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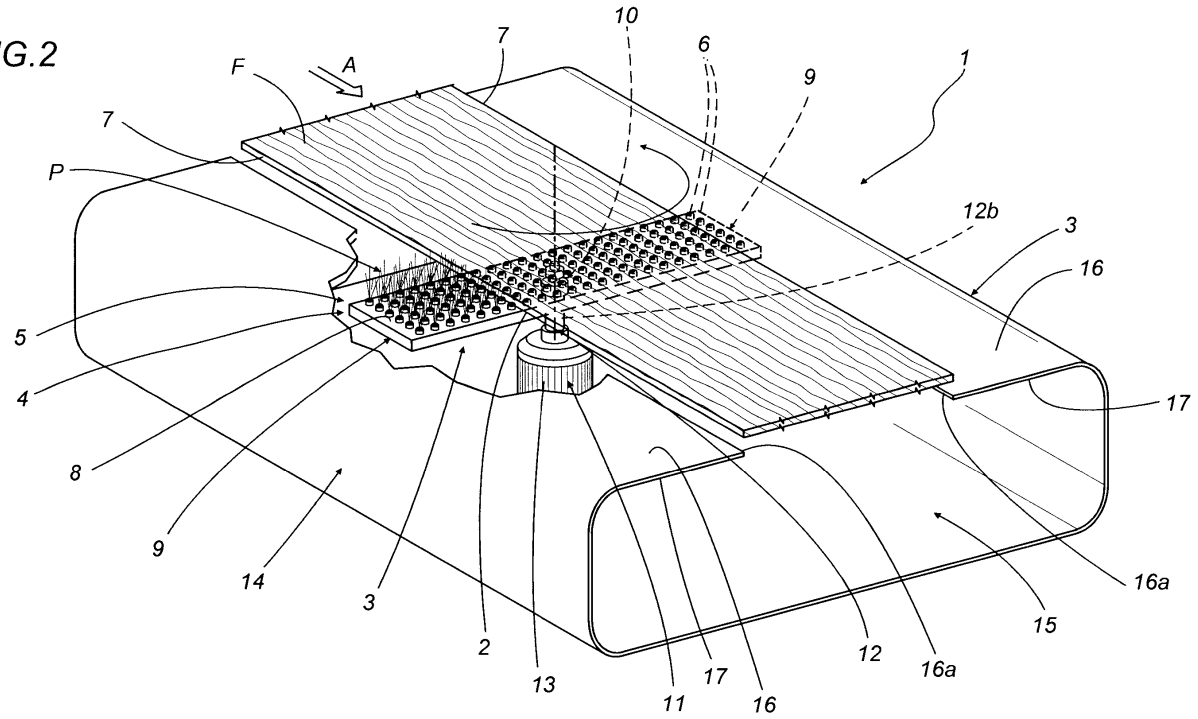
(54) **A device for the treatment of filter material used in tobacco products**

(57) In a device (1) for the treatment of filter material used in tobacco products, a continuous stream (F) of filter material is advanced along a predetermined feed path (A) above a plurality of nozzles (6) delivering a plasticizer fluid (P); the nozzles are carried on a table (5), which presents a longitudinal dimension greater than the transverse dimension of the stream (F) and is rotatable relative to the stream so as to increase or reduce the number of nozzles (6) directed at the stream (F), according to the relative positioning of the stream (F) and the table (5).

FIG.2



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Description

[0001] The present invention relates to a device for the treatment of filter material utilized in tobacco products, typically cigarettes.

[0002] Conventionally, the manufacture of filter tips for cigarettes, be it with simple or composite type filter plugs, involves processing a filter material consisting for instance in a ribbon or stream of fibrous cellulose acetate tow, which is stretched initially, then impregnated with plasticizers, and finally gathered around a central axis to form a continuous rod, which is enveloped in a paper plugwrap.

[0003] The impregnating step takes place as the stretched ribbon is directed through special treatment devices designed to invest the advancing material with a flow of plasticizer, typically triacetin, which at the normal operating temperature and pressure of the treatment devices will remain in the liquid state. Accordingly, the ribbon is sprayed with a flow of liquid consisting in particles of predetermined quantity and size, in such a manner that a prescribed quantity of the triacetin will be absorbed.

[0004] Prior art type devices used to implement the step in question comprise a container, or bath, holding a predetermined quantity of triacetin, and a revolving brush partly immersed in the triacetin, which when set in rotation at a normal operating speed will project a flow of liquid droplets toward a ribbon of cellulose acetate advancing in close proximity.

[0005] Other prior art devices make use of spray nozzles positioned below the ribbon being impregnated, by which a flow of triacetin is directed upwards at the underside of the advancing ribbon.

[0006] While serviceable, both of the aforementioned devices present a major drawback, associated with the difficulty of regulating the quantity of triacetin delivered in such a way as to maintain a uniform distribution of the plasticizer over the filter material.

