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(54) A METHOD FOR FORMING A CAST SHEET MATERIAL

(57) The present invention relates to a method for forming a cast sheet material, comprising introducing a slurry in a casting apparatus, casting the slurry onto a movable support by means of a casting means to form a layer and drying the layer for obtaining the cast sheet material.

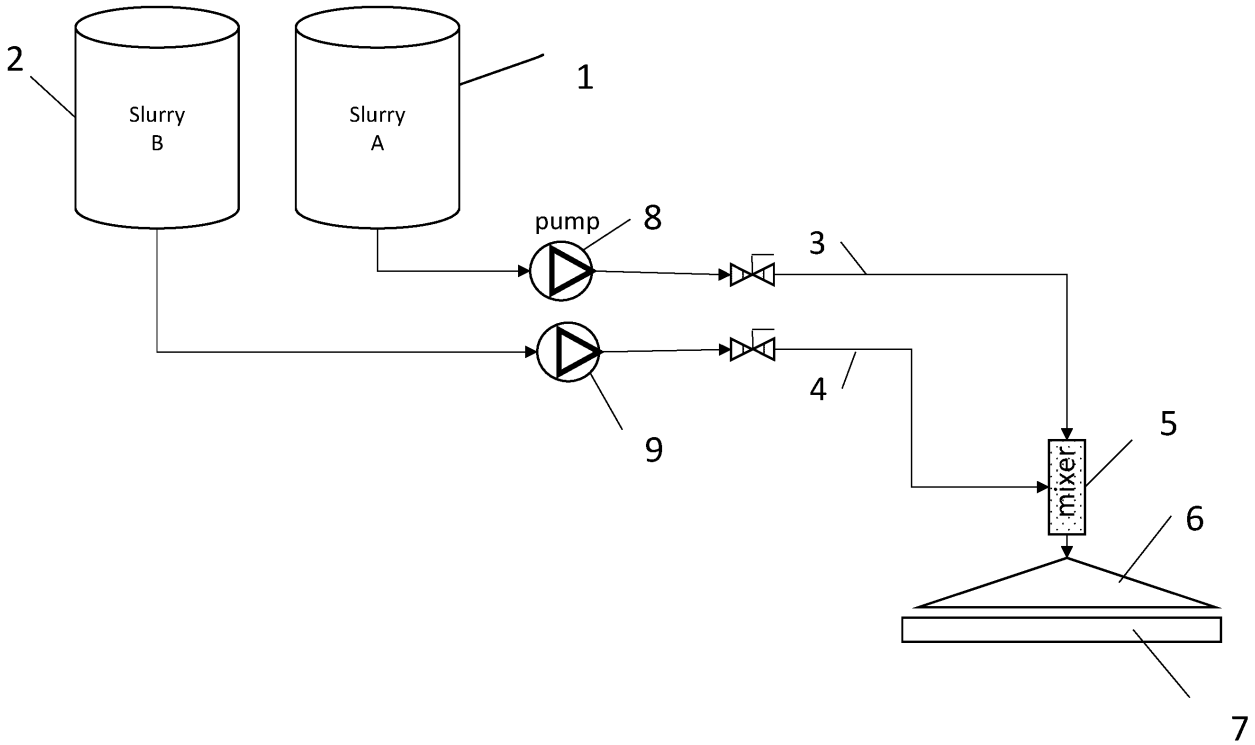

Fig. 1

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Description

[0001] The present invention relates to a method for forming a cast sheet material, comprising introducing a slurry in a casting apparatus, casting the slurry onto a movable support by means of a casting means to form a layer and drying the layer for obtaining the cast sheet material. The present invention also relates to a cast sheet material and its use.

[0002] EP 3 232 823 relates to a method for forming a cast web of homogenized tobacco material, comprising the introduction of a slurry of homogenized tobacco material in a casting box, casting said slurry onto a movable support by means of a casting blade so as to form a cast web. Homogenized tobacco materials are formed by mixing several ingredients with water to obtain a slurry and in a further step, a continuous web of homogenized material is created on a support by casting the slurry onto the support, wherein the resulting homogenized tobacco material has a relatively high tensile strength and a good homogeneity.

[0003] EP 1 489 927 relates to a method for manufacturing a top loaded cigarette filler, the method comprising the steps of dosing a slurry composed on a basis of a fraction of fine tobacco and cellulose fibres on a drying conveyor for forming a base layer, spreading over the base layer a fraction of coarse tobacco for forming a top load on the base layer and subsequently subjecting the total to a drying treatment, wherein composing the base layer comprises a steps of combining and mixing the slurry.

[0004] EP 3 075 267 relates to a method for manufacturing a film consisting of at least two layers, the method comprising the following steps of arranging a first, still liquid bottom layer on an endless belt, arranging a second, still liquid top layer on the still liquid bottom layer, after which the composition of bottom layer and top layer is subjected to a drying treatment for the purpose of obtaining said film consisting of at least two layers. The compositions of each of the layers to be arranged differ from each other and as a result of the use of different layers different properties at the same moment in the same end product can be obtained.

[0005] US 2021/267260 relates to a casting apparatus to cast a sheet of a material containing alkaloids, the casting apparatus includes a casting box apt to contain a slurry to be cast to form the sheet, a slurry supply element defining a feeding channel apt to introduce the slurry into the casting box in a supply direction, path diverting fins positioned within the feeding channel, the path diverting fins being apt to come into contact with the slurry inside the feeding channel, a movable support, and a casting blade apt to cast the slurry contained in the casting box onto the movable support so as to form the cast sheet.

