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(71) Applicant: **Jaume Anglada Viñas S.A.**
08120 La Llagosta (ES)

(72) Inventor: **ANGLADA VIÑAS, Jaume**
08120 La Llagosta (ES)

(74) Representative: **Curell Suñol S.L.P.**
Via Augusta 21
08006 Barcelona (ES)

(54) MACHINE FOR THE FINISHING TREATMENT OF A TEXTILE WEB AND CORRESPONDING METHOD

(57) The invention relates to a machine (1) and method for the finishing treatment of a textile web (100), comprising first and second accumulation chambers (4, 6) with first and second take-up areas (8, 10). Said machine (1) also comprises a conveyance duct (12) extending between first and second ends (14, 16) and communicating the first and second chambers (4, 6) with one another. The duct (12) furthermore has first and second gas inlets (22, 24). The first gas inlet (22) is provided inside the duct (12), at the first end (14) and in a position adjacent to the first chamber (4). The second gas inlet (24) is provided inside the duct (12), at the opposite second end (16) and adjacent to the second chamber (6) so as to move the textile web in an alternating manner between the first and second chambers and make it impact at least one impact element (2, 36, 38).

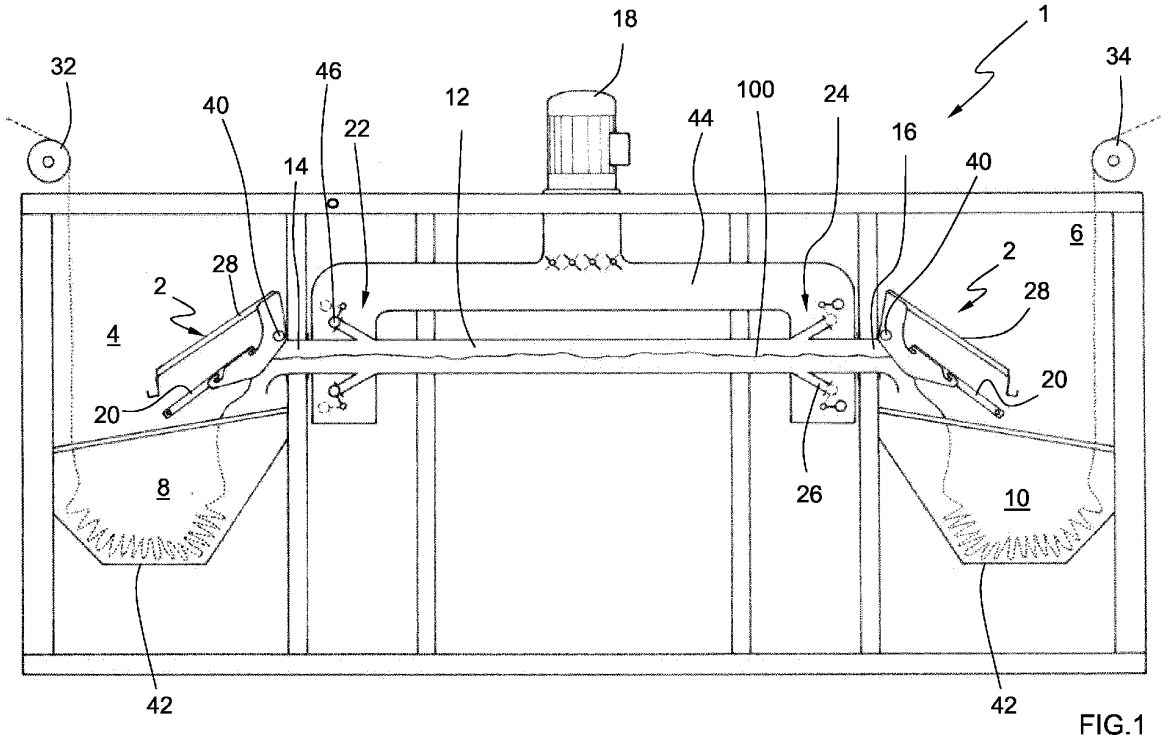

FIG.1

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Description

Field of the invention

[0001] The invention relates to a machine for the finishing treatment of a textile web comprising first and second accumulation chambers for accumulating said web with first and second take-up areas for taking up said web, a conveyance duct having a length extending between first and second ends, said duct communicating said first and second chambers with one another, said duct being configured so that, during treatment, said web is conveyed inside said duct widthwise, said duct comprising first and second gas inlets, and said machine further comprising gas drive means functionally connected with said duct so that, during treatment, a gas is insufflated inside said duct in an alternating manner through said first and second gas inlets, and with said first gas inlet being oriented such that, during treatment, said gas circulates towards said second chamber, and with said second gas inlet being oriented such that, during treatment, said gas circulates towards said first chamber, and at least one impact element arranged so that, during treatment, said web impacts said at least one impact element.

[0002] Furthermore, the machine relates to a method for the finishing treatment of a textile web in a machine comprising: first and second accumulation chambers for accumulating said web with first and second take-up areas for taking up said web, and a conveyance duct of length extending between first and second ends, said duct communicating said first and second chambers with one another, said duct being configured so that, during treatment, said web is conveyed inside said duct widthwise.

State of the art

[0003] Machines for the treatment of textile webs by making the web impact a surface are known in the state of the art. In these machines, the textile web is moved along a conveyance duct between first and second accumulation chambers for accumulating web, conveyed by means of a drive gas, such as, for example, air insufflated into the conveyance duct by fan-type, centrifugal pump-type, or similar type operating means.

[0004] Document ES 2593839 A1 discloses an example of machines of this type. At the outlet of the duct which is located between both accumulation chambers for accumulating web, there are provided passive impact elements. These impact elements are, for example, panels which, arranged facing the respective outlet of the duct, functionally interact with the web. The passive striking consists of the web impacting these passive or stationary impact elements. The impact force of the web is proportional to the movement speed thereof. Thus, the higher the movement speed of the web, the more intense is the impact occurring in the web upon impacting the respective panel. This treatment is known as tumbling. Tumbling makes the textile web have a smoother, more flexible, and bulkier texture because it relaxes the structure of the web.

