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(54) GLUE DISTRIBUTOR ASSEMBLY FOR EDGEBANDING MACHINE AND METHOD OF PANEL EDGEBANDING

(57) A new glue distributor assembly for edgebanding machine is described, wherein the contacting roll, intended to roll on the panel edge to be edgeboarded, or on a finishing profile for panels, is hollow and crossed by melted glue flowing from the collecting chamber of the distributor assembly body. Preferably, within the contacting roll a mixing element is inserted, pivotally with respect to the contacting roll, activable to mixing the melted glue.

The distributor assembly is provided with adjusting squeegees of both the thickness of the glue layer released on the outer surface of the contacting roll, and with a height of the glue layer. The squeegees, acting as adjusting valves between the glue collecting chamber and the contacting roll, have a flatting on the outer surface, with a side corner and a higher corner and being pivotable and movable on the respective longitudinal axes, parallel to the contacting roll.

The contacting roll is fixed to the body of the distributor assembly with pivots removable, in order to allow the easy cleaning or replacing of the roll without acting on the body of the distributor assembly, to disassembly or move it.

The outer surface of the contacting roll has a helicoidal profile making it self-cleaning with respect to the solid particles detaching from the edgebonded panels and migrates on the contacting roll and in the melted glue adherent to the contacting roll.

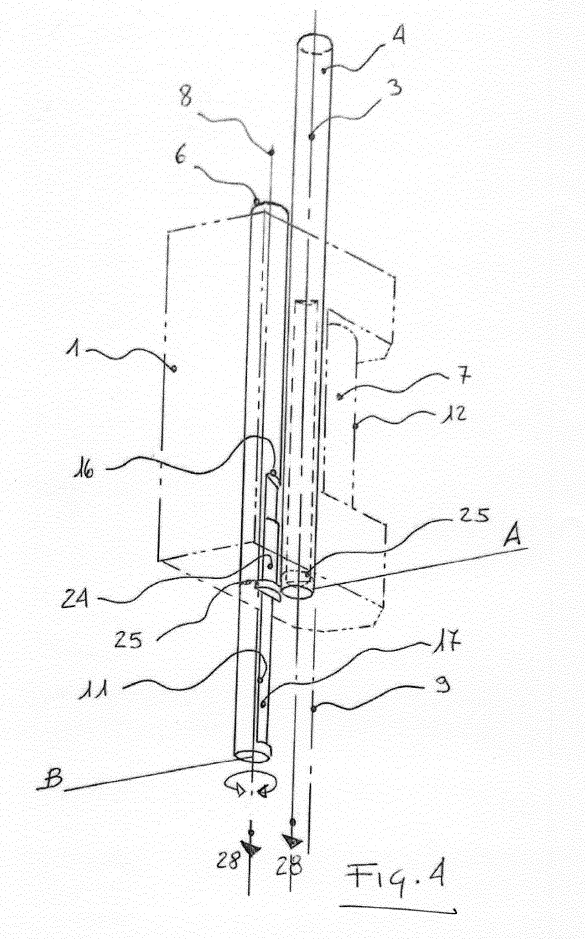

Fig. 4

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Description

Field of the invention

[0001] The present invention refers to a glue distributor assembly, associable to the edgebanding machine, and a method to carry out panel edgebanding.

Prior art

[0002] Wood panels, solid wood or derivatives thereof, for example chipboard or also plastic material, are used to manufature furnitures, shelving units, shelves and they are generally manufactured with two opposed flat faces and with an edge which is perpendicular to faces.

[0003] The two faces of the raw panels are covered with a foil of ennobled material in suitable processing centers, in order to obtain the desired surface finishing and appearance, wherein such foils can have various colors, appearance, finishing and finishings. Once the two faces of a panel were ennobled, panels are subjected to an operation of *edgebanding.*

[0004] In the wood processing industry the edgebanding machines has the function of applying a tape finishing element on the panel edge under processing, such that to ennobling also the panel edge. The tape finishing element can also be defined as profile, listel or strip, and it is commonly made of synthetic material.

[0005] For the sake of simplicity, hereinafter, the tape finishing element will be named profile, or finishing profile, or edge profile.

[0006] In the edgebanding machine, the finishing profiles are glued on the corresponding panel edge, remaining raw after the ennobling of the two faces of the panel. The finishing profile is usually applied as protruding: the profile has a width higher than the one of the panel board to which it is glued, in order to be sure to obtain a perfect covering of the edge and, in general, of the panel.

[0007] Therefore, in order to obtain the finished panel, it is necessary to remove the exceeding part of the finishing profile, i.e. it is necessary to cut the profile to panel board size, both longitudinally, and transversally, i.e. in length and height. The splicing is an operation through which the finishing profile is cut to the same length of the panel board; the subsequent trimming operation involves the removal of the higher and lower portions of the finishing profile transversally protruding from the panel edge, beyond the faces. The splicing and the trimming are respectively carried out by specific splicing and trimming assembly, respectively; the first moving for a certain period of time together with the panel under processing, i.e. they move jointly to the panels for the time necessary to cut the part of the finishing profile exceeding in length, the second being stationary and carrying out the trimming taking advantage of the panel movement advancing in the edgebanding machine.

[0008] The panel thus processed is then finished with the removal of processing waste and residues, by scrapers and brushes.

[0009] The same operations described above for plate-edge panels are also carried out on panels with beveled edges; in this case the edgebanding machine will be equipped with molded tools in a substantially complementary way with respect to the panel edge.

[0010] The following documents, in the name of SCM Group, describe edgebanding machine or components thereof: EP 1997597, EP 2251165, EP 2062706, EP 2052822, EP 1785243, EP 1588812, EP 1464470, EP 0945235, EP1260277.

[0011] An object of the present invention is a glue distributor assembly, or more simply a *distributor assembly,* intended to be installed on a edgebanding machine in order to allow a precise and effective glue application on the panel edge to be ennobled with the finishing profile, and / or in order to allow the precise and effective glue application on the same profile.

[0012] A typical distributor assembly comprises a contacting roll, generally metallic and knurled, configurable to roll on the panel edge, or on the finishing profile, and releasing a glue amount on the related surface, which is sufficient to guarantee the right fastening of the profile on the panel edge. The contacting roll is motorized and the related rotation axis is maintained parallel to the surface of the panel edge under processing, or the surface of the finishing profile to be glued.

[0013] The distributor assembly further comprises a heated tank, since the glue commonly used is of the thermal fuse polyurethane-type (PU, PUR, HMPUR), i.e. a glue with a relatively high melting temperature, usually included between 100°C and 140°C, which is to be hot-applied, being liquid, and cross-linking by reaction of isocyanate groups with the air humidity resulting in three-dimensional polyethers and / or polyurethane polyesters, comprising ureic bonds. Alternatively, glues containing ethylene vinyl acetate (EVA)-based thermoplastic resins are used, the latter also being hot-applied.

[0014] At least one squeegee is arranged adjacent to the contacting roll, or a blade or a distributing blade-function element which together with the contacting roll defines the useful section for the glue passage towards the panel edge under processing.

[0015] The glue is suitably distributed from the related container to the contacting roll surface, and then being distributed on the panel edge or on the finishing profile, before these two elements are pressed against one another in the edgebanding machine. The thickness of the glue layer deposited on the panel edge depends, as anticipated above, on the interstice defined between the squeegee, or the squeegees when more than one, and the contacting roll. Such thickness is adjustable, involving the possibility to adjust, i.e. precisely adjusting the position of the squeegee or squeegees with respect to the contacting roll.

[0016] The glue distributor assemblies today available have some limits.

[0017] A first limit relates to the maintenance of glue

distributor assemblies. In the solutions today available, the cleaning of the contacting roll is complex, since it is not easy when the distributor assembly is assembled on the edgebanding machine, and a complete disassembly of the distributor assembly, i.e. its removal from the edgebanding machine and disassembly, is often necessary to obtain a deep cleaning. Obviously, the disassembly of the distributor assembly requires a machine downtown, during which the edgebanding machine cannot operate.

[0018] A second limit consists in that, the glue firstly contained in the related tank, and then fed to the contacting roll, can be homogeneous: due to the fact that the temperature distribution between the inner surface of the tank, the outer surface of the contacting roll and the squeegee outer surface can be uniform, over the time the glue can have a different viscosity between one point and another of the distributor assembly and, in the worst case, clumps can be formed or it can locally crosslink.

[0019] A third limit consists in that, the squeegees can damage the contacting roll surface when, during the maintenance operation, are brought to limit stop, in the position of minimum distance from the contacting roll. This case can be critical, since the squeegees can contact the surface of the contacting roll and damaging it if applied with high pressure. On the other side, there is a persistent need to nullify the glue passage section, i.e. there is the need for the user, during some operations of maintenance or testing, or fine-tuning of the edgebanding machine, to use the squeegees as barrier to completely intercept the glue passage and preventing the glue to reach the panel.

[0020] A forth limit relates to the thickness variability of panels to be edgebanded and, accordingly, the finishing profiles height: based on the production batch, the panels can have an higher or lower thickness, or can change the height of the panel edge, for example 1.5 cm for a batch and 2 cm for another batch. In this case, the known distributor assemblies showed to be not very versatile, i.e. not very adaptable, resulting in that, glue distribution is often not optimal, with a dispersion beyond the panel edge, on the related faces, or with an insufficient distribution on the panel edge. In the first case, the results are the excessive fouling of panel faces, and in the second case the consequence is that the adhesion of the finishing profile to the corresponding panel edge is not perfect.

[0021] A fifth limit consists is the tendency of the knurled contacting roll tends to hold wood particles detaching from the edge during panel edgebanding. The reason of such phenomenon is mostly due to the double knurling of the contacting roll, right and left, and it defines small rhomboid recesses in which over time, i.e. with the increasing number of edgebanded panels, the accumulated detached particles, are incorporated into the glue and thus affecting the contacting roll.

Summary of the invention

[0022] Therefore, a first object of the present invention is to provide a glue distributor assembly which simply and effectively the limits of the solutions today available.

[0023] Therefore, a first aspect optional of the present invention, for which the Applicant reserves the right to file a divisional application, relates to a glue distributor assembly comprising a body provided with a melted glue collecting chamber, and a contacting roll, pivotally supported on the body. The collecting chamber of the melted glue can be defined within the body, or it can be external to the body and constrainable to it, such as an outer tank. The outer surface of the contacting roll is intended for rolling on a panel edge to be edgebanded, or on a panel finishing profile, to distribute the melted glue collected from the collecting chamber and allowing panels ennoblement.

[0024] Advantageously, the contacting roll is hollow and delimits an inner volume which is connected to the collecting chamber and in use it is crossed by the melted glue.

[0025] Practically, the contacting roll has not only the function of distributing the melted glue on the panel edge to be edgebanded, or on the finishing profiles, also being part of a slow circuit of the melted glue, and this feature allows to uniformed temperature distribution in the distributor assembly. Having the possibility to recirculate, continuously or at time intervals, the melted glue in a specific distributor assembly circuit allows to solve the second drawback described with specific reference to the known solutions, that allows to avoid non-uniformity in the melted glue mass, in particular temperature non-uniformity. This result, in turn, allows to limit or completely preventing clumps formation in the glue, or the crosslinking in glue. Therefore, the proposed solution provides an improvement in the distributor assembly operation, which provides an improved gluing quality, reduced cleaning of the distributor assembly and, accordingly, reduced downtimes of the edgebanding machine.