[0007] In effect, it will be appreciated that the quantity cannot be regulated either by varying the flow rate of the plasticizer, in the case of the nozzles, or by increasing the speed of rotation in the case of the brush, as this would produce a change in the size of the triacetin particles delivered ultimately to the target.

[0008] Consequently, the flow of plasticizer directed at the filter material undergoes a modification, and the impregnation is rendered non-uniform.

[0009] Accordingly, the object of the present invention is to provide a device for the treatment of filter material used in tobacco products, such as will be unaffected by the drawbacks mentioned above.

[0010] In particular, the object of the invention is to provide a device for treating filter material used in tobacco products, such as will allow of regulating the quantity of triacetin delivered, and maintaining a uniform distribution of the plasticizer over the ribbon or stream of filter material.

[0011] A further object of the invention is to provide a device for the treatment of filter material used in tobacco products, having the merits of simplicity in construction and a low cost of realization.

[0012] The stated objects are achieved in a device according to the present invention for the treatment of filter material used in tobacco products, of which the features are recited in the appended claims.

[0013] The invention will now be described in detail, by way of example, with the aid of the accompanying drawings, in which:

- figure 1 illustrates a cigarette filter making machine, equipped with a device according to the present invention;
- figure 2 is a perspective view of the device according to the present invention, shown with certain parts cut away better to reveal others;
- figures 3a, 3b and 3c illustrate the device in plan from above, shown in a succession of operating positions;
- figure 4 is a side view of the device according to the invention.

[0014] With reference to the accompanying drawings, numeral 1 denotes a device, in its entirety, for treating filter material used in tobacco products, in accordance with the present invention.

[0015] The device 1 is applicable to machines 100 used in the manufacture of filters for tobacco products, and for cigarettes in particular, substantially of the type illustrated in figure 1.

[0016] Such machines 100 comprise a magazine 101 holding filter material, and more exactly containing one or more bales 102 of filter material, of which one only is illustrated in figure 1. Two respective fibrous tows 103 are drawn from the bales 102 and directed by means of conventional guide devices toward a station at which the filter material is processed.

[0017] In detail, the filter material passes through a processing station comprising at least one blower device 104 of conventional type, producing a flow of air by which the fibrous tows 103 are expanded and formed into continuous streams "F" of given width. In a preferred embodiment, the processing station will comprise three such blower devices 104, stationed along a feed line "L" as illustrated in figure 1.

[0018] The aforementioned processing station further comprises a device 1 according to the present invention for treating the filter material, located downstream of the blower devices 104, by which the continuous streams "F" of fibrous tow are taken up and plasticized through impregnation with a suitable plasticizer fluid.

[0019] The treated streams "F" advance thereafter toward a transfer device 105 by which the continuous tows are taken up on the infeed side, gathered each about a respective centre axis, and caused to emerge on the outfeed side in the form of ropes 106, each advancing above a corresponding web 107 of previously gummed paper, and finally wrapped in the gummed webs 107 to fashion

respective rods 108 of filter material.

[0020] The rods 108 obtained in this way are fed toward a device 109 that will test their density, thence to a cutter head 110 by which the selfsame rods 108 are divided transversely into respective successions of plugs, not illustrated.

[0021] The device 1 according to the present invention for treating filter material used in tobacco products, indicated in the central part of figure 1, will now be described in detail.

[0022] In particular, the device 1 comprises feed means (conventional in embodiment and therefore not illustrated in detail) by which the continuous stream "F" of fibrous tow is caused to advance along a predetermined path denoted "A".

[0023] The device 1 further comprises at least one delivery unit 3 from which a plasticizer fluid "P", such as triacetin, is directed at a surface 2 of the stream "F".

[0024] The delivery unit 3 is placed below the stream "F" of fibrous tow, so as to project the fluid "P" upwardly at the stream "F" as it advances in a longitudinal feed direction denoted "A" in figure 2.

[0025] Also forming part of the device 1 are control means 4 serving to regulate the quantity of fluid "P" directed at the stream "F" of fibrous tow, acting on the delivery unit 3 in such a way as to adjust its position relative to the path followed by the stream "F".

[0026] Such control means 4 comprise at least one table element 5, also a plurality of spray nozzles 6 carried by the table element and forming part of the delivery unit 3, by which the aforementioned fluid "P" is projected at the stream "F" of fibrous tow as an array of respective liquid cones.

[0027] As illustrated by way of example in figures 3a, 3b and 3c, the table element 5 is capable of movement between a first operating position, in which the nozzles 6 lie entirely within the transverse dimensional limits of the stream "F" (figure 3c), as defined by two longitudinal edges 7 of the selfsame stream "F", and at least a second operating position in which at least certain of the nozzles 6 are located outside the selfsame transverse dimensional limits (figures 3a and 3b).

[0028] In particular, the table element 5 presents a surface 8 directed toward the aforementioned surface 2 of the stream "F", and referable to a predominating longitudinal dimension that extends transversely to the longitudinal feed direction "A".

[0029] To advantage, the multiple spray nozzles 6 carried by the table element 5 are arranged in close order along the full length of the surface 8 presented by the element.