[0005] To achieve movement of the web, in the central area of the conveyance duct there are provided first and second gas inlets. The first and second gas inlets respectively include a plurality of nozzles. This plurality of nozzles is provided respectively in the upper part and lower part of the duct. The nozzles of the first gas inlet are inclined such that they form an angle which directs the gas towards the second accumulation chamber for accumulating web. In turn, the nozzles of the second gas inlet are inclined such that they form an angle which directs the gas towards the first accumulation chamber for accumulating web. Thus, in operation, the air outlet of the first or second gas inlets is completely or partially blocked to cause the movement of the web towards the corresponding accumulation chamber. Thanks to that, the web can be moved without contact with the duct between both accumulation chambers.

[0006] This type of machine is widely used for treating preferably, but not exclusively, towel-type textile webs. Up until now, the machine worked satisfactorily, meeting previous consumer demands. Nevertheless, new needs or trends in relation to the finishing of textile web have recently emerged. For some time now, consumers want the textile web to have an even softer texture than what was common in the art. In other cases, consumers want a textile web with an aged appearance.

[0007] One of the problems in the machine of document ES 2593839 A1 is that in order to achieve a different finish, the force with which the web impacts the impact element must be increased. The greater the level of impact of the web with the impact panel, the higher the level of broken fibers. This has a direct effect on the hand and appearance of the web, that is, it is softer and/or more aged. Nevertheless, to achieve intensive treatment of a web it is necessary to insufflate a very large air flow. This requires over-sizing the operating means and/or greatly increasing the blowing power. The consequences of these means are additional costs and a higher energy consumption of the machine.

Summary of the invention

[0008] The object of the invention is a machine for the finishing treatment of a textile web of the type indicated above, which allows applying more intense finishes, without negatively affecting the manufacturing costs of the machine, or the energy consumption thereof.

[0009] This purpose is achieved by a machine for the finishing treatment of a textile web of the type indicated at the beginning, characterized in that said first gas inlet is provided inside said duct, at said first end and in a position adjacent to said first chamber, and said second gas inlet is provided inside said duct, at said opposite second end of said duct and adjacent to said second

chamber.

[0010] In the invention, finishing treatment does not necessarily mean that it is the last treatment applied to a textile web, but rather it is simply a treatment applied on its surface to improve or modify its structure and hand.

[0011] Unlike the machines of the state of the art in which the gas inlets are in the center of the duct, the gas inlets of the machine according to the invention are at the first and second ends of the duct. Thanks to that, the duct segment along which the textile web is conveyed by the mass of air is elongated. Thanks to that, at the same blowing speed with respect to machines of the state of the art, the conveyance speed of the web upon reaching the end of the duct, before impacting the impact element, will be noticeably higher than the speed of the web in the machines of the state of the art. This leads to a higher intensity in the impact with the impact element, and accordingly to a more intensive treatment.

[0012] Despite this fact, it is not necessary to increase blowing speed of the operating means, but rather the increase in displacement speed of the web is based solely and exclusively on the increase in the length of the conveyance path of the web. All this makes the machine more flexible, which allows increasing the range of the types of treatment applied to the textile web.

[0013] Alternatively, if the intention is to merely obtain the same intensity of impact with the impact element, air speed can be reduced. Therefore, energy consumption of the machine is reduced.

[0014] In relation to the drive gas according to the invention, preferably the gas is dry air. Nevertheless, water vapor or vapors of other similar gases can also be used.

[0015] Therefore, the machine according to the invention provides a simple system so that different types of treatment can be carried out, without needing to install more blowing power or increase the blowing speed.

[0016] The invention further includes a number of preferred features that are object of the dependent claims and the utility of which will be highlighted hereinafter in the detailed description of an embodiment of the invention.

[0017] Preferably, said machine comprises a feed duct which fluidically connects said driving means and said conveyance duct through said first and second ends of said conveyance duct.

[0018] In a preferred embodiment the objective of which is to maximize the speed of the web at the outlet of the duct, said first gas inlet is provided in the first third of the length of said conveyance duct and preferably in the first fourth of the length, and said second gas inlet is provided in a position of said duct that is mirror-symmetrical to said first gas inlet. The closer the gas inlets are to the ends, the more length of the duct is available, and therefore a higher movement speed of the web is achieved at the opposite end of the duct.

[0019] In order to achieve a smooth but at the same time effective impact, by way of brushing against the surface of the textile web, said at least one impact element comprises at least one first impact element which is arranged inside said conveyance duct, said first impact element being movable between: a passage position of said web, in which, during treatment, said first impact element is arranged such that said web passes freely through said duct without impacting said first impact element, and an impact position of said web, in which, during treatment, said first impact element is arranged such that said web passes through said duct impacting said first impact element. This impact element can be, for example, in the center of the conveyance duct.

[0020] To increase the speed of the treatment and therefore reduce the machine operating energy cost, said at least one impact element further comprises at least one second impact element which is arranged inside said conveyance duct, said impact element being movable between a passage position of said web, in which, during treatment, said second impact element is arranged such that said web passes freely through said duct without impacting said second impact element, while said first impact element is in the impact position, and an impact position of said web, in which, during treatment, said second impact element is arranged such that said web passes through said duct impacting said second impact element, while said first impact element is in said passage position. As a result of the second impact element, the web can be treated in both movement directions of the web.

[0021] Once again, to even further increase the speed of applying the treatment, the machine comprises at least two first and two second impact elements, each of said first impact elements being arranged respectively on opposite faces of said duct and each of said second impact elements being arranged respectively on opposite faces of said duct. Therefore, the web can be treated simultaneously on both faces.

[0022] In another preferred embodiment the objective of which is to soften the hand of the web, said first and second impact elements of one face of said duct are offset in the longitudinal direction with respect to said first and second impact elements of the opposite face of said duct. This alternating arrangement of the impact elements causes the web upon moving to carry out a winding motion during the movement, slightly impacting the impact elements or brushing against them and therefore causes the fibers to become even softer.

[0023] To generate an impact with the greatest possible energy, and therefore the most effective treatment possible, in a preferred embodiment said at least one first impact element is arranged in the first third of the length L of said conveyance duct, and said at least one second impact element is provided in said duct in a position that is mirror-symmetrical to said first impact element.