[0006] US 2022/287354 relates to a method for casting a sheet of a material containing alkaloids, the method comprising forming a slurry of the material containing alkaloids, the slurry having a viscosity value, storing the slurry in a first tank, providing a first flow-path and a second flow-path for fluid communication between the first tank and a casting box, directing the slurry either along the first flow-path or along the second flow-path from the first tank to the casting box, defining a flow of slurry through the first flow-path or through the second flow-path, on the basis of the viscosity value of the slurry, and casting the slurry to obtain a sheet of material containing alkaloids.

[0007] Heat-not-burn articles are well known in the art. For example, EP 3,949,771 discloses a heat-not-burn smoking article comprising a tobacco filler containing tobacco and an aerosol former; and a filter disposed downstream of the tobacco filler. US 2019/373948 discloses a heat-not-burn cigarette.

[0008] EP 1 85 0685 relates to a cigarette where the cigarette filter includes one or more capsules containing an additive material for modifying characteristics of tobacco smoke during smoking of the cigarette. The one or more capsules each comprise a frangible wall encapsulating the additive material, wherein the frangible wall breaks to expose the additive material when the capsule is subjected to external force, wherein the additive material comprises menthol.

[0009] Since 2007, the popularity of flavour capsule cigarettes is rapidly growing, which shows there is a desire for a more variable smoking experience. When consuming a smoking article, the taste and aroma of the wrapping material contribute significantly to the smoking experience. Thus, a wrapper with a variable taste and/or aroma will result in a desirable variable smoking experience.

[0010] The cast sheet materials as discussed above can be seen as sheet materials having a homogenous composition. Such a homogeneous composition means that the composition of the cast sheet material in the length direction is the same as in the width direction, and the composition of the cast sheet material is the same over the thickness of the material as well. There is no difference of the composition in any of its directions. The term homogeneous as used here refers to a macroscopic level, i.e. on a scale of a few mm and upward. Under a microscope, inhomogeneities, like air pockets and agglomerates of certain components may be visible, but on a macroscopic level, the microscopic inhomogeneities are of a scale that is usually no longer visible or otherwise organoleptically distinguishable. In a situation wherein a cast sheet material having a homogenous composition is used, for example, as a tobacco material, the consumer of such a tobacco material will not notice any difference during the use of the tobacco material, i.e. during the smoking process.

[0011] In addition, when some additional flavouring components are added to the tobacco material, these flavouring components will be distributed over the cast sheet material in a homogeneous way. Thus, the consumer will experience a constant flavouring taste during the smoking process.

[0012] An object of the present invention is to manufacture a cast sheet material via a process of casting a slurry onto a movable support wherein the cast sheet material thus produced has an inhomogeneous structure on a macroscopic level.

[0013] Another object of the present invention is to manufacture a cast sheet material wherein specific components have a different concentration in the length and/or width direction of the cast sheet material.

[0014] The present invention thus relates to a method for forming a cast sheet material, comprising introducing a slurry in a casting apparatus, casting the slurry onto a movable support by means of a casting means to form a layer and drying the layer for obtaining the cast sheet material, wherein the slurry comprises at least two different types of slurries that are inhomogeneously blended with each other, such that in the cast sheet material the at least two different types of slurries are distinguishable as different types of sheet.

[0015] On basis of such a method one or more objects are achieved. The present inventors thus found that, for example when using the cast sheet material as a wrapper material for a smoking article, a variable taste, aroma, and smoking experience may be achieved by changing one or more of the components of the wrapper, for instance aromas, sweeteners, aerosol formers, plant based materials, and thereby contributing to the total smoking experience. The variable character of the cast sheet material may also be reflected in the appearance of the material e.g. colour, surface structure, and thereby further enhancing the experience. Colour or structural differences in the cast sheet material may also be used to create a pleasing appearance for an otherwise macroscopically homogeneous material.

[0016] In an example of the method the cast sheet material obtained after drying is a single layer. In such a single layer the at least two different types of slurries are distinguishable as different types of sheet, wherein the types of slurries may be present in the length and/or width direction of the cast sheet material.

[0017] In an example of the method the at least two different types of slurries are different from each other in the composition thereof, wherein components of the composition are chosen from the group of fragrances, flavours, colouring agents, plant based materials, binding agents, humectants and fibers, or a combination thereof. In for example an embodiment of a wrapper for a smoking article, wherein two types of slurries are different from each other with regard to the flavours used, the consumer will experience a flavouring taste that will change during the smoking process.

[0018] In an example of the method the at least two different types of slurries are different from each other in the amount of the components of the composition. In such an embodiment the components used in the slurries are the same, but its concentration is different.

[0019] In an example of the method the at least two different types of slurries are mixed in the same ratio or in different ratios.

[0020] In an example of the method an intermediate step is carried out between the step of casting and the step of drying, the intermediate step comprising disturbing the layer on the moveable support for changing the pattern of the layer formed by the casting step. Such an intermediate step enables the formation of different patterns of the layer.

[0021] The present invention also relates to a cast sheet material consisting of a layer, in which layer at least two different types of slurries are distinguishable as different types of sheet material.

[0022] The present inventors found that such a cast sheet material can be obtained by using different mixing ratios of slurries having different compositions, applying different or multiple positions of slurries having different compositions and disturbing the slurry layer after casting, for instance using a comb or a needle.

