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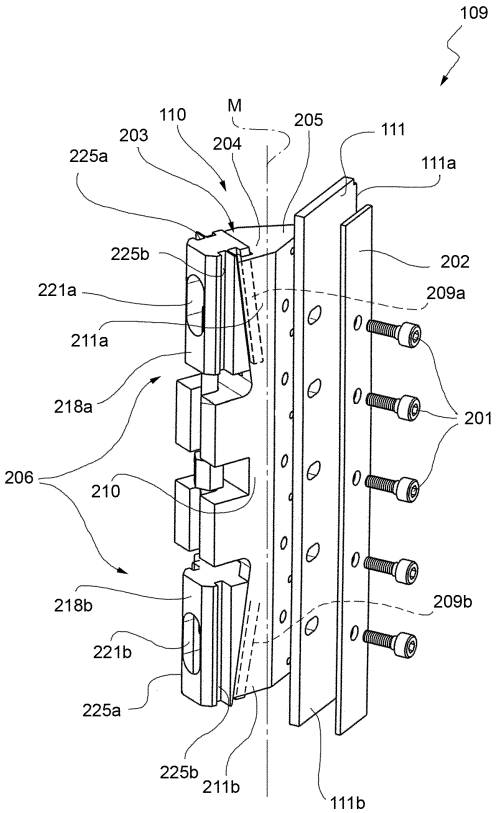
(54) An adhesive scraper for a gluing unit

(57) There is described an adhesive scraper (109) for removing the excess adhesive and smoothing the surface of adhesive applied on the lateral surface of a glue roller (101) of a gluing unit (100); the adhesive scraper (109) comprises a scraper support (110), a scraping tool (111) and means for adjusting the position of scraping tool (111) relative to the lateral surface; the scraper support (110) comprises a body (203) extending along a main axis (M) parallel to the rotation axis of the glue roller (101) and comprising a fixing portion (204) and a scraper bearing portion (205); the scraper support (110) further comprises distal adjustment means (206) for fixing scraper support (110) to a support structure (116) of the gluing unit (100) and adjusting the relative distance between the body (203) and the support structure (116); the distal adjustment means (206) are operatively coupled with the body (203) and the support structure (116) in sliding arrangement so as to be movable solely along an axis parallel to the main axis (M) and so that the translation of the distal adjustment means (206) along the axis parallel to said main axis (M) results in a proportional translation along the axis orthogonal to the main axis (M) of the body (203), with respect to the support structure (116).(Figure 7)

FIG. 7



EP 2 727 850 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to an adhesive scraper for a gluing unit for labelling machines, particularly for the type of labelling machines comprising a reel from which the labelling material web is cut into lengths of a predetermined size and applied on items, namely on containers.

BACKGROUND ART

[0002] In roll-fed labelling machines, containers are carried by a carousel and advanced towards a labelling station along a predetermined container path. The labelling material, in the form of a web wound about a reel, is progressively advanced towards the labelling station along a respective label path, along which a cutting unit is provided for cutting a length of labelling material of the desired size and for transferring the resulting stripes of labelling material, typically by means of a vacuum drum, to the labelling station. As the strips of labelling material, i.e. the newly-cut labels, are transferred from the cutting unit toward the labelling station, a layer of adhesive is typically applied on its surface for subsequently securing them to the surface of the containers being fed to the labelling station.

[0003] To this purpose, roll-fed labelling machines comprise a gluing unit comprising, in turn:

- a glue roller for applying the layer of adhesive to the labels (i.e. the newly-cut strips of labelling material being received from the cutting unit); and
- means for supplying adhesive to the glue roller in a controlled manner.

[0004] Figure 1 shows schematically the typical arrangement of a roll-fed labelling machine 1 comprising a cutting unit 2.

[0005] Cutting unit 2 generally comprises (see Figure 2a) a rotary blade 3 and a stationary blade 4 - to which reference is often made also as the counterblade - which are arranged adjacent to vacuum drum 5. In use, the web of labelling material is advanced between the stationary and the rotary blade of the cutting unit, the leading edge of the web being picked, by suction, by the vacuum drum.

[0006] The vacuum drum is typically driven to rotate at a speed higher than the speed at which the labelling material web is advanced along the label path, whereby the vacuum drum applies a pulling force on the leading edge of the web. When, upon rotation, the rotary blade becomes contraposed to the stationary blade, the labelling material web is cut. Typically, since there is substantially no direct interference between the stationary blade and the rotary blade, the labelling material web (generally a thin, polymeric film) is weakened along the cutting line and the label is "torn" off the rest of the web by means of the pulling force applied by the vacuum drum. By appropriately setting the vacuum drum rotation speed and the speed at which the labelling material web is advanced, the label length can conveniently be adjusted.

[0007] Once picked by the vacuum drum and adhering to the lateral surface thereof by virtue of the relative suction means, the newly-cut labels advance along the label path which is locally defined by the periphery of the vacuum drum. Prior to reaching labelling station 7, i.e. the portion of labelling machine 1 where the vacuum drum is operatively coupled with the carousel carrying the containers to be labelled, the newly-cut labels reach gluing station 8, at which the vacuum drum is operatively coupled with gluing unit 9.

[0008] As illustrated schematically in Figure 2b, at gluing station 8 the glue roller 10 contacts the label carried by the vacuum drum, thereby applying onto its surface a given glue pattern. Accuracy of glue application is paramount to ensure quality of application of the label on the respective container downstream from the gluing station.

[0009] To this purpose, the means for supplying adhesive to the glue roller in a controlled manner of the gluing unit, to which reference has briefly been made above, generally include:

- means 11 for distributing a continuous flow of adhesive onto the glue roller lateral surface; and
- means 12 for regulating the amount of adhesive carried on the glue roller lateral surface.

[0010] In greater detail, the distributing means comprise a stationary adhesive distributor bar adapted to pour adhesive onto the glue roller lateral surface.

[0011] Typically, the stationary adhesive distributor bar extends parallel to the rotation axis of the glue roller, and is provided with a plurality of holes facing the lateral surface of the glue roller and hydraulically connected with a source of adhesive. Upon rotation of the glue roller about its axis, the stationary adhesive distributor bar pours adhesive on the whole lateral surface of the glue roller.

[0012] In general, in order to ensure that the lateral surface of the glue roller is homogeneously covered with adhesive, this is supplied in an amount greater than the amount strictly necessary for proper gluing of the labels received by the gluing unit.

