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(54) UNIT AND METHOD FOR APPLYING AN ADDITIVE ON A CIGARETTE FILTER MANUFACTURING MACHINE

(57) Unit (17) and method for applying an additive on a cigarette filter manufacturing machine (1); at least one strip (13a; 13b) of filtering material is fed over an open-top tank (23); a jet of additive is directed onto the strip (13a; 13b) of filtering material by means of a spray device (26) located inside the tank (23); and in use the spray device (26) is moved inside the tank (23) along a vertical adjusting direction (D) to adjust the distance between the spray device (26) and the strip (13a; 13b) of filtering material.

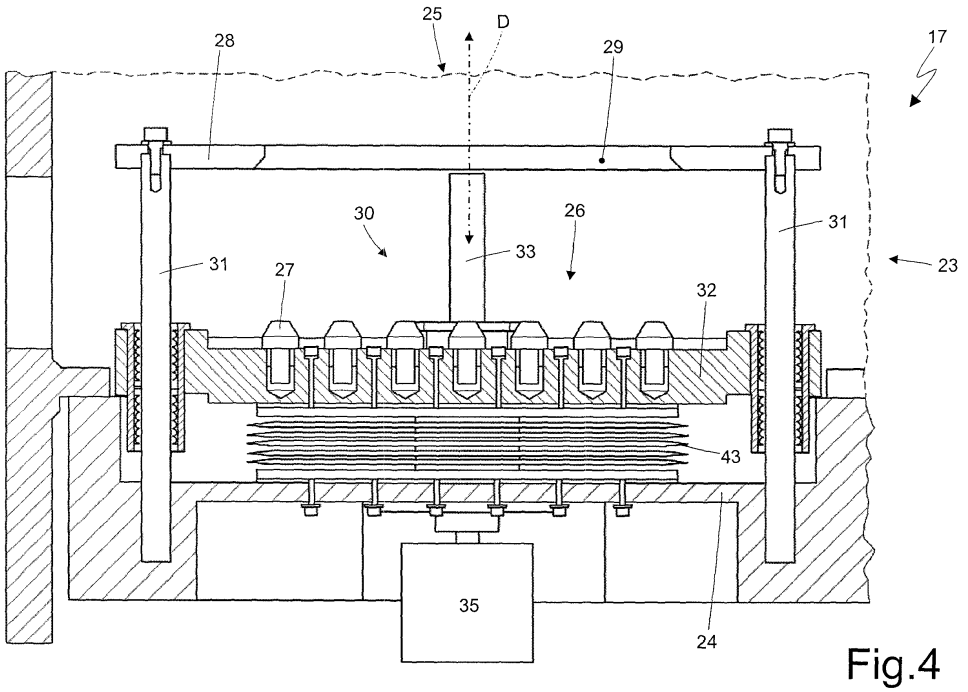

Fig.4

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Description

TECHNICAL FIELD

[0001] The present invention relates to an application unit and method for applying an additive on a cigarette filter manufacturing machine.

[0002] The present invention finds advantageous application in a double packing machine for manufacturing cigarette filters to which the following description will make explicit reference without this implying any loss of generality.

PRIOR ART

[0003] A double packing machine for manufacturing cigarette filters comprising two forming beams for forming respective continuous rods of filter and, for each beam, a feed line of filtering material. The feed lines are suited to receive in turn the filtering material from a conveying line, which extends between an input station of the feed lines themselves and a depository, in which two bales of filtering material are contained. From the bales respective tows of filtering material with circular cross section are drawn, which are fed along the conveyor line up to an intake device which is located at the input station and is suited to transversely spread out the two tows of filtering material so as to form two strips of filtering material with flattened section. Downstream from the intake device the two strips of filtering material are advanced along the respective feed lines and through a straightening unit, through a widening device which is suited to blow air inside the strips of filtering material to increase the volume of the strips themselves, and finally through an application unit for applying an additive, wherein the strips of filtering material are impregnated with chemicals (usually triacetin based) suited for giving flavour and plasticity to the filtering material.

[0004] In an application unit for applying additive it is necessary to be able to adjust the amount of additive that is fed towards each strip of filtering material, both depending on the type of filtering material used, and as a function of the actual operating speed (the additive to be absorbed by the filtering material being equal, the greater the feeding speed of the strip of filtering material is, the greater must be the amount of additive that is fed onto the strip of filtering material). To adjust the amount of additive that is fed to each strip of filtering material various technical solutions have been proposed: for example, it was suggested to modify the feed pressure of the additive onto the application unit, it has been proposed (patent application EP1847188A1) to change the relative orientation between a battery of spray nozzles and the strip of filtering material, or it has been proposed (patent applications WO2012156911A1 and EP1847188A1) to use movable baffles which are arranged inside the application unit and intercept part of the additive before the additive reaches the strip of filtering material. However, the known technical solutions to adjust the amount of additive that is applied to each strip of filtering material does not allow obtaining a very precise and accurate control, because there is a strongly non-linear relationship between the intervention (i.e. the adjustment action) and the effect (i.e. the change in the amount of additive that is fed to each strip of filtering material).

DESCRIPTION OF THE INVENTION

[0005] Object of the present invention is to provide an application unit and a method for applying an additive on a cigarette filter manufacturing machine, in which said unit and method are free from the drawbacks described above, and are at the same time easy and inexpensive to produce.

[0006] According to the present invention an application unit and a method for applying an additive on a cigarette filter manufacturing machine as defined in the appended claims are obtained.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The present invention will now be described with reference to the accompanying drawings, which illustrate a non-limitative embodiment, wherein:

- Figure 1 is a front and schematic view of a double packing machine for manufacturing filters;
- Figure 2 is a plan view of the packing machine of Figure 1;
- Figure 3 is a perspective and schematic view of an application unit for applying an additive which is part of the packing machine of Figure 1 and is produced according to the present invention;
- Figure 4 is a schematic view and in longitudinal section of a part of the application unit of Figure 3; and
- Figure 5 is a schematic view and in cross section of the application unit of Figure 3.