[0024] For the purpose of increasing the number of high-intensity impacts per processing step, in another optional embodiment said at least one impact element comprises at least one third impact element arranged

facing the outlet of one of said first and second ends so that, during treatment, said web impacts said at least one third impact element. It is indeed at the outlet of the duct where the web has the highest speed, and therefore the impact is more efficient.

[0025] Also for the purpose of making the machine flexible in terms of treatment intensity of the web, in another optional embodiment said at least one third impact element is mounted so as to be movable with respect to the rest of the machine for adjusting the distance and/or angle of said at least one third impact element with respect to said duct.

[0026] Another problem that is considered in the invention is for modifications to the arrangement of the third impact elements to be as quick as possible and provide maximum flexibility. To that end, said at least one third impact element is optionally mounted so as to rock around a rocking shaft, said shaft being perpendicular to the longitudinal direction of said conveyance duct, and where said third impact element may adopt any angular position from an upper position, in which said third impact element is spaced apart from said duct, and a lower position, in which said third impact element is close to said duct. The variation of the angle of inclination of the third impact element allows transitioning from a pure striking treatment, if the angle is very small with respect to the vertical direction, to an effect of rubbing the surface of the web, when the angle of inclination is large with respect to the vertical direction.

[0027] In another embodiment the objective of which is prevent the web from becoming disarranged when it is placed in the take-up areas of the respective take-up chambers, the third impact element further comprises a deflector panel with said deflector panel being mounted so as to divert the direction of said drive gas coming out of said impact panel in the take-up direction for taking up said textile web.

[0028] It is particularly preferred for the third impact element to be an impact panel that is, for example, metallic, metallic with different shapes on the front or rear surfaces, metallic with mineral elements on the impact surfaces, or metallic with an at least partially rough surface coating, or metallic with abrasive material inlays, which provides sufficient weight for having an optimized fastening, taking advantage of the weight of the impact panel and providing different finish characteristics.

[0029] In an optional embodiment the objective of which is to achieve a panel having a simple and cost-effective manufacture, said impact panel comprises a perimetral chassis and first and second arrangements of bars, which are adjacent to one another and not coplanar and mounted in said chassis to respectively form said front and rear surfaces.

[0030] Thus, the front surface is formed by the first arrangement of bars, which are preferably arranged with their axes being coplanar. In turn, the rear surface is formed by the second arrangement of bars, which are preferably arranged with their axes being coplanar. The axes of the first and second arrangements are not coplanar.

[0031] In one embodiment the objective of which is to provide a different treatment in a simple manner, the bars of said first and second arrangements of bars have one or more cross sections of the group formed by circles, triangles, squares, triangles open at the base, U-shaped with a square base, U-shaped with a circular base, C-shaped, or combinations thereof.

[0032] In another alternative embodiment, said impact panel comprises a perimetral chassis and a first arrangement of bars parallel to one another, mounted in said chassis so as to respectively form said front and rear surfaces and the side of said bars which forms said front surface is made of a different material than the side of the bars which forms said rear surface. Preferably, the bars are bars of a metallic material such as steel, aluminum, or the like, while the other material are abrasive minerals such as pumice-type stones, popularly known as pumice stone, basalt stones, stone and cement aggregates, or the like.

[0033] In a preferred embodiment, said bars are formed by a plurality of hollow metallic tubes and abrasive minerals, said tubes forming a housing extending in the longitudinal direction of the bar, and said abrasive minerals protruding from said hollow metallic tubes.

[0034] Preferably for a more homogeneous distribution of the flow of gas, the machine comprises a plurality of first and second gas inlets.

[0035] In another embodiment, which seeks a maximum reduction in losses due to friction, said at least first and second gas inlets are provided in the upper part and lower part of said duct.

[0036] The invention also relates to a method for the finishing treatment of a textile web in a machine according to the invention comprising the steps of insufflating air into said conveyance duct in an alternating manner from said first or second ends, and making said web impact at least one impact element.

[0037] Likewise, the invention also includes other detail features illustrated in the detailed description of an embodiment of the invention and in the attached figures.

Brief description of the drawings

[0038] Further advantages and features of the invention will become apparent from the following description, in which, without any limiting character, preferred embodiments of the invention are disclosed, with reference to the accompanying drawings in which:

Figure 1 shows a longitudinally sectioned schematic view of a machine according to the invention.

Figure 2 shows a longitudinally sectioned detail view of a first embodiment of the conveyance duct.

Figure 3 shows a longitudinally sectioned detail view of a second embodiment of the conveyance duct.

Figure 4 shows a detail view of a machine according

to the invention with the conveyance duct of Figure 3.

Detailed description of embodiments of the invention

[0039] A first embodiment of a machine 1 according to the invention for the treatment of a textile web 100 can be seen in Figures 1 and 2.

[0040] In general, the machine 1 is split into first and second accumulation chambers 4, 6 for accumulating the web 100. In this embodiment, the web 100 enters the first chamber 4 through the upper part of the machine 1 by means of a feed roller 32 and is extracted from the second chamber 6 through the upper part of the opposite end by means of an extraction roller 34.

[0041] The feed roller 32 introduces a sufficient amount of web 100 into the second chamber 6 for it to accumulate in a first lower take-up area 8 of the machine 1, which consists of a basket 42. The latter is sized so as to receive the entire width of the web 100, preventing the formation of creases in the web because of the width of the basket 42. Likewise, the extraction roller 34 does not pull the textile web 100 until a certain amount of web 100 has accumulated in the second take-up area 10. Precisely these accumulations of web 100 leave a sufficient amount of web 100 that is not tensioned so as to enable applying the alternating treatment of the web 100 described below.

[0042] On the other hand, the machine 100 comprises a conveyance duct 12 of length L extending between first and second ends 14, 16. It is important to differentiate between and not confuse the ends of the duct, that is, the final segment of each side of the duct 12, with the outlet point. The duct 12 communicates the first and second chambers 4, 6 with one another. The duct 12 of the machine 100 according to the invention is wide enough so that, during treatment, the web 100 is conveyed in its inner duct 12 widthwise, the web 100 being fully extended. Furthermore, the duct 12 comprises first and second gas inlets 22, 24.