[0013] Means for appropriate regulation and control of the amount of adhesive carried on the glue roller lateral surface therefore generally form part of the gluing unit and typically comprise an adhesive scraper for removing the excess adhesive and smoothing the surface of the adhesive layer applied onto the glue roller lateral surface. Furthermore, gluing unit 9 may comprise means for collecting the excess adhesive thus removed and for recycling it back to the stationary adhesive distributor bar.

[0014] Furthermore, gluing unit 9 typically comprises means 13 for removing labels that may accidentally stick to the glue roller instead of advancing towards the labelling station to be applied on a respective container. Typ-

ically, said means comprise a blade adapted to scrape the accidentally stuck label off the glue roller.

[0015] Correct relative positioning of the glue roller tools, i.e. stationary adhesive distributor bar 11, adhesive scraper 12 and label removal blade 13 with respect to the glue roller lateral surface are crucial for good gluing performances and, consequently, for ensuring proper application of the label to the container (correct alignment, stability, etc.). In particular, accurate adjustment of the adhesive scraper relative to the glue roller lateral surface plays a very important role for achieving ensuring satisfactory quality standards.

[0016] Means are therefore typically provided for varying the relative distance between the adhesive scraper and the lateral surface of the glue roller. Traditionally, the adhesive scraper is advanced/retracted by means of an array of jacking screws arranged along the length of the adhesive scraper support. However, these screws tend to deform with time, thereby causing an undesirable rotation of the adhesive scraper support, which results in incorrect profiles and non-uniform contact when positional adjustments of the adhesive scraper are attempted. A need is felt in the art for overcoming this drawback.

[0017] On the labelling machine market, several different machine configurations are generally made available for the final user - which is typically a company in the food or pharmaceutical industry - to choose among. In particular, as shown in Figure 3, right-hand (standard) and left-hand (non-standard) configurations are made available to the final user in order to match their needs in term of space usage. Besides, both right-hand and left-hand configurations are generally made available with either positive or negative spin. By these terms, reference is made to whether the carousel and the vacuum drum rotate about their axes in opposite directions or in the same direction, respectively. It shall be apparent that, in positive-spin configurations, at label transfer, the opposing surfaces of the carousel and of the vacuum drum move in the same direction. On the other hand, in negative-spin configurations, at label transfer, the opposing surfaces of the carousel and of the vacuum drum move in opposite directions.

[0018] Consequently, several details of a labelling machine often need to be tailored on the final user's needs. Among these is the positioning of the glue roller tools relative to the glue roller lateral surface, i.e. to the position of the rotation axis of the glue roller.

[0019] In order to cope with the requests coming from their customers, labelling machine producers have had to multiply their design efforts to be able to provide a variety of gluing units, each of them being especially adapted for a specific machine configuration.

[0020] In particular, different gluing units with different reciprocal arrangements of the stationary adhesive distributor bar, the adhesive scraper, the label removal blade and the glue roller shaft are generally required to adapt a labelling machine to the final user's requirements. For a labelling machine producer, this entails not only providing different support structures for the different basic components of a gluing unit, but also different and specifically designed systems for the supply of adhesive, as well as means for adjusting the relative distance between the adhesive scraper and the glue roller, and so forth.

[0021] Not only does this make the development of new labelling machines very time-consuming and complex for labelling machine designers, but also it makes it necessary for the labelling machine producer to destine a significant space to the storage of spare gluing units for the different machine configurations.

[0022] In practice, the need to adapt the machine configuration and, consequently, the gluing unit, to the different requirements of the final users, results, for labelling machine producers, in dramatically increased costs and the undesirably inefficient usage of storage space.

DISCLOSURE OF INVENTION

[0023] It is an object of the present invention to provide an adhesive scraper for a gluing unit which makes it possible to overcome at least one of the above drawbacks in straightforward and inexpensive fashion.

[0024] This object is achieved by an adhesive scraper as claimed in claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025] A non-limiting embodiment of the present invention will be described in the following by way of example and with reference to the accompanying drawings, in which:

Figure 1 shows a schematic plan view of a labelling machine;

Figure 2a shows a schematic representation of the layout of the cutting unit of the labelling machine of Figure 1;

Figure 2b shows a schematic representation of the layout of the gluing unit of the labelling machine of Figure 1;

Figure 3 shows several examples of different configurations of the labelling machine of Figure 1;

Figure 4 shows a schematic plan view of a gluing unit for roll-fed labelling machines;

Figure 5 shows a schematic prospective view of the gluing unit of Figure 4;

Figure 6 shows a schematic partial section of the gluing unit of Figure 4;

Figure 7 shows a schematic perspective view of an adhesive scraper according to the present invention, making part of the gluing unit of Figure 4; and

Figure 8 shows a schematic side view of the adhesive scraper of Figure 7.

BEST MODE FOR CARRYING OUT THE INVENTION

[0026] Number 100 in Figure 4 indicates as a whole a gluing unit, in particular for roll-fed labelling machines

[0027] Gluing unit 100 comprises a glue roller 101 for applying an adhesive pattern to labels (i.e. the newly-cut strips of labelling material fed to the gluing unit) and a stationary adhesive distributor bar 102 adapted to pour adhesive onto the lateral surface of glue roller 101.

[0028] Glue roller 101 is mounted rotatable about a relative shaft 103 and is adapted to contact, at a gluing station 104, a label 105 carried by a vacuum drum 106 rotatable about a respective axis (not shown) substantially parallel to the axis of shaft 103. The lateral surface of glue roller 101 is knurled for favouring adhesive adherence.

[0029] Stationary adhesive distributor bar 102 extends parallel to the rotation axis of glue roller 101, and is provided (see Figure 6) with a plurality of holes 107a facing the lateral surface of glue roller 101 and hydraulically connected, by internal ducts 107b, with a source of pressurised adhesive (not shown). The gluing unit 100 typically comprises elastic means 108 (e.g. a spring) for holding stationary adhesive distributor bar 102 against the lateral surface of glue roller 101.

[0030] Furthermore, gluing unit 100 comprises an adhesive scraper 109 for removing the excess adhesive and smoothing the surface of the adhesive layer applied onto the lateral surface of glue roller 101.