PREFERRED EMBODIMENTS OF THE INVENTION

[0008] In figure 1, number 1 indicates as a whole a double packing machine for manufacturing cigarette filters. The packing machine 1 comprises two forming beams 2a and 2b for forming respective continuous rods 3a and 3b of filter and, for each beam 2a and 2b, a respective feed line 4a and 4b of filtering material. The feed lines 4a and 4b are suited to receive, in turn, the filtering material by a conveyor line 5, which is part of the packing machine 1 and extends between an input station 6 of the feed lines 4a and 4b themselves and a depository 7, in which two bales 8a and 8b of filtering material are contained.

[0009] As illustrated in Figures 1 and 2, from the bales 8a and 8b respective tows 9a and 9b of filtering material with circular cross section are drawn, which are fed along the conveyor line 5 due to the traction imparted to the

tows 9a and 9b of filtering material themselves by a roller traction assembly 10a located at the input station 6.

[0010] The conveyor line 5 comprises a guiding device 11 for the tows 9a and 9b of filtering material located above the bales 8a and 8b and a spreading device 12 located at the input station 6 immediately upstream from the traction assembly 10a and is suited to transversely open up the tows 9a and 9b of filtering material with circular cross section by means of spurts of compressed air so as to form respective strips 13a and 13b of filtering material with flattened section which are then fed to the roller traction assembly 10a.

[0011] Downstream from the traction assembly 10a, the two strips 13a and 13b of filtering material are advanced, along respective feed lines 4a and 4b and in a direction 14 substantially horizontal, through a straightening unit 15, which is constituted by two assemblies 10b and 10c similar to the roller traction assembly 10a. Subsequently, the two strips 13a and 13b of filtering material are advanced, along respective feed lines 4a and 4b in the direction 14, through a widening device 16, which is suited to blow air inside the strips 13a and 13b of filtering material to increase the volume of the strips 13a and 13b of filtering material themselves, and then through an application unit 17, in which the strips 13a and 13b of filtering material are soaked (impregnated) with elasticizing agents (typically triacetin) suited to confer flavour and plasticity to the filtering material. Finally, the two strips 13a and 13b of filtering material are advanced, along respective feed lines 4a and 4b in the direction 14, and through a roller traction assembly 10a 10d, which is similar to the traction assemblies 10a and 10b, 10c and defines an output portion of the feed lines 4a and 4b.

[0012] The feed lines 4a and 4b are connected to the forming beams 2a and 2b through a twisting assembly 18 located immediately downstream from the traction assembly 10d. The twisting assembly 18 receives the strips 13a and 13b of filtering material from the feed lines 4a and 4b, twists the strips 13a and 13b of filtering material themselves to obtain two ropes of filtering material, and feeds said ropes of filtering material to the forming beams 2a and 2b. In each forming beam 2a or 2b the rope of filtering material is fed over a tape 19a or 19b of paper previously rubberized in a gumming station 20 and subsequently wrapped transversely about the rope of filtering material itself to obtain a continuous rod 3a or 3b of filter.

[0013] At the exit of the forming beams 2a and 2b a control station 21 for the density of the rods of filter 3a and 3b and a cutting head 22 are finally arranged, which is suited to cut transversely the rods 3a and 3b themselves to obtain respective successions of filter plugs (not illustrated).

[0014] As shown in Figures 3, 4 and 5, the application unit 17 comprises a tank 23 which contains a plasticizer additive fluid (generally triacetin based) and has a bottom wall 24 and an top opening 25 at which the strips 13a or 13b of filtering material are advanced horizontally (i.e. along a horizontal advancing direction); in other words, each strip 13a or 13b of filtering material is fed over the tank 23 along a horizontal feed direction so as to slide at the top opening 25 of the tank 18 itself.

[0015] The tank 23 houses inside a pair of spray devices 26, each of which directs a jet of additive (i.e. plasticizer fluid) onto a corresponding strip 13a or 13b of filtering material (i.e. to each spray device 26 a corresponding strip 13a or 13b of filtering material is coupled). In the preferred embodiment illustrated in the attached figures, each spray device 26 comprises a plurality (battery) of spray nozzles 27 which are arranged one alongside with the other, are aligned perpendicular to a feed direction of the strips 13a and 13b of filtering material, and are oriented vertically upwards (i.e. onto the strip 13a or 13b of filtering material). According to an alternative embodiment not illustrated, each spray device 26 comprises a rotating brush provided with bristles and partially immersed in a bath of additive; with the rotation of the brush, the bristles 42 collect additive and by means of an abutment, with which the bristles partially interfere during rotation, spray the additive towards the strip 13a or 13b of filtering material.

[0016] The tank 23 comprises two screens 28, each of which is interposed between the corresponding spray device 26 and the strip 13a or 13b of filtering material and has at least one through window (slit) 29 for the passage of the additive onto the strip 13a or 13b of filtering material. Each window 29 has a smaller size than the size of the top opening 25 of the tank 23; furthermore, the width of each window 29 is slightly greater than the width of the strip 13a or 13b of filtering material so as to ensure a proper supply of additive also on the lateral edges of the strip 13a or 13b of filtering material in the event of any misalignment to which the strip 13a or 13b of filtering material may be subjected during the advancement. When the packing machine 1 is stopped, the size of each window 29 is manually adjustable by means of corresponding screws arranged inside the slots.