[0043] The machine also comprises gas drive means 18, such as, for example, a fan. The fan can be a centrifugal fan, without discarding other equivalent solutions which may incorporate devices, such as a compressor or other similar devices. The driving means 18 are functionally connected with the duct 12 so that, during treatment, a gas is insufflated into the duct 12 in an alternating manner through the first and second gas inlets 22, 24. It can be seen in the figures that the first gas inlet 22 is oriented such that, during treatment, the gas circulates towards the second chamber 6. In turn, the second gas inlet 26 is oriented such that, during treatment, the gas circulates towards the first chamber 4.

[0044] The alternating movement is achieved as a result of the machine 100 comprising shut-off valves 46 which move between a shut-off position (see Figure 2, left side), preventing air from entering the duct 12, and a passage position (see Figure 2, right side), which allows air to enter the duct 12. Therefore, by blocking the second gas inlet 24 and leaving the first gas inlet 22 open, the web 100 is moved from the first chamber 4 to the second chamber 6. Conversely, by blocking the first gas inlet 22 and leaving the second gas inlet 24 open, the web 100 is moved in the opposite direction. Therefore, the web 100 is thereby conveyed in an alternating manner between the first and second chambers 4, 6 in order to be subjected to treatment.

[0045] The injection of gas to cause the alternating movement inside the duct 12 does not necessarily require the second gas inlet 24 to be completely blocked when the first gas inlet 22 is open. Thus, when needed, the opposite gas inlet can be left partially open for a certain gas flow to circulate in the direction opposite the main stream in order to create turbulence.

[0046] Preferably, the gas is dry air, but humid air, vapor, or other gases can also be used.

[0047] As has already been explained, tumbling treatment consists of striking the textile web 100 multiple times to soften its texture.

[0048] To that end, the machine 100 of the first embodiment has at the outlet of the duct 12 two third impact elements 20 arranged so that, during treatment, the web 100 impacts respectively either impact element 20 as a result of each of the third impact elements 2 being arranged facing the outlet of the respective first or second ends 14, 16.

[0049] The intensity of the impact largely depends on the speed of the web at the outlet of the conveyance duct 12. Therefore, to obtain a machine 100 which allows applying more intense finishes, without negatively affecting the manufacturing costs of the machine, or the energy consumption thereof, in the invention the first gas inlet 22 is provided inside the duct 12, at the first end 14 and in a position adjacent to the first chamber 4, and the second gas inlet 24 is provided inside the duct 12, at the opposite second end 16 of the duct 12 and adjacent to the second chamber 6. This allows taking the most advantage of the length L of the duct 12 to impart speed to the web 100 over this entire length L, such that speed is at its maximum value at the outlet of the conveyance duct 12.

[0050] It has been found in the invention that the best results are achieved the first gas inlet 22 is provided in the first third of the length L of the conveyance duct 12 and preferably in the first fourth of the length L. Likewise, as can be seen in Figure 2, the second gas inlet 24 is provided in a position of the duct 12 that is mirror-symmetrical to said first gas inlet 22.

[0051] Also in this embodiment, the third impact elements 2 are mounted so as to be movable with respect to the rest of the machine 1 for adjusting the distance and/or angle of each of the third impact elements 2 with respect to the duct 12.

[0052] In particular, the third impact elements 2 are mounted so as to rock around a rocking shaft 40. This rocking shaft 40 is perpendicular to the longitudinal direction of said conveyance duct 12. Thanks to that, each

third impact element 2 may adopt any one angular position from: an upper position, in which the third impact element 2 is spaced apart from the duct 12, and a lower position, in which the third impact element 2 is close to the duct 12.

[0053] Finally, to assure that the web falls into the baskets 40 in an orderly manner, each of the third impact elements 2 further comprises a deflector panel 28. This is mounted so as to divert the direction of the drive gas coming out of the impact panel 20 in the take-up direction for taking up the textile web 100.

[0054] Thus, the machine described hereinabove allows putting into practice a method according to which the web is moved in an alternating manner between the first and second chambers 4, 6 upon insufflating air into said conveyance duct in an alternating manner from said first or second ends, and making said web impact the corresponding impact element 2.

[0055] Other embodiments of the machine according to the invention which share many of the features described in the preceding paragraphs are shown below. Therefore, only the different element will be described hereinafter, while for the common elements reference will be made to the description of the first embodiment.

[0056] In the machine 1 according to Figures 3 and 4, said machine 1 comprises four first and four second impact elements 36, 38 which are arranged inside said conveyance duct 12 and are respectively adjacent to the first and second chambers 4, 6.

[0057] The first impact elements 36 are movable between: a passage position of the web 100, in which, during treatment, the first impact elements 36 are arranged such that the web 100 passes freely through the duct 12 without impacting them, and an impact position of the web 100, in which, during treatment, these first impact elements 36 are arranged such that the web 100 passes through the duct 12 impacting the first impact elements 36. Figure 3 shows the first impact elements 36 in the impact position.

[0058] The second elements 38 also are movable between: a passage position of the web 100, in which, during treatment, these second impact elements 38 are arranged such that the web 100 passes freely through the duct 12 without impacting the second impact elements 38, while the first impact elements 36 are in the impact position, and an impact position of the web 100, in which, during treatment, the second impact elements 38 are arranged such that the web 100 passes through the duct 12 impacting the second impact elements 38, while the first impact elements 36 are in said passage position. Figure 3 shows the second impact elements 38 in the passage position.

[0059] It can also be seen in the figures that each of the first and second impact elements 36, 38 are arranged respectively on opposite faces of the duct 12, in this case, the upper and lower faces 48, 50 of the duct 12. Furthermore, the first and second impact elements 36, 38 of the upper face 48 of the duct 12 are offset in the longitudinal direction with respect to the first and second impact elements 36, 38 of the lower face 50 of the duct 12.

[0060] It should be mentioned that the impact positions of the first and second impact elements 36, 38 may be variable. That is, the first and second impact elements 36, 38 may be arranged in different impact positions.

[0061] Also in a preferable manner, so as to facilitate changing the forward movement direction of the web 100 in a quick manner, the first and second impact elements 36, 38 rock between the respective passage and impact positions.