[0031] In greater detail, adhesive scraper 109 comprises a scraper support 110 and a scraping tool 111 mounted on the scraper support 110, the radial distance between the lateral surface of glue roller 101 and the scraping tool 111 substantially setting the thickness of the adhesive layer carried by glue roller 101, hence also the amount of adhesive transferrable to label 105. Therefore, to enable regulation and control of the amount of adhesive carried on the lateral surface of glue roller 101, adhesive scraper 109 comprises means for adjusting the position of the scraping tool 111 relative to the lateral surface of glue roller 101. Further structural features, adjustment and operation of adhesive scraper 109 shall be described in greater detail.

[0032] Preferably, gluing unit 100 further comprises means (not shown) for collecting the excess adhesive removed by means of adhesive scraper 109 and for recycling it back to stationary adhesive distributor bar 102.

[0033] Labels 105 carried by vacuum drum 106 may accidentally stick to glue roller 101 instead of advancing towards the labelling station to be applied on a respective container. Gluing unit 100 preferably comprises means 112 for removing labels which have stuck to the lateral surface of glue roller 101, said means typically comprise a support means 113 and a blade 114 arranged such as to substantially scrape the lateral surface of glue roller 101, upstream from stationary adhesive distributor bar 102 with respect to the direction of rotation of glue roller 101.

[0034] Gluing unit 100 further comprises means for heating glue roller 101. In the embodiment illustrated in Figure 4, said heating means comprise a pair of heating blocks 115a and 115b arranged on opposite sides of glue roller 103, respectively upstream and downstream from gluing station 104, and shaped such as to partly envelop glue roller 101.

[0035] Gluing unit 100 comprises a support structure 116 for supporting stationary adhesive distributor bar 102 and adhesive scraper 109 in operative coupling with glue roller 101. Advantageously, the rotation axis of glue roller 101 substantially identifies (see Figure 4), with stationary adhesive distributor bar 102, a symmetry plan S; support structure 116 defining at least two seats 117a and 117b arranged symmetrically with respect to plan S and adapted to receive and support adhesive scraper 109 so that gluing unit 100 can be assembled in either right-hand or left-hand configuration.

[0036] Seats 117a and 117b are also adapted to receive and support label removal means 112, so that the seat symmetrical to the one occupied by adhesive scraper 109 can conveniently be occupied by label removal means 112.

[0037] More particularly, in the embodiment shown in Figures 5 and 6, support structure 116 comprises two pillars 118a, 118b arranged symmetrically with respect to symmetry plane (S), and a bridge structure 119 extending transversally to pillars 118a, 118b and releasably fixable thereto at a predetermined height, bridge structure 119 defining symmetrical seats 117a and 117b and a centrally located seat 119 for receiving and supporting stationary adhesive distributor bar 102. Preferably, pillars 118a, 118b are symmetrical.

[0038] Pillars 118a, 118b are provided with respective heating blocks 115a, 115b and define together a housing 120 for receiving glue roller 101. In particular, heating blocks 115a, 115b have respective cylindrically shaped heating surfaces 122a, 122b facing glue roller 101, a pair of cavities 123a, 123b being defined between heating surfaces 122a, 122b and the lateral surface of glue roller 101.

[0039] In certain embodiments, support unit 116 may comprise (see Figure 4) profile extension elements 124 arranged adjacent to heating blocks 120a, 120b in order to encase to a greater extent glue roller 101, thereby making it possible to adapt gluing unit 100 to specific thermal and/or ergonomics requirements.

[0040] In the embodiment shown in Figures 5 and 6, bridge structure 119 comprises two substantially identical bars 124, 124' extending transversally with respect to pillars 118a, 118b to which they are releasably fixed. Preferably, bars 124, 124' are connected to one another by means of a central plate 125 adapted to support elastic means 108 for holding stationary adhesive distributor bar against the lateral surface of glue roller 101 (see, in particular, Figure 8).

[0041] Adhesive scraper 109 and label removal means 112 are also advantageously designed so as to develop

symmetrically, so that they can conveniently be turned upside-down with a view to matching the specifics of either left-hand or right-hand labelling machine configurations.

[0042] In particular, both adhesive scraper 109 and label removal means 112 comprise (see Figures 5 and 6) a support body releasably fixable to support structure 116 and bearing a respective tool portion. Advantageously, the support body has a symmetrical cross section, so as to provide two surfaces to either of which the tool portion may be releasably fixed.

[0043] It shall appear that the design of these modular elements forming adhesive scraper 109 and label removal means 112 is such that it is possible to easily assemble, from the same finite number of modular elements, adhesive scrapers 109 and label removal means 112 adapted for use in either left-hand or right-hand labelling machine configurations.

[0044] With reference to Figures 7 and 8, a preferred embodiment of adhesive scraper 109 of gluing unit 100 shall now be described in greater detail.

[0045] Scraping tool 111 of adhesive scraper 109 substantially consists of a plate having a free end 111a and a fixed end 111b, free end 111a being adapted to remove, in use, the excess adhesive off the lateral surface of glue roller 101. At fixed end 111b, scraping tool 111 is releasably fastened to scraper support 110, e.g. by means of a plurality of screws 201. As illustrated in Figure 7, screws 201 are used in combination with a thin plate 202 which substantially serves the purpose of a washer.

[0046] Scraper support 110 comprises:

- a body 203 extending along a main axis M parallel to the rotation axis of glue roller 101, comprising a fixing portion 204 and a scraper bearing portion 205; body 203 being movable solely along an axis N orthogonal to main axis M; and
- distal adjustment means 206 for fixing scraper support 110 to support structure 116 and adjusting the relative distance between body 203 and support structure 116; distal adjustment means 206 being operatively coupled with body 203 and support structure 116 in sliding arrangement so as to be movable solely along an axis parallel to main axis M, and so that the translation of distal adjustment means 206 along said axis parallel to main axis M results in a proportional translation along said axis orthogonal to main axis M of body 203, with respect to support structure 116.

[0047] Scraper bearing portion 205 projects from fixing portion 204 transversally to said main axis M and is tapered so as to provide a pair of symmetrically converging surfaces, to either of which scraping tool 111 may advantageously be fastened, depending on the desired gluing unit (labelling machine) configuration.

[0048] Fixing portion 204 of scraper support 110 (see Figure 8) has, on the side opposite scraper bearing portion 205, at least two blind holes 207, aligned with corresponding holes 207' (see Figure 6) in support structure 116 and adapted to receive with play respective alignment bolts 208 fixable to support structure 116.

