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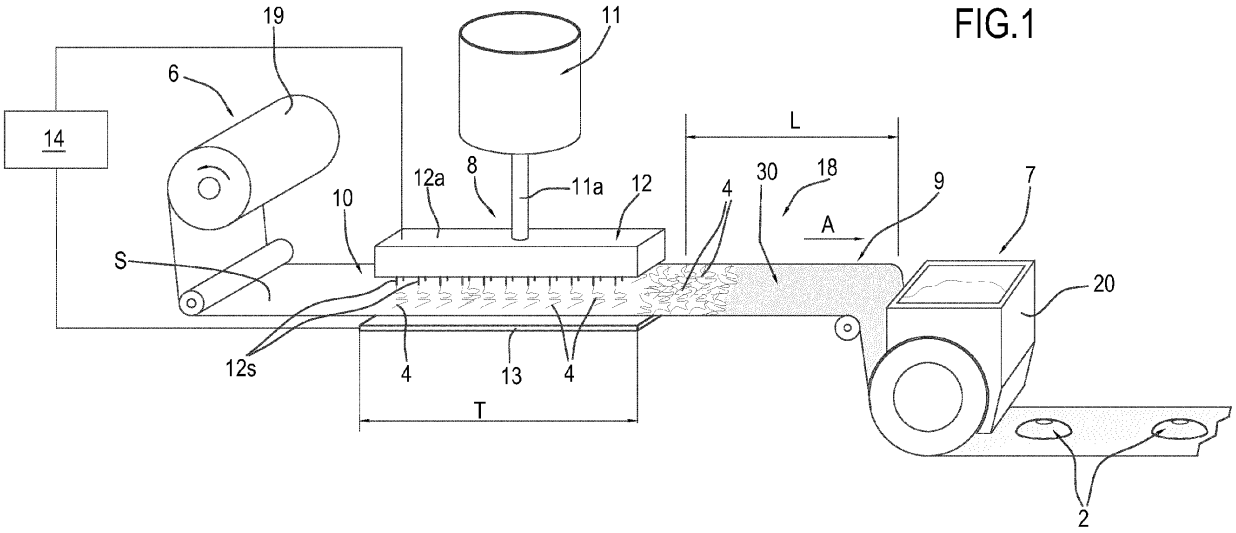
(54) **Method and machine for making filter bags for infusion or extraction products, and filter bag obtained thereby**

(57) A method for making filter bags (1) for infusion or extraction products includes a step of feeding at least one continuous strip (S) of filter material along an advancement direction (A); a step of dosing doses (2) of infusion or extraction product on to the strip (S) of filter material in advancement; a step of forming the filter bags (1); and a step of depositing on to the strip (S) of filter material one or more continuous fibers (4) including one or more flavoring substances.

A machine for carrying out the method comprises a feeding station (6) for feeding the continuous strip (S); a dosing station (7); a forming station (31) for forming the filter bags (1); and a deposition station (8) for depositing one or more continuous fibers (4) including one or more flavoring substances onto the continuous strip (S) of filter material.

FIG.1



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Description

[0001] The present invention relates to a method and a machine for making filter bags for infusion or extraction products, such as tea, coffee, chamomile, etc. including one or more flavoring substances.

[0002] The invention further relates to a filter bag obtained by such method and such machine.

[0003] It is known to add flavoring substances to infusion or extraction products packaged in filter bags, to differentiate/enhancing the organoleptic properties of the beverages obtained by infusion or extraction of such products.

[0004] For example, for filter bags containing tea blends, it is known to add flavoring substances directly to the tea blend in form of particles, such as granules, extrusions, or powders obtained by atomization. The blends with the particles are used to package filter bags in known forms: single lobe, or double lobe filter bags, with or without string and tag, etc. Nevertheless, such method of adding flavoring substances to the tea blends presents drawbacks, from an esthetical, functional and productive point of view.

[0005] Indeed, the flavoring substances in form of granules, extrusions, or powders have relatively large dimensions and are therefore easily visible within the filter bag: such a filter bag looks not particularly pleasant to the consumer.

[0006] The above described flavoring method presents further disadvantages:

- it obliges to stock many different tea blends, in fact different from one another in the flavoring substances only, not in the single teas that form the blends, with an increase in encumbrances and costs; and
- low infusion yields of the flavored tea blends are obtained, because the particles containing the flavoring substances present relatively large dimensions, i.e. a relatively low surface to volume ratio, which is disadvantageous for the process of extraction of the flavoring substances from the particles.

[0007] It is an object of the invention to provide a method for making filter bags for infusion or extraction products that overcomes the drawbacks of the above mentioned prior art.

[0008] In particular, it is an object of the invention to provide a method and a machine to make filter bags for infusion or extraction products including one or more flavoring substances that are simple and flexible.

[0009] It is a further object of the invention to provide a machine for making filter bags for infusion or extraction products including one or more flavoring substances, that allows, during production, to quickly and flexibly change the flavoring substances that are used, maintaining high standards of quality and productivity.