[0023] In an example the cast sheet material is a single layer.

[0024] In an example the at least two different types of slurries are different from each other in the composition thereof, wherein components of the composition are chosen from the group of fragrances, flavours, colouring agents, plant based materials, binding agents, humectants and fibers, or a combination thereof. Another way of preparing different types of slurries is to use different particle sizes of powder thereby creating texture differences, using different amounts of fibers per slurry, using different types of fibers which will have an influence on tensile strength and/or tear properties.

[0025] In an example the at least two different types of slurries are different from each other in the amounts of some or all of the components of the composition. If for example the composition comprises components X, Y and Z, wherein the weight percentage of X+Y+Z amounts to 100 wt.%, and one would like to change the amount of, for example component X, it is clear that the amount of component Y, the amount of component Z, or the amount of both component Y and Z has to be changed as well.

[0026] The present invention also relates to the use of a cast sheet material obtained according to a method as discussed above or a cast sheet material as discussed above as a wrapper for a smoking article.

[0027] In an example the wrapper is a heat-not-burn article.

[0028] The term "cast sheet" as used here refers to a class of materials that is produced, for example, according to a process comprising the following steps: preparing a fluid, microscopically largely homogeneous slurry mix that may comprise web forming materials (e.g. cellulose fibers and binding agents), structural components (e.g. powdered cellulose, tobacco, herbal components), humectants (e.g. glycerol, propylene glycol), product enhancing components (e.g. colorants, preservatives, sweeteners, aromas), and other additional ingredients for influencing physical properties. The carrier of this fluid is usually water, but also organic solvents are known in the art. The prepared and microscopically

largely homogeneous slurry is applied as an even layer, on a carrier, which is usually is a stainless steel belt.

[0029] For applying the slurry on a carrier, i.e. a movable support such as a stainless steel belt, several well-known technologies comprise, inter alia, knife casting, (reversed) roll coater casting and slot die casting.

[0030] Knife casting is concerned with a bar positioned horizontally over the whole width of the carrier, usually perpendicular to the moving direction of the carrier. There is a small vertical gap over the width of the bar between the carrier and the bar. The slurry is deposited on the carrier, just before the bar, and the slurry is transported under the bar by the movement of the carrier and formed into a flat layer on the carrier by the action between the carrier and the bar.

[0031] The technology of (reversed) roll coater casting is concerned with a rubber roller positioned very closely (e.g. a distance of micrometres) from the carrier. The rubber roller rotates in the same direction of the carrier, meaning that where the surface of the rubber roller is closest to the carrier, the carrier and the roller rotate in opposite directions. A thin, homogeneous layer of slurry is applied on the rubber roller and this thin layer is subsequently transferred to the movable carrier by the rotating rubber roller.

[0032] According to the technology of slot die casting the slurry is fed under pressure to a chamber with a slit shaped outlet, wherein the slurry is pressed through the slit and flows as a layer with even thickness out of the chamber and drops onto the carrier. The carrier provided with the layer of slurry is transported through a drying process wherein water is removed by means of (heated) air. Extra heat may be applied against the underside of the carrier. Once the slurry has formed into a sheet, having a desired moisture content, it is removed from the carrier (doctoring). In some cases the sheet may be remoistened prior to the doctoring step. In subsequent steps the sheet can be slit and rolled, sheeted, shredded, or cut in flakes, or subjected to other processes.

[0033] The cast sheet material manufactured according to the prior art processes is by nature largely macroscopically, homogenous. As a result of imperfections in the process, air pockets, incomplete dissolving of soluble components, agglomeration of solid materials and inhomogeneities in the sheet may be present, but these are usually on a microscopic level and its dimensions are no larger than a few millimetres.

[0034] Homogeneity is usually seen as a positive property of cast sheet materials, however the present invention relates to a process for manufacturing an inhomogeneous sheet product where this inhomogeneity on a macro scale (e.g. a few mm up to centimetres) enhances the usability and attractiveness of the product.

[0035] The present invention is thus related to a technology where two or more slurries with different aspects and/or properties are processed in such a way that on the carrier, a macroscopically inhomogeneous sheet layer is formed. When for instance a visual difference is to be obtained, a visible random pattern like marble may be created, or a visible regular pattern, like for instance striping may be formed. After drying the slurry, these differences in aspects and/or properties are reflected in the cast sheet material.

[0036] The present method can also be applied in a continuous producing installation, as is common in the industry of cast sheet manufacturing. Important for the present invention is what happens before the drying process, also identified as "the wet end."

[0037] A cast sheet installation may consist of the following parts on the wet end: an installation for preparing a slurry mixture, as will be discussed in Example 1, a buffer tank from which the prepared slurry is fed to the drying line, a feeding system for controlled and continuous feeding of the slurry to the drying line, a slurry divider with which the slurry is supplied to the receptacle of the casting system on or more points or continuously over the width, a casting system for applying the slurry in a an even layer on the carrier, a stainless steel belt carrying the slurry layer through a drying oven. In order to prepare a cast sheet with macroscopic areas with different properties as per the present invention, the process can be modified in various ways.

[0038] The first way for preparing a macroscopically inhomogeneous blend of slurries assumes a batch based slurry mixing process, where two (or more) slurry batches with different aspects are prepared separately and stored in separate buffer tanks. In case more than two slurries are used, it may be advantageous when still a number of the slurries are identical.