[0030] With reference in particular to figure 3a, it will be seen that the table element 5, when occupying the second position, extends at right angles to the longitudinal feed direction "A". In this situation, respective opposite ends 9 of the surface 8 are located outside the transverse dimensional limits of the stream "F", with the result that no fluid "P" is directed at the stream "F" from the nozzles 6 carried by these same two ends 9.

[0031] Figure 3c shows the table element 5 occupying the first operating position, in which all of the nozzles 6 are located within the transverse dimensional limits of the stream "F", so that a greater quantity of fluid "P" is directed at the filter material.

[0032] Figure 3b shows the table element 5 occupying an intermediate operating position, in which more of the nozzles 6 are located within the transverse dimensional limits of the stream "F" than is the case in the second position.

[0033] Significantly, the movement of the table element 5 is effected by inducing rotation about a respective fulcrum point 10, in such a way as to position the ends 9 internally or externally of the longitudinal edges 7 of the stream "F".

[0034] In particular, the control means 4 include motion-inducing means 11 by which the table element 5 is made to rotate between the first and second position, pivoting on the fulcrum point 10, the fulcrum being located on a median line of the table element 5.

[0035] As illustrated to better advantage in figure 2 and in figure 4, such motion-inducing means 11 present a substantially vertical shaft 12 of which a first end 12a is fixed to the table element 5 at the fulcrum point 10, and a second end 12b opposite to the first end 12a is associated with a respective motor 13.

[0036] To advantage, as illustrated in figure 4, the device 1 comprises a collection tank 14 positioned with an open cavity facing toward the advancing stream "F" of fibrous tow.

[0037] The tank 14 functions as a channel 15 in which to catch the fluid "P" delivered by the nozzles 6 when not absorbed by the stream "F".

[0038] The device 1 further comprises a pair of apron elements 16, each interposed between one end 9 of the surface 8 and a longitudinal edge 7 of the stream "F".

[0039] More exactly, each apron element 16 is associated with a relative side wall of the tank 14 and located below the level of the stream "F", presenting one respective edge 16a in alignment with the corresponding longitudinal edge 7.

[0040] In addition, the underside 17 of each apron element 16 is directed toward the nozzles 6 located at one respective end 9 of the table element 5 when in the second operating position.

[0041] Thus, when the surface 8 of the table element 5 is positioned with the two ends 9 beyond the transverse dimensional limits of the stream "F" of fibrous tow, the fluid "P" released from the nozzles 6 not directed at the stream "F" is intercepted by the underside 17 of each apron element 16 and will drop into the channel 15. Accordingly, the fluid "P" is recovered and returned to the delivery system for reuse.

[0042] Advantageously, according to the invention, the quantity of fluid "P" directed at the stream "F" of fibrous tow is regulated by inducing motion in the table element 5.

[0043] In effect, by positioning the table 5, it becomes

possible to include a greater or lesser number of nozzles 6 within the transverse dimensional limits of the stream "F", and at the same time increase or reduce the overlap between areas targeted by the single spray cones. Accordingly, the quantity of fluid "P" directed at the stream "F" can be regulated without altering the flow rate, thus maintaining a uniform distribution of the fluid "P" along and across the stream.

[0044] It will be observed, moreover, that the device 1 is structurally simple, as also is the step of regulating the flow of plasticizer fluid, accomplished simply by rotating the table element 5.

Claims

1. A device for the treatment of filter material used in tobacco products, comprising means by which to advance a continuous stream (F) of filter material along a predetermined feed path (A), at least one delivery unit (3) by which a plasticizer fluid (P) is directed at a surface (2) of the stream (F), and control means (4) regulating the quantity of fluid (P) directed at the stream (F)
characterized
in that the control means (4) operate on the delivery means (3), by positioning the selfsame delivery means (3) selectively in relation to the path (A) followed by the stream (F) of filter material.

2. A device as in claim 1, wherein the delivery unit (3) comprises a plurality of spray nozzles (6), and the control means (4) comprise at least one element (5) carrying the nozzles (6), capable of movement relative to the surface (2) of the stream in such a way as to increase or reduce the number of nozzles (6) facing the stream (F) according to the relative positioning of the stream (F) and the element (5).

3. A device as in claim 2, wherein the element (5) carrying the nozzles consists in a table presenting a longitudinal dimension greater than the transverse dimension of the stream (F) of filter material, and rotatable relative to the surface (2) of the stream in such a way as to increase or reduce the number of nozzles (6) facing the stream (F) according to the relative positioning of the stream (F) and the table element (5).

4. A device as in claim 3, wherein the table element (5) is rotatable between a first operating position in which the nozzles (6) lie entirely within the transverse dimensional limits of the stream (F), and at least a second operating position in which at least certain of the nozzles (6) are located outside the transverse dimensional limits of the stream (F).

5. A device as in claim 4, wherein the table element (5) presents a surface (8) directed toward the surface (2) of the stream (F) of filter material, on which the nozzles (6) delivering the fluid (P) are arrayed.