[0062] Finally, to make maximum use of the length of the duct 12 to speed the web 100 prior to impacting the first or second impact elements 36, 38, the first impact elements 36 are arranged in the first third of the length L of the conveyance duct 12. In turn, the second impact elements 38 are provided in the duct 12 in a position that is mirror-symmetrical to the respective first impact elements 36.

Claims

1. A machine (1) for the finishing treatment of a textile web (100) comprising

[a] first and second accumulation chambers (4, 6) for accumulating said web (100) with first and second take-up areas (8, 10) for taking up said web (100),

[b] a conveyance duct (12) having a length (L) extending between first and second ends (14, 16), said duct (12) communicating said first and second chambers (4, 6) with one another, said duct (12) being configured so that, during treatment, said web (100) is conveyed inside said duct (12) widthwise,

[c] said duct (12) comprising at least first and second gas inlets (22, 24), and said machine further comprising

[c] gas drive means (18) functionally connected with said duct (12) so that, during treatment, a gas is insufflated inside said duct (12) in an alternating manner through said first and second gas inlets (22, 24), and with said first gas inlet (22) being oriented such that, during treatment, said gas circulates towards said second chamber (6), and with said second gas inlet (26) being oriented such that, during treatment, said gas circulates towards said first chamber (4), and

[d] at least one impact element (2, 36, 38) arranged so that, during treatment, said web (100) impacts said at least one impact element (2, 36, 38),

characterized in that

[e] said first gas inlet (22) is provided inside said duct (12), at said first end (14) and in a position adjacent to said first chamber (4), and said sec-

ond gas inlet (24) is provided inside said duct (12), at said opposite second end (16) of said duct and adjacent to said second chamber (6).

2. The machine (1) according to claim 1, **characterized in that** said first gas inlet (22) is provided in the first third of the length (L) of said conveyance duct (12) and preferably in the first fourth of the length (L), and said second gas inlet (24) is provided in a position of said duct (12) that is mirror-symmetrical to said first gas inlet (22).

3. The machine (1) according to claim 1 or 2, **characterized in that** said at least one impact element comprises at least one first impact element (36) which is arranged inside said conveyance duct (12), said first impact element (36) being movable between:

[ai] a passage position of said web (100), in which, during treatment, said first impact element (36) is arranged such that said web (100) passes freely through said duct (12) without impacting said first impact element (36), and
[aii] an impact position of said web (100), in which, during treatment, said first impact element (36) is arranged such that said web (100) passes through said duct (12) impacting said first impact element (36).

4. The machine (1) according to claim 3, **characterized in that** said at least one impact element further comprises at least one second impact element (38) which is arranged inside said conveyance duct (12), said impact element (38) being movable between:

[ai] a passage position of said web (100), in which, during treatment, said second impact element (38) is arranged such that said web (100) passes freely through said duct (12) without impacting said second impact element (38), while said first impact element (36) is in the impact position, and
[aii] an impact position of said web (100), in which, during treatment, said second impact element (38) is arranged such that said web (100) passes through said duct (12) impacting said second impact element (38), while said first impact element (36) is in said passage position.

5. The machine (1) according to claim 3 or 4, **characterized in that** it comprises at least two first and two second impact elements (36, 38), being each of said first impact elements (36) arranged respectively on opposite faces of said duct (12) and each of said second impact elements (38) arranged respectively on opposite faces of said duct (12).

6. The machine (1) according to claim 5, **characterized in that** said first and second impact elements (36, 38) of one face of said duct (12) are offset in the longitudinal direction with respect to said first and second impact elements (36, 38) of the opposite face of said duct (12).

7. The machine (1) according to any one of claims 4 to 6, **characterized in that** said at least one first impact element (36) is arranged in the first third of the length (L) of said conveyance duct (12), and said at least one second impact element (38) is provided in said duct (12) in a position that is mirror-symmetrical to said first impact element (36).

8. The machine (1) according to any one of claims 1 to 7, **characterized in that** said at least one impact element comprises at least one third impact element (2) arranged facing the outlet of one of said first and second ends (14, 16) so that, during treatment, said web (100) impacts said at least one third impact element (2).

9. The machine (1) according to claim 8, **characterized in that** said at least one third impact element (2) is mounted so as to be movable with respect to the rest of the machine (1) for adjusting the distance and/or angle of said at least one third impact element (2) with respect to said duct (12).

10. The machine (1) according to claim 9, **characterized in that** said at least one third impact element (2) is mounted so as to rock around a rocking shaft (40), said shaft being perpendicular to the longitudinal direction of said conveyance duct (12), and where said third impact element (2) may adopt any one angular position from among:

[a] an upper position, in which said third impact element (2) is spaced apart from said duct (12), and
[b] a lower position, in which said third impact element (2) is close to said duct (12).

11. The machine (1) according to any one of claims 1 to 10, **characterized in that** said at least one third impact element (2) further comprises a deflector panel (28), said deflector panel (28) being mounted so as to divert the direction of said drive gas coming out of said impact panel (20) in the take-up direction for taking up said textile web (100).

12. The machine (1) according to any one of claims 1 to 11, **characterized in that** it comprises a plurality of first and second gas inlets (22, 24).

13. The machine (1) according to any one of claims 1 to 12, **characterized in that** said at least first and second gas inlets (22, 24) are provided in the upper part

and lower part of said duct (12).

14. Method for the finishing treatment of a textile web (100) in a machine comprising:

[a] first and second accumulation chambers (4, 6) for accumulating said web (100) with first and second take-up areas (8, 10) for taking up said web (100),
[b] a conveyance duct (12) of length (L) extending between first and second ends (14, 16), said duct (12) communicating said first and second chambers (4, 6) with one another, said duct (12) being configured so that, during treatment, said web (100) is conveyed inside said duct (12) widthwise, **characterized in that** it comprises the steps of
[c] insufflating air into said conveyance duct (12) in an alternating manner from said first or second ends (14, 16), and
[d] making said web (100) impact at least one impact element (2, 36, 38).