[0049] Furthermore, on the side opposite scraper bearing portion 205, fixing portion 204 of scraper support 110 defines two guide surfaces 209a, 209b symmetrically converging towards a central portion 210 from which said guide surfaces 209 extend.

[0050] In greater detail, guide surfaces 209 are defined by respective tapered end portions 211a, 211b of fixing portion 204. More particularly, end portions 211a, 211b taper so as to form, with main axis M, an angle α less than 90°.

[0051] In the embodiment shown, tapered end portions 211a, 211b have a substantially C-shaped cross section, so as to define respective longitudinal grooves 212a, 212b adapted to couple with distal adjustment means 206.

[0052] More particularly, longitudinal grooves 212a, 212b have respective sides 213-214a, 213-214b and bottoms 215a, 215b. Sides 213-214a, 213-214b comprise respective relative undercuts 216-217a, 216-217b.

[0053] Distal adjustment means 206 comprise two symmetrically arranged wedge-shaped means 218a, 218b slidably coupled with longitudinal grooves 212a, 212b, respectively.

[0054] More particularly, wedge-shaped means 218a, 218b comprise respective coupling portions 219a, 219b adapted to mate with respective longitudinal grooves 212a, 212b, and connecting portions 220a, 220b for operative coupling with support structure 116.

[0055] Coupling portions 219a, 219b of wedge-shaped means 218a, 218b are tapered in complementary manner with respect to the relative tapered end portion 211a, 211b which they engage, thereby defining tapered surfaces symmetrically diverging from central portion 210 from which said guide surfaces 209 extend. In practice, coupling portions 219a, 219b taper so as to form, with main axis M, an angle β supplementary to angle α. Furthermore, coupling portions 219a, 219b have a substantially T-shaped cross section, so as to mate with respective longitudinal grooves 212a, 212b.

[0056] Connecting portions 220a, 220b have (see Figure 7) respective through slotted holes 221a, 221b, substantially aligned with corresponding blind holes 207 in fixing portion 204 and adapted to receive with play alignment bolts 208 fixable to support structure 116.

[0057] Furthermore, each connecting portion 220a, 220b has a respective base 222a, 222b opposite the relative coupling portion 219a, 219b and sides 223-224a, 223-224b. On their respective sides 223-224a, 223-224b, connecting portions 220a, 220b define respective pairs of longitudinal grooves 225a, 225b adapted to engage corresponding mating portions 226a, 226b of support structure 116.

[0058] As illustrated in greater detail in Figure 8, mating portions 226a, 226b of support structure 116 have a sub-

stantially C-shaped cross section, so as to define respective longitudinal grooves adapted to partially receive connecting portion 220a, 220b. Furthermore, sides of mating portions 226a, 226b have respective undercuts adapted to mate with longitudinal grooves 225a, 225b in sides 223-224a, 223-224b of connecting portions 220a, 220b.

[0059] Distal adjustment means 206 are coupled with a two-thread endless screw 300, which is, in turn, rotatably coupled with body 203 and extends parallel to main axis M, its two branches 300a and 300b having opposite inclination (right-handed and left-handed threads). To this purpose, as illustrated in Figure 7, central portion 210 of body 203 is longitudinally bored to receive endless screw 300 and defines a housing 301 for a fixed nut 302 for longitudinally fixing endless screw 300 to body 203. Fixed nut 302 also serves as actuator for an operator to rotate endless screw 300, thereby adjusting the relative distance between body 203 and support structure 116, as shall be clarified in the following.

[0060] Wedge-shaped means 218a, 218b are also bored along an axis parallel to main axis M and internally define respective screwed surfaces 303a, 303b adapted to mate with respective branches 300a, 300b of endless screw 300. The screwed surface of the internal bores of wedge-shaped means 218a, 218b have inclinations such as to match the respective inclination of the screwed surface of the branch 300a, 300b with which they are to mate.

[0061] Wedge-shaped means 218a, 218b engage, at once, alignment bolts 208 with slotted holes 221a, 221b; longitudinal grooves 212a, 212b with coupling portions 219a, 219b; and mating portions 226a, 226b with longitudinal grooves 225a, 225b. As a consequence, wedge-shaped means 218a, 218b are only free to move along an axis parallel to main axis M, whereas they cannot move along any other direction, let alone rotate about the axis along which they can move.

[0062] Accordingly, upon rotation of endless screw 300 about its axis, wedge-shaped means 218a, 218b shall move symmetrically and in opposite directions along said axis. Wedge-shaped means 218a, 218b and body 203 cooperating along tapered surfaces, the symmetrical translation of wedge-shaped means 218a, 218b along endless screw branches 300a, 300b results in a proportional translation along an axis orthogonal to main axis M of body 203, i.e. in a variation of the distance between body 203 and support structure 116.

[0063] In use, by rotating endless screw 300 about its axis, it is therefore advantageously possible to finely adjust the distance between body 203 and support structure 116. Consequently, it is possible to adjust the distance between scraping tool 111 - which is borne by body 203 at the end opposite support structure 116 - and glue roller 101, the relative position of the shaft of glue roller 101 and support structure 116 being fixed.

[0064] The advantages of adhesive scraper 109 according to the present invention will be clear from the above description.

[0065] In particular, adhesive scraper 109 according to the invention enables a very fine regulation of the relative distance between the lateral surface of the glue roller and scraping tool 111, thereby allowing high precision in the application of adhesive onto the glue roller and, consequently, on each label reaching the gluing station.

[0066] Clearly, changes may be made to adhesive scraper 109 as described and illustrated herein without, however, departing from the scope of protection as defined in the accompanying claims.

Claims

1. An adhesive scraper (109) for removing the excess adhesive and smoothing the surface of adhesive applied on the lateral surface of a glue roller (101) of a gluing unit (100), comprising a scraper support (110), a scraping tool (111) mounted on said scraper support (110) and means for adjusting the position of scraping tool (111) relative to said lateral surface; **characterised in that** said scraper support (110) comprises:

   - a body (203) extending along a main axis (M) parallel to the rotation axis of said glue roller (101), comprising a fixing portion (204) and a scraper bearing portion (205); said body (203) being movable solely along an axis (N) orthogonal to said main axis (M); and
   - distal adjustment means (206) for fixing scraper support (110) to a support structure (116) of said gluing unit (100) and adjusting the relative distance between said body (203) and said support structure (116); said distal adjustment means (206) being operatively coupled with said body (203) and said support structure (116) in sliding arrangement so as to be movable solely along an axis parallel to said main axis (M) and so that the translation of said distal adjustment means (206) along said axis parallel to said main axis (M) results in a proportional translation along said axis orthogonal to said main axis (M) of said body (203), with respect to said support structure (116).