[0026] In the case wherein the glue collecting chamber is external to the body, it is connected to the flowing circuit through at least a specific connection; alternatively, and preferably, the collecting chamber is directly defined within the distributor assembly body.

[0027] Preferably, the role of the inner volume of the contacting roll is not limited to the passage of the glue: in the preferred embodiment, the melted glue is subjected to a mixing within the contacting roll, continuous or according to time intervals. In other words, the inner volume of the contacting roll is configurable as a mixing chamber of the melted glue, arranged in fluid communication with the collecting chamber within the body.

[0028] This expedient allows to maximize the above-described advantages, meaning that the mixing of the melted glue minimizes the risk of glue clotting or crosslinking.

[0029] The mixing of the melted glue within the con-

tacting roll can be obtained through several modes.

[0030] A first mode involves making, above the inner surface, one or more projections, or ribs, so that after the rotation of the contacting roll on their rotation axis the projections, or ribs, provide a thrust on the melted glue, along the contacting roll.

[0031] A second mode, which can be implemented alternatively or in addition to the first just described, consists of providing the distributor assembly of a mixing element inserted within the contacting roll. The mixing element is pivotable with respect to the contacting roll, and the relative rotation between the mixing element and the melted glue present in the contacting roll generates a thrust on the melted glue along the contacting roll.

[0032] Clearly, the rotation direction of the contacting roll and the mixing element possibly positioned within defines the direction of the thrust on the melted glue, vertical ascending or vertical descending.

[0033] Preferably the projections or ribs, and the mixing element, substantially extending as screw, or helix, or double helix.

[0034] In the case wherein the mixing element is inserted in the contacting roll, it is coaxial to the roll and the projections or ribs.

[0035] In the preferred embodiment, the collecting chamber extends in the body parallel to the contacting roll, and arranged in fluid communication with the inner volume of the contacting roll, at the ends of the contacting roll.

[0036] Preferably, the distributor assembly comprises a top pivot and a lower pivot, and the contacting roll is supported on the body by these pivots, which are at least partially inserted in a corresponding end of the contacting roll. At least one between the top pivot and the lower pivot, and preferably both, is/are removable and the removal of the pivot, or pivots, releases the contacting roll from the body, for the disassembly.

[0037] The coupling described above is advantageous since it allows the contacting roll to be assembled on the distributor assembly body, and disassembling the contacting roll from the body, in a simple and rapid manner, without necessarily dismounting the body or removing it from the edgebanding machine, missing the tolerances previously registered. In fact, in order to obtain the cleaning of the contacting roll, or for the substitution thereof, it will be sufficient removing a pivot, or both the pivots, in order to be able to remove the contacting roll from the body, without acting on the body itself.

[0038] In this embodiment the pivots are preferably provided with at least a radial opening allowing the passage of the glue from the inner volume of the contacting roll, i.e. from the mixing chamber, to the collecting chamber, and vice versa.

[0039] According to an embodiment, the distributor assembly has a through hole extending between an inlet, accessible to the outside of the distributor assembly, and an inner outlet al distributor assembly, by injection of a dye within the distributor assembly. Preferably the inner outlet of said through hole is arranged in correspondence of the contacting roll or the collecting chamber. Alternatively, the injection of the dye is carried out arranging a specific valve on the body of the distributor assembly providing an access to the melted-glue collecting inner chamber, or furthermore, arranging suitable injection means in the collecting chamber when the latter being external to the body.

[0040] Providing the possibility to inject the dye in the distributor assembly, and particularly in the mixing chamber, where the mixing element is present, advantageously allows to obtain a rapid color change of the melted glue color and, especially, a uniform change of all the mass of melted glue present in the flow circuit, rapidly. In fact, the mixing element can be activated to vigorously mix the melted glue and obtaining a uniform dye distribution.

[0041] The present invention also relates a method, according to claim 6, for the panel edgebanding. The method comprises:

- feeding a panel to a edgebanding machine equipped with a glue distributor assembly, provided with a body, an melting glue collecting chamber, outer or inner, and a contacting roll pivotally supported on the body and externally sprinkled with melted glue collected from the collecting chamber;
- Through the contacting roll, distributing melted glue on a panel edge to be edgebanded, or on a finishing profile intended to be glued on the panel edge, thus rolling the outer surface of the contacting roll on the panel edge or on the finishing profile.

[0042] Advantageously, the method also provides arranging the hollow contacting roll and allowing the melted glue to flow from the collecting chamber through the contacting roll, and vice versa, in order to obtain the above described advantages with respect to the distributor assembly.

[0043] According to a second aspect of the present invention, for which the Applicant reserves the possibility to file a divisional patent application, concerning an optional adjusting element of the same thickness of the melted glue layer adherent to the outer surface of the contacting roll.

[0044] Hereinafter, such adjusting element will be named squeegee.

[0045] The squeegee is substantially cylindrical and is housed in the body of the distributor assembly, parallel to the contacting roll and it is functionally interposed, with glue barrier function, between the outer surface of the contacting roll and the glue collecting chamber. Preferably, the squeegees are two. Each squeegee has a flat surface, or flatting, or slot, for example obtained by milling an outer surface portion, defining a side corner of the squeegee.

[0046] Each squeegee is pivotable on its own longitudinal axis, which is parallel to the rotation axis of the contacting roll, and the side corner is accordingly movable

between:

- a proximal position, in correspondence to which, the side corner is at the minimum distance from the outer surface of the contacting roll, and possibly in flush with it, and the thickness of the glue layer that can leave the collecting chamber and depositing on the contacting roll through the interstice defined by the side corner and from the contacting roll itself is minimum, for example 1-2 hundredths of a millimeter, and possibly null, and
- a distal position, in correspondence of which the side corner is at the maximum distance of the external surface of the contacting roll, for example 1 mm, and the thickness of the glue layer that can leave the collecting chamber and depositing on the contacting roll through the interstice defined by the side corner and the contacting roll itself is maximum, for example 1 mm.

[0047] In an intermediate angular position of the squeegees, the interstice created between the side corner and the outer surface of the contacting roll, and therefore the thickness of the melted glue on the contacting roll, is from 2-3 tenths of a millimeter.

[0048] Preferably le squeegees are pivotable on the respective longitudinal axes selectively and independent from each other. The activation can be manual, motorized or servo-assisted, and the squeegees can be blocked in the desired angular position.

[0049] The proposed solution allows to effectively adjust, and without malfunctioning risks, the thickness of the glue layer on the contacting roll.

[0050] Preferably the contacting roll is pivotable with respect to the rotation axis and each squeegee is pivotally on the longitudinal axes thereof, parallel to the rotation axis of the contacting roll. The longitudinal axis of each squeegee is at a distance from the rotation axis of the contacting roll corresponding to the sum of the outer radii of the contacting roll and of the squeegee, with a tolerance H/h7. This precaution allows to avoid that a mechanical interference occurs between the squeegees and the contacting roll, and jamming that could cause ruptures.

[0051] According to a second aspect of the present invention relates also to a method, the second to claim 21, for the panel edgebanding. II method comprises:

- feeding a panel to an edgebanding machine equipped with a glue distributor assembly, provided with a body, a melted glue collecting chamber, a contacting roll pivotally supported on the body and externally sprinkled with melted glue collected from the collecting chamber, and at least one substantially cylindrical squeegee, functionally interposed between the collecting chamber and the contacting roll to adjust the amount of melted glue leaving from the collecting chamber directed towards the contacting roll;
- by the contacting roll, distributing the melted glue on an edge to be to be edgeboarded of the panel, or on a finishing profile intended to be glued on the panel edge, the outer surface of the contacting roll is allowed to rotate son the panel edge or the finishing profile.

[0052] Advantageously, the method also provides:

- obtaining on the at least one squeegee a flat surface with a side corner, wherein through the interstice delimited from by the outer surface of the contacting roll and the flat surface the melted glue passage occurs, and
- adjusting the thickness of the glue layer released on the contacting roll rotating the at least one squeegee on its own longitudinal axis, parallel to the contacting roll, to correspondingly adjust the distance between the outer surface of the contacting roll and the side corner.

[0053] The advantages of this method are the same described above in relation to the distributor assembly provided with squeegees with side corner, adjustable angularly.

[0054] An aspect of the present invention, concerns the following element optional for the height regulation of the melted glue layer adherent to the outer surface of the contacting roll, where the terms height refers to the extension of the glue layer parallel to the rotation axis of the contacting roll, i.e. parallel to the outer surface of the contacting roll.

[0055] Such adjusting element is even a squeegee, i.e. a cylindrical element, housed in the body parallel to the contacting roll and functionally interposed, with a glue barrier function, between the outer surface of the contacting roll and the glue collecting chamber. Preferably the squeegees are two. Each squeegee has a flat surface, or flatting, e.g. obtained by milling a portion of the outer surface of the squeegee, defining a higher corner of the squeegee. Each squeegee is sliding with respect to the contacting roll, on its own longitudinal axis, and the higher corner is accordingly movable between:

- a maximum height position, in correspondence of which the height of the glue layer which can leave the collecting chamber and depositing on the contacting roll through the interstice defined by the squeegee and the contacting roll itself is maximum, for example equal to 15 mm, e
- a minimum height position a minimum height position , in correspondence of which the height of the glue layer which can leave the collecting chamber and depositing on contacting roll through the interstice defined by the squeegee and by the contacting roll itself is minimum, for example equal to 8 mm.

[0056] The proposed solution allows to effectively adjust, and without risks of malfunctioning, the height of the glue layer on the contacting roll.

[0057] Preferably the squeegees are movable along the respective longitudinal axes, for example moving, selectively and independently from each other. The activation can be manual, motorized or servo-assisted, and the squeegees can be blocked in the desired vertical position.

[0058] The present invention is preferably implemented with two squeegee pivotable and sliding on the respective longitudinal axes and provided with both side corner, for adjusting the thickness of the melted glue layer released on the contacting roll, and the higher of the higher corner, for adjusting the height of the melted glue layer released on the contacting roll.

[0059] Preferably the distributor assembly comprises, for each squeegee, a seal element, or *flap,* arranged in the body, in correspondence of the lower end of the respective squeegee, defining a lower corner of the flat surface described above and prevents the leakage of the melted glue from the bottom, i.e. it prevents the that melted glue can pour along the squeegee and leaking from the from the body of the distributor assembly. The squeegee being sliding with respect to the seal element thereof to adjust the distance between the higher corner and the lower corner and adjusting, accordingly, the height of the melted glue layer on the contacting roll.

[0060] Preferably the seal element, or flap, is constrained to the body and it is blocked against the longitudinal movements against the longitudinal movements.

[0061] The third aspect of the present invention also relates to a method, according the claim 6, for the panel edgebanding, comprising:

- feeding a panel to an edgebanding machine equipped with a glue distributor assembly, provided with a body, a melted glue collecting chamber, a contacting roll pivotally supported on the body and externally sprinkled with melted glue collected from the collecting chamber, and at least one substantially cylindrical squeegee, functionally interposed between the collecting chamber and the contacting roll to adjust the amount of melted glue leaving from the collecting chamber directed towards the contacting roll;
- by the contacting roll, distributing the melted glue on an edge to be edgeboarded of the panel, or on a finishing profile intended to be glued on the panel edge, allowing the rolling of the outer surface of the contacting roll on the panel edge or on the finishing profile.