[0010] It is a further object of the invention to provide a filter bag for infusion or extraction products including one or more flavoring substances that presents high yield of infusion or extraction and that, therefore, provides for enhanced organoleptic properties with the same quantities of flavoring substances used in the known filter bags.

[0011] Said objects are achieved by a method and a machine for making filter bags for infusion or extraction products according to claim 1 and 8, respectively, and by a filter bag according to claim 12.

[0012] In particular, the method for making filter bags for infusion or extraction products according to the invention includes a step of feeding at least one continuous strip of filter material along an advancement direction, a step of dosing doses of infusion or extraction product on to the advancing strip of filter material, and a step of forming the filter bag.

[0013] According to the invention, the method further includes a step of depositing on to the strip of filter material one or more continuous fibers, or filaments, including one or more flavoring substances.

[0014] The continuous fibers have a diameter comprised between one thousandth and one millionth of a millimeter.

[0015] Advantageously, the continuous fibers are achieved by an electrospinning process. Advantageously, the step of depositing one or more continuous fibers including one or more flavoring substances is carried out upstream, or downstream of the step of dosing.

[0016] The presence of flavoring substances directly on the filter material, independently from the infusion or extraction product that is used, allows to produce filter bags with high flexibility and reduced costs, because it allows to stock and use the same blend of infusion or extraction products, changing the flavoring substances only.

[0017] Furthermore, the continuous fibers including the flavoring substances, having micro or nanodimensions, are hard to be visible to human eye, so that the filter bag results visually "clean" and, therefore, acceptable for the consumer.

[0018] Furthermore, the continuous fibers with micro or nanodimensions have a relatively high surface to volume ratio, such to obtain an infused or extracted beverage of high quality. In other words, the flavoring substances being equal to those used in the known filter bags, in which the flavoring substances are present in the product in form of granules, extrusions or powders, the filter bags of the present invention guarantee better infusion or extraction, i.e. the filter bags of the present invention guarantee that larger quantities of flavoring substance dissolve in the beverage. It goes without saying that, on the contrary, it is possible to obtain beverages of equal quality than the beverages obtained with known filter bags by utilizing less quantities of flavoring substance.

[0019] Preferably, the method includes a step of free advancement of the strip of filter material, subsequently the step of depositing the continuous fibers including one or more flavoring substances, to allow, if necessary, a residual evaporation of solvents utilized in the step of

depositing.

[0020] The invention will be described in detail with reference to the enclosed drawings, given by way of illustrative and not limiting examples, in which:

- figure 1 is a schematic perspective view of a part of a machine according to a first embodiment of the invention, with some parts omitted to better illustrate others;
- figure 2 is a schematic side view of a further part of the machine of figure 1;
- figure 3 is a schematic side view of a machine according to a second embodiment of the invention;
- figure 4 is a perspective view of an example of filter bag for infusion products obtained by a method according to the invention and the machine of figure 3.

[0021] With particular reference to figures 1 and 3, a method according to the invention is utilized to make filter bags 1 (of which a non limiting example is visible in figure 4) for infusion or extraction products, such as tea, coffee, chamomile, etc., and blends thereof.

[0022] In figure 4 there is illustrated, as an example, a filter bag 1 of the double-lobe type for infusion products with string and tag, but there is understood that the method and machine according to the invention can be utilized to make filter bags of different type and shape, such as single chamber or single lobe filter bags, with or without string and tag, etc, for infusion or extraction products.

[0023] The method for making filter bags 1 for infusion or extraction products according to the invention includes the step of:

- feeding at least one continuous strip S of filter material through an advancement path along an advancement direction A;
- dosing doses 2 of infusion or extraction product onto the continuous strip S of filter material advancing along the advancement direction A;
- forming the filter bags 1.

[0024] Advantageously, the doses 2 of infusion or extraction product are dosed at prefixed distances from one another.

[0025] The step of forming the filter bags 1 may comprise, depending on the type and shape of filter bag that is intended to be made, different sub-steps, such sealing free edges of the continuous strip S of filter material, cutting stretches of filter material from the continuous strip S, folding the continuous strip S or the stretches, joining the string and the tag to the continuous strip or to the stretches, addition of overwrapping envelopes, etc.

[0026] According to the invention, the method includes a step of depositing on to the strip S of filter material one or more continuous fibers, or filaments, 4 including one or more flavoring substances.

[0027] Preferably, the step of depositing is carried out before, or upstream of, the step of forming the filter bags 1. More preferably, the step of depositing is carried out before, or upstream of, the step of dosing the doses 2 of product.

[0028] Advantageously, the continuous fibers have diameter comprised between one thousandth and one millionth of a millimeter.

[0029] In alternative, not illustrated embodiments, the step of depositing is carried out subsequently, or downstream of, the step of dosing, or subsequently, or downstream of, the step of forming. In a further alternative, not illustrated embodiment, the step of depositing may be carried out in a sub-step of the step of forming.