2. The adhesive scraper according to Claim 1, wherein said fixing portion (204) of said scraper support (110) defines two guide surfaces (209a, 209b) symmetrically converging towards a central portion (210) from which said guide surfaces (209) extend and adapted to couple with said distal adjustment means (206); distal adjustment means (206) comprising two symmetrically arranged wedge-shaped means (218a, 218b) slidably coupled with said guide surfaces (209a, 209b) and only free to move symmetrically and in opposite directions along said axis parallel to said main axis (M).

3. The adhesive scraper according to Claim 2, further comprising a two-thread endless screw 300, rotatably coupled with said body (203) and extending parallel to main axis M, its two threads (300a, 300b) having opposite inclination; said wedge-shaped means (218a, 218b) being bored along an axis parallel to said main axis (M) and defining internally respective screwed surfaces (303a, 303b) adapted to mate with said branches (300a, 300b) of said endless screw (300).

4. The adhesive scraper according to Claim 2 or 3, wherein said fixing portion (204) of scraper support (110) has, on the side opposite said scraper bearing portion (205), at least two blind holes (207), aligned with corresponding holes (207') in said support structure (116) and adapted to receive with play respective alignment bolts (208) fixable to said support structure (116); said wedge-shaped means (218a, 218b) having respective through slotted holes (221a, 221b) substantially aligned with said blind holes (207) in said fixing portion (204) and adapted to receive with play said alignment bolts (208).

FIG. 1

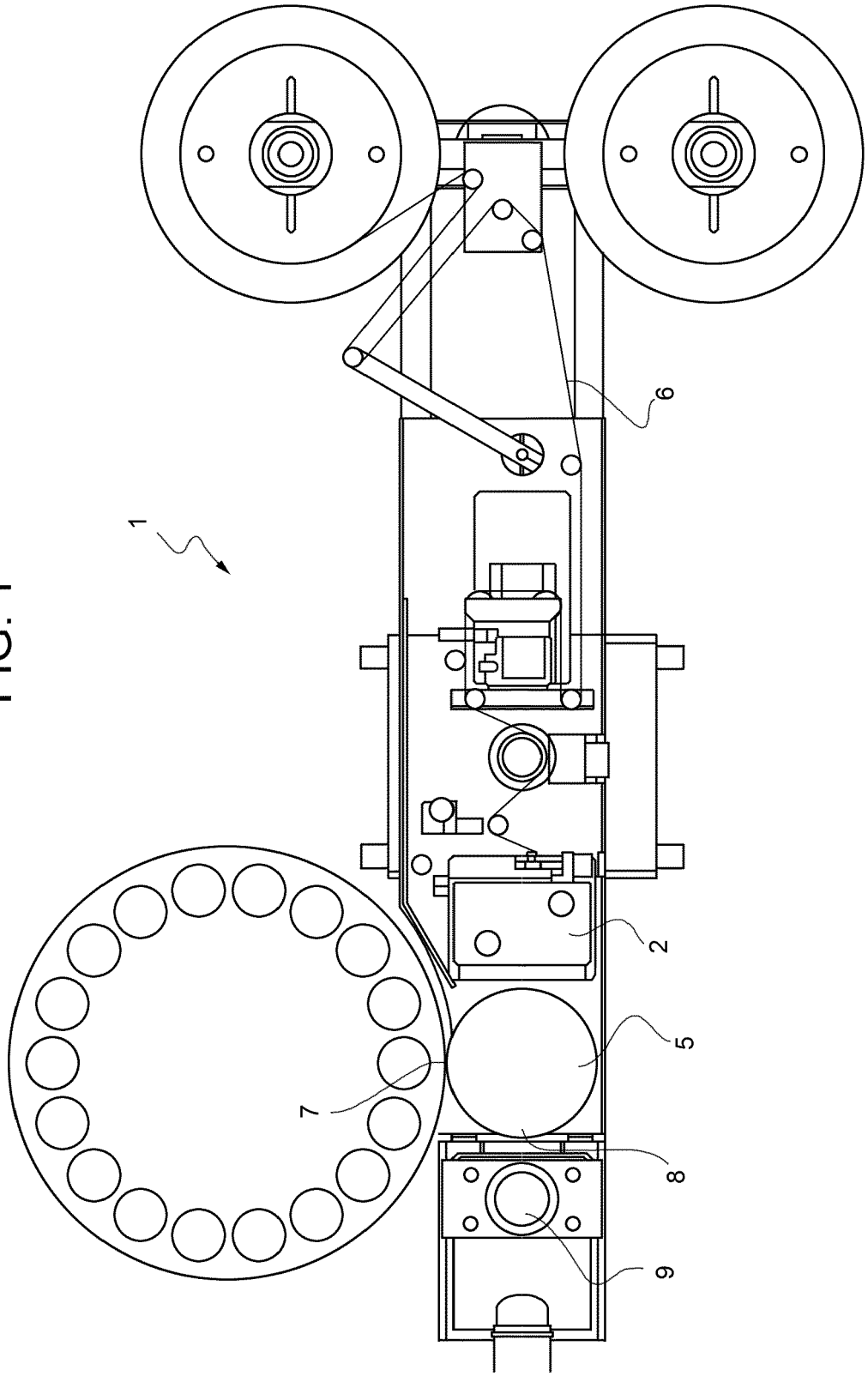
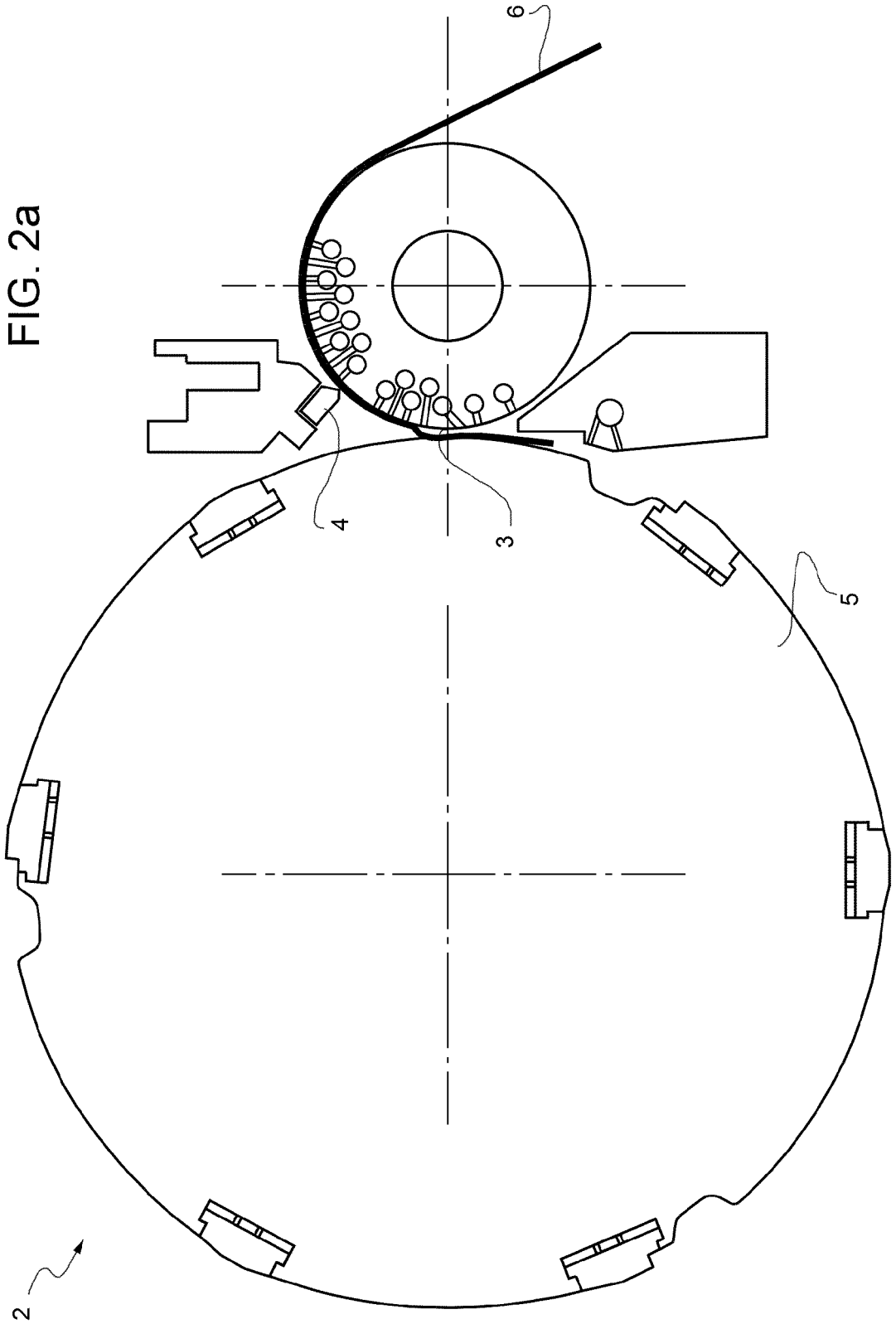