[0062] Advantageously, the method also provides:

- obtaining on the at least one squeegee a flat surface with one higher corner, wherein through the interstice delimited by the outer surface of the contacting roll and la flat surface the passage of the melted glue occur, and
- adjusting the height of the glue layer released on the roll moving the least one squeegee on its own longitudinal axis, parallel to the contacting roll, to correspondingly adjust the portion of the higher corner.

[0063] The advantages of this method are the same described above relating to relating the distributor assembly provided with squeegees with higher corner, adjustable vertically.

[0064] An other aspect of the present invention, for which the Applicant reserves the possibility to file a divisional patent application, relates to the coupling removable, and interchangeable, of the contacting roll on the body of the distributor assembly, obtained through a fastening element of the ends of the contacting roll of which at least one is removable. As described above, such fastening element are preferably pivots, one higher and one lower to, respectively, constrain the higher end and the lower end of the contacting roll to the body of the distributor assembly.

[0065] Having removable fastening element allows to remove the contacting roll from the body of the distributor assembly, and assembly it again, in a short time, in a simple way and without necessarily disassembling or shifting the body of the distributor assembly.

[0066] Preferably the fastening element, substantially the pivots, are at least partially hollow and they are part of the flow circuit of the melted glue, meaning that they define a part of the circuit formed by the inner volume of the contacting roll and the collecting chamber of the body.

[0067] Preferably, the pivots have one or more radial openings exactly to allow the passage of the melted glue from the contacting roll to the collecting chamber, and vice versa.

[0068] This aspect of the present invention also relates to a method for the panel edgebanding, comprising:

- feeding a panel to an edgebanding machine equipped with a glue distributor assembly, provided with a body, a melted glue collecting chamber, a contacting roll pivotally supported on the body and externally sprinkled with melted glue collected from the collecting chamber;
- by the contacting roll, distributing melted glue on an edge to be edgeboarded of the panel, or on a finishing profile intended to be glued on the panel edge, allowing the outer surface of the contacting roll to roll on the panel edge or on the finishing profile.

[0069] Advantageously, the method also comprises:

- constraining the contacting roll to the body of the distributor assembly at the ends thereof, by respective fastening element, wherein at least one of the fastening element is removable to allow the disassembly of the contacting roll from the body by main-

tenance or replacing, without requiring the disassembly of the body.

[0070] An other element of the present invention, for which the Applicant reserves the possibility to file a divisional patent application, related to the following optional feature: in the preferred embodiment the contacting roll does not have an outer surface with knurling or double knurling, but its outer surface has a continuous helicoidal profile. This precaution allows to promote the migration to the ends of the contacting roll di possible solid particles - initially detached from the panels subjected to edgebanding - present on the outer surface of the same contacting roll or incorporated in the glue. In this way, the formation of glue clumps and solid particles or mixtures is limited or completely prevented.

[0071] The above described features is also object of the method claim 24, and correspond to make self-cleaning the contacting roll with respect to the undesired solid particles.

Brief list of the drawings

[0072] Further characteristics and advantages of the invention will be better highlighted by examining the following detailed description of a preferred embodiment, but not exclusive, according to an illustrative, but not limiting, purpose, by means of the finishing enclosures, wherein:

- figure 1 is a front isometric view of a glue distributor assembly according to the present invention;
- figure 2 is a vertical section view, considered on the median plane B-B showed in figure 1;
- figure 3 is an horizontal section view, considered on the plane A-A showed in figure 1;
- figure 4 is a rear perspective view of the glue distributor assembly showed in figure 1;
- figure 5 è an elevation view and partially enlarged of a component of the glue distributor assembly showed in figure 1;
- figure 6 is a plane view and from the bottom of the glue distributor assembly showed in figure 1.

Detailed description of the invention

[0073] The attached figures show the preferred embodiment of the glue distributor assembly 100 according to the present invention, hereinafter briefly indicated as *distributor assembly*.

[0074] The distributor assembly 100 comprises a body 1 supporting the other components. The body 1, preferably metallic, has a general C-shape C, i.e. it has two horizontal portions ha due horizontal portions 1' joined by a vertical portion 1". Between the horizontal portions 1' a contacting roll 7 is supported, whose rotation axis 9 is vertical, i.e. parallel to the vertical portion 1" of the body 1. The contacting roll 7 is intended to constrain by rolling the edge of a panel to be edgeboarded with the finishing profile (not showed), in order to apply on such edge a glue layer sufficient to guarantee the adhesion of a finishing profile, as described below.

[0075] The contacting roll 7 is pivotally assembled on the body 1 and it is motorized. The rotation speed, or rpm, are selected such that between the rotating contacting roll 7 and the panels to be edgeboarded, moving on the edgebanding machine, slipping do not occur.

[0076] A first advantageous feature of the distributor assembly 100, for which the Applicant reserves the possibility to file a divisional patent application, consist in the fact that the contacting roll 7 is easily removable from the body 1 of the distributor assembly 100, in a substantially interchangeable way.

[0077] This result is obtained, as showed as best as possible in figure 2, constraining the contacting roll 7 to the body 1 at the ends thereof, with fastening elements 18 and 19, of which at least one is removable.

[0078] Preferably, the fastening means are a top pivot 18 and a lower pivot 19, which operate also as bushings for the pivotable support of the contacting roll 7. The pivots 18 and 19 are vertically inserted through the horizontal portions 1' of the body 1, coaxially with respect to the rotation axis 9 of the contacting roll 7. At least one between the top pivot 18 and the lower pivot 19, and preferably both, are removable from the body 1 of the distributor assembly 100 to allow the disassembly of the contacting roll 7. In other words, once the top pivot 18 and the lower pivot 19 were removed from the respective horizontal portions 1' of the body 1, the contacting roll 7 is laterally or frontally from the body 1, simply with one hand. For example, the top pivot 18 and the lower pivot 19 are inserted without any clearance, or with minimum tolerances, in corresponding sites 18' and 19' obtained in the body 1 of the distributor assembly 100 and blocked by Seager rings, pins or other mechanical fasteners. Alternatively, the top pivot 18 and the lower pivot 19 are addressed to the respective sites 18' and 19'.

[0079] According to an embodiment, the relative rotation between the contacting roll and the pivots 18, 19 is provided. At the occurrence, in order to improve the sliding between the inner surface 7 and the pivots 18 and 19, among these elements some bushings are inserted, for example, made of teflon.

[0080] According to an alternative embodiment the contacting roll 7 and the pivots 18 and 19 rotate integral with respect to the body 1, for example supported by bushings or bearings.

[0081] Preferably, the inner diameter of the contacting roll 7 has a first value at the central portion, and a second value which is higher than the first one at the end, such that the pivots 18 and 19 are inserted in the contacting roll 7 wired with the inner surface of the central portion, such that to define within the contacting roll 7 a perfectly cylindrical volume.

[0082] The coupling between the contacting roll 7 and

the body 1 of the distributor assembly 100 allows to solve the first described drawback relating to the prior art. In fact, due to the fact that the disassembly of the contacting roll 7 is easily obtainable by simply removing the top pivot 18 and the lower pivot 19 from the body 1, and removing the contacting roll 7, the cleaning and the maintenance of the contacting roll 7 are possible rapidly, in a simple way, as the reassembly. For the reassembly of the contacting roll 7 on the body 1 it will be sufficient to carry out the operations inversely with respect to the disassembly: a mechanical maintenance technician will insert the contacting roll 7 in the body 1, vertically along the rotation axis 9, between the horizontal portions 1' and parallel to the vertical portion 1", and proceeding by inserting the pivots 18 and 19 through the respective sites 18' and 19', so as to complete the coupling by blocking the pivots 18 and 19 on the body 1.

[0083] Clearly, it is possible to have a plurality of spare contact rolls 7, such that minimizing the length of the machine downtime: the mechanical maintenance technician will be able to simply replace the contacting roll 7, as described above, with a clean roll and starting the edgebanding machine, in few minutes, having the possibility to calmly clean the contacting roll 7 previously collected.

[0084] The possibility to constantly maintain the contacting roll 7 in good cleaning conditions allows to maximize the productivity and the quality of the edgebanding.

[0085] Preferably, as showed in figures 1 and 2, the distributor assembly 100 comprises a guard element 2 screwed to the body 1 with screws 2', frontally at the lower horizontal portion 1'. The guard element 2 protrudes beyond the higher edge of the lower horizontal portion 1' such that to delimit collecting tray 2" of the residual or excess glue, possibly casted from the contacting roll 7. Indeed, the guard element 2 guarantee that the contacting roll 7 cannot be disassembly from the body 1 without having previously unscrewed and separated the guard element 2 itself.

[0086] A first method of edgebanding according to the present invention provides, therefore, the easy disassembly of the contacting roll 7 from the body 1, simply removing the pivots 18 and 19 and removing the roll from the body 1.

[0087] Once pivots 18 and 19 are removed, the contacting roll 7 is removable from the horizontal portions 1' of the body 1 of the distributor assembly 100, simply pulling with a hand.

[0088] The method also involves an easy reassembly of the contacting roll 7: it will be sufficient to reposition the contacting roll 7 between the horizontal portions 1' of the body 1, coaxially to the rotation axis 9, and subsequently inserting pivots 18 and 19 in the respective sites 18' and 19' through le horizontal portions 1' of the body 1.

[0089] A second advantageous feature of the distributor assembly 100, for which the Applicant reserves the possibility to file a divisional patent application, is constituted by the fact that the contacting roll 7 is internally hollow, and the melted glue, i.e. maintained to a temperature higher to the related melting temperature, is allowed to flow and the melting glue is continuously mixed at the molten state, i.e. maintained at a temperature higher to the related melting temperature.

[0090] As better showed in figure 2, preferably also the top pivot 18 and the lower pivot 19 are hollow, such that to allow the passage of the melted glue, and the inner volume of the contacting roll 7 delimits a mixing chamber 7' of the melted glue. The mixing chamber 7', is coaxial with respect to the rotation axis 9, practically extending within the contacting roll 7, and also through the pivots 18 and 19. In turns, the mixing chamber 7' is connected to a collecting chamber 13 of the melted glue, extending within the vertical portion 1" of the body 1 of the distributor assembly 100 along an axis 27 parallel to the rotation axis 9, such that the two chambers, i.e. the mixing chamber 7' and the collecting chamber 13 define a circuit for the melted glue flowing. Observing figure 2, the melted glue flowing can be counterclockwise (white arrow x) or clockwise (black arrow y), as described below, more in detail. The collecting chamber 13 is opened at the top in correspondence of an opening 27', closable by a cap, allowing to load new glue.

[0091] According to an alternative embodiment, the collecting chamber 13 is external to the body 1, for example positioned next to the body 1, and connected to the mixing chamber 7' through a hole made in the body 1 which allows the access to the flow circuit.

[0092] In the embodiment showed in the figures, the top pivot 18 and the lower pivot 19 have each a radial opening, see figure 2, or they are laterally opened towards the collecting chamber 13, in order to allow the passage of the melted glue from and towards the collecting chamber 13 during the use of the distributor assembly 100.

[0093] The glue is maintained to a temperature higher than the melting temperature from one or more resistors 5 inserted in the body 1 of the distributor assembly 100. The resistors 5 dissipate energy by Joule effect.