[0030] The step of depositing allows to add the flavoring substances directly on to the filter material that will be used to form the filter bag 1, in particular on to the continuous strip S advancing along the advancement direction A.

[0031] Depositing the flavoring substances directly on to the filter material, thus flavoring the filter material, allows to use a reduced number of blends of infusion or extraction products, certainly lower than the number of flavored blends that are intended to be packaged in filter bags. In other words, rather than stocking a high number of already flavored blends, it suffices to stock a limited number of not flavored blends and to add the flavoring substances during the production of the filter bag.

[0032] Furthermore, it allows to aesthetically enhance the filter bag of the invention with respect to the filter bags of the prior art comprising the flavoring substances in form of particles such as granules and powders, because the single continuous fibers, thanks to the diameter of micro or nanodimension, are hard to be distinguished from the filter material to which adhere.

[0033] Furthermore, it is to be noted that the micro or nanodimensions of the continuous fibers considerably enhance the yield of flavoring during infusion or extraction of the product, because the surface to volume ratio is particularly high and therefore favorable for the flavoring substances to pass in to the infusion or extracted beverage, so that the flavoring of the beverage results particularly effective.

[0034] Preferably, the method includes a step of advancing for freely advancing the strip S of filter material at a prefixed advancement speed, subsequently the step of depositing the continuous fibers 4, to allow drying of the continuous fibers 4, if necessary.

[0035] If needed, the step of advancing for freely advancing the strip S of filter material may comprise, in a drying/evaporation tract L of the advancement path, a step of heating the strip S of filter material, or a step of suction to favor evaporation of solvents, if used in the step of depositing and still present in such tract L.

[0036] It is to be noted that the drying/evaporation tract L of the strip S of filter material has length depending on the characteristics of the filter material and of the continuous fibers 4, and on the advancement speed of the same strip S, in order to obtain a suitable degree of drying of the continuous fibers 4 before the subsequent steps of

dosing and forming. Preferably, the step of depositing the continuous fibers 4 is carried out through an extrusion process of a liquid solution, including one or more flavoring substances, one or more solvents, and suitable additives, such as, for example, carriers, adhesion promoters, viscosity modifiers, etc. Preferably, the extrusion process is obtained by means of an electrical field.

[0037] Preferably, the step of depositing the continuous fibers 4 is carried out along a deposition tract T of the continuous strip S of filter material.

[0038] Preferably, the step of depositing the continuous fibers 4 foresees to deposit one or more continuous fibers 4 along the deposition tract T of the continuous strip S of filter material. Preferably, the step of depositing the continuous fibers 4 foresees to deposit the continuous fibers 4 on to an upper surface 30 of the strip S of filter material advancing along the advancement direction A.

[0039] Preferably, the step of depositing the continuous fibers 4 foresees to deposit the continuous fibers 4 on to the upper surface 30 of the strip S of filter material advancing along the advancement direction A on an horizontal plane.

[0040] In an alternative, not illustrated embodiment, the step of depositing the continuous fibers 4 foresees to deposit the continuous fibers 4 on a surface of the strip S of filter material advancing along the advancement direction A on a vertical plane.

[0041] Advantageously, the step of depositing the continuous fibers 4 includes a process of electrospinning, by means of which, by virtue of an electrical field of suitable force, continuous fibers, or filaments, 4 of diameter comprised between one thousandth and one millionth of a millimetre are generated starting from a liquid solution containing one or more flavouring substances, one or more solvents, and suitable additives, such as carriers, adhesion promoters, viscosity modifiers, etc.

[0042] The process of electrospinning includes providing an electric field between at least one supplying nozzle 12s through which the liquid solution passes and a collection screen 13, positioned opposite to the supplying nozzle 12s with respect to the strip S of filter material. In substance, the supplying nozzle 12s and the collection screen 13 are electrostatically charged at different potentials, so that the liquid solution exiting the supplying nozzle 12s is stretched in continuous fibers 4 of diameter of micro or nanodimensions, that deposit on to the strip S of filter material in the deposition tract T. In other words, the strip S of filter material runs along the advancement path between the at least one supplying nozzle 12s and the collection screen 13.

[0043] It is to be noted that, depending on the type of filter bag that is intended to be made, the step of forming the filter bags may vary.

[0044] For example, a filter bag in form of a filter bag with a single chamber, as visible in figure 2, may include two continuous strips of filter material, one lower strip S on to which the dose 2 of product is dosed and one upper strip S1.

[0045] The step of depositing may include depositing continuous fibers 4 including one or more flavoring substances on to the lower continuous strip S only, or on to the upper continuous strip S1 only, or on to both.

[0046] Subsequently, the second strip S1 is superimposed on the first strip S on to which the doses 2 of product are dosed.