[0017] The screens 28 are adjustable and/or replaceable in shape, i.e. as a function of the width, the thickness and/or the material of the strips 13a and 13b of the filtering material to be treated. It is important to note that the screens 28 remain completely still during the operation of the packing machine 1 and are adjusted and/or replaced only when the packing machine 1 is stopped and is therefore subject to a tuning operation, or to a shape change operation.

[0018] Inside the tank 23, each spray device 26 is mounted movable along a vertical adjusting direction D to adjust the distance between the spray device 26 and the strip 13a or 13b of filtering material (i.e. to bring the spray device 26 closer to the strip 13a or 13b of filtering material or to remove the spray device 26 from the strip 13a or 13b of filtering material). It is important to note that the adjusting direction D along which each spray device 26 is moved is perpendicular to the lying plane (oriented horizontally) of the strip 13a or 13b of filtering material and is also perpendicular to the feed direction (also ori-

ented horizontally) of the strip 13a or 13b of filtering material, in addition, each spray nozzle 27 is oriented vertically, i.e. parallel to the adjusting direction D.

[0019] Each spray device 26 is coupled to a specialized electrically controlled actuating device 30 which moves the spray device 26 in the vertical adjusting direction D. In particular, in the tank 23 and for each spray device 26 two guides 31 are provided, which are arranged in a fixed position inside the tank 23 at a certain distance from one another, which protrude projecting from the bottom wall 24 of the tank 23 itself, and are oriented vertically, i.e. parallel to the adjusting direction D. Each spray device 26 comprises a rigid supporting body 32 which is fitted to the guides 31 to slide along the same guides 31 parallel to the adjusting direction D and supports the spray nozzles 27 of the spray device 26 itself; in particular, each supporting body 32 has two through holes, through which the corresponding guides 31 slide. Each actuating device 30 is mechanically interposed between the tank 23 (in particular the bottom wall 24 of the tank 23) and the supporting body 32 to adjust the position of the supporting body 32 itself along the guides 31 (i.e. in the adjusting direction D).

[0020] According to a preferred (but not binding) embodiment, each actuating device 30 comprises a screw 33 located in an axially fixed position inside the tank 23, is oriented parallel to the vertical adjusting direction D and is inserted inside a threaded hole 34 formed through the supporting body 32; obviously the thread of the screw 33 meshes with the thread of the threaded hole 34 so as to establish a mechanical coupling, stable and reliable between the screw 33 and the supporting body 32. In addition, each actuating device 30 comprises an electric motor 35 for rotating the screw 33 both ways to determine a consequent axial sliding of the supporting body 32 along the screw 33 and therefore in the adjusting direction D.

[0021] According to a preferred (but not binding) embodiment, each screen 28 (which is interposed between the spray device 26 and the strip 13a or 13b of filtering material) is supported and rigidly fixed (typically by means of corresponding screws shown in Figure 4) to the tops of the guides 31. In essence, the two guides 31 also perform the function of supporting the screen 28.

[0022] For each spray nozzle 27 a corresponding feed conduit 36 is provided, which feeds the additive to the spray nozzle 27 and comprises, among other things, a flexible hose 37 that deforms elastically as the spray nozzle 27 moves (together with the supporting body 32) in the vertical adjusting direction D. In particular, the flexible hose 37 that forms an intermediate part of each feed conduit 36 is made of elastic material and forms a loop, so as to accompany, with an elastic deformation devoid of relevant mechanical stress, the movement of the spray nozzle 27 (together with the supporting body 32) in the vertical adjusting direction D. Upstream from each flexible hose 37 a solenoid valve 38 is provided, which is hydraulically arranged along the corresponding feed conduit 36 and is electronically controllable to open or close (and possibly reduce) the feed conduit 36 itself. In other words, each spray nozzle 27 is controlled by a corresponding solenoid valve 38 which activates or stops (and possibly reduces) the supply of additive through the spray nozzle 27 itself.

[0023] Each spray device 26 comprises a corresponding electro-actuated circulating pump 39, which has an intake that draws the additive both inside the tank 23 (recycling the additive which has been previously sprayed by the nozzles 27 but was not retained by the strips 13a and 13b of filtering material), and from an outside tank. Furthermore, each circulating pump 39 has a delivery side which feeds the additive under pressure to all the spray nozzles 27 of the corresponding spray device 26; in particular, a manifold 40 is provided which receives the additive under pressure from the delivery side of the corresponding circulating pump 39 and distributes the additive under pressure to all the corresponding solenoid valves 38 (from which the additive under pressure reaches to the spray nozzles 27).

[0024] A final portion 41 of each feed conduit 36 close to the spray nozzle 27 is rigid (i.e. is made of non deformable rigid material) and slides freely inside a through-hole 42 formed through the bottom wall 24 of the tank 23 so as to accompany the movement of the spray nozzle 27 (together with the supporting body 32) in the vertical adjusting direction D. According to a preferred (but not limiting) embodiment, a flexible corrugated tube 43 is provided, which is located around the end portions 41 of all feed conduits 36 of the same spray device 26 and deforms elastically during the movement of the spray nozzles 27 (together with the supporting body 32) in the vertical adjusting direction D. In particular, the flexible tube 43 is sealingly fixed on one side to the supporting body 32 and on the opposite side is sealingly fixed to the bottom wall 24 of the tank 23 so as to isolate the end portions 41 of the feed conduits 36 and mainly the corresponding through holes 42 from the bath of additive on the bottom of the tank 23.

[0025] According to a possible embodiment, the atomization of the additive exiting the spray nozzles 27 could take place by exploiting a flow of compressed air inside of which the additive is fed at a relatively low pressure; in other words, operation takes place with the particularly reduced pressure of the additive and the additive is atomized by mixing the additive with compressed air suitably adjusted in pressure.