[0094] Preferably, within the contacting roll 7 a mixing element 21, having the function of promoting the mixing and the movement of the melted glue, is housed. The mixing element 21 can be made as a screw-element, or a cochlea, or as an helicoidal stirrer. In the example showed in the figure, and in particular in figure 2, the mixing element extends from the top pivot 18 up to the lower pivot 19, for the whole length of the contacting roll 7, resulting coaxial thereto. According to alternative embodiment, the mixing element 21 is shorter than the contacting roll 7.

[0095] The flowing of the melted glue can be obtained according two modes, provided that a relative rotation, between the contacting roll 7 and the mixing element 21 housed within it, is obtained.

[0096] According to a first embodiment the contacting roll 7 is motorized, i.e. it is connected to the crank shaft 20 of an electric motor M, directly as showed in figure 1

or indirectly by a transmission system, in such case, through friction between the inner surface 7 and the melted glue, an axial thrust is created, i.e. along the rotation axis 9, depending on the helix direction of the mixing element 21, resulting glue in that the glue is mixed and allowed to flow.

[0097] According to a second embodiment, in addition to the contacting roll 7, the mixing element 21 is motorized, this component being connected to the crank shaft 20 of an electric motor M, through the lower pivot 19. In this case, the mixing element 21 directly thrusts axially the melted glue, mixing and allowed to flow.

[0098] When it is necessary to maintain the seal, and preventing melted glue leakages, O-ring seals are installed, for example between the pivots 18 and 19 and the body 1.

[0099] Alternatively, or in addition to the mixing element 21, the inner surface 7 is provided with protruding ribs (not showed), for example helicoidally, thrust the melted glue upward or downward, according to the rotation directions, when the contacting roll 7 is thrust-rotation. The protruding ribs can have a continuous path, or can be interrupted and extending as circle arcs.

[0100] In other words, the mixing element 21 can be used in combination with a contacting roll 7 provided with inner protruding ribs, suitably sized to avoid mechanical interferences.

[0101] The possibility of usually or continuously mixing the melted glue and allowing it to flow within the above-described circuit, allows to solve the second drawback described relating to the known solutions, i.e. allowing to avoid a non-uniformity in the mass of the melted glue, in particular temperature non-uniformity, as well as clumps or localized crosslinking and, in general, it allows to obtain results which are qualitatively higher and repeatable over time.

[0102] In some applications, it is necessary to have available a glue of a certain color, typically a color matching with the color of the material used to ennoble panels.

[0103] In order to satisfy such necessity, the distributor assembly 100 is optionally provided with an injection system of a dye within the distributor assembly itself, in particular in the mixing chamber 7'. More in detail, the mixing element 21 is provided on the top with at least a hole 22, see figure 2, axially extending between an inlet, which is showed in the example as funnel-shaped, and an outlet which opens in the mixing chamber 7' at one or more doors 23; the operator can use the hole 22 to inject the concentrated dye, so as to change the color of the melted glue already present in the mixing chamber 7'. Advantageously, in this way the desired color of the melted glue can be obtained without empting the glue circuit to fill it with another glue of the desired color, and therefore maintaining constant the circuit temperature. The mixture of the melted glue obtained as described above guarantees the uniform chromatic tone of all the melted glue flowing in the circuit.

[0104] Alternatively, the dye injection can be performed involving a suitable valve on the body 1 of the distributor 100, providing access to the collecting chamber 13.

[0105] A second method of edgebanding according to the present invention involve, therefore, the melted glue flowing not only in the inner collecting chamber 13 to the body 1 of the distributor assembly 100, but also through the contacting roll 7, which is hollow. More in detail, the method involve to make a flow circuit of the melted glue, arranging in flow communication the inner volume of the contacting roll 7 with the collecting chamber 13 of the body 1.

[0106] Based on the rotation direction of the contacting roll, clockwise or counter clockwise, the thrust on the melted glue will be directed upwards or downwards.

[0107] Preferably, the secondo method is implemented using a contacting roll internally shaped with the thrust surfaces, projections or ribs, for example at least helicoidally, and / or arranging in the contacting roll 7 a stirring element 21, having a screw-, or helix- or double helix-extension, such that the contacting roll 7 has a cochlea function for the melted glue inside, i.e. such that the rotation causes the movement of the melted glue in the flow circuit.

[0108] The second method optionally involves to change the color of the melted glue color present in the flow circuit, injecting a dye by a through hole present in the stirring element 21 described-above.

[0109] A third feature of the distributor assembly 100, for which the Applicant reserves the possibility to file a divisional patent application, relates to a precaution which allows to effectively adjust the thickness of the glue layer deposited on the panel edge to be edgeboarded.

[0110] With reference to figure 1 and 3, the distributor assembly 100 comprises at least one squeegees 4, 6, and preferably due squeegees 4, 6 positioned adjacent to the contacting roll 7 and in particular positioned parallel to each other and with the contacting roll 7.

[0111] As described below, the squeegees 4, 6 are almost cylindrical elements, and each being provided with a own longitudinal axis, identified respectively with the reference numbers 3 and 8. Each squeegees 4, 6 being pivotable on the respective longitudinal axis 3, 8 parallel to the rotation axis 9 of the contacting roll 7. Considering that the squeegees 4, 6 rotate on the respective longitudinal axes 3 and 8, also such axes are configured as rotating axes.

[0112] With reference to figure 3, showing an horizontal section of the distributor assembly 100, or a section considered on a plane orthogonal to the three rotating axis 9, 3 and 8, it can be noted the arrangement of the squeegees 4 and 6 each being intermediate between the contacting roll 7 and the vertical portion 1" of the body 1, which is stationary. As observable, the squeegees 4 and 6 are partially contained in corresponding sites of complementary shapes obtained in correspondence of the vertical portion 1" of the body 1 of the distributor assembly 100, wherein a gap is not defined within, such that be-

tween the squeegees 4 and 6 and la vertical portion 1" of the body 1 a passage of melted glue does not occur.

[0113] In other words, the contacting roll 7, the squeegees 4 and 6 and the vertical portion 1" of the body 1 of the distributor assembly 100 jointly delimit the collecting chamber 13 described above. It should be considered in figure 3 that, the melted glue moves orthogonally to the design, parallel to the contacting roll 7 and the squeegees 4 and 6.

[0114] With reference to figure 1, 3 and 4, the squeegees 4 and 6 are not cylindrical, but they have a flat surface 17 interrupting the circular profile of the squeegees 4 and 6. Such flat surface 17 can also be defined *flatting* and it is obtainable, for example, by milling. The intersection between the flat surface 17 and the remaining part of the outer cylindrical surface of the squeegees 4 and 6 defines a corner 10, 11, which can be defined side or vertical corner. Based on the angular position of the squeegees 4 and 6, the related corner 10, 11 is at a corresponding distance from the outer surface of the contacting roll 7.

[0115] The side corner 10, 11 is parallel to the rotation axis 9 of the contacting roll 7 and the longitudinal axis 3, 8 of the respective squeegees 4, 6.

[0116] In other words, the corner 10, 11 is movable between a distal position and a proximal position with respect to the contacting roll 7, depending on the angular position of the respective squeegees 4, 6 on the related longitudinal axis 3, 8. Between the corner 10, 11 and the outer surface of the contacting roll 7 a gap or window, through which the melted glue passes, is therefore defined. Accordingly, the squeegees 4 and 6 can be rotated on the respective axes 3 and 8 according to a direction to close the gap, and preventing the leakage of melted glue from the collecting chamber 13, or they can be rotate on the respective axes 3 and 8 according to an opposed direction to open or reducing the gap, and allowing the leakage of melted glue from the collecting chamber 13, on the surface of the contacting roll 7.

[0117] Practically, when the contacting roll 7 rotates on the rotation axis 9, it brings on its surface a certain amount of melted glue depositing on the portion of the contacting roll 7 oriented within the collecting chamber 13. The thickness of the glue layer that actually remains on the outer surface of the contacting roll 7 corresponds to the width of the gap defined between the corner 10, 11 of the squeegees 4 and 6 and the outer surface of the contacting roll 7. The corners 10 and 11 therefore can act as spatulas holding in the amount of melted glue exceeding the desired limit in the collecting chamber 13. Closing the squeegees 4 and 6, or rotating them on the respective axes 3 and 8 such that bringing the corners 10, 11 wired to the outer surface of the contacting roll 7, practically at a distance of 2-3 hundredths of a millimeter, the leaving of the glue from the collecting chamber 13 is prevented, i.e. the containment function of the melted glue is performed, since substantially the whole is scraped and collected from the surface of the contacting roll 7.

[0118] The activation of the squeegees 4 and 6 can be manual, for example by an operation through a manual adjustment of the angular position of each squeegees 4, 6 selectively, through an adjusting screw, or the squeegees can be controlled by one or more actuators or servocontrols, according to a selective way.

[0119] In the configuration showed in figure 3, the contacting roll 7 rotates counterclockwise, the first squeegee 4 is stationary in an opening position, corresponding to a gap, and therefore corresponding to a thickness of the melted glue layer, equal to 2-3 tenths of a millimeter, and the second squeegee 6 is stationary in a closure position, with the related corner 10 in flush or almost in flush against the side surface of the contacting roll 7. In this way, the melted glue possibly contaminated by material particles of the panel subjected to edgebanding, does not return in the collecting chamber 13, but is scraped from the surface of the contacting roll to fall in the collecting tray 2".

[0120] The maximum opening position of the squeegees 4, 6 corresponds to a distance from the outer surface of the contacting roll 7 equal to about 1 mm.

[0121] Reference 15 indicates the rotation direction of the squeegees 4 and 6 to obtain the above described configuration.

[0122] It is evident that reversing the rotation direction of the contacting roll 7, it is sufficient to close the first squeegee 4 and opening the second squeegee 6 to obtain an effective result, or precisely adjusting the thickness of the melted glue layer on the contacting roll 7.

[0123] The proposed solution allows to precisely adjusting, but at the same time easily and effectively, the thickness of the melted glue layer on the contacting roll 7, guaranteeing at the same time to avoid the fouling of the melted glue in the collecting chamber 13.

[0124] A further advantage provided by the third described feature consists of avoiding the contacting roll to ruin: also in the hypothesis wherein, by mistake, the operator acts clumsily on the squeegees 4 and 6, and disruptive interference with the contacting roll 7 is never created. This result is particularly obtained taking care of positioning the squeegees 4 and 6 with the related longitudinal axes 3 and 8 at the distance from the outer surface of the contacting roll not lower than the radius of the same squeegees 4 and 6, with a tolerance H/h7 according to standard UNI 6388 ISO R.286. In other terms, the distance between the rotation axis 9 of the contacting roll 7 and the longitudinal axis 3 of the first squeegee 4 or the longitudinal axis 8 of the second squeegee 6, will be higher or equal to the outer sum of the outer radius of the contacting roll 7 and the radius of the squeegees 4 and 6, with tolerance H/h7. Therefore, the corner 10, 11 can at the limit be in flush on the surface of the contacting roll 7, to avoid the leakage of the melted glue, without having the possibility to practice any pressure sufficient to damage the knurling or the surface finishing of the contacting roll 7.

[0125] Alternatively, the surface 17 can also be concave, or however can have a non-flat geometry, provided that its extending does not create any interference between the respective squeegees 4, 6 and the contacting roll 7.

[0126] A third method of edgebanding according to the present invention therefore provides adjusting the thickness of the melted glue layer present on the outer surface of the contacting roll, acting on the squeegees 4, 6, and in particular and modifying the angular position thereof, rotating the squeegees 4, 6 on the respective longitudinal axes 3, 8, parallel to the contacting roll 7.