[0047] The two strips S and S1 are then mutually joined (for example by means of thermosealing) in correspondence of joining zones to form a closed chamber G adapted to contain the dose 2 of product and are cut to obtain single filter bags in form of pods (herein not illustrated). Advantageously, in the step of depositing, no continuous fibers 4 are deposited on the joining zones.

[0048] In the embodiment of figure 3, the continuous strip S of filter material is fed along the advancement direction A to form filter bags 1 of the double lobe type, with string 16, tag 17 and outer overwrapping envelope.

[0049] In such embodiment, the continuous strip S of filter material, subsequently, or downstream of, the step of depositing and the step of dosing, is subjected to a step of forming that includes the sub-steps of:

- folding and closing the continuous strip S of filter material to achieve a closed chamber around the dose 2 of product;
- cutting single stretches 15 of filter material containing the dose 2 of product;
- folding the stretches 15 of filter material to achieve a double lobe shape; and
- applying a string 16 and a tag 17 to each stretches 15.

[0050] The step of forming may advantageously include a sub-step of packaging the filter bags 1 within outer overwrapping envelopes.

[0051] In a further not illustrated embodiment, the continuous strip S of filter material is fed along the advancement direction A to form filter bags of the single lobe type. In such further embodiment, the continuous strip S of filter material, subsequently or prior to the step of depositing, is subjected to a step of forming that includes the sub-steps of folding and longitudinally closing (e.g. sealing) the continuous strip S of filter material to achieve a continuous tube of filter material, transversally closing (e.g. sealing) the continuous tube of filter material to achieve a bottom of a filter bag; transversally closing (e.g. sealing) the continuous tube of filter material to achieve a top of the filter bag; cutting the continuous tube of filter material to achieve single filter bags. In such further embodiment, the step of dosing is carried out during the step of forming, in particular subsequently the sub-step of transversally closing the continuous tube of filter material to achieve a bottom of the filter bag and prior to the sub-step of transversally closing the continuous tube of filter material to achieve a top of the filter bag.

[0052] In other words, depending on the type of filter bag that is intended to be made, the step of forming the

filter bags may include different sub-steps, the step of dosing may be carried out upstream the step of forming or in between different sub-steps of forming, and the step of depositing the continuous fibers 4 may be carried out upstream or downstream any one of the step of dosing and the step of forming.

[0053] The present invention further provides a machine for making filter bags 1 for infusion or extraction products.

[0054] The machine 18 includes (see figure 1 and 3):

- a feeding station 6 for feeding at least one continuous strip S of filter material through an advancement path along an advancement direction A;
- a dosing station 7 for dosing doses 2 of infusion or extraction product on to the continuous strip S of filter material advancing along the advancement direction A and arranged downstream of the feeding station 6 with respect to the advancement direction A;
- a forming station 31 for forming the filter bag 1.

[0055] According to the invention, the machine 18 further includes a deposition station 8 adapted to deposit one or more continuous fibers, or filaments, 4 including one or more flavouring substances on to the continuous strip S of filter material.

[0056] The deposition station 8 is configured to deposit at least one continuous fiber , or filament, 4 with diameter comprised between one thousandth and one millionth of a millimeter on to the continuous strip S of filter material.

[0057] Advantageously, as in the embodiments illustrated in figures 1 and 3, the deposition station 8 is positioned between the feeding station 6 and the dosing station 7. Alternatively, in not illustrated embodiments, the deposition station 8 may be positioned downstream of the dosing station 7, for example integrated into the forming station 31, or downstream of the forming station 31.

[0058] Advantageously, the deposition station 8 is arranged upstream of the forming station 31, so that complicated adaptations or displacements of other stations on existing machines are avoided.

[0059] The deposition station 8 includes an electrospinning device 10 adapted to achieve the continuous fibers 4.

[0060] The electrospinning device 10 includes at least one supplying nozzle 12s, with capillary dimensions, connected to a reservoir 11 by means of a conduit 11a. The reservoir 11 is adapted to contain a liquid solution containing one or more flavoring substances, one or more solvents, and suitable additives, such as carriers, adhesion promoters, viscosity modifiers, etc.

[0061] Preferably, the electrospinning device 10 includes a plurality of supplying nozzles 12s, orderly arranged and connected to the conduit 11a by means of a collector unit 12a, adapted to supply a predetermined flow of liquid solution.

[0062] The electrospinning device 10 includes a collection screen 13, positioned opposite to the nozzle 12s with respect to the continuous strip S of filter material at a prefixed distance.

[0063] The collection screen 13 includes a plane metal plate of suitable length and width to face all the supplying nozzles 12s. In the embodiment of figure 1, the collection screen 13 is arranged below the continuous strip S advancing along the advancement direction A, so that the continuous fibers 4 are deposited on a surface of the continuous strip S of filter material that will be an inner surface of the formed filter bag 1.

[0064] In alternative not illustrated embodiments, supplying nozzles 12s and collection screen 13 may be inverted in position, or mutually arranged so that the continuous fibers 4 be deposited on a surface of the continuous strip S of filter material that will be an outer surface of the formed filter bag 1.