[0026] According to a possible embodiment not illustrated, for each strip 13a or 13b of filtering material two spray devices 26 opposite one to the other are provided, which are arranged on opposite sides of the strip 13a or 13b of filtering material so as to apply the additive on both the opposite faces of the strip 13a or 13b of the filtering material itself; in this embodiment, only one spray device 26 (typically the lower spray device 26) may be movable in the vertical adjusting direction D towards and away from the strip 13a or 13b of filtering material, or

both spray devices 26 may be movable in the vertical adjusting direction D towards and away from the strip 13a or 13b of filtering material.

[0027] According to a possible embodiment electric heaters are provided which are arranged close to each spray device 26 (typically in the corresponding manifold 40) and are controlled to maintain the temperature of the additive equal to a generally predetermined optimum temperature; preferably, the electric heaters are controlled in feedback by using one or more temperature sensors arranged in contact with the additive.

[0028] According to a preferred embodiment, the application unit 17 comprises a closing lid (not illustrated) for the tank 23 located over the tank 23 itself. Preferably, the tank 23 has, parallel to the feed direction of the strips 13a and 13b of filtering material, a respective lid supporting bracket which keeps the lid at a certain distance from the laying plane of the strips 13a and 13b of filtering material, so as to allow the free sliding of the strips 13a and 13b of filtering material themselves.

[0029] During operation of the packing machine 1, i.e. during operation of the application unit 17, in the tank 23 it is possible to move each spray device 26 in the vertical adjusting direction D to adjust the distance between the spray device 26 and the strip 13a or 13b of filtering material, and then change the setting for applying the additive on the strip 13a or 13b of filtering material itself (or adjust the amount of additive that is fed onto the strip 13a or 13b of filtering material). In particular, by distancing the spray device 26 from the strip 13a or 13b of filtering material the amount of additive that is fed onto the strip 13a or 13b of filtering material is decreased, while by approaching the spray device 26 to the strip 13a or 13b of filtering material the quantity of additive which is fed onto the strip 13a or 13b of filtering material is increased.

[0030] By varying the distance between the spray device 26 and the strip 13a or 13b of filtering material two effects are obtained. First, by varying the distance between the spray device 26 and the strip 13a or 13b of filtering material the impact speed of the additive micro-drops onto the strip 13a or 13b of filtering material varies, therefore the penetration capacity of the additive micro-drops onto the strip 13a or 13b of filtering material varies; in particular, by increasing the distance between the spray device 26 and the strip 13a or 13b of filtering material the speed of impact of the additive micro-drops onto the strip 13a or 13b of filtering material decreases, and therefore the penetration capacity of the additive micro-drops onto strip 13a or 13b of filtering material decreases and consequently the amount of additive that is fed to the strip 13a or 13b of filtering material decreases. Furthermore, by varying the distance between the spray device 26 and the strip 13a or 13b of filtering material the mechanical interaction between the cone of additive sprayed from each spray nozzle 27 and the window 29 of the screen 28 varies; in particular, by increasing the distance between the spray device 26 and the strip 13a or 13b of filtering material the cone of additive sprayed from each spray nozzle 27 is more open when impacting onto the screen 28, therefore the fraction of the additive that crosses the window 29 decreases and consequently the amount of additive that is fed to the strip 13a or 13b of filtering material decreases.

[0031] It is important to emphasize that the adjustment of the distance between each spray device 26 and the strip 13a or 13b of filtering material may be combined with other expedients intended to regulate the amount of additive that is applied to the strip 13a or 13b of filtering material itself; for example it could be possible to change the supply pressure of the additive towards each spray device 26 or movable partitions may be used which are located inside the tank 23 and intercept part of the additive before the additive reaches the strips 13a and 13b of filtering material.

[0032] In the preferred embodiment illustrated in the attached figures, at the application unit 17 the strips 13a and 13b of filtering material are fed horizontally and the spray devices 26 spray vertically onto the strips 13a and 13b of filtering material; consequently, the adjusting direction D is oriented vertically. According to a different embodiment not shown, at the application unit 17 the strips 13a and 13b of filtering material are fed vertically and the spray devices 26 spray horizontally onto the strips 13a and 13b of filtering material; consequently, the adjusting direction D is oriented horizontally.

[0033] The application unit 17 described above has numerous advantages.

[0034] In the first place, the application unit 17 described above allows to adjust in a very effective, accurate and precise way the quantity of additive that is applied to each strip 13a or 13b of filtering material when the packing machine 1 is operative. In particular, in the application unit 17 a relationship exists, almost completely linear, between the intervention (i.e. the adjustment action that is actualized in moving each spray device 26 in the adjusting direction D) and the effect (i.e. the change in the amount of additive that is fed to each strip 13a or 13b of filtering material); in this way, the control of the quantity of additive that is fed to each strip 13a or 13b of filtering material is simple and precise.

[0035] Moreover, the application unit 17 described above is simply and inexpensively produced, since, with respect to a similar known application unit, has easily implementable modifications.

Claims

1. An application unit (17) for applying an additive on a cigarette filter manufacturing machine (1); the application unit (17) comprising:

   an open-top tank (23) over which at least one strip (13a; 13b) of filtering material is fed; and
   a spray device (26) located inside the tank (23) and which directs a jet of additive onto the strip

(13a; 13b) of filtering material;
the application unit (17) being **characterized in that**, inside the tank (23), the spray device (26) is mounted to move in an adjusting direction (D) to adjust the distance between the spray device (26) and the strip (13a; 13b) of filtering material.

2. An application unit (17) as claimed in Claim 1, and comprising an electrically controlled actuating device (30) for moving the spray device (26) in the adjusting direction (D).