[0127] More in detail, the third method provides rotating the squeegees 4, 6 to correspondingly modify the orientation of the flat portion 17, and in particular the position of the corner 10, 11, and blocking the squeegees 4, 6 in the desired position, univocally corresponding to the width desiderata of the interstice present between the outer surface of the contacting roll 7 and each squeegees 4, 6; such interstice, being selectively settable for each squeegees 4, 6, defines the width of the melted glue layer that can leave the collecting chamber 13 and depositing on the outer surface of the contacting roll 7.

[0128] A fourth feature of the distributor assembly 100, for which the Applicant reserves the possibility to file a divisional patent application, relates to a precaution which allows to effectively adjust the vertical extending of the melted glue layer deposited on the contacting roll 7, varying the thickness of the panels to be edgeboarded, between one batch and another batch.

[0129] With particular reference to figure 1 and 4, based on the production batch and, therefore, based on the thickness of panels to be edgebanded, it is desirable that the height of the melted glue layer deposited on the contacting roll 7 can be adjusted, i.e. the extension of the parallel layer to the rotation axis 9. This result is obtained in the distributor assembly 100 through the fact that the squeegees 4 and 6 are sliding in the respective sites 25 obtained in the body 1, each squeegees 4, 6 being movable along the own longitudinal axis 3, 8, also corresponding to the rotation axis of the squeegee 4 or 6, and it can be blocked in a defined position.

[0130] Nin the example showed in the figures, the sites 25 of the squeegees 4 and 6 are holes passing through the body 1 of the distributor assembly 100, in particular passing through le horizontal portions 1' of the body 1.

[0131] The vertical sliding and the block of the squeegees 4 and 6 can be performed manually, by means for example of screw-elements, or each squeegees 4 and 6 can be equipped with of an actuator exactly configured for this purpose.

[0132] As better showed in figure 4, the flat surface 17 of the squeegees 4 and 6 ends at the top with a corner 16, i.e. a step, which can be defined as higher corner 16. When the distributor assembly 100 is operating, and the contacting roll 7 rotates on its own rotation axis 9, collecting the melted glue from the collecting chamber 13, the corner or step 16 delimits at the top the extension of the melted glue layer, which can leave the collecting chamber 13. Clearly, considering that the squeegees 4 and 6 are adjustable in height, the vertical position of the corner 16 is also adjustable, i.e. determined by the operator depending on the need. As described above, the position of the corner 10, 11 of the flat surface 17 of the squeegees 4 and 6 defines, together with the outer surface of the contacting roll 7 the thickness of the glue layer.

[0133] The higher corner 16 is twisted with respect to the longitudinal axis 3, 8 of the respective squeegees 4, 6.

[0134] Moving longitudinally the squeegees 4 and 6 in the direction of the arrow 28 from position A of maximum height of the melted glue layer, to the position B of minimum height of the melted glue layer, and blocking the squeegees 4 or 6 to the desired height, the precise adjusting of the melted glue layer on the contacting roll 7, seamless independently by the angular position of the squeegees 4, 6, is obtained.

[0135] The lower limit of the flat surface 17 of the squeegees 4, 6 is defined by a seal element, also indicated as *flap,* 24 having, in transversal section, a shape which is complementary to the section of the respective squeegees 4, 6, or it can complete the circumference thereof. In other words, the shape of the flap 24 corresponds to the squeegee 4 or 6 portion eliminated to create the flat surface 17.

[0136] The flaps 24 are visible also in figure 6 showing the distributor assembly 100 in a flat view, from the bottom.

[0137] The flaps 24 are constrained to the body 1 of the distributor assembly 100 by means of a fastening element di 26 holding the flaps 24 however leaving a free-grade, i.e. the flaps 24 have the possibility to rotate together with the respective squeegees 4, 6. For example, the element di fastening 26 is a guide inserting in a sliding way in an undercut of the flaps 24.

[0138] At the bottom, the flaps 24 are provided with a corner or step 16' equivalent to corner/step 16 described above, and indicated as lower corner 16'. The corner or step 16' prevent the melted glue to color along the squeegees 4 and 6 through the holes 25 constituting the sites of the body 1 where the squeegees 4 and 6 rotate and move. This feature allows to maintaining clean the distributor assembly 100 in the lower part thereof.

[0139] A for the method of edgebanding according to the present invention therefore provides adjusting the height of the melted glue layer present on the outer surface of the contacting roll, acting on the squeegees 4, 6, and in particular modifying the vertical position, i.e. the portion.

[0140] More in detail, the fourth method provides to lifting or lowering the squeegees 4, 6 in the respective sites of the body 1 of the distributor assembly 100, to modify the corresponding portion of the flat portion 17, and in particular the position of the higher corner 16, and blocking the squeegees 4, 6 in the desired position, univocally corresponding to the desired height desiderata of the interstice present between the outer surface of the

contacting roll 7 and each squeegees 4, 6; such interstice, selectively configurable for each squeegees 4, 6, defines the height of the melted glue layer which can leave the collecting chamber 13 and depositing on the outer surface of the contacting roll 7. In fact, said height is determined from the distance between the higher corner 16 of the flat surface 17 and the lower corner 16' present on the seal element, or flap 25, closing at the bottom the flat surface 17 e, in general, the corresponding squeegees 4, 6.

[0141] The fourth method can be carried out alternatively or jointly to the third method.

[0142] Ultimately, the angular position of the flat surface 17 defines the thickness of the melted glue layer leaving the collecting chamber 13 on the outer surface of the contacting roll, and the vertical position, or height, of the flat surface 17 defines the height of the melted glue layer, i.e. the extension in a direction parallel to the rotation axis 9 of the contacting roll 7.

[0143] The main advantage provided by the proposed solution is evident: the distributor assembly 100 is configurable by the user based on the thickness of the panels to be edgeboarded, and that can be performed selectively for each batch, even if the thickness changes from one batch to another. The operator can easily obtain the adjustment of the height of the melted glue layer applied to the contacting roll 7 adjusting the vertical position of the squeegees 4 and 6, as explained above.

[0144] According to one embodiment, the squeegees 4, 6 can be removed from the top, along the related longitudinal axis, interchangeably, for their cleaning or replacing. For example, it is sufficient to involve a shape-coupling di forma of the squeegees 4, 6 with the respective lower sites obtained at the lower part of the body 1.

[0145] In the case wherein this solution is implemented together with the possibility, previously described, of adjusting the thickness of the glue layer, it can be understood as the distributor assembly 100 is extremely versatile, giving to the operator the complete control of the geometrical characteristics of the melted glue layer.

[0146] A fifth feature of the distributor assembly 100, for which the Applicant reserves the possibility to file a divisional patent application, relates to a precaution allowing to constantly maintain clean melted glue deposited on the outer surface of the contacting roll 7.

[0147] With particular reference to figure 5, the outer surface of the contacting roll 7 has preferably an profile helicoidal, and more preferably helicoidal continuous, i.e. of the screw-type, alternatively to the conventional knurling or double knurling. This precaution allows to maintain clean the contacting roll 7, because it will be sufficient to equip the distributor assembly 100 with a comb-type scraper of a complementary form with respect to the profile of the contacting roll: thus, glue accumulations on the contacting roll 7 will be avoided.

[0148] However, even if a scraper is not used, the helicoidal profile of the outer surface of the contacting roll 7 allows the particles of panel materials, possibly incorporated in the glue not-detached from the contacting roll 7, to accumulate at the higher or lower ends of the contacting roll 7, based on the rotation directions provided by motor M, which can be clockwise or counterclockwise AO, and depending on the direction of the profile helix. In this way, the contacting roll 7 with the helicoidal profile outer surface can be defined as *self-cleaning,* precisely because the particles thrusted upwards or downwards, but do not remain in the zone of the contacting roll 7 intended to roll on the panel edge to be edgeboarded.

[0149] Therefore, advantageously, considering a use of the distributor assembly 100 for many hours per day, the solid particles possibly detached from the panels and incorporated in the glue present on the contacting roll 7, tend to accumulate to the higher end or to the lower end of the contacting roll 7, where the removal of the excess glue will be easy, for example with manual interventions, by scrapers. In any case, particles are removed and they does not more represent a drawback referring to the fouling of glue and panels under processing.

[0150] Therefore, a fifth method of edgebanding according to the present invention provides maintaining clean the outer surface of the contacting roll 7 making the same contacting roll 7 with profile helicoidal or screw outer surface, and not with the conventional knurling. The helicoidal outer surface promotes the automatic elimination of the undesired particles, which due to the rotation of the contacting roll 7, are thrusted towards the higher end or the lower end of the roll.

[0151] In the attached figures, the distributor body 100 has a generic C-shape; however this is not the sole shape possible: for example, the body C can be made with a cylindrical shape, with the collecting chamber 13 coaxial and external with respect to the mixing chamber 7' and the contacting roll 7.

[0152] The present invention also relates to the following points, for each of which the Applicant reserves the possibility to file a divisional patent application.

1. A glue distributor assembly (100) for edgebanding machine, comprising a body (1) provided with a melted glue collecting chamber (13), and a contacting roll (7), pivotally supported on the body (1), wherein the outer surface of the contacting roll (7) is intended for rolling on a panel edge to be edgebanded or on a panel finishing profile, to distribute the melted glue collected from the collecting chamber (13), characterized in that the contacting roll (7) is hollow, and delimits a volume (7') connected to the collecting chamber (13) and crossed, in use, by the melted glue.

2. Distributor assembly (100) according to point 1, wherein the volume (7') within the contacting roll (7) and the collecting chamber (13) jointly define a flow circuit of the melted glue.

3. Distributor assembly (100) according to point 1 or point 2, wherein the inner volume of the contacting roll (7) is a mixing chamber (7') of the melted glue,

arranged in fluid communication with the collecting chamber (13) within the body (1).

4. Distributor assembly (100) according to any one of the preceding points 1-3, wherein the inner surface (7) has one or more projections, or ribs, and / or the distributor assembly (100) comprises a mixing element (12) inserted within the contacting roll (7) and pivotable thereto, and wherein the relative rotation between the projections, or ribs, and the melted glue present in the contacting roll (7) when in use, and / or the relative rotation between the mixing element (12) and the melted glue present in the contacting roll (7) when in use, generate a thrust on the melted glue.

5. Distributor assembly (100) according to point 4, wherein said projections, or ribs, and / or said mixing element (12), substantially extending as screw-, or helix- or double helix.

6. Distributor assembly (100) according to any one of the preceding points, wherein the collecting chamber (13) extending in the body (1) parallel to the contacting roll (7) and arranged in fluid communication with the inner volume of the contacting roll (7) at the ends of the contacting roll (7).

7. Distributor assembly (100) according to any one of the preceding points, wherein the distributor assembly (100) has a through hole (22) extending between an inlet, accessible to the outside of the distributor assembly (100), and an outlet within the distributor assembly (100) itself, for the injection of a dye within the distributor assembly (100) such that said dye, in use, mixing with said melted glue.

8. Distributor assembly (100) according to point 7, wherein said internal outlet of said through hole (22) is arranged in correspondence of said contacting roll (7) or said collecting chamber (13).

9. Distributor assembly (100) according to any one of the preceding points, comprising a top pivot (18) and a lower pivot (19), wherein the contacting roll (7) is supported on the body (1) by the top pivot (18) and the lower pivot (19), each being at least partially inserted in a corresponding end of the contacting roll (7), and wherein at least one between the top pivot (18) and the lower pivot (19) is removable and the removal makes the contacting roll (7) free from the body (1), for the disassembly.