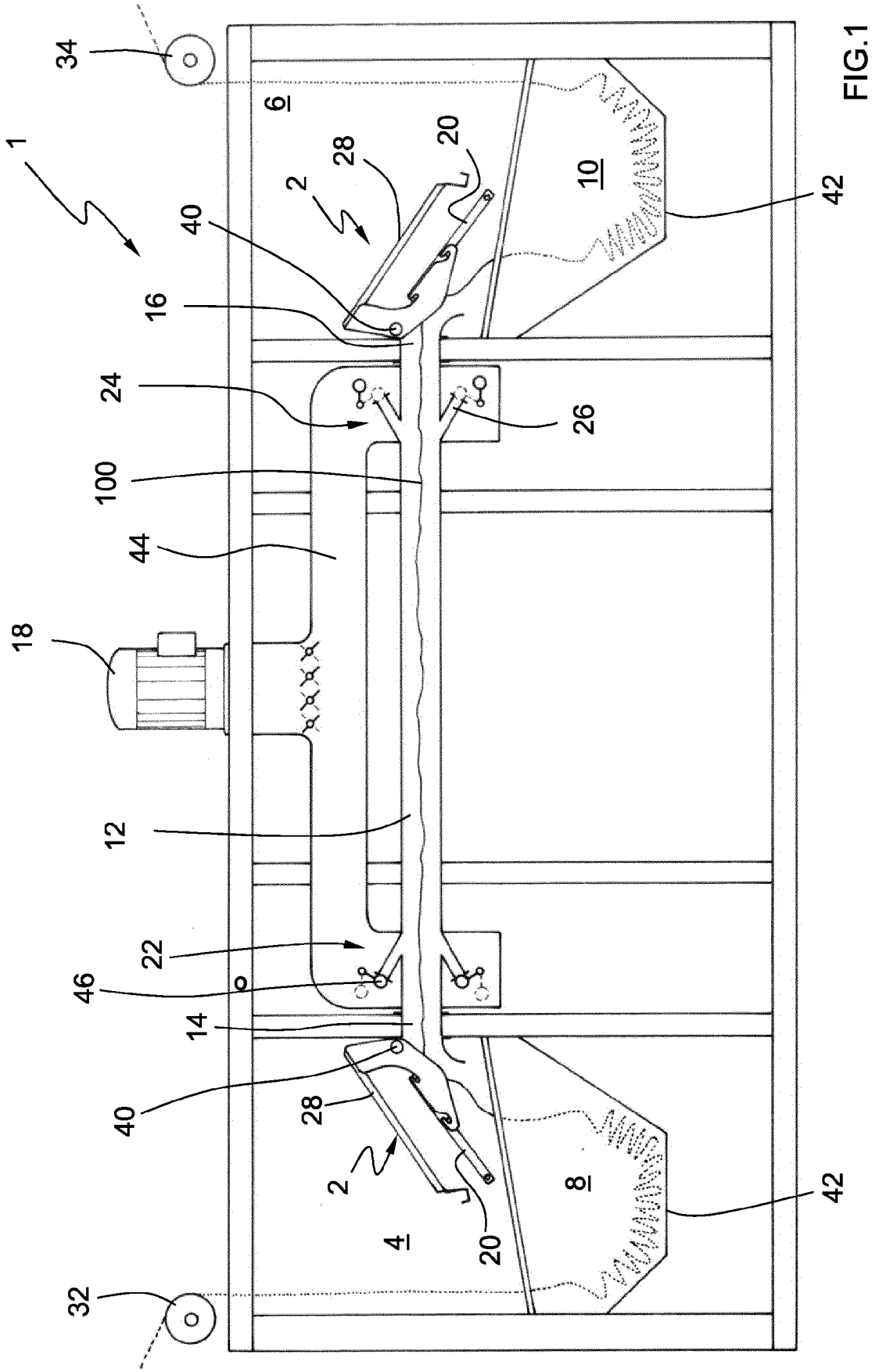

FIG.1

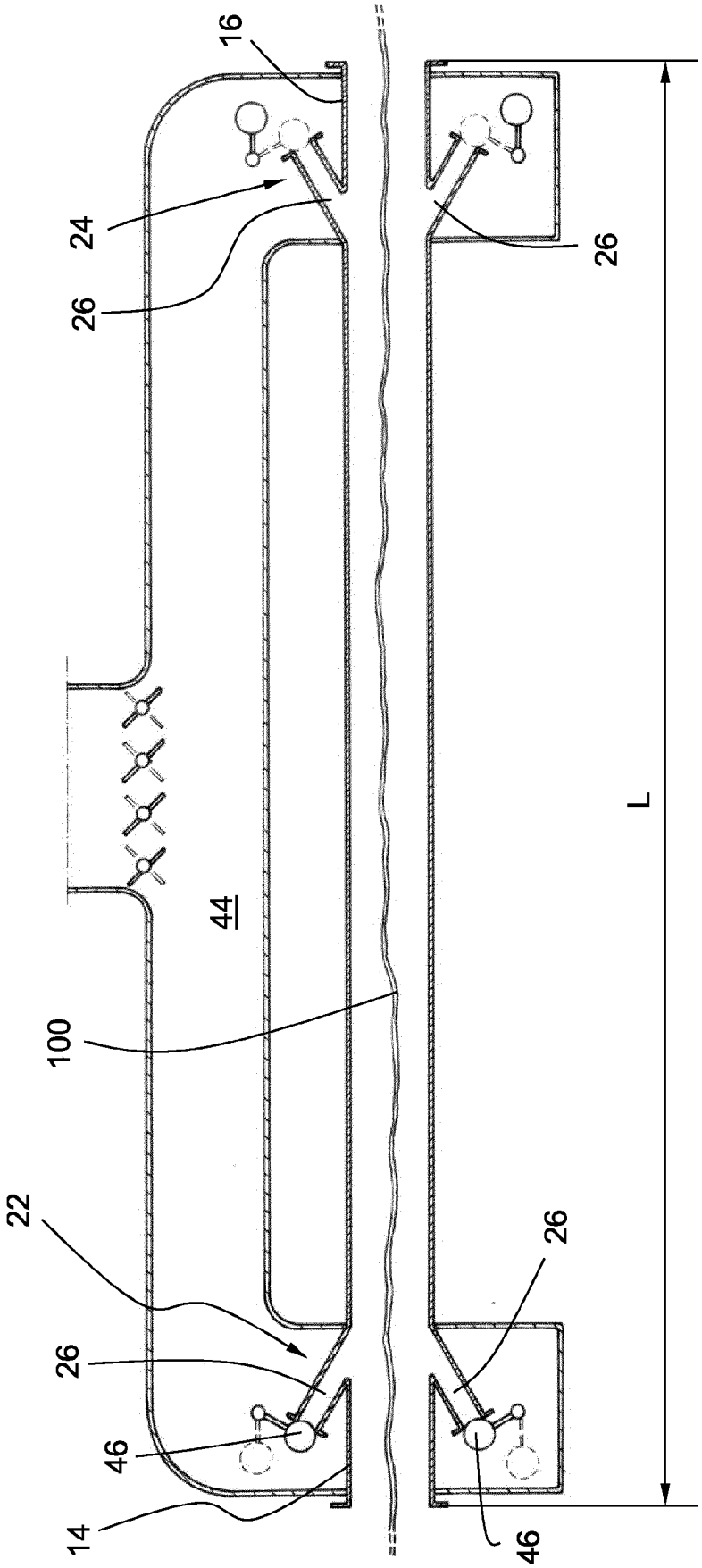

FIG.2

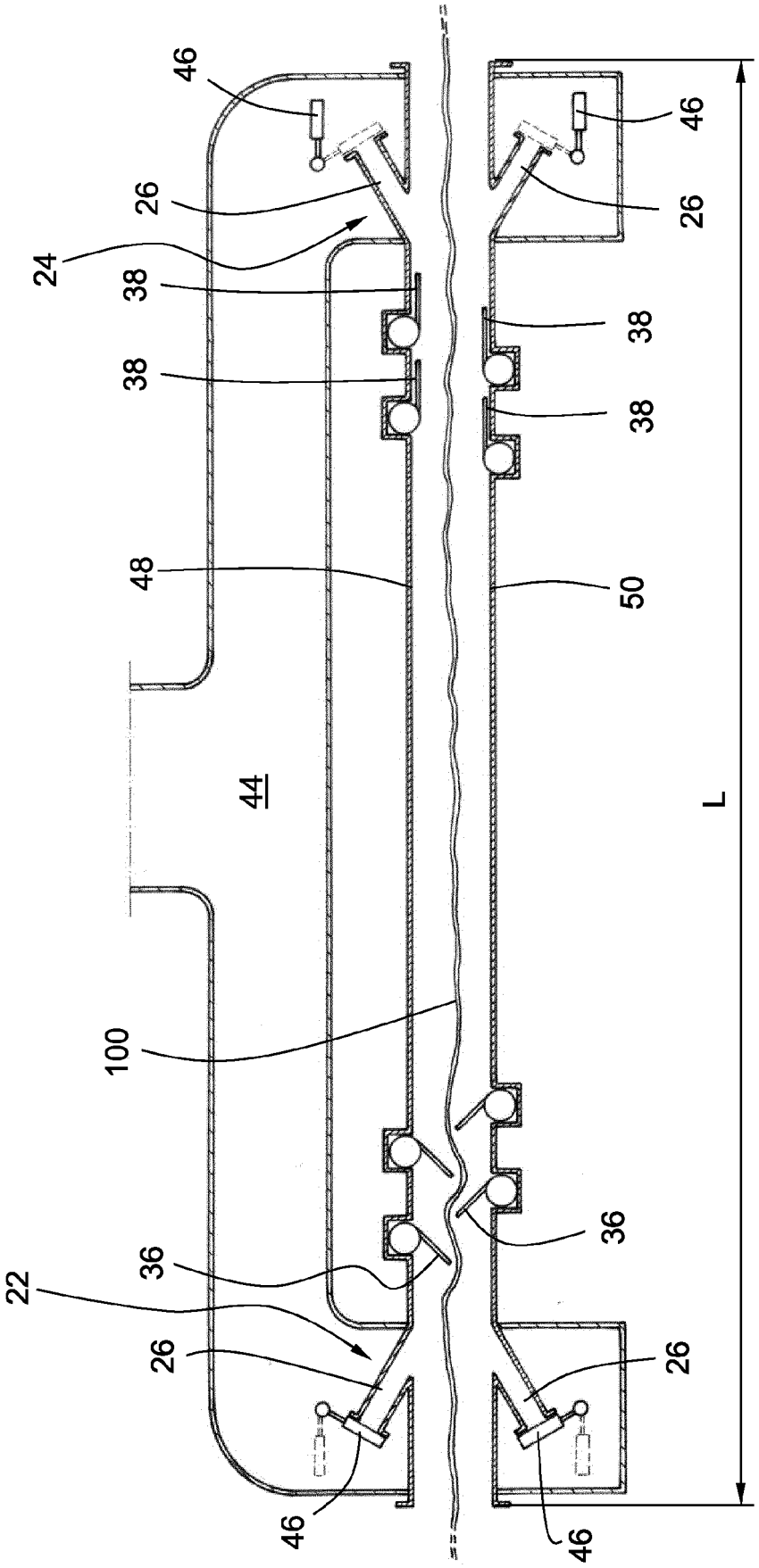

FIG.3

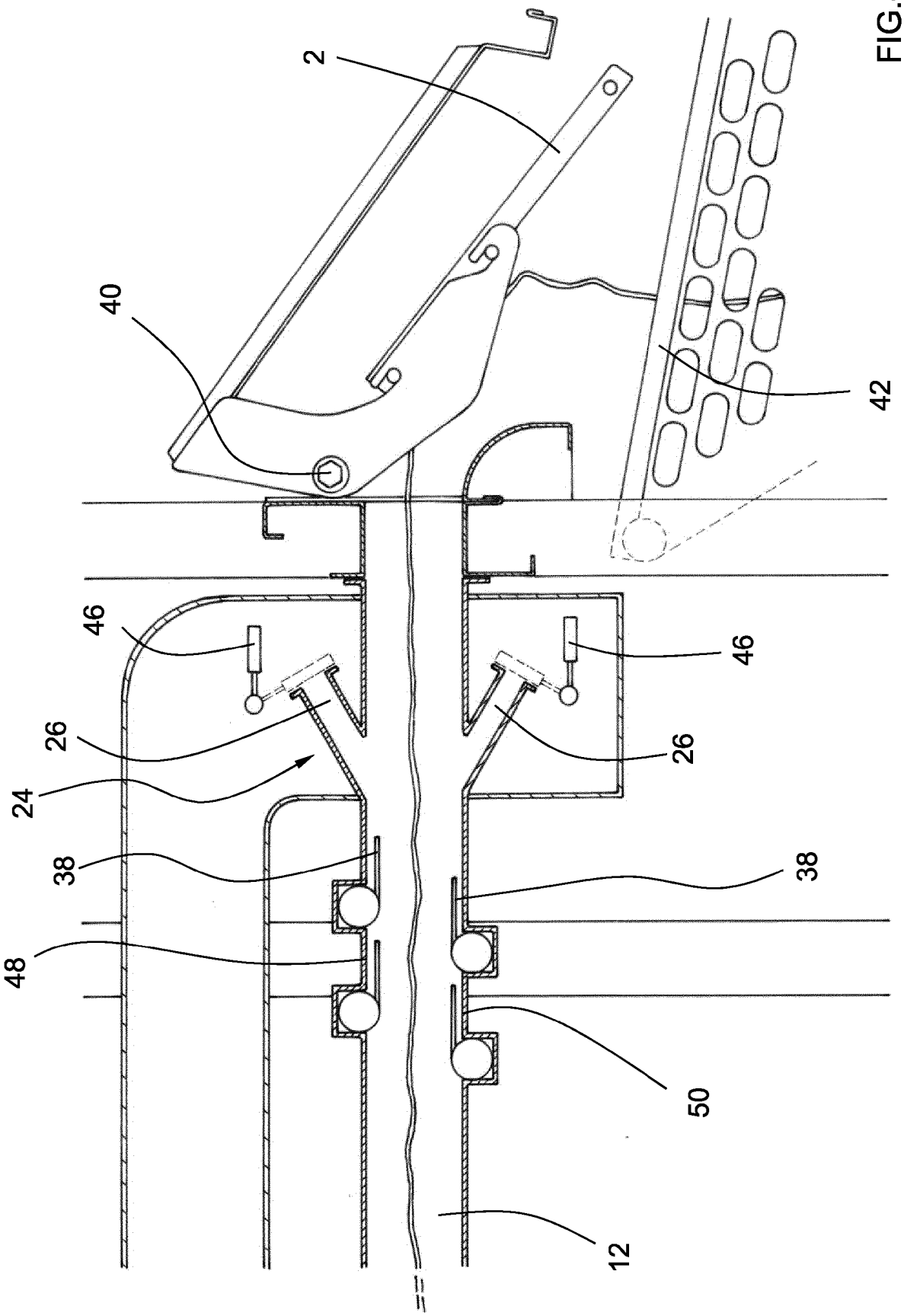

FIG.4

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EUROPEAN SEARCH REPORT

Application Number
EP 19 38 3141

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	EP 1 054 093 A2 (ANGLADA VINAS SA JAUME) 22 November 2000 (2000-11-22) * paragraphs [0012], [0024]; claim 1; figures 1,7,9 *	1,2,8,9, 12-14 3-7	INV. D06C19/00
X Y	US 2015/218665 A1 (ROHR KARL [CA] ET AL) 6 August 2015 (2015-08-06) * paragraphs [0008], [0032], [0045], [0046]; claim 1; figures 5-7,9,10 *	1-3,8-14 9,10	
X Y	CN 209 353 105 U (NEUWEG MACHINERY MFG JIANGSU CO LTD) 6 September 2019 (2019-09-06) * paragraphs [0001], [0003]; figures 1,2 *	1,2,8, 12,14 1,2,8, 12,14	