[0039] Each buffer tank is provided with an individual pump and a piping system leading up to the slurry dividing system. The individual pumps are controlled in such a way (electronically and/or mechanically) that the total amount of slurry of all types is sufficient to keep the receptacle of the casting system filled, without overfilling. The second function of the control system is to ensure a given ratio between the different slurries. However, the ratio between the slurries may be varied on purpose, e.g. for changing the created pattern.

[0040] Between the tanks, the feeding system, the slurry divider and the receptacle, the slurries may be blended in a number of ways, or a combination thereof. In an example a manifold is used, and two or more slurry pipes may be joined into one pipe. In order to promote intermixing of the slurries, the pipes may be provided with an in-line static or dynamic mixer. In a situation where a slurry divider is used that starts a small width, and may spread out over a wider area, i.e. up until the total cast width, ridges, needles, baffles, or similar obstructions may be used to redirect the flow and promote intermixing of the slurries. Slurry feed pipes may each have one or more separate nozzles with which the slurry is deposited in the receptacle of the casting system. Nozzles may be used to feed a flow of slurry into a slurry that already flows inside the divider. The slurry divider or nozzles, or both, may be moved continuously with the objective to create

patterns of the different slurries in eventually the receptacle of the casting system. The movement of the slurry divider and/or the nozzles may be predetermined and repeatable or random in shape and/or frequency. An object may be moved through the slurries in the slurry divider, the receptacle of the casting system, on the carrier, or any combination thereof. That object may have different geometries, e.g. a needle, a paddle, or a spoon. The movement of the object may be predetermined and repeatable or random in shape and/or frequency.

[0041] In each of the mixing methods for preparing a blend of the slurries described here it is clear that the object is not to intimately mix, or to homogenize the different types of slurries, but to create a mixture where the different types of slurries are still macroscopically distinguishable.

[0042] In cases where the compositions of the slurries possess small variations, for instance where the difference between the slurries is to be seen in the taste components, the system may be simplified as follows. From a slurry tank, two pipelines (or one pipeline that is being split) exit towards the slurry divider, identified as line 1 and line 2. Before the divider, via a separate system with a vessel, a pump and a flow control mechanism, an amount of an additional ingredient is fed into the main slurry flow of line 1. After this action, the slurry of line 1 passes through an in line static or dynamic mixer to form a modified slurry. The additional ingredient may for instance be a taste component, such as vanillin or caramel. The same steps may be repeated for slurry line 2, preferably with a different additional ingredient, for instance a taste component that differs from the taste component that was used for the slurry in slurry line 1. Each of the different streams form a slurry much like the different slurries described above, and the same steps may be used to create the macroscopically inhomogeneous blend.
It is understood that the above mentioned steps may be repeated as often as needed thereby creating a virtually unlimited number of different slurries.

[0043] The present invention will be illustrated by specific embodiments, by way of example only.

Figure 1 shows a batch based slurry mixing process according to the present invention.
Figure 2 shows a slurry mixing process according to the present invention.
Figure 3 shows a slurry divider.
Figure 4 shows another example of a slurry divider.
Figure 5 shows another example of a slurry divider.
Figure 6 shows a slurry mixing process according to the present invention.

Examples

[0044] An aqueous slurry is prepared, comprising the components as shown here. The weight percentage is based on the weight of the final product excluding moisture)

Example 1

[0045]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Powdered cellulose	70%
Glycerol	10%

[0046] The mixture of Example 1 is split into two parts of equal weight. One part is mixed with a water soluble colorant, thereby creating two different slurries, i.e. slurry A (provided with 1 wt.% of a red colour) and slurry B.

[0047] For preparing the laboratory sheet, a sheet making set up is used consisting of a glass plate, acting as a carrier material, a casting knife, or film applicator to apply a thin layer of slurry on the carrier material. The film applicator having a small receptacle over the width of the applicator, just before the feed side of the applicator, and a water bath on which the glass plate can rest during the drying stage. In a next step, the film applicator is placed on the glass plate, and slurry A and B are placed in the receptacle. When the film applicator is drawn over the glass plate, slurry A and B are slightly mixed in the receptacle, forming a macroscopically inhomogeneous blend of the two slurries, and the slurry layer deposited by the applicator therefore shows areas of different colour and upon drying, a sheet with a colour pattern is obtained.

[0048] The organoleptically distinguishable pattern of the slurries may be influenced by any or more of the following methods:

Example 2

[0049]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Tobacco powder	70%
Glycerol	10%

Example 3

[0050]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Hemp leaf powder	70%
Glycerol	10%

[0051] When slurries with the compositions of Example 2 and Example 3 are processed according to the method of the present invention, a cast sheet will result having distinct macroscopic areas with either a clear tobacco character or a clear hemp character. Upon consumption as a wrapper for a smoking article, this will lead to the taste subtly alternating between tobacco taste and hemp taste. Materials other than hemp leaf powder and tobacco powder can be used as well, for instance various herbs, taro leaf, various types of tea, or any combination of materials suitable for cast sheet manufacturing. In an embodiment where components are used that have a similar colour, the macroscopic pattern may not be visible, but will be detectable via other senses, like smell or taste.

[0052] Furthermore, the ratio between the different components may be varied, for example a composition having a more hemp like character with hints of tobacco, or a composition where the amount of tobacco is increased.