10. Distributor assembly (100) according to point 9, wherein the top pivot (18) and the lower pivot (19) have at least a radial opening in order to allow the fluid communication with the collecting chamber (13).

11. Distributor assembly (100) according to any one of the preceding points, comprising at least an adjusting element (4, 6) of the thickness of the melted glue layer adhering to the outer surface of the contacting roll (7), defined squeegee, substantially cylindrical, housed in the body (1) parallel to the contacting roll (7) and functionally interposed, with glue barrier function, between the outer surface of the contacting roll (7) and the glue collecting chamber (13), and wherein the at least one squeegee (4, 6) has a flat surface (17), or flatting, or slot, defining a side corner (11, 10) of the squeegee (4, 6), and wherein the at least one squeegee is pivotable on its own longitudinal axis (3, 8) and said side corner (11, 10) is accordingly movable between:

- a proximal position, in correspondence of which the side corner (11, 10) is at a minimum distance from the outer surface of the contacting roll (7), and possibly flushed on it, and the thickness of the glue layer which can leave the collecting chamber (13) and depositing on the contacting roll (7) through the interstice defined by the side corner (11, 10) and by the contacting roll itself (7) is minimum, and possibly null, and
- a distal position, in correspondence of which the side corner (11, 10) is at the maximum distance from the outer surface of the contacting roll (7), and the thickness of the glue layer which can leave the collecting chamber (13) and depositing on the contacting roll (7) through the interstice defined by the side corner (11, 10) and by the contacting roll itself (7) is maximum.

12. Distributor assembly (100) according to point 11, wherein the contacting roll (7) è pivotally on a respective rotation axis (9) and each squeegee (4, 6) is pivotally on its own longitudinal axis (3, 8), and wherein the longitudinal axis of each squeegee (4, 6) is at a distance from the rotation axis (9) of the contacting roll (7) corresponding to the sum of the outer radii of the contacting roll (7) and of the squeegee (4, 6), preferably with tolerance H/h7.

13. Distributor assembly (100) according to any one of the preceding points, comprising at least an adjusting element (4, 6) of the height of the melted glue layer adherent to the outer surface of the contacting roll (7), defined squeegee, substantially cylindrical, housed in the body (1) parallel to the contacting roll (7) and functionally interposed, with glue barrier function, between the outer surface of the contacting roll (7) and the glue collecting chamber (13), and wherein the at least one squeegee (4, 6) has a flat surface (17), or flatting, defining a higher corner (16) of the squeegee (4, 6), and wherein the at least one squeegee is sliding with respect to the body (1) on its own longitudinal axis (3, 8) and said higher corner (16) is accordingly movable between:

- a position of maximum height, in correspondence of which the height of the glue layer which can leave the collecting chamber (13) and depositing on the contacting roll (7) through the interstice defined by the squeegee (4, 6) and by the contacting roll itself (7) is maximum, and

- a minimum height position , in correspondence of which the height of the glue layer that can leave the collecting chamber (13) and depositing on the contacting roll (7) through the interstice defined by the squeegee (4, 6) and by the contacting roll itself (7) is minimum.

14. Distributor assembly (100) according to point 13, comprising for each squeegee (4, 6) a seal element (25), or flap, arranged in the body (1), in correspondence of the lower end of the respective squeegee (4, 6), defining a lower corner (16') of the flat surface (17), and wherein the squeegee (4, 6) is sliding with respect to the seal element (25) to adjust the distance between the higher corner (16) and the lower corner (16') and adjusting, accordingly, the height of the melted glue layer on the contacting roll (7).

15. Distributor assembly (100) according to any one of the preceding points, wherein the outer surface of the contacting roll (7) has a continuous profile helicoidal.

16. A method of panel edgebanding, comprising:

- feeding a panel to an edgebanding machine equipped with a glue distributor assembly (100), provided with a body (1), a melted glue collecting chamber (13), and a contacting roll (7) pivotally supported on the body (1) and externally sprinkled with melted glue collected from the collecting chamber (13);
- by means of the contacting roll (7), distributing melted glue on an edge to be edgeboarded of the panel, or on a finishing profile intended to be glued on the panel edge, allowing the outer surface of the contacting roll to roll (7) on the panel edge or on the finishing profile;
  characterized by
- arranging the hollow contacting roll (7) and allowing the melted glue to flow from the collecting chamber (13) through the contacting roll (7).

Claims

1. A glue distributor assembly (100) for edgebanding machine, comprising a body (1) provided with a collecting chamber (13) of melted glue, a contacting roll (7), pivotally supported on the body (1), and at least one substantially cylindrical squeegee (4, 6), functionally interposed between the collecting chamber (13) and the contacting roll (7) to adjust the amount of melted glue leaving from the collecting chamber (13) directed towards the contacting roll (7), wherein the outer surface of the contacting roll (7) is intended for rolling on a panel edge to be edgeboarded or on a panel finishing profile, to distribute the melted glue collected from the collecting chamber (13), **characterized in that** said squeegee (4, 6) is pivotable on a longitudinal axis thereof (3, 8), parallel to the contacting roll (7), and has a flat surface (17), or flatting, or slot, defining a side corner (10, 11) of the squeegee (4, 6) and the fact that the distance between the outer surface of the contacting roll (7) and the side corner (10, 11) is univocally determined from the angular position of the squeegee squeegee (4, 6) and corresponds to the thickness of the glue layer released on the roll (7).

2. Distributor assembly (100) according to claim 1, wherein the side corner (10, 11) is movable, in response to the rotations provided to the respective squeegee (4, 6) on the related longitudinal axis (3, 8), between a proximal position, corresponding to the minimum distance from the outer surface of the contacting roll (7), and corresponding to the minimum thickness of the glue layer released on the roll (7), and a distal position, corresponding to the maximum distance from the outer surface of the contacting roll (7), and corresponding to the maximum thickness of the glue layer released on the roll (7).

3. Distributor assembly (100) according to claim 1 or claim 2, comprising a seal element (25), or flap, interposed between the body (1) and the respective squeegee (4, 6), to close at the bottom the opening defined between the flat surface (17) and the body (1), wherein the squeegee (4, 6) is sliding with respect to the corresponding seal element (25), and the seal element (25) comprises a lower corner (16') delimiting at the bottom the glue layer released on the roll (7).

4. Distributor assembly (100) according to claim 3, wherein the seal element is constrained to the body (1) and is blocked against the longitudinal movements, and wherein the higher corner (16) is movable, in response to the longitudinal movements of the respective squeegee (4, 6), between a position od minimum distance from the lower corner (16'), corresponding to the minimum height of the glue layer released on the roll (7), and a position od maximum distance from the lower corner (16'), corresponding to the maximum height of the glue layer released on the roll (7).

5. Distributor assembly (100) according to any one of the claims 1-4, comprising two squeegees (4, 6) supported on the body (1) pivotable sui respective longitudinal axes (3, 8) parallel to the rotation axis (9) of the contacting roll (7), wherein le squeegees (4, 6) intercept a corresponding passage present between the collecting chamber (13) and the contacting roll (7), and wherein the squeegees (4, 6) are selectively pivotable and they can be blocked in the desired position, independently from each other.

6. A method of panel edgebanding, comprising:

- feeding a panel to an edgebanding machine equipped with a glue distributor assembly (100), provided with a body (1), a collecting chamber (13) of melted glue, a contacting roll (7) pivotally supported on the body (1) and externally sprinkled with melted glue collected from the collecting chamber (13), and at least one substantially cylindrical squeegee (4, 6), functionally interposed between the collecting chamber (13) and the contacting roll (7) to adjust the amount of melted glue leaving from the collecting chamber (13) directed towards the contacting roll (7);
- by means of the contacting roll (7), distributing melted glue on an edge to be edgeboarded of the panel, or on a finishing profile intended to be glued on the panel edge, allowing the outer surface of the contacting roll to roll (7) on the panel edge or on the finishing profile;

characterized by

- obtaining on said at least one squeegee (4, 6) a flat surface (17) with a higher corner (16), wherein through the interstice delimited by the outer surface of the contacting roll (7) and the flat surface (17) the passage of the melted glue occurs, and
- adjusting the height of the glue layer released on the roll (7) moving the least one squeegee (4, 6) on its own longitudinal axis, parallel to the contacting roll (7), to correspondingly adjust the portion of the higher corner (16).

7. A glue distributor assembly (100) for edgebanding machine, comprising a body (1) provided with a collecting chamber (13) of melted glue, a contacting roll (7), pivotally supported on the body (1), and at least one substantially cylindrical squeegee (4, 6), functionally interposed between the collecting chamber (13) and the contacting roll (7) to adjust the amount of melted glue leaving from the collecting chamber (13) directed towards the contacting roll (7), wherein the outer surface of the contacting roll (7) is intended for rolling on a panel edge to be edgeboarded or on a panel finishing profile, to distribute the melted glue collected from the collecting chamber (13), **characterized in that** said squeegee (4, 6) is movable longitudinally along their own longitudinal axis (3, 8), parallel to the contacting roll (7), and has a flat surface (17), or flatting, or slot, defining a higher corner (16) of the squeegee (4, 6) and due the fact that the portion of the higher corner (16) is univocally determined by the longitudinal position of the squeegee (4, 6) and corresponds to the height of the glue layer released on the roll (7).

8. Distributor assembly (100) according to claim 7, wherein the higher corner (16) is movable, in response to the longitudinal movements provided to the respective squeegee (4, 6) on the related longitudinal axis (3, 8), between a minimum height position, corresponding to the minimum height of the glue layer released on the roll (7), and a position of maximum height, corresponding to the maximum height of the glue layer released on the roll (7).

9. Distributor assembly (100) according to claim 8, wherein la proximal position of the side corner (10, 11) corresponds to the corner in flush against the outer surface of the contacting roll (7), and corresponds to prevent the passage of melted glue from the collecting chamber (13) to the contacting roll (7).

10. Distributor assembly (100) according to any one of the claims 7-9, comprising due squeegees (4, 6) supported on the body (1) movable along the respective longitudinal axes (3, 8) parallel to the rotation axis (9) of the contacting roll (7), wherein le squeegees (4, 6) intercept a corresponding step present between the collecting chamber (13) and the contacting roll (7), and wherein the squeegees (4, 6) are selectively movable and they can be blocked in the desired longitudinal position, independently from each other.

11. Distributor assembly (100) according to any one of the claims 1-5, wherein le squeegees (4, 6) have the characteristics described in any one of the points 16-19.

12. A glue distributor assembly (100) for edgebanding machine, comprising a body (1) provided with a collecting chamber (13) of melted glue, a contacting roll (7), pivotally supported on the body (1), wherein the outer surface of the contacting roll (7) is intended for rolling on a panel edge to be edgeboarded or on a panel finishing profile, to distribute the melted glue collected from the collecting chamber (13), **characterized in that** le ends of the contacting roll (7) are constrained to the body (1) by the corresponding fastening elements (18, 19) of which at least one is removable to allow the disassembly of the contacting roll (7) from the body (1).

13. Distributor assembly (100) according to claim 12, wherein the contacting roll (7) is hollow and the fastening elements (18, 19) are a top pivot (18) and a lower pivot (19), even these being hollow, and together with the contacting roll (7) define an inner volume that can be crossed by the melted glue.