X Y	CN 106 149 266 A (JIANGYIN YUEFA PRINTING & DYEING MACHINERY CO LTD) 23 November 2016 (2016-11-23) * paragraph [0017]; figure 1 *	1,2, 8-10, 12-14 1,2, 8-10,12, 14	TECHNICAL FIELDS SEARCHED (IPC) D06C
Y	JP H05 279952 A (.) 26 October 1993 (1993-10-26) * paragraphs [0017], [0022], [0037]; figures 1,2,4,6 *	1,2,8, 13,14	
Y	EP 1 781 854 A1 (CORAMTEX SRL [IT]) 9 May 2007 (2007-05-09) * paragraphs [0016], [0017]; figures 23,5,6 *	1,2,8, 13,14	
Y	EP 2 034 077 A1 (JAUME ANGLADA VINAS SA [ES]) 11 March 2009 (2009-03-11) * paragraphs [0003], [0009], [0010]; figure 1 *	3-7	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 July 2020	Uhlig, Robert

CATEGORY OF CITED DOCUMENTS

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23-07-2020

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1054093 A2	22-11-2000	AT 267904 T	15-06-2004
		BR 0002167 A	02-01-2001
		CA 2307980 A1	20-11-2000
		CN 1274781 A	29-11-2000
		DE 60010971 T2	28-10-2004
		EP 1054093 A2	22-11-2000
		ES 2172364 A1	16-09-2002