3. An application unit (17) as claimed in Claim 1 or 2, and comprising:

at least one guide (31) located in a fixed position inside the tank (23) and parallel to the adjusting direction (D); and
a supporting body (32) which supports the spray device (26) and is fitted to, to run along, the guide (31).

4. An application unit (17) as claimed in Claim 3, and comprising a screen (28) which is interposed between the spray device (26) and the strip (13a; 13b) of filtering material, has at least one through window (29) allowing passage of the additive onto the strip (13a; 13b) of filtering material, and is fixed rigidly to the top of the guide (31).

5. An application unit (17) as claimed in Claim 3 or 4, and comprising an electrically controlled actuating device (30) for moving the spray device (26) in the adjusting direction (D).

6. An application unit (17) as claimed in Claim 5, wherein the actuating device (30) comprises:

a screw (33) which is located in an axially fixed position inside the tank (23), is oriented parallel to the adjusting direction (D), and is inserted inside a threaded hole (34) formed through the supporting body (32); and
an electric motor (35) for rotating the screw (33) both ways.

7. An application unit (17) as claimed in one of Claims 1 to 6, wherein the spray device (26) comprises at least one spray nozzle (27) oriented parallel to the adjusting direction (D).

8. An application unit (17) as claimed in Claim 7, and comprising a feed conduit (36) for feeding additive to the spray nozzle (27), and which comprises a flexible hose (37) which deforms elastically as the spray nozzle (27) moves in the adjusting direction (D).

9. An application unit (17) as claimed in Claim 7 or 8, and comprising a circulating pump (39) having an intake, which draws additive both from the tank (23) and from an outside tank, and a delivery side which feeds the additive under pressure to the spray nozzle (27).

10. An application unit (17) as claimed in Claim 7, 8 or 9, and comprising:

a feed conduit (36) for feeding the additive to the spray nozzle (27); and
a flexible corrugated tube (43) which surrounds an end portion (41) of the feed conduit (36), close to the spray nozzle (27), and deforms elastically as the spray nozzle (27) moves in the adjusting direction (D).

11. An application unit (17) as claimed in Claim 10, wherein the end portion (41) of the feed conduit (36) slides freely inside a through hole (42) formed through a bottom wall (24) of the tank (23).

12. A method of applying an additive on a cigarette filter manufacturing machine (1); the method comprising the steps of:

feeding at least one strip (13a; 13b) of filtering material over an open-top tank (23); and
directing a jet of additive onto the strip (13a; 13b) of filtering material by means of a spray device (26) located inside the tank (23);
the method being **characterized by** comprising the further step of moving the spray device (26), inside the tank (23), in an adjusting direction (D) to adjust the distance between the spray device (26) and the strip (13a; 13b) of filtering material.

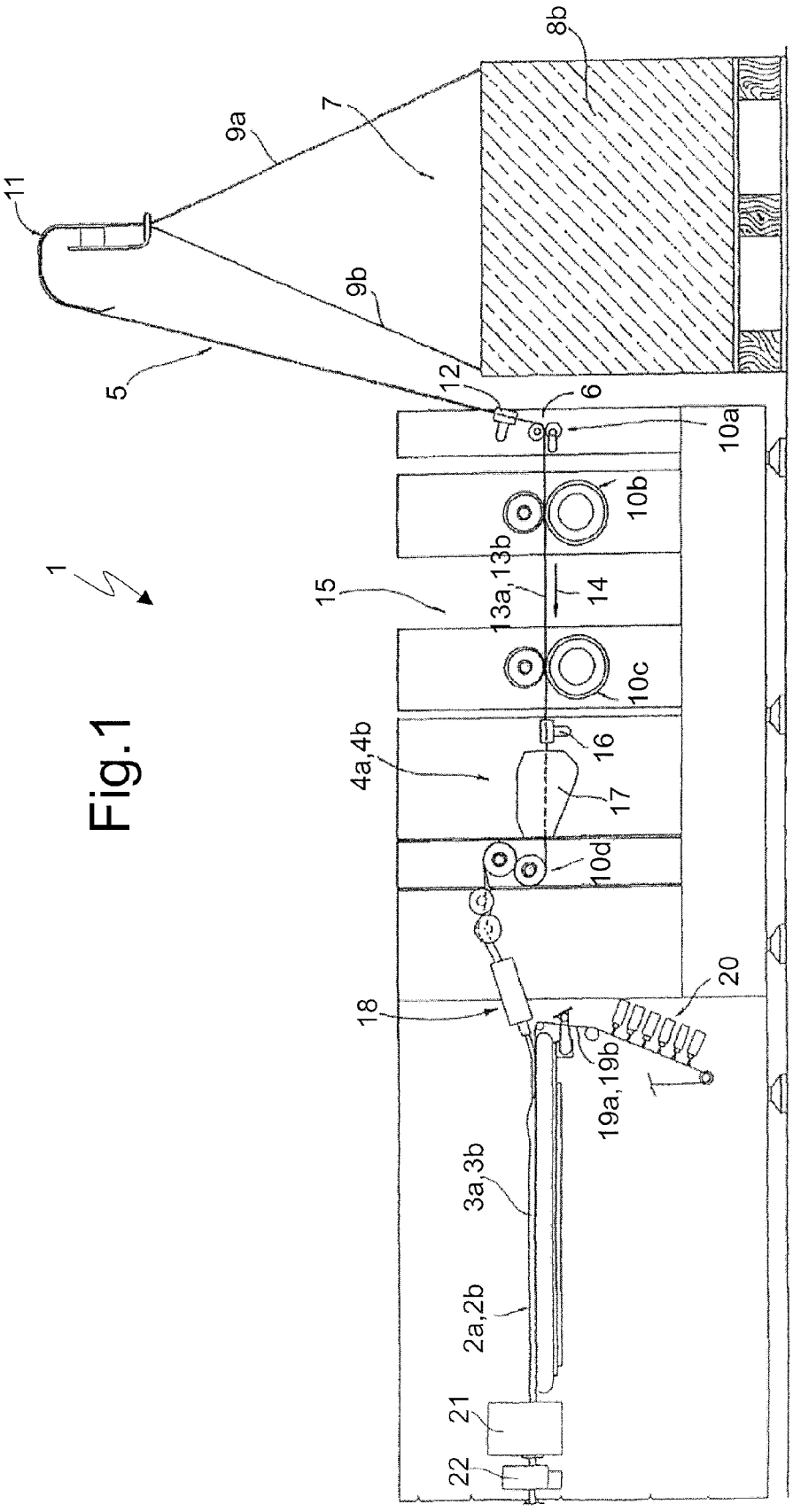
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Fig.1