FIG. 2a



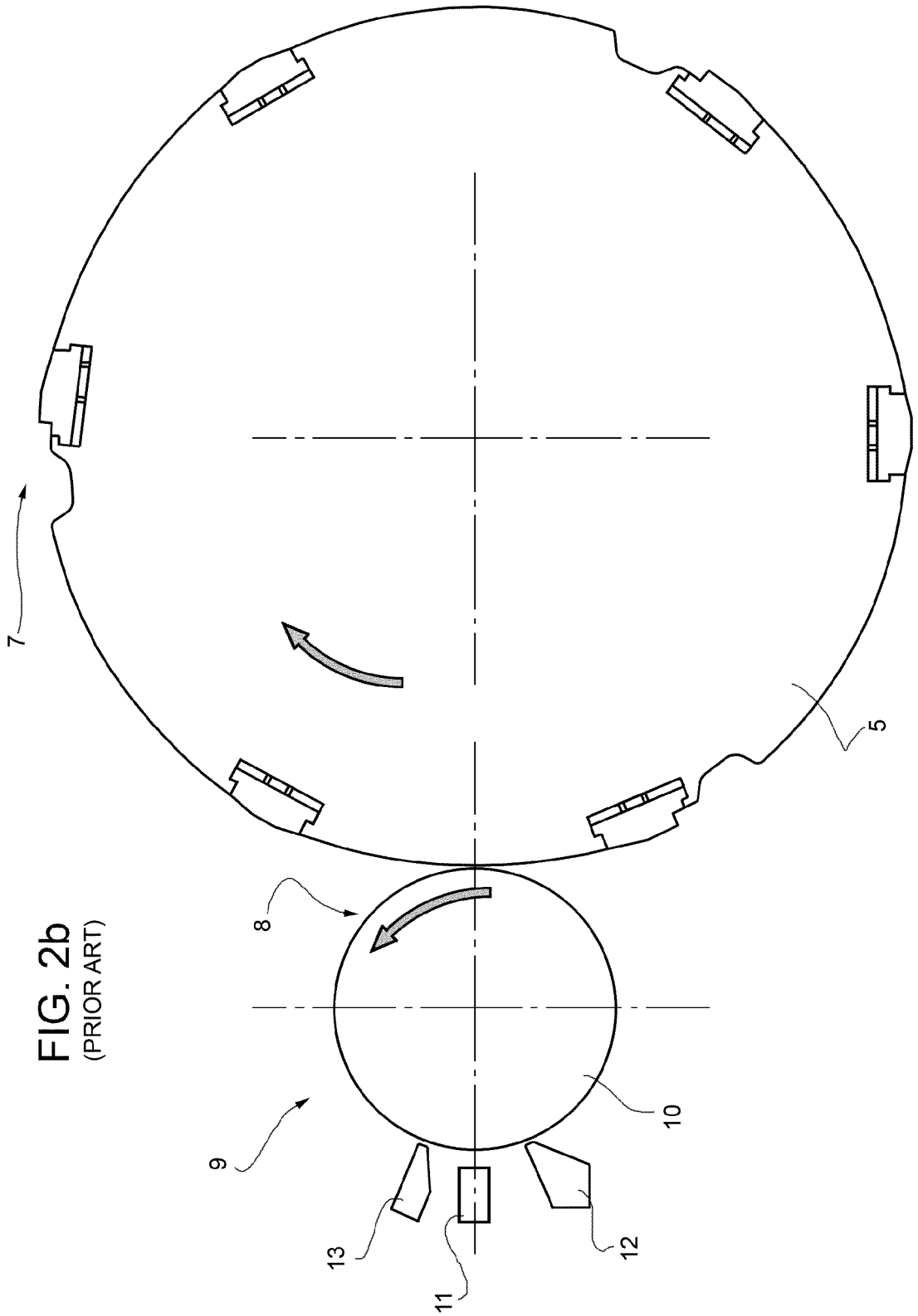