Example 4

[0053]

Component	Amount (wt.%)
Cellulose fibers	5%
Carboxymethylcell u lose	15%
Tobacco powder	70%
Glycerol	10%

Example 5

[0054]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Tobacco powder	70%
Glycerol	10%

[0055] When slurries with the compositions of Example 4 and Example 5 are processed according to the method of the present invention, as a result of the different ratios of binding agents and fibers, areas with different tensile strength and elasticity will result. This may for instance be used for manufacturing products that will tear at predetermined zones when a force is exercised. This may also be used for partitioning of the product. For instance, when thin streams of the

weaker material are fed into the coater, thin tear lines appear in the finished product. It is clear that the width and the number of streams influence the ratio between the slurries.

Example 6

[0056]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Tobacco powder	70%
Glycerol	10%

Example 7

[0057]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Tobacco powder	69.5%
Vanillin	0.5%
Glycerol	10%

[0058] In the above embodiment, one of two slurries (the slurry according to Example 6) is provided with a flavouring agent with a low vapour pressure. As with the combination of the slurries of Example 2 and Example 3 this will result in a product whereby consumption will lead to a variation in taste during consumption. In this case, the macroscopical inhomogeneities of the product will not be directly visible but will be organoleptically (smell) detectable. It will be clear that various flavouring agents, aromas, and taste enhancing components can be used in this fashion. It will also be clear that a component with a high vapour pressure (e.g. menthol) will eventually distribute homogeneously over the total product.

Example 8

[0059]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Fine Tobacco powder (D50 = 60μm)	70%
Glycerol	10%

Example 9

[0060]

Component	Amount (wt.%)
Cellulose fibers	10%
Carboxymethylcellulose	10%
Coarse Tobacco powder (D50 = 140μm)	70%
Glycerol	10%

[0061] In the above embodiment, the slurries prepared on basis of the composition of Example 8 and Example 9 are identical in composition from a chemical point of view, and both contain tobacco. However, because in one of the slurries,

i.e. the slurry according to Example 9, a coarser ground tobacco is used, the final cast sheet material will show areas with a fine structure, interspersed with areas with a tactile noticeable coarser structure.

[0062] Although the present Examples shown here are a combination of only two slurries, it will be clear that combinations of more than two slurries, for example three, four or even five, are equally possible, and also that different applications may be combined into one product. For instance, a cast sheet material with areas of tobacco character, interspersed with areas of hemp character, may have as a third feature that the final product is provided with lines where the product may tear easily. Likewise, a cast sheet material may be produced with two optically remarkably similar materials (for instance hemp and taro leaf). In order to create a noticeable difference between the cast sheet materials, the hemp slurry may for instance be made with finely ground hemp powder, whereas the taro slurry may be made with a coarse ground taro powder. The difference in texture of the final cast sheet material will then indicate a difference in smoking properties to the consumer.

[0063] Figure 1 shows a batch based slurry mixing process according to the present invention. In such a batch based slurry mixing process two slurry batches, i.e. a slurry A and a slurry B with a different composition are prepared separately and stored in separate buffer tanks 1, 2. Slurry A is transported via pump 8, slurry B is transported via pump 9 and both slurries 3, 4 are mixed in mixer 5, such as an in- line static or dynamic mixer. The slurry thus obtained is cast onto a movable support (not shown) by means of a slurry divider 6 and a coating device 7 to form a layer.

[0064] Figure 2 shows a slurry mixing process according to the present invention. From a slurry tank 20 a slurry is transported via pump 8 and split into two separate lines. An amount of an additional ingredient stored in tank 21 is fed via pump 9 into the main slurry flow. After this action, the slurry passes through an in line static or dynamic mixer 25 to form a modified homogeneous slurry 26 of that additional component. Thus, the composition of slurry 24 differs from the composition of slurry 26. Slurry 24 originating from tank 20 is mixed with slurry 26 in mixer 27. Such a mixing step results in a slurry comprising two different types of slurries that are inhomogeneously blended with each other.The slurry thus obtained is cast onto a movable support (not shown) by means of a slurry divider 6 and a coating device 7 to form a layer.

[0065] Figure 3 shows a slurry divider. In a situation where a slurry divider 6 is used that starts a small width, and may spread out over a wider area, i.e. up until the total cast width, ridges, needles, baffles, or similar obstructions may be used to redirect the flow and promote intermixing of the slurries 30, 31.

[0066] Figure 4 shows another example of a slurry divider. According to slurry divider 6 of figure 4 nozzles 42 are used to feed a flow of slurry 41 into a slurry 40 that already flows inside divider 6.

[0067] Figure 5 shows another example of a slurry divider. Slurry feed pipes may each have one or more separate nozzles 52 with which slurry 51 is deposited in coating device 7. According to figure 5, a slurry divider 6 for slurry 50 is used, and a nozzle system for slurry 51 is used, and both slurries are simultaneously deposited in the coating device.

[0068] Figure 6 shows a slurry mixing process according to the present invention. An intermediate step is carried out between the step of casting and the step of drying, the intermediate step comprises disturbing layer 64 on moveable support 63 for changing the pattern of the layer formed by the casting step. Such an intermediate step enables the formation of different patterns of the layer. According to figure 6 slurry 60 and slurry 61 are fed to mixing means 62 and the thus obtained inhomogeneous blend of slurries 60, 61 is transported to slurry divider 6 and coating device 7. Bar 65 rod provided with pins that are in contact with layer 64 on moveable support 63 can be moved in a plane parallel to the moveable support 63, or even perpendicular to the movement direction of the moveable support 63 ("left to right"), and these movements may be carried out in a continuous or discontinuous mode, or a combination thereof. The perpendicular movement may be combined with an alternating movement parallel to the direction of movement of the moveable support 63. In specific cases, it may be advantageous to have no movement of bar 65. The function of bar 65 is to change the pattern of layer 64 formed by the casting step.