6. A device as in claim 5, wherein the surface (8) of the table element (5) presents a predominating longitudinal dimension extending transversely to the longitudinal feed direction (A) followed by the stream (F) of filter material.

7. A device as in claim 5 or 6, wherein the surface (8) of the table element (5) is disposed, when occupying the second operating position, substantially perpendicular to the longitudinal feed direction (A) followed by the stream (F) of filter material.

8. A device as in claims 5 to 7, wherein the surface (8) of the table element (5) presents respective opposite ends (9), each positioned to coincide with a corresponding longitudinal edge (7) of the continuous stream (F) of filter material and proportioned so as to project externally of the longitudinal edge (7) at least when the table element (5) occupies the second operating position.

9. A device as in claims 1 to 8, wherein the control means (4) comprise motion-inducing means (11) by which the position of the delivery unit (3) can be varied in relation to the stream (F) of filter material.

10. A device as in claims 3 and 9, wherein the motion-inducing means (11) comprise a shaft (12) presenting a first end (12a) fixed to the table element (5) at a fulcrum point (10), and a second end (12b) associated operationally with a motor (13).

11. A device as in claim 10, wherein the fulcrum point (10) is located on a median line of the table element (5).

12. A device as in preceding claims, further comprising a collection tank (14) presenting a substantially concave face directed toward the stream (F) of filter material and functioning as channel (15) in which to catch surplus fluid released from the nozzles.

13. A device as in claims 8 and 12, further comprising a pair of apron elements (16), each interposed between one end (9) of the surface (8) presented by the table element (5), and a longitudinal edge (7) of the stream (F).

14. A device as in claim 13, wherein the underside (17) of each apron element (16) is directed toward the nozzles (6) located at one respective end (9) of the surface (8) presented by the table element (5) when occupying the second operating position.

15. A machine for manufacturing cigarette filters, in which at least one continuous stream (F) of filter material is advanced toward a processing station comprising a device (1) for the treatment of filter material used in tobacco products, as in preceding claims.