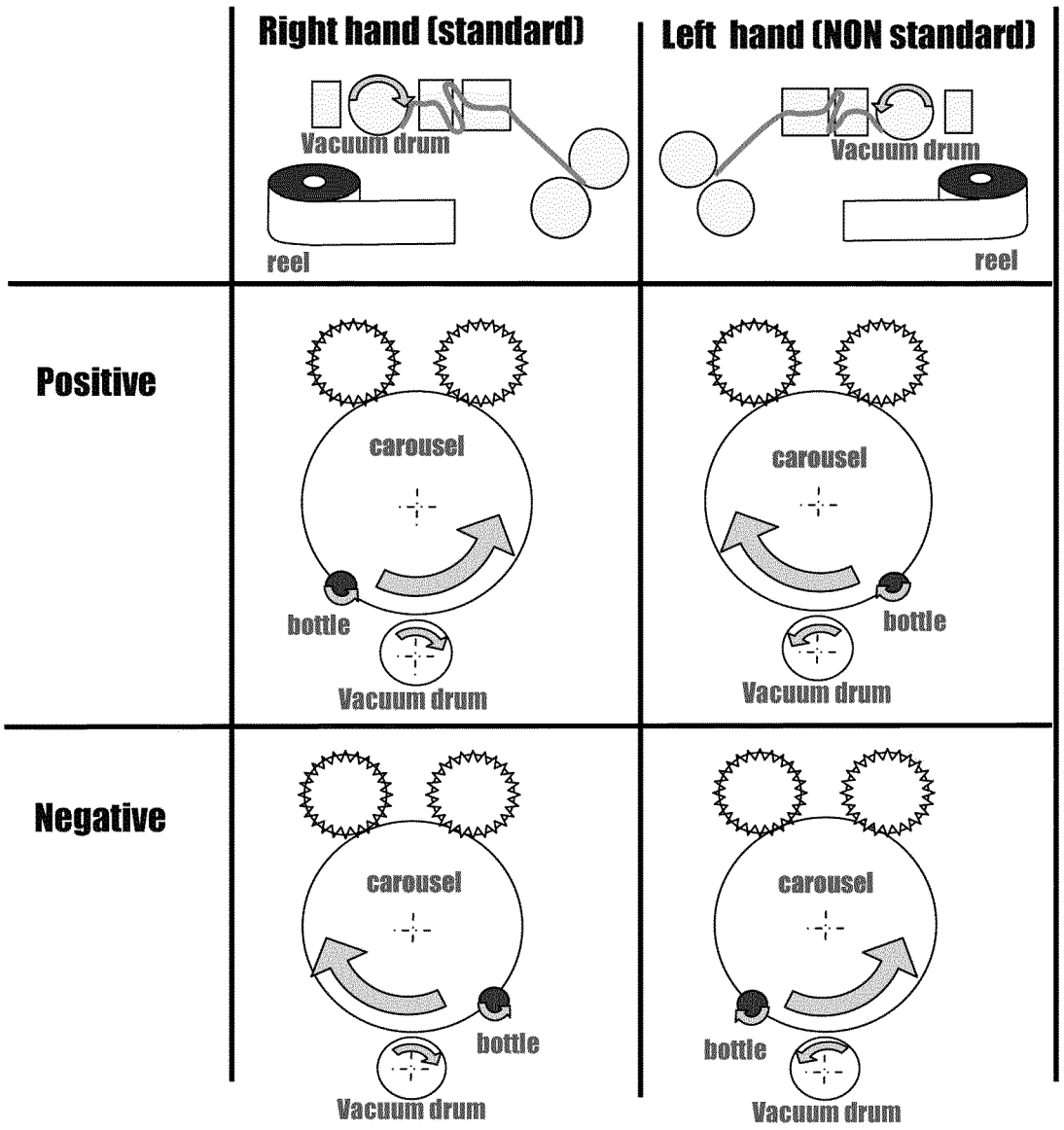
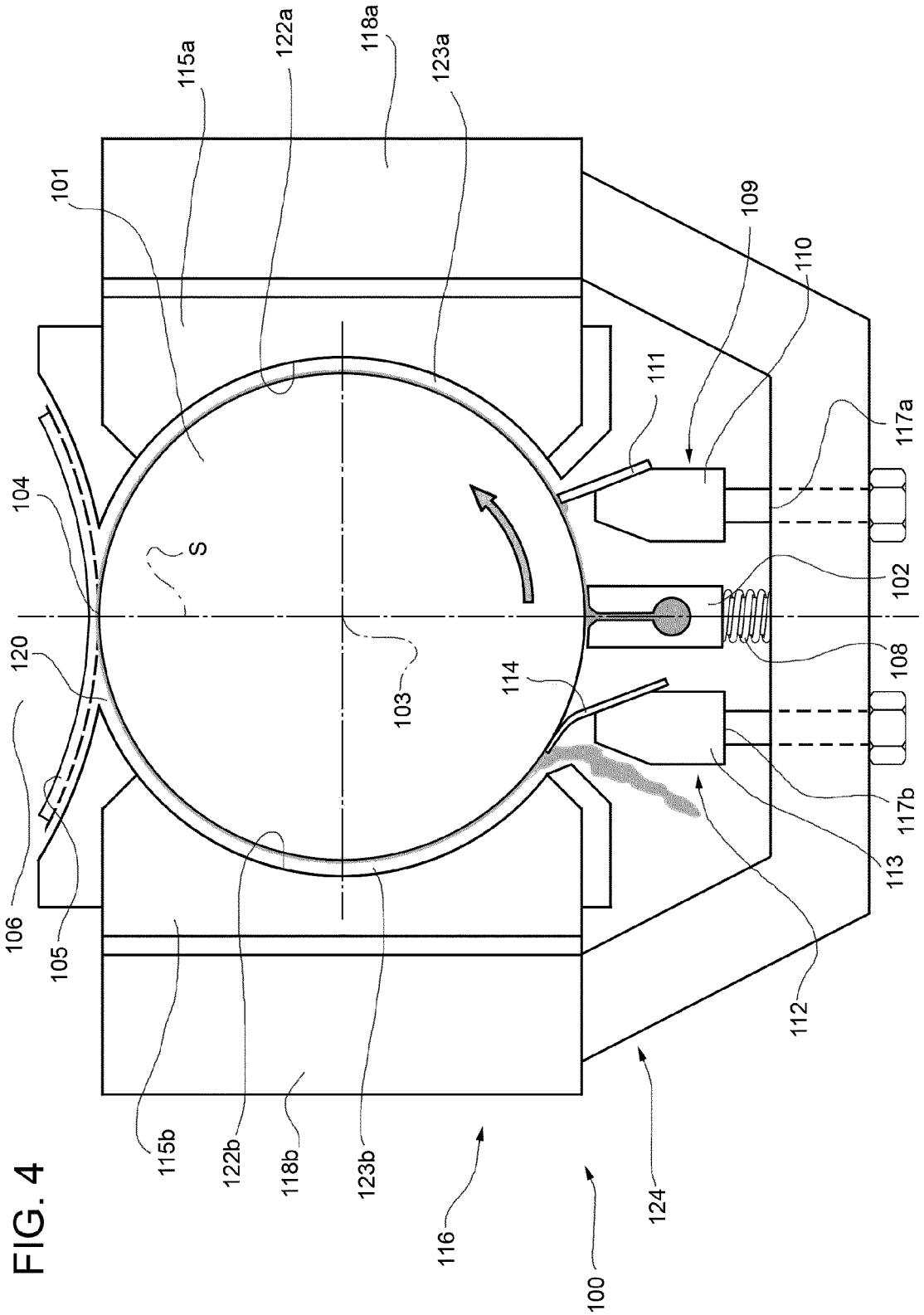