14. Distributor assembly (100) according to claim 12 or claim 13, wherein the contacting roll (7) is hollow and the inner volume thereof is in a fluid communication with the collecting chamber (13), through the fastening elements (18, 19), and the inner volume of the contacting roll (7) and the collecting chamber (13)

jointly defining a flow circuit of the melted glue.

15. Distributor assembly (100) according to claim 13 or claim 14, wherein the top pivot (18) and the lower pivot (19) have at least a radial opening in order to allow the fluid communication with the collecting chamber (13).

16. Distributor assembly (100) according to any one of previous claims 12-15, wherein the inner surface (7) has one or more projections, or ribs, and / or the distributor assembly (100) comprises a mixing element (12) inserted within of the contacting roll (7) and pivotable thereto, and wherein la relative rotation between the projections or ribs and la melted glue present in the contacting roll (7), and la relative rotation between the mixing element (12) the melted glue present in the contacting roll (7), generate a thrust on the melted glue.

17. Distributor assembly (100) according to claim 16, wherein said projections or ribs, and said mixing element (12), extending substantially as a screw, or an helix, or a double helix.

18. Distributor assembly (100) according to any one of the previous claims 15-17, wherein the mixing element (12) has a through hole (22) extending between an inlet, accessible to the outside of the contacting roll (7), and an outlet within the contacting roll (7), for the injection of a dye within the contacting roll (7).

19. A glue distributor assembly (100) for edgebanding machine, comprising a body (1) provided with a collecting chamber (13) of melted glue, a contacting roll (7), pivotally supported on the body (1), wherein the outer surface of the contacting roll (7) is intended for rolling on a panel edge to be edgeboarded or on a panel finishing profile, to distribute the melted glue collected from the collecting chamber (13), **characterized in that** the outer surface of the contacting roll (7) has a continuous helicoidal profile.

20. Distributor assembly (100) according to any one of the preceding claims, wherein the contacting roll (7) is motorized.

21. A method of panel edgebanding, comprising:

- feeding a panel to an edgebanding machine equipped with a glue distributor assembly (100), provided with a body (1), a collecting chamber (13) of melted glue, a contacting roll (7) pivotally supported on the body (1) and externally sprinkled with melted glue collected from the collecting chamber (13), and at least one substantially cylindrical squeegee (4, 6), functionally interposed between the collecting chamber (13) and the contacting roll (7) to adjust the amount of melted glue leaving from the collecting chamber (13) directed towards the contacting roll (7);
- by means of the contacting roll (7), distributing melted glue on an edge to be edgeboarded of the panel, or on a finishing profile intended to be glued on the panel edge, allowing the outer surface of the contacting roll to roll (7) on the panel edge or on the finishing profile;

characterized by

- obtaining on said at least one squeegee (4, 6) a flat surface (17) with a side corner (10, 11), wherein through the interstice delimited by the outer surface of the contacting roll (7) and la flat surface (17) the passage of the melted glue occur, e
- adjusting the thickness of the glue layer released on the roll (7) rotating the at least one squeegee (4, 6) on its own longitudinal axis, parallel to the contacting roll (7), to correspondingly adjust the distance between the outer surface of the contacting roll (7) and the side corner (10, 11).

22. Method according to claim 6, having the characteristics described in claim 21.

23. A method of panel edgebanding, comprising:

- feeding a panel to an edgebanding machine equipped with a glue distributor assembly (100), provided with a body (1), a collecting chamber (13) of melted glue, a contacting roll (7) pivotally supported on the body (1) and externally sprinkled with melted glue collected from the collecting chamber (13);
- by means of the contacting roll (7), distributing melted glue on an edge to be edgeboarded of the panel, or on a finishing profile intended to be glued on the panel edge, allowing the outer surface of the contacting roll to roll (7) on the panel edge or on the finishing profile;

characterized by

- constraining the contacting roll (7) al body (1) of the distributor assembly (100) at the ends thereof, by the respective fastening elements (18, 19), wherein at least one of the fastening elements (18, 19) is removable to allow the disassembly of the contacting roll (7) from the body (1) by maintenance or replacing.

24. A method of panel edgebanding, comprising:

- feeding a panel to an edgebanding machine equipped with a glue distributor assembly (100), provided with a body (1), a collecting chamber (13) of melted glue, a contacting roll (7) pivotally supported on the body (1) and externally sprin-

kled with melted glue collected from the collecting chamber (13);
- by means of the contacting roll (7), distributing melted glue on an edge to be edgeboarded of the panel, or on a finishing profile intended to be glued on the panel edge, allowing the outer surface of the contacting roll to roll (7) on the panel edge or on the finishing profile;
characterized by
- promoting the migration at the ends of the contacting roll (7) of possibly solid particles present on the outer surface of the same contacting roll (7), configuring the outer surface of the contacting roll (7) with a continuous helicoidal profile.