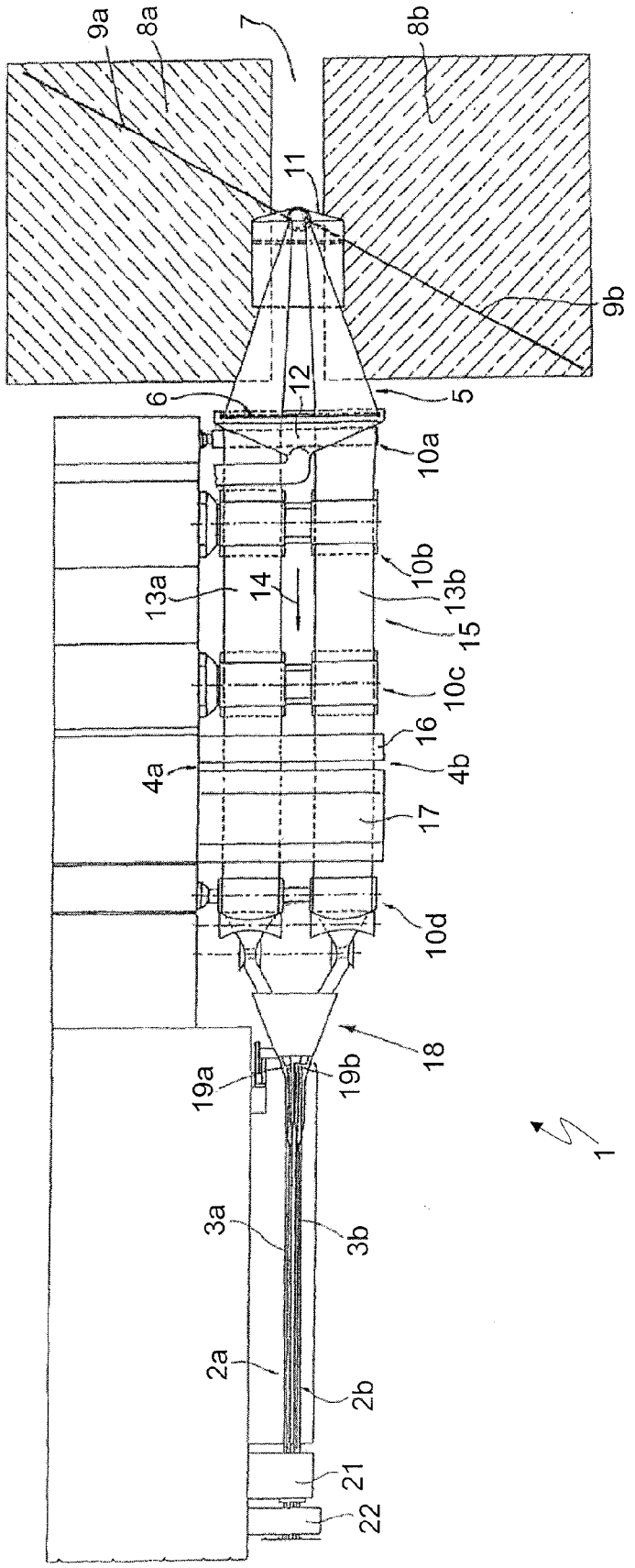
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Fig.2