[0065] In further alternative embodiments, supplying nozzles 12s (and associated collection screens 13) may be arranged on both sides of the continuous strip S, so that continuous fibers 4 be deposited on both surfaces of the continuous strip S.

[0066] The electrospinning device 10 further includes a charging unit 14 for electrostatically charging the supplying nozzles 12s and the collection screen 13 at different electric potentials. Between the supplying nozzles 12s and the collection screen 13 there is generated an electric field that attracts the liquid solution exiting the supplying nozzles 12s towards the collection screen 13. In substance, the liquid solution exiting the supplying nozzles 12s is stretched into continuous fibers 4, or filaments, with diameter comprised between one thousandth and one millionth of a millimeter, attracted towards the collection screen 13, and intercepted by the continuous strip S of filter material, on to which the continuous fibers 4 deposit.

[0067] The liquid solution may exit the supplying nozzles 12s under pressure by means of suitable pumping devices.

[0068] The solvents used in the liquid solution evaporate yet in the deposition station 8 when the continuous fibers 4 pass from the supplying nozzle 12s to the continuous strip S of filter material, by virtue of a high surface to volume ratio of the same continuous fibers 4.

[0069] If necessary, to complete the evaporation of the solvent, it is possible to provide, downstream of the deposition station 8, an evaporation/drying station 9 adapted to favor the evaporation of the solvent and to dry the continuous fibers 4. Such evaporation/drying station 9 may advantageously include heating elements, or suction elements, adapted to favor the drying of the continuous fibers 4. In the embodiments illustrated in figures 1 and 3, the evaporation/drying station 9 is achieved by a drying/evaporation zone wherein the continuous strip S of filter material, on to which the continuous fibers 4 are deposited, freely advances.

[0070] The drying/evaporation zone extends from the deposition station 8 to the dosing station 7 for a drying/evaporation tract L sufficient to obtain a complete

evaporation of the solvent(s) from the continuous fibers 4.

[0071] Advantageously, in the illustrated embodiments, the drying/evaporation tract L is horizontal. Alternatively, the drying/evaporation tract L may be vertical, or may include horizontal, vertical and/or inclined tracts.

[0072] It is to be noted that the machine according to the invention may be suitable controlled in many process parameters by means of a control unit (not illustrated) depending on the type of filter material, the flavoring substance(s) to be deposited, and the productivity of the machine to be achieved. In particular, the parameter may be the electric field generated by the charge unit 14, the flow of liquid solution exiting the supplying nozzles 12s, the number of supplying nozzles 12s, the distance between the supplying nozzles 12s and the collection screen 13, so as to adjust the quantity and the diameter of the continuous fibers 4 deposited on the continuous strip 4 of filter material per length unit thereof. Advantageously, the deposition station 8 is arranged upstream of the forming station 31, as visible in figures 1 and 3, which allows to adapt machines already in operation, without substantially modifying the structure and arrangement of the forming station 31.

[0073] In particular, in figure 3 there is illustrated a machine including:

- a feeding station 6 with a bobbin holder 19 that carries the continuous strip S of filter material;
- a deposition station 8 adapted to deposit the continuous fibers 4 including one or more flavoring substances;
- a dosing station 7 with a dosing group 20 adapted to dose doses 2 of infusion or extraction product on to the continuous strip S; and
- a forming station 31 that includes:
- a folding group 21 for folding the continuous strip S to form a plurality of chambers for containing the product;
- a closing group 21 for closing the chambers (for example by means of thermosealing);
- a cutting group 23 for cutting stretches 15 of filter material containing the doses 2 of product;
- a movement carousel 24 adapted to move the stretches 15 towards further operative groups, such as:
- a group 25 for applying a string 16;
- a group 26 for applying a tag 17;
- a packaging group 40 for packaging the filter bag 1 in an outer envelope of overwrapping material 41.

[0074] The present invention further provides a filter bag 1 for infusion or extraction products including at least one closed containment chamber G made of filter material and a dose 2 of infusion or extraction product contained in the containment chamber G.

[0075] According to the invention, the filter bag 1 includes continuous fibers, or filaments, 4 including one or more flavoring substances deposited onto the filter material.

[0076] Advantageously, the continuous fibers 4 are achieved by means of an electrospinning process starting from a liquid solution including one or more flavoring substances, one or more solvents, and suitable additives, such as carriers, adhesion promoters, viscosity modifiers, etc.

[0077] Advantageously, such continuous fibers 4 have diameters comprised between one thousandth and one millionth of a millimeter.

[0078] The continuous fibers 4 adhere to the filter material that achieves the closed containment chamber G. Advantageously, the continuous fibers 4 adhere to an inner surface of the containment chamber G.

[0079] Alternatively, or in addition, the continuous fibers 4 adhere to an outer surface of the containment chamber G.