		ES 2220378 T3	16-12-2004
		PT 1054093 E	29-10-2004
		SI 1054093 T1	31-10-2004
		TR 200001426 A2	21-02-2001
		US 6425271 B1	30-07-2002
US 2015218665 A1	06-08-2015	US 2015218665 A1	06-08-2015
		WO 2014047307 A1	27-03-2014
CN 209353105 U	06-09-2019	NONE	
CN 106149266 A	23-11-2016	NONE	
JP H05279952 A	26-10-1993	JP H0647785 B2	22-06-1994
		JP H05279952 A	26-10-1993
EP 1781854 A1	09-05-2007	AT 393253 T	15-05-2008
		BR PI0514550 A	17-06-2008
		CN 101006220 A	25-07-2007
		DE 602005006290 T2	14-05-2009
		EP 1781854 A1	09-05-2007
		ES 2304711 T3	16-10-2008
		US 2007266741 A1	22-11-2007
		WO 2006021978 A1	02-03-2006
EP 2034077 A1	11-03-2009	AT 469258 T	15-06-2010
		CN 101403172 A	08-04-2009
		EP 2034077 A1	11-03-2009
		ES 2296558 A1	16-04-2008
		ES 2345578 T3	27-09-2010

EPO FORM P0459

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Patent documents cited in the description

- ES 2593839 A1 **[0007]**