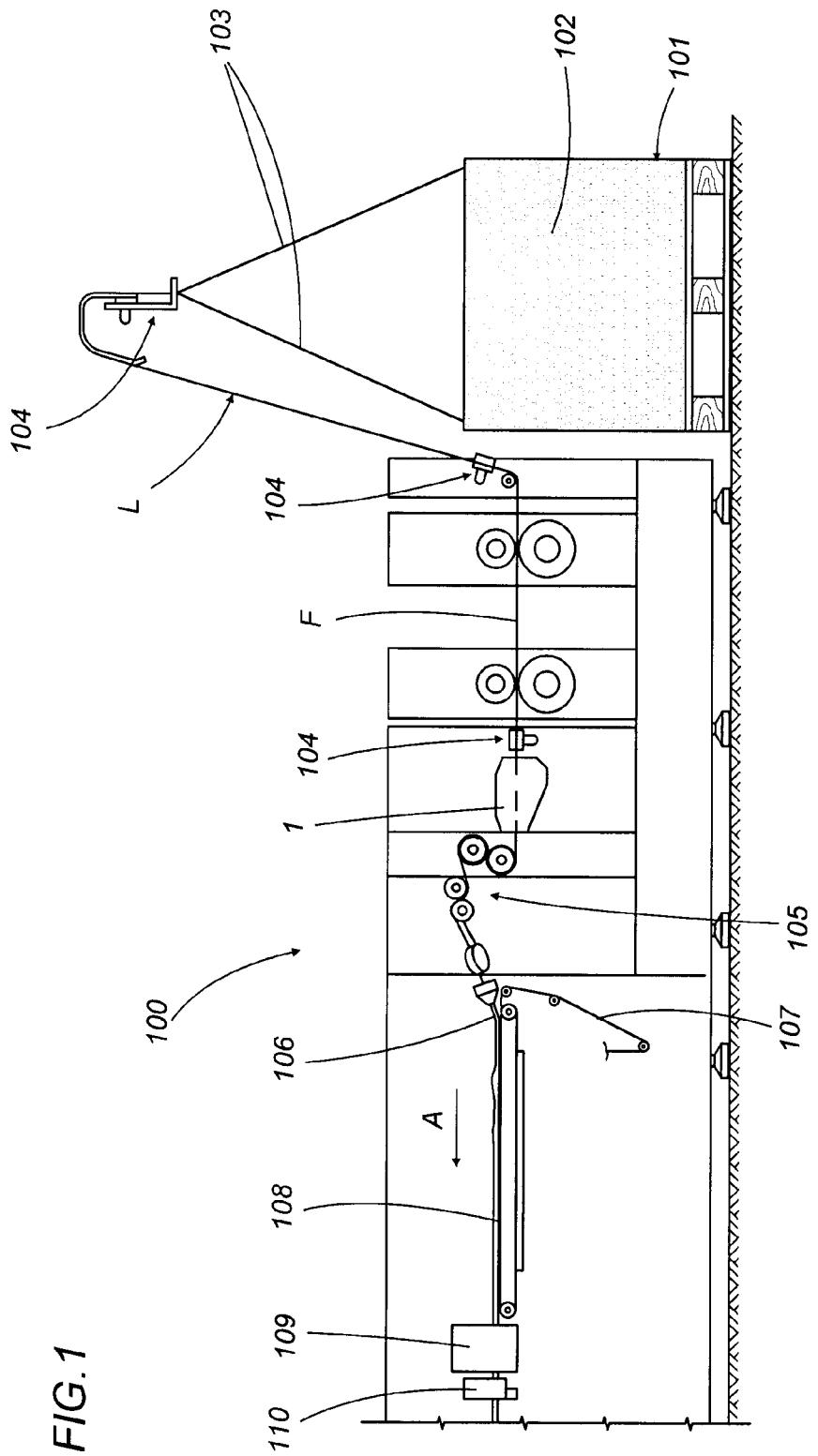


FIG.1

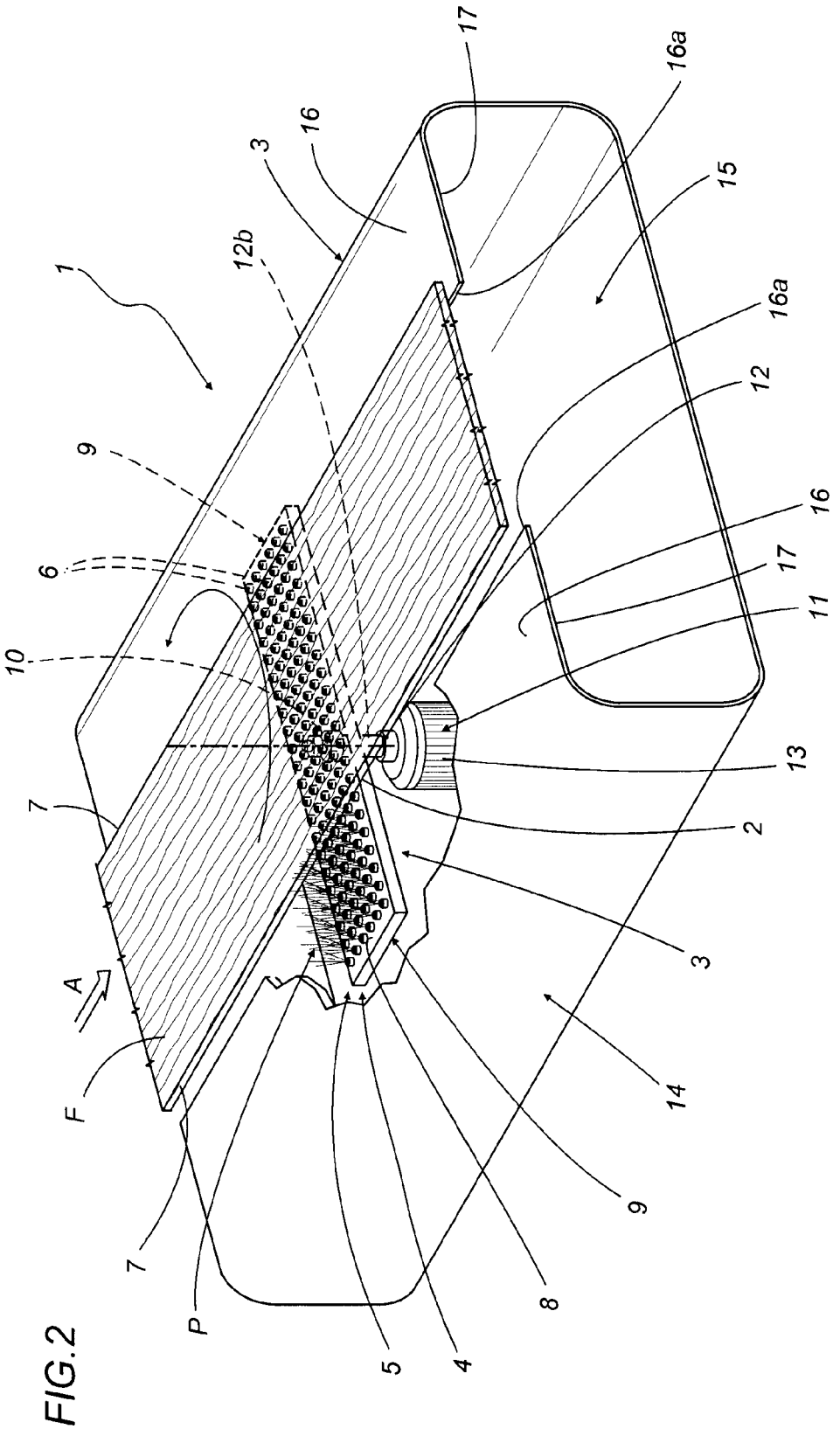


FIG.2

FIG.3a

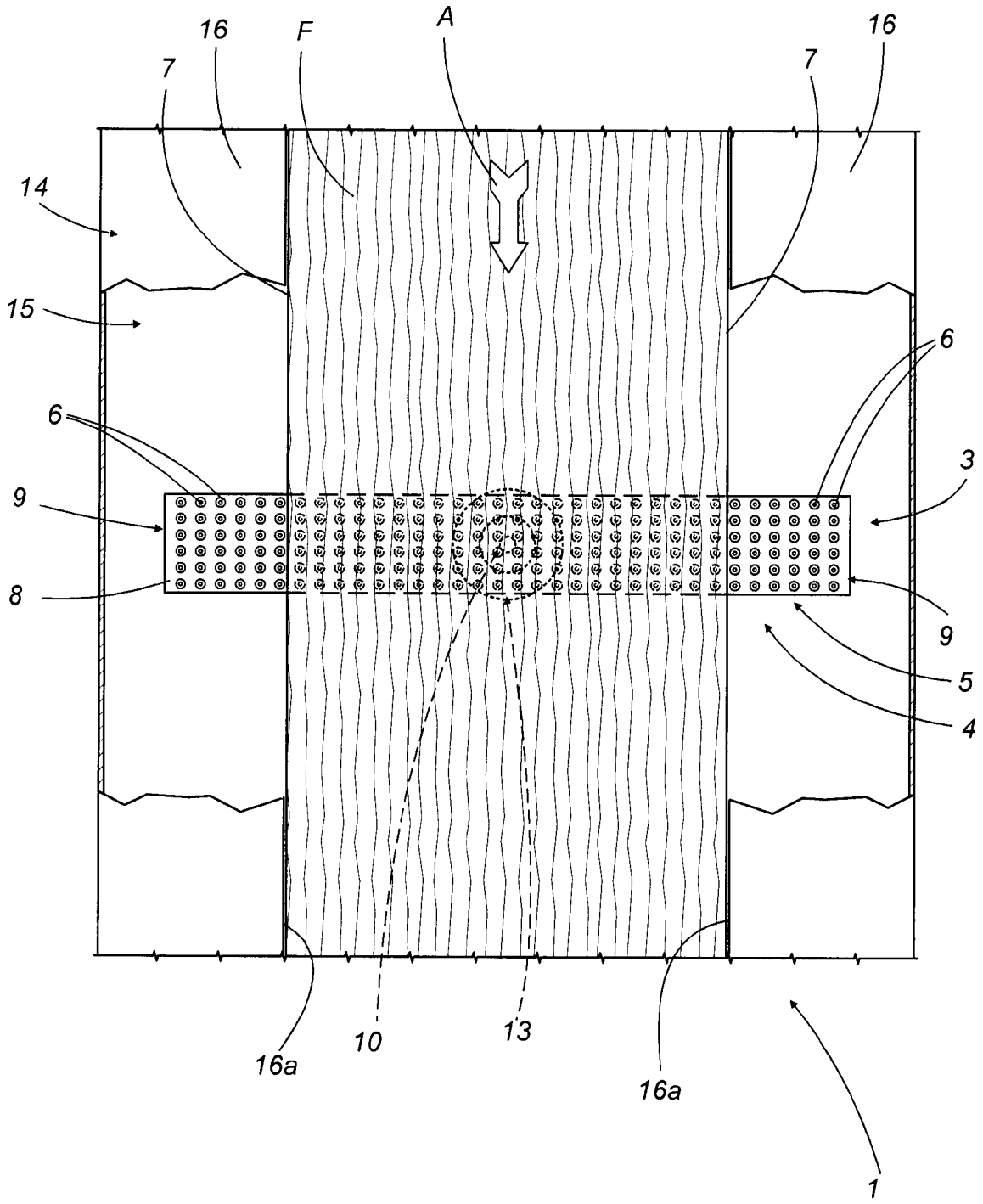


FIG.3b