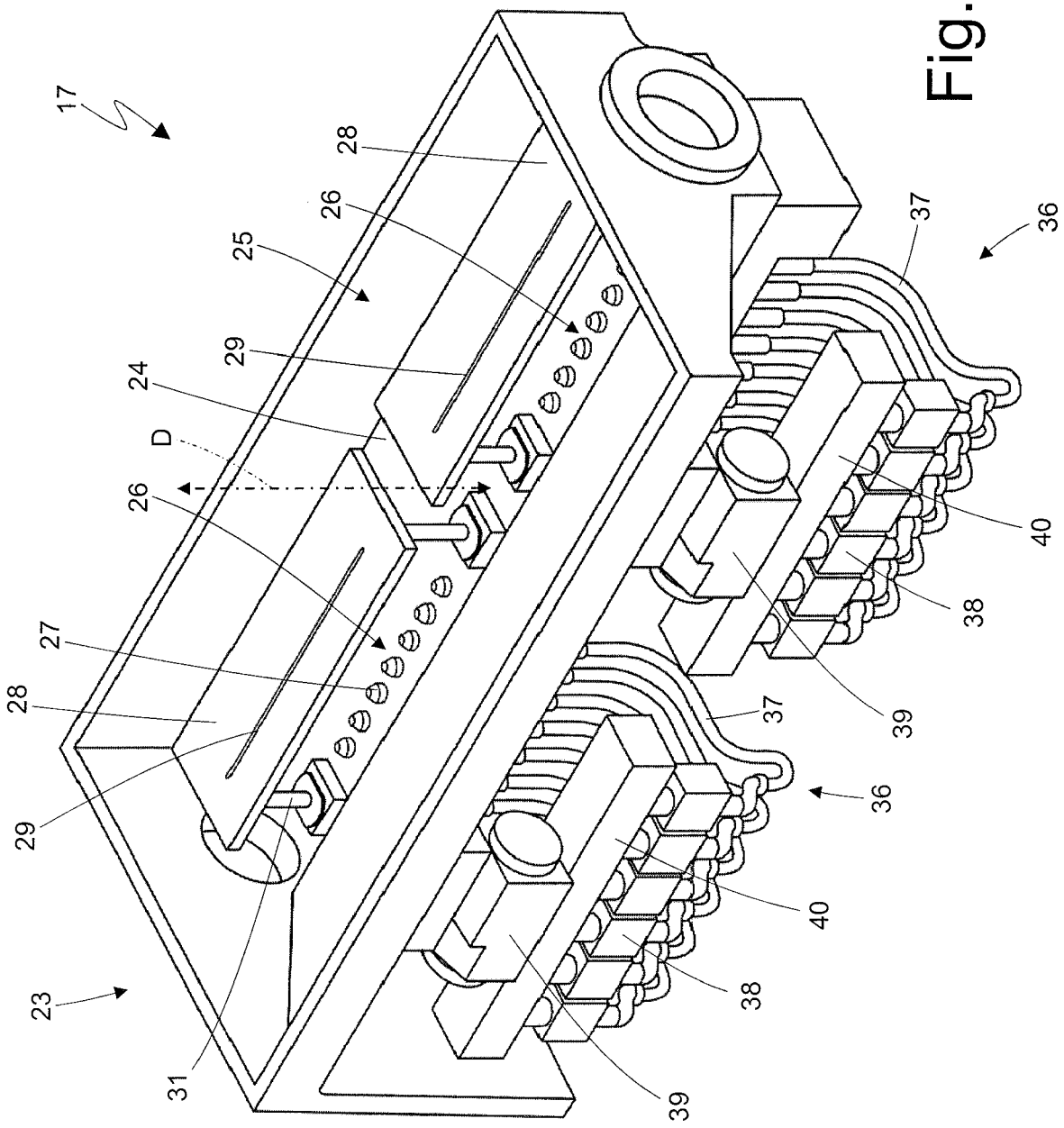

Fig.3

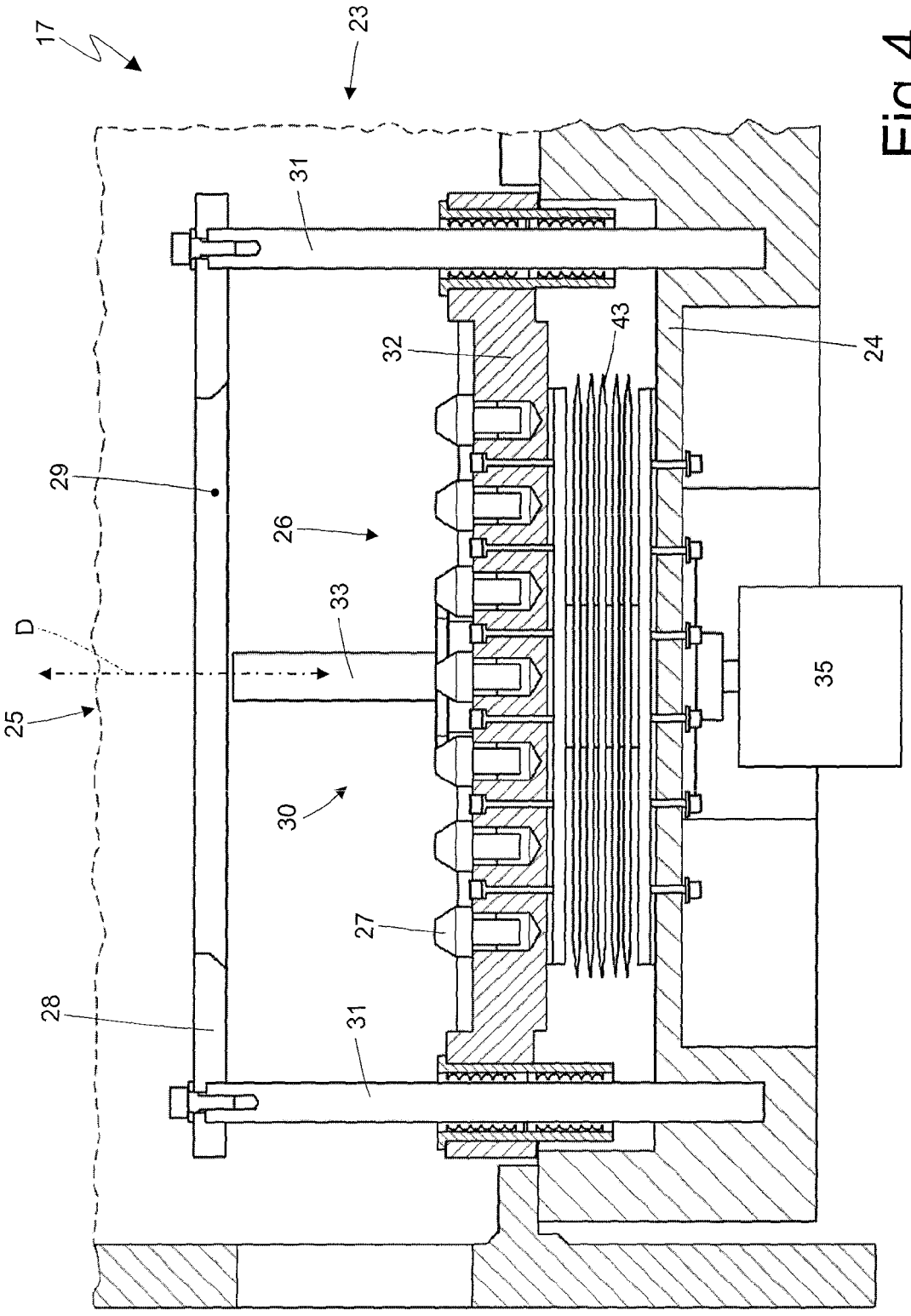

Fig.4

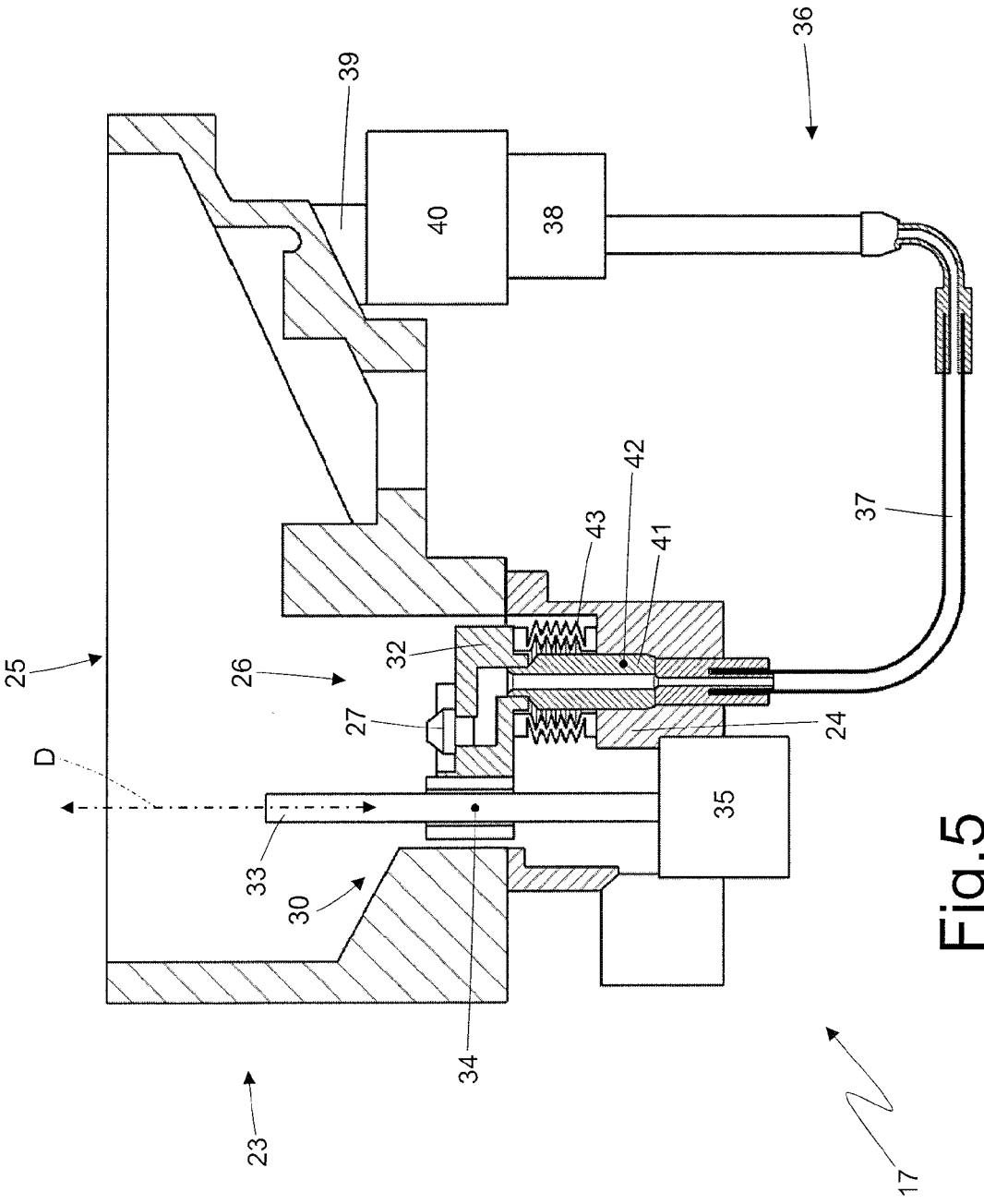

Fig.5

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European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 15 19 1346

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,D	EP 1 847 188 A1 (GD SPA [IT]) 24 October 2007 (2007-10-24) * paragraph [0026] - paragraph [0044]; figures *	1-12	INV. A24D3/02 B05B15/04 B05B15/08
A	US 6 190 727 B1 (THAGGARD CHARLES E [US]) 20 February 2001 (2001-02-20) * abstract; figures *	1-12	
A	EP 1 886 589 A1 (GD SPA [IT]) 13 February 2008 (2008-02-13) * abstract; figures *	1-12	
A	EP 1 834 529 A1 (HAUNI MASCHINENBAU AG [DE]) 19 September 2007 (2007-09-19) * paragraph [0055] - paragraph [0062]; figures *	1-12	
A	DE 10 2012 101024 A1 (HAUNI MASCHINENBAU AG [DE]) 8 August 2013 (2013-08-08) * paragraph [0034] - paragraph [0037]; figures *	1-12	TECHNICAL FIELDS SEARCHED (IPC)
A	DE 103 54 924 A1 (HAUNI MASCHINENBAU AG [DE]) 30 June 2005 (2005-06-30) * paragraph [0039] - paragraph [0040]; figure 5 *	1-12	A24D B05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 March 2016	Marzano Monterosso

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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L : document cited for other reasons

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 15 19 1346

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