[0080] Advantageously, the filter bag may further comprise a string 16 and a tag 17, and be of the single, double, or multi-chamber type.

[0081] The method and machine for making filter bags for infusion or extraction products according to the invention attain the advantages set forth above by adding to the filter material of the filter bag continuous fibers containing one or more flavoring substances that adhere to the filter material.

[0082] Several advantages are obtained:

- the continuous fibers that adhere to the filter material are hard to be seen and the flavoring substances are not distinguishable in the filter bag, that aesthetically appears as a common filter bag;
- the distribution of the continuous fibers on the whole filter material that makes up the bag and the dimensions of the same continuous fibers allow to obtain an extremely high surface to volume ratio (during infusion or extraction) and thus beverages of higher quality with the same quantity of flavoring substances used in the known bags.

[0083] In addition, there is possible to make filter bags with the desired flavoring substances in an extremely flexible manner, because the addition of flavoring substances may be decided at any time, maintaining unchanged the utilized blend of infusion or extraction product; the latter aspect allows to cut down storage costs of the producer.

Claims

1. Method for making filter bags (**1**) for infusion or extraction products including the steps of:

    - feeding at least one continuous strip (**S**) of filter material along an advancing direction (**A**);
    - dosing doses (**2**) of infusion or extraction product onto the continuous strip (**S**) of filter material

advancing along the advancing direction (**A**); and
- forming the filter bags (**1**)
characterized by comprising a step of depositing onto the continuous strip (**S**) of filter material one or more continuous fibers (**4**) including one or more flavoring substances.

2. Method according to claim 1, wherein said step of depositing is achieved by means of a process of electrospinning.

3. Method according to claim 2, wherein said process of electrospinning comprises producing an electric field between at least one supply nozzle (**12s**), through which a liquid solution including one or more flavoring substances, one or more solvents, carriers, adhesion promoters, viscosity modifiers passes, and a collecting screen (**13**), arranged opposite to the supply nozzle (**12s**) with respect to the continuous strip (**S**) of filter material.

4. Method according to any one of the preceding claims, wherein said one or more continuous fibers (**4**) have diameter comprised between one thousandth and one millionth of millimeter.

5. Method according to any one of the preceding claims, wherein said step of depositing is carried out upstream of said step of forming the filter bags (**1**), preferably upstream of said step of dosing doses (**2**) of infusion or extraction product.

6. Method according to any one of the preceding claims, including a step of advancing for freely advancing the continuous strip (**S**) of filter material, subsequently the step of depositing, to allow the continuous fibers (**4**) to dry.

7. Method according to any one of the preceding claims, wherein the step of depositing is carried out onto the continuous strip (**S**) of filter material in advancement.

8. Machine for making filter bags (**1**) for infusion or extraction products, including:

- a feeding station (**6**) for feeding a continuous strip (**S**) of filter material along an advancing direction (**A**);
- a dosing station (**7**) for dosing doses (**2**) of infusion or extraction product onto the continuous strip (**S**) of filter material in advancement and arranged downstream of the feeding station (**6**) with respect to the advancing direction (**A**); and
- a forming station (**31**) for forming the filter bags (**1**),
characterized by including a deposition station (**8**) adapted to deposit one or more continuous fibers (**4**) including one or more flavoring substances onto the continuous strip (**S**) of filter material.

9. Machine according to claim 8, wherein said deposition station (**8**) includes an electrospinning device (**10**) adapted to achieve said continuous fibers (**4**).

10. Machine according to claim 9, wherein said electrospinning device (**10**) includes at least one supply nozzle (**12s**), a collecting screen (**13**) arranged opposite to said at least one supply nozzle (**12s**) with respect to the continuous strip (**S**) of filter material, and a charge unit for electrostatically charging said at least one supply nozzle (**12s**) and said collecting screen (**13**) at different electric potentials.

11. Machine according to claim 10, wherein said at least one supply nozzle (**12s**) has capillary dimension and is adapted, in cooperation with said collecting screen (**13**), to deposit said one or more continuous fibers (**4**) with diameters comprised between one thousandth and one millionth of a millimeter.

12. Filter bag for infusion or extraction products including:

- a closed, containment chamber (**G**) made of filter material;
- a dose (**2**) of infusion or extraction product contained in the closed, containment chamber (**G**);
characterized in that the filter bag (**1**) includes one or more continuous fibers (**4**) including one or more flavoring substances deposited onto the filter material.

13. Filter bag according to claim 12, wherein said one or more continuous fibers (**4**) are achieved by means of a process of electrospinning and feature diameter comprised between one thousandth and one millionth of a millimeter.

14. Filter bag according to any one of claims 12 and 13, wherein said one or more continuous fibers (**4**) are deposited onto an inner surface of the closed, containing chamber (**G**).

15. Filter bag according to any one of claims 12 and 13, wherein said one or more continuous fibers (**4**) are deposited onto an outer surface of the closed, containing chamber (**G**).