Claims

1. A method for forming a cast sheet material (64), comprising introducing a slurry (60,61) in a casting apparatus (6,7), casting the slurry onto a movable support (63) by means of a casting means to form a layer and drying the layer for obtaining the cast sheet material, **characterized in that** the slurry comprises at least two different types of slurries that are inhomogeneously blended with each other, such that in the cast sheet material the at least two different types of slurries are distinguishable as different types of sheet.

2. A method according to claim 1, **characterized in that** the cast sheet material obtained after drying is a single layer.

3. A method according to any one of the preceding claims, **characterized in that** the at least two different types of slurries are different from each other in the composition thereof, wherein components of the composition are chosen from the group of fragrances, flavours, colouring agents, plant based materials, binding agents, humectants and

fibers, or a combination thereof.

4. A method according to claim 3, **characterized in that** the at least two different types of slurries are different from each other in the amounts of some or all of the components of the composition.

5. A method according to any one of the preceding claims, **characterized in that** the at least two different types of slurries are mixed in the same ratio or in different ratios.

6. A method according to any one of the preceding claims, **characterized in that** between the step of casting and the step of drying an intermediate step is carried out, the intermediate step comprising disturbing the layer on the moveable support for changing the pattern of the layer formed by the casting step.

7. A method according to any one or more of the preceding claims, comprising the following steps: a) preparing a base slurry; b) diverting the base slurry into two or more different slurry streams; c) adding to at least one of the slurry streams one or more components for creating a slurry stream having a composition that is different from the other slurry stream(s); d) casting the slurry streams thus obtained onto the movable support.

8. A method according to claim 7, **characterized in that** before step d) an intermediate step is carried out, the intermediate step comprises inhomogeneously blending of the slurry streams.

9. A cast sheet material consisting of a layer, in which layer at least two different types of slurries are distinguishable as different types of sheet material.

10. A cast sheet material according to claim 9, **characterized in that** the cast sheet material is a single layer.

11. A cast sheet material according to any one or more of claims 9-10, **characterized in that** the at least two different types of slurries are different from each other in the composition thereof, wherein components of the composition are chosen from the group of fragrances, flavours, colouring agents, plant based materials, binding agents, humectants and fibers, or a combination thereof.

12. A cast sheet material according to any one or more of claims 9-11, **characterized in that** the at least two different types of slurries are different from each other in the amount of the components of the composition.

13. The use of a cast sheet material obtained according to a method according to any one or more of claims 1-8 or a cast sheet material according to any one or more of claims 9-12 as a wrapper for a smoking article.

14. The use of a cast sheet material according to claim 13, **characterized in that** the wrapper is a heat-not-burn article.

