact with at least one of the 2 fibrous supports,

c_2) bringing the solid additive into contact with at least one of the 2 fibrous supports, and

d_2) stacking the 2 fibrous supports such that the solid additive is between the 2 fibrous supports,

step b_2) possibly being carried out at the same time as step c_2),

said process also comprising a step:

s_2) of drying after step d_2) of stacking the 2 fibrous supports.

11. Process according to Claim 9 or Claim 10, in which the fibrous support or the 2 fibrous supports are obtained by passing plant fibres into a papermaking machine, in particular the fibrous support or the 2 fibrous supports are obtained by a papermaking process.

12. Process according to any one of Claims 9 to 11, in which the plant fibres and the plant extract are obtained according to the following steps:

e) mixing one or more plant parts with water in order to extract the plant extract of the plant fibres,

f) separating the plant extract from the plant fibres.

13. Use of the reconstituted plant sheet as defined in Claims 2 to 8 in a device for heating tobacco without burning it.