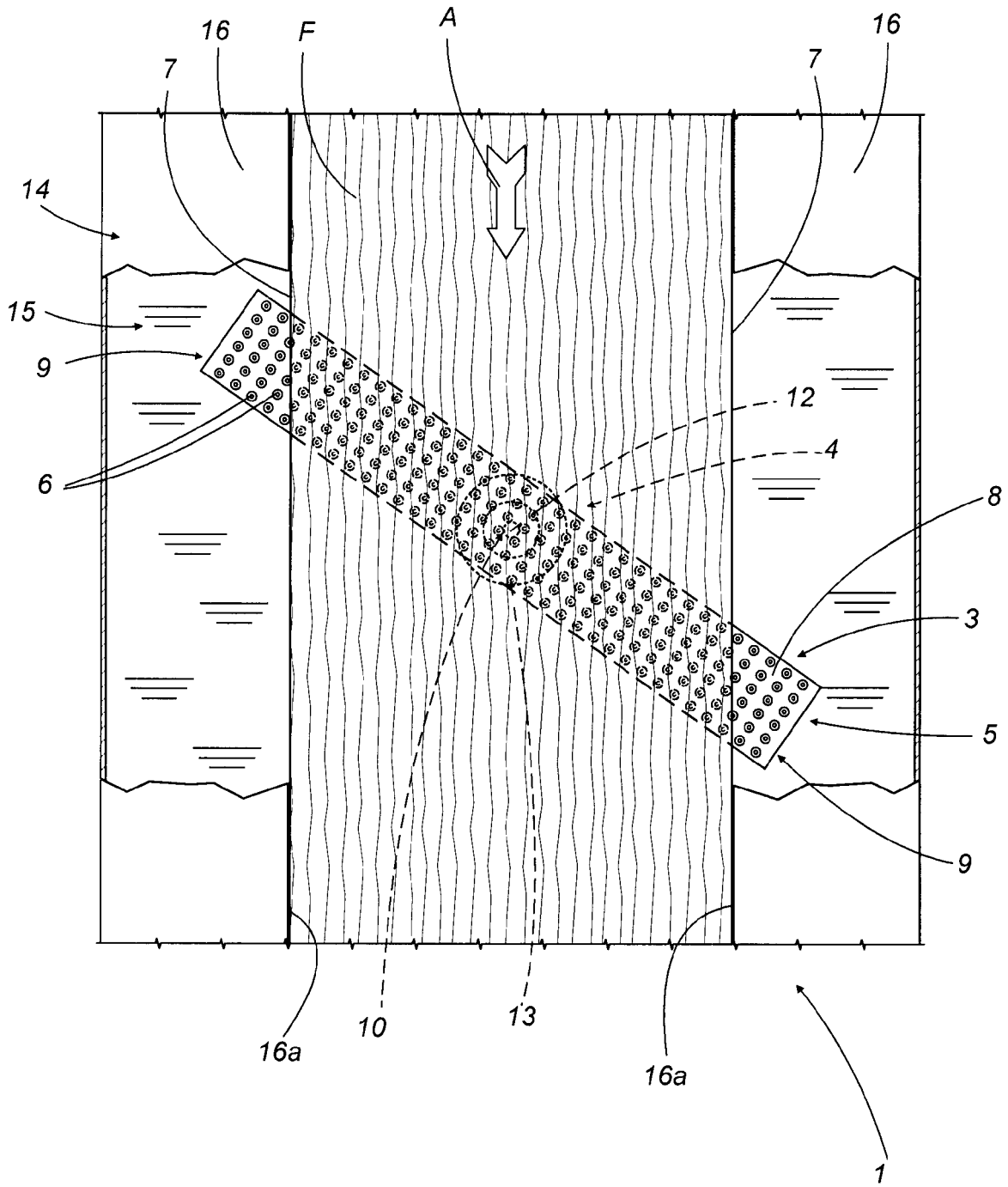


FIG.3c

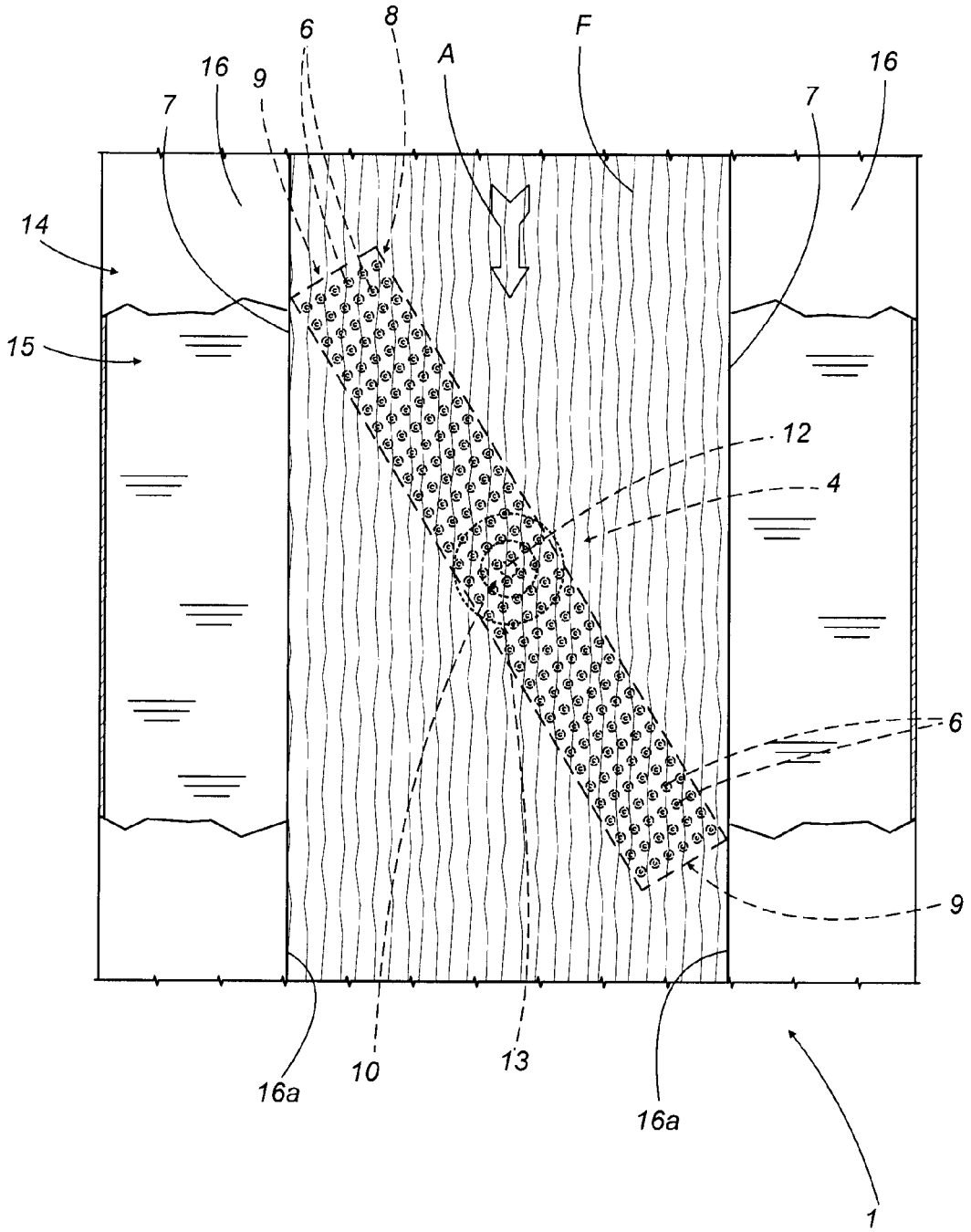
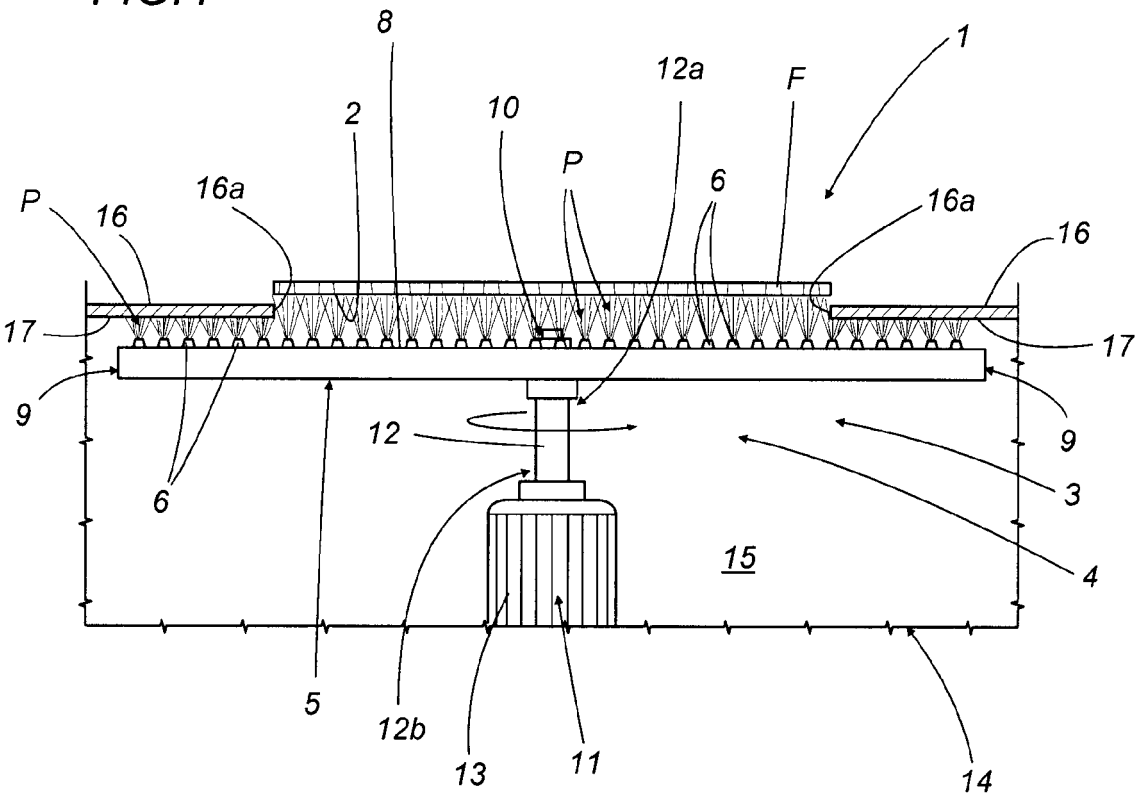


FIG.4



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EUROPEAN SEARCH REPORT

Application Number
EP 07 11 3753

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TECHNICAL FIELDS SEARCHED (IPC)

A24D
B05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	15 November 2007	MARZANO MONTEROSSO

CATEGORY OF CITED DOCUMENTS

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