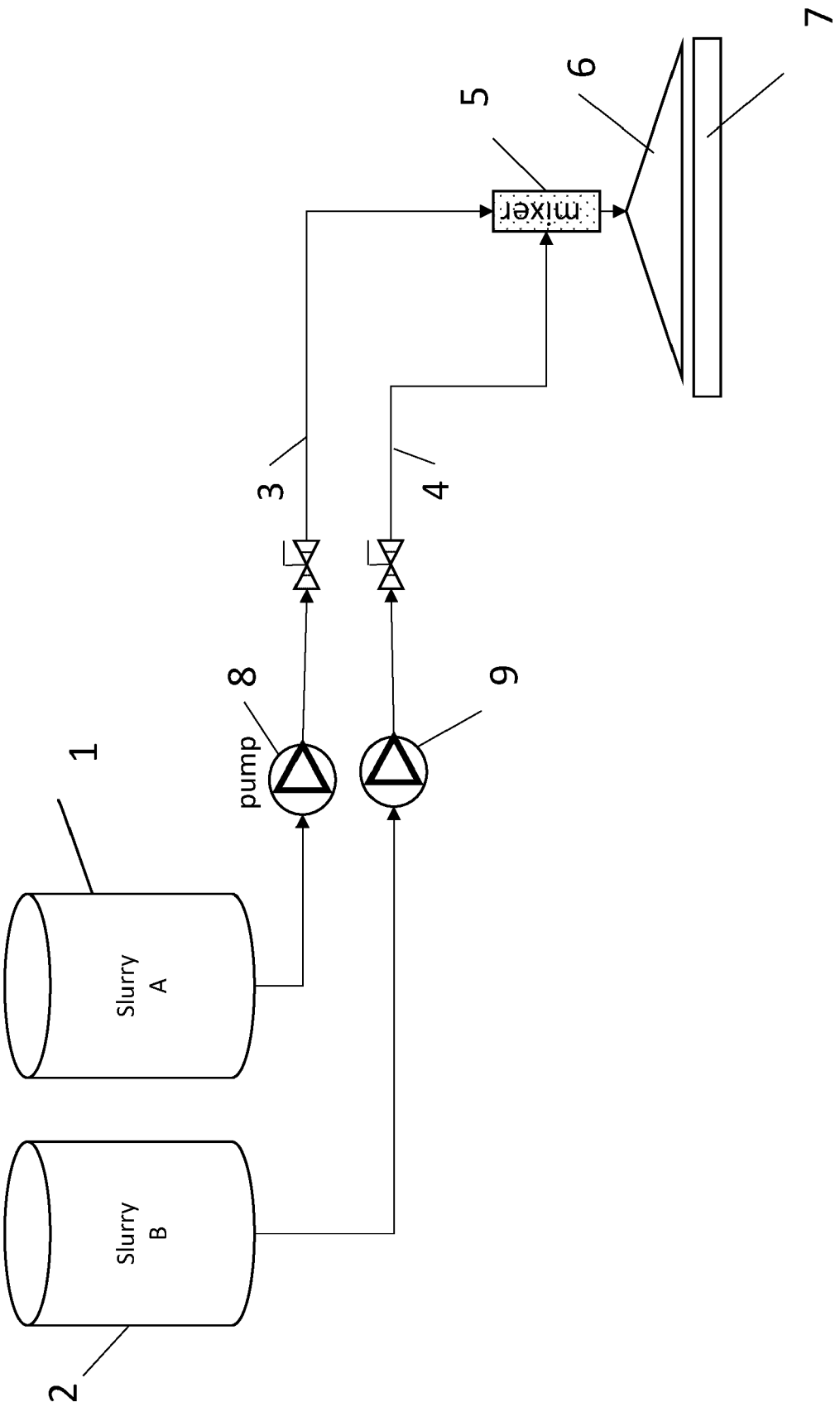

Fig. 1

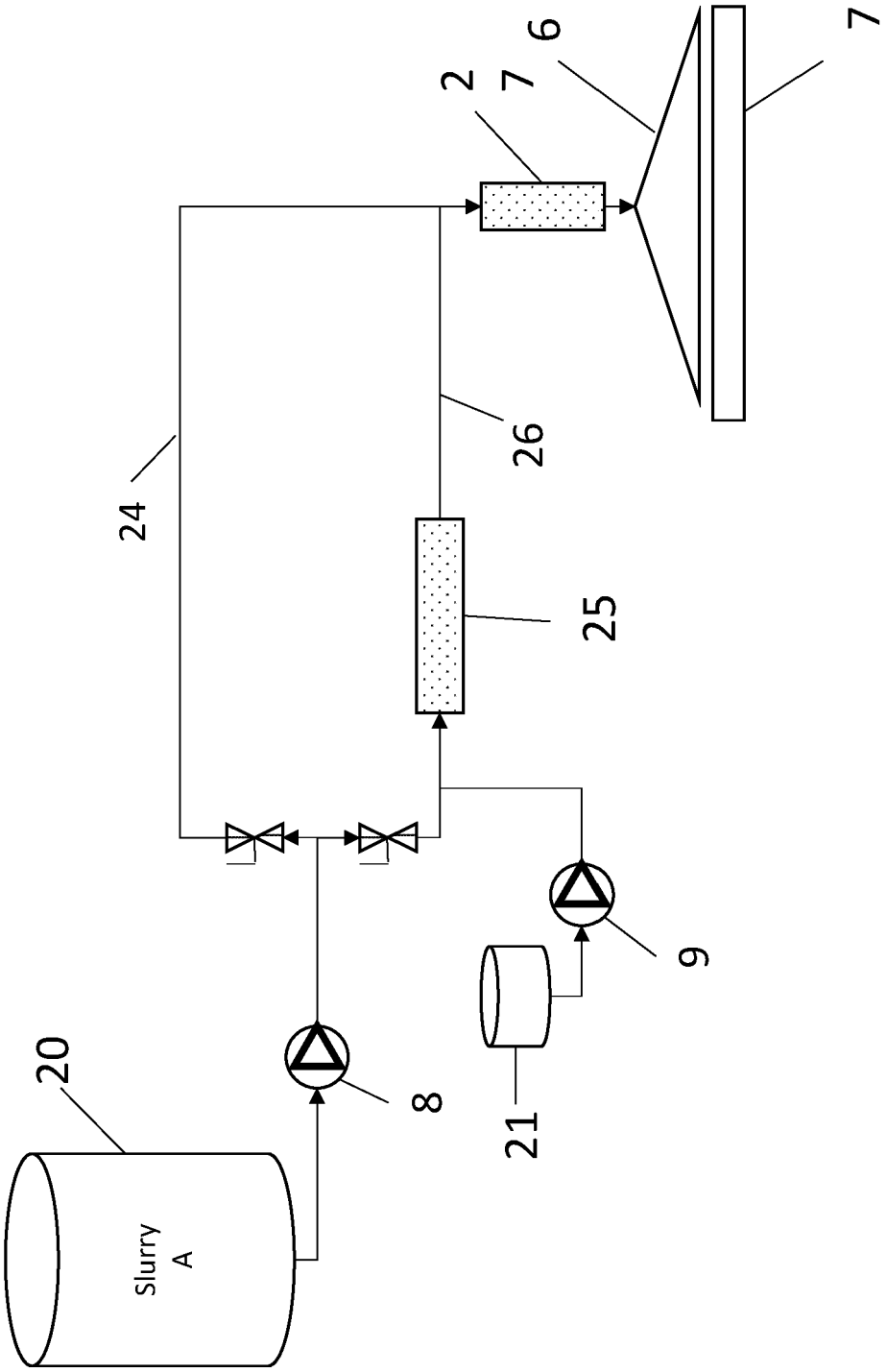

Fig. 2

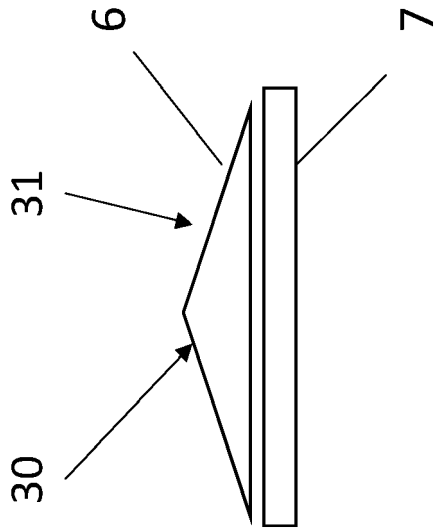

Fig. 3

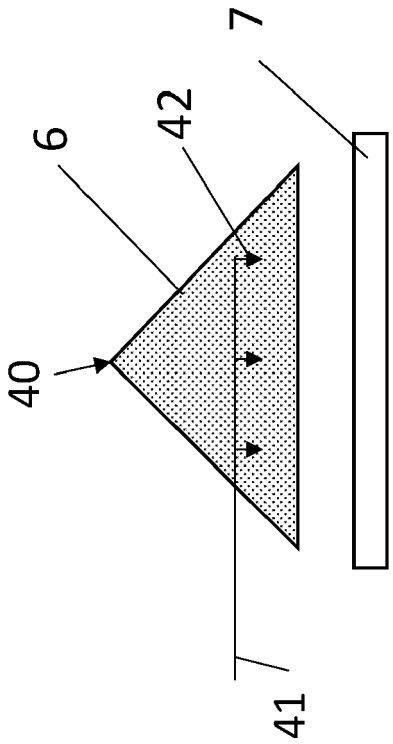

Fig. 4

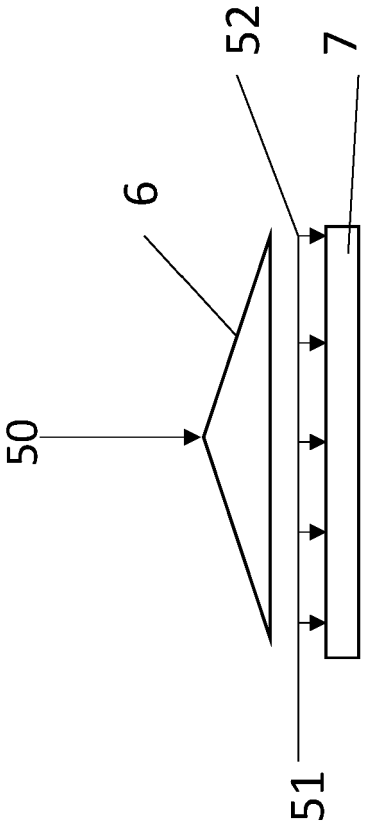

Fig. 5

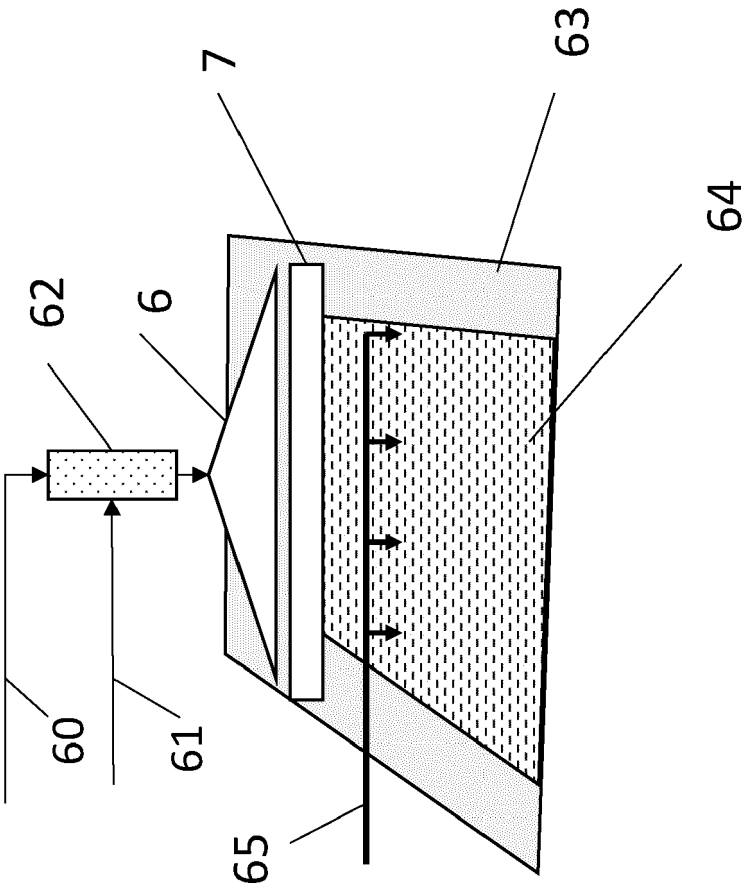

Fig. 6

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Application Number
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Place of search	Date of completion of the search	Examiner
Munich	1 August 2024	Schwarzer, Bernd

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