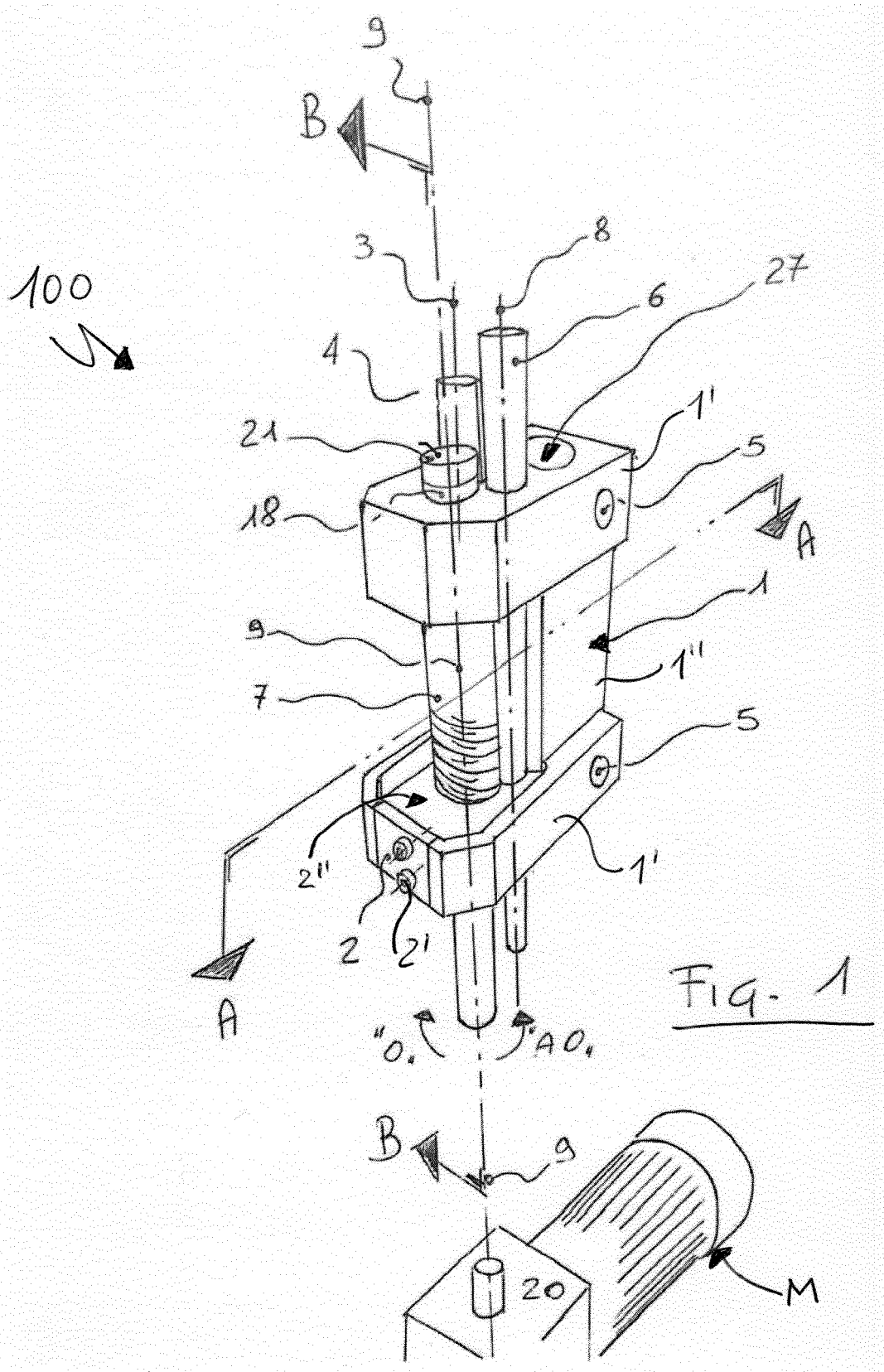


FIG. 1

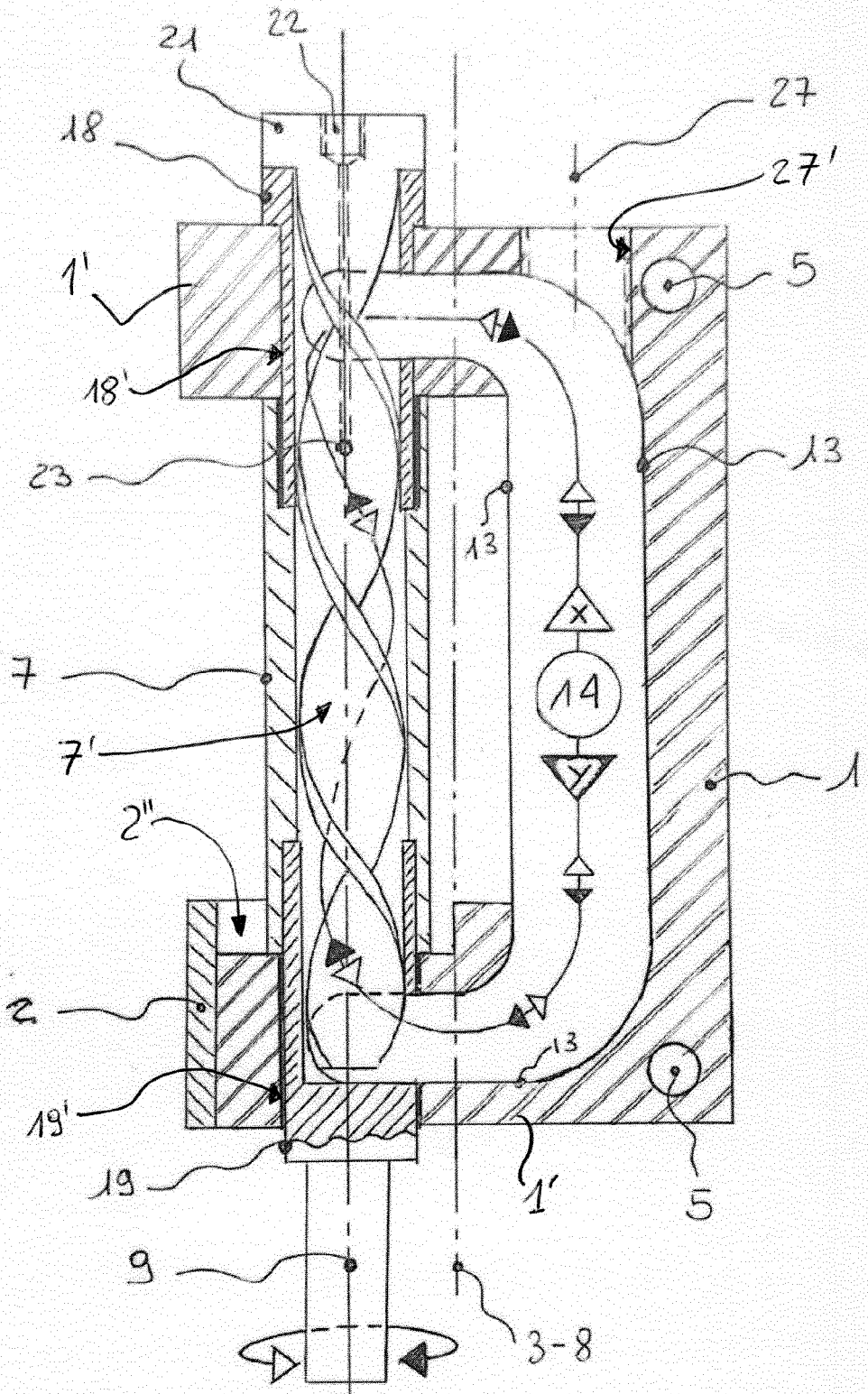


FIG.2 SEZ B-B

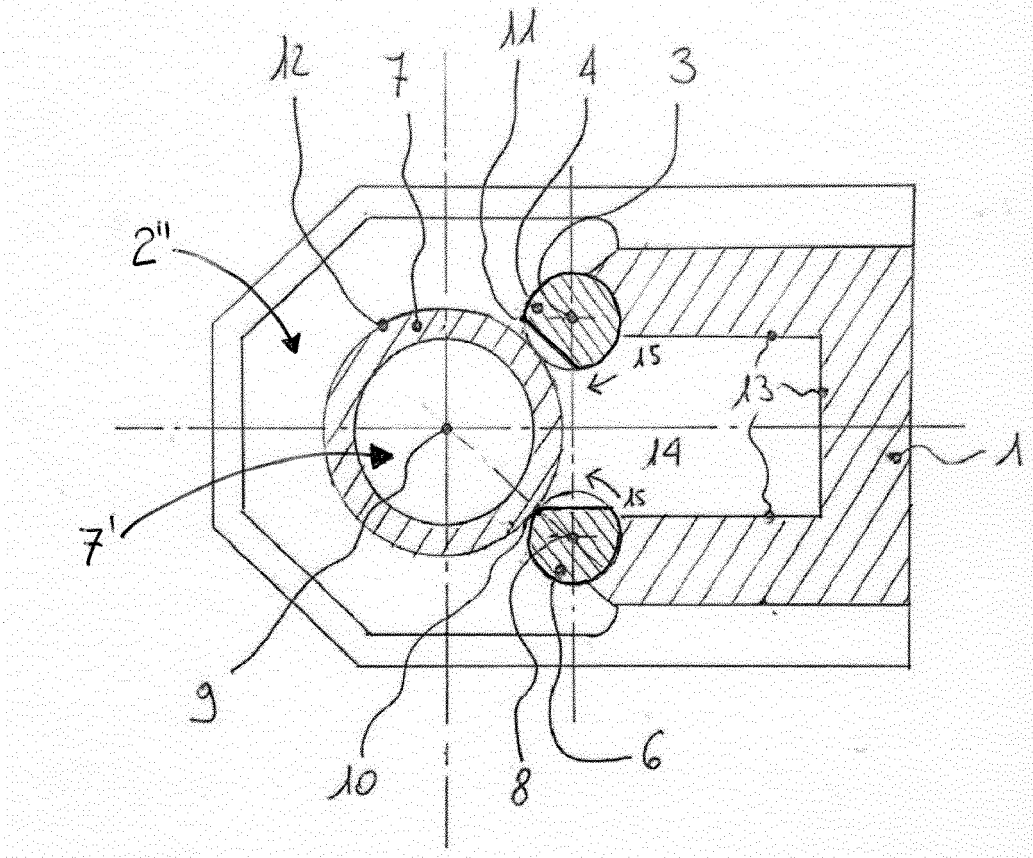


FIG. 3
SEZ A-A

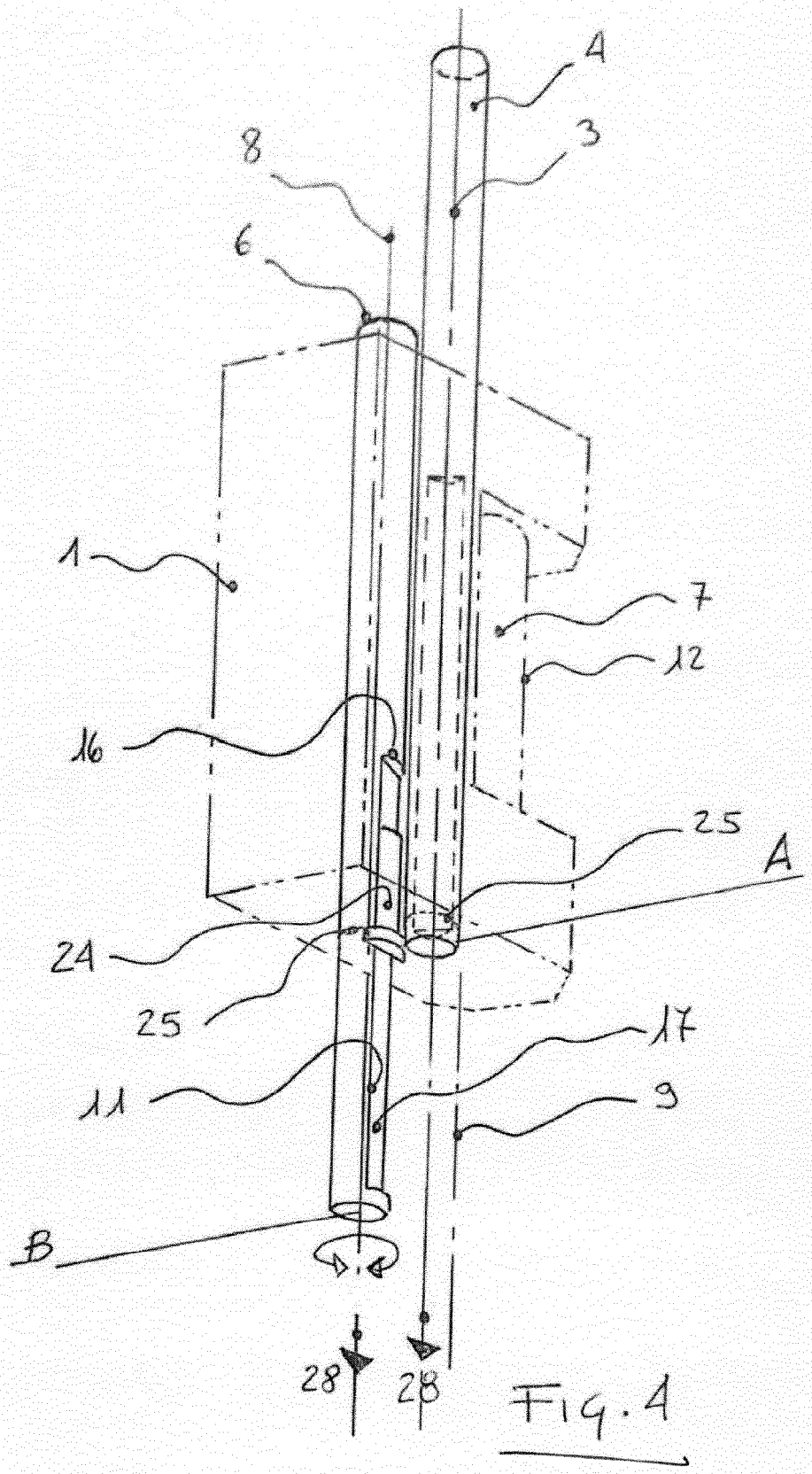
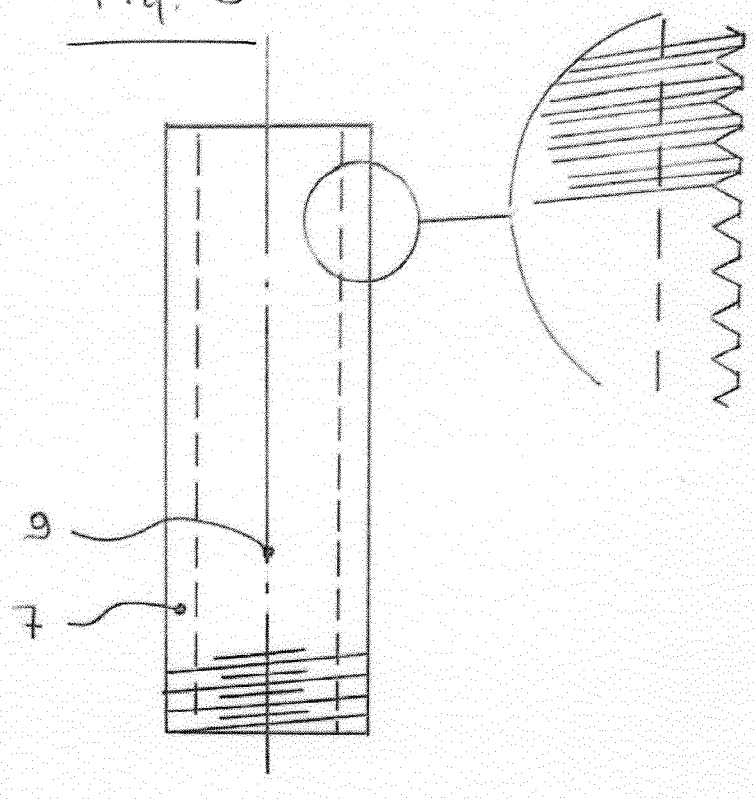


Fig. 4

FIG. 5



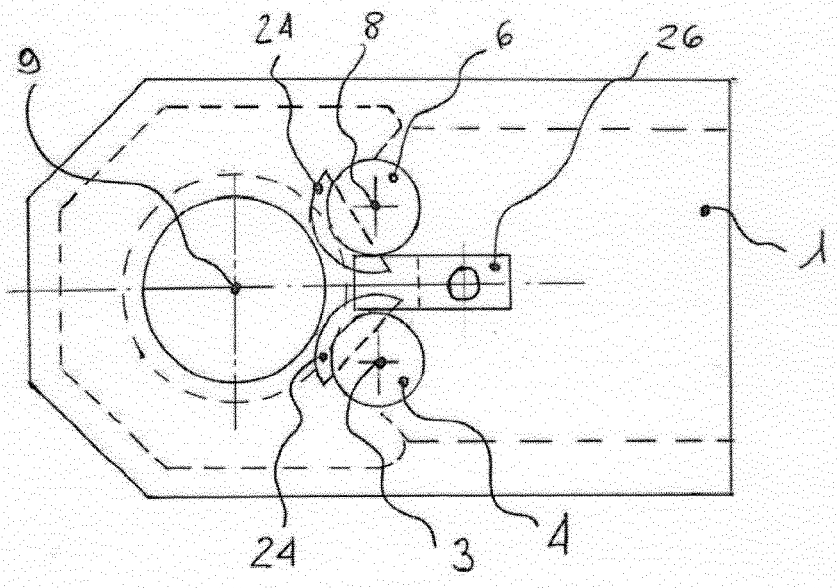


FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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