FIG.1

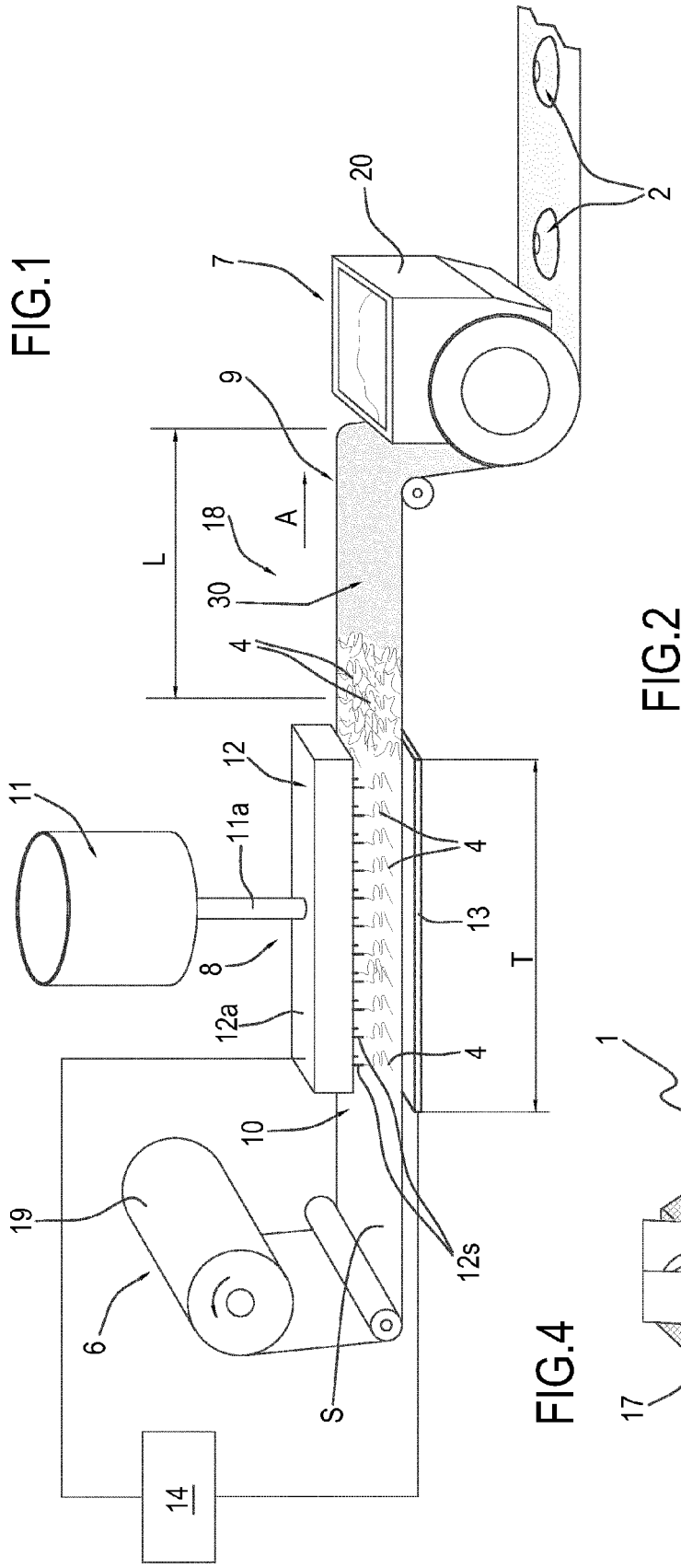


FIG.2

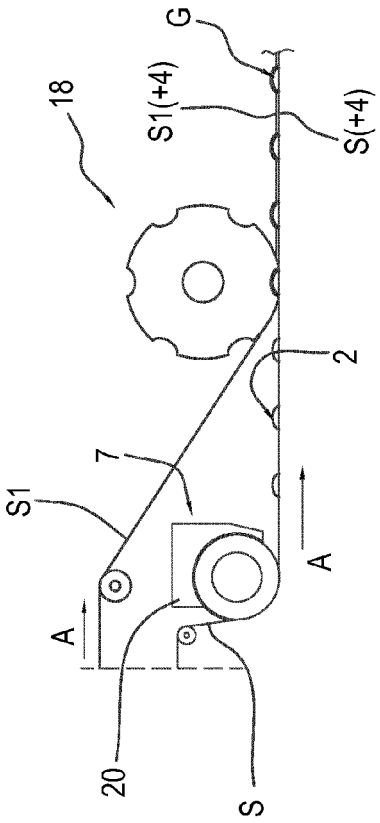
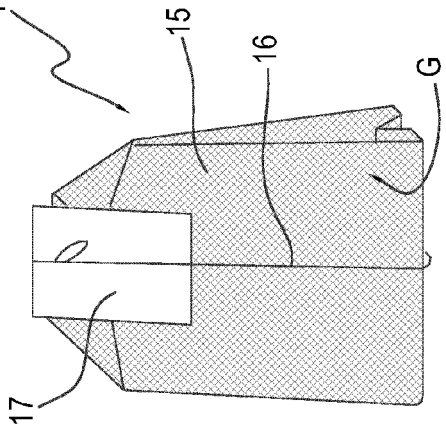


FIG.4



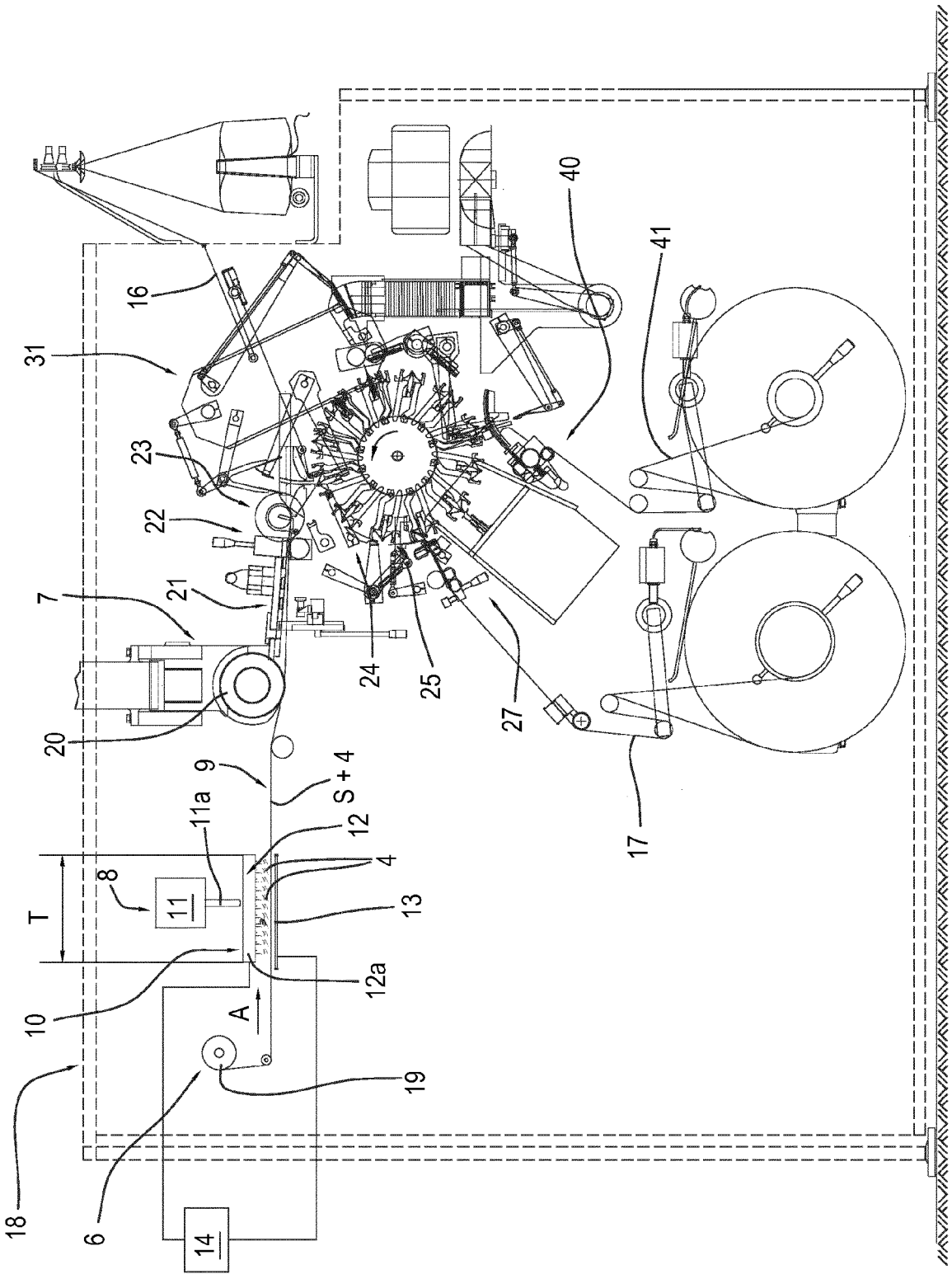

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FIG.3

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EUROPEAN SEARCH REPORT

Application Number
EP 13 19 5500

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2012/004169 A2 (UNILEVER PLC [GB]; UNILEVER NV [NL]; UNILEVER HINDUSTAN [IN]; FORD THO) 12 January 2012 (2012-01-12) * paragraph [0041] - paragraph [0063] * * figures 1-7 * -----	1-15	INV. B65B29/02 B65D85/808
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TECHNICAL FIELDS SEARCHED (IPC)

B65B
B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	19 March 2014	Rodriguez Gombau, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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19-03-2014

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