FIG. 2b
(PRIOR ART)

FIG. 3


Right hand (standard)
Left hand (NON standard)
Vacuum drum
reel
Positive
Negative
carousel
bottle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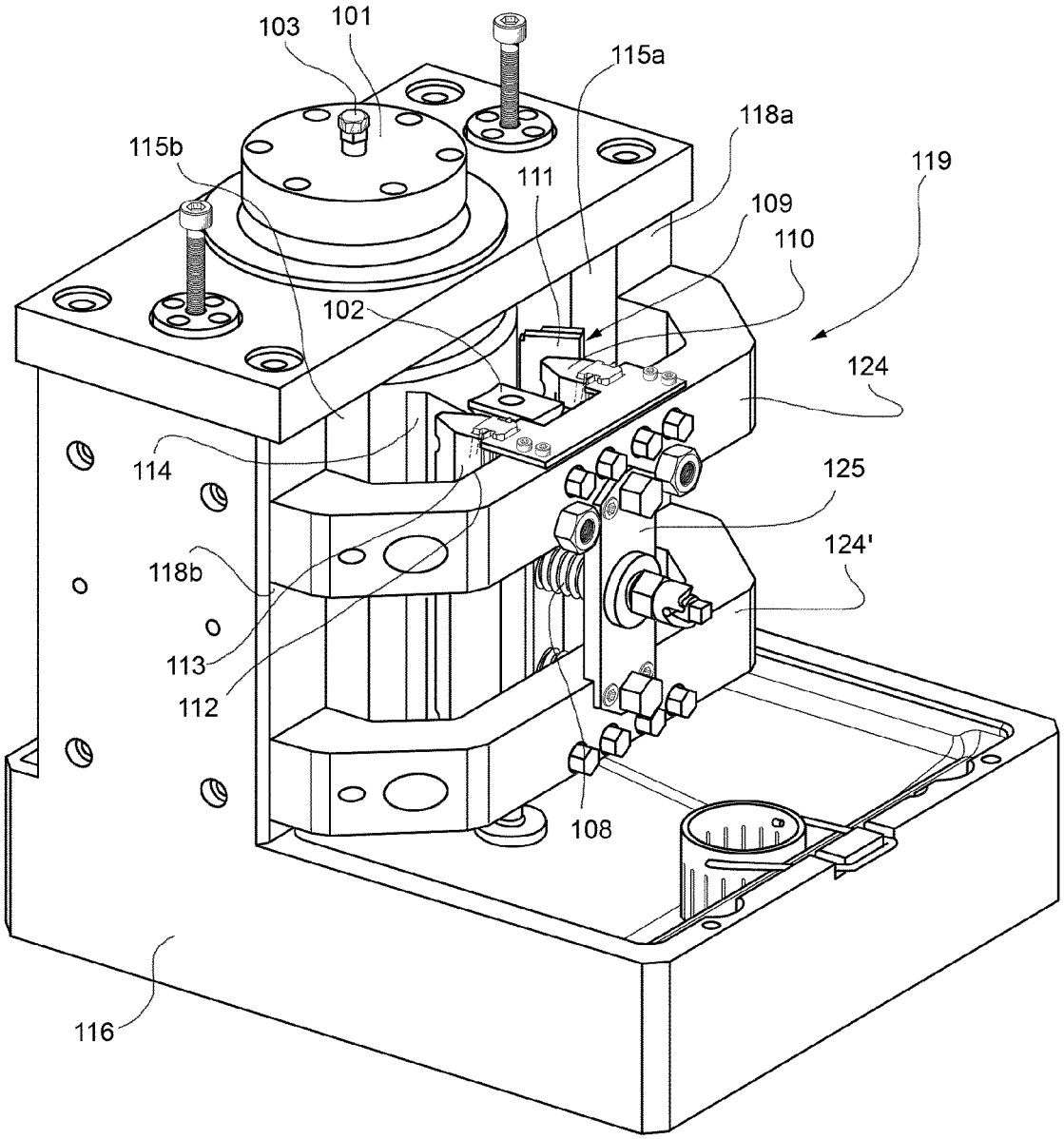
118a
123a
101
109
110
111
117a
104
S
102
120
103
114
108
117b
113
106
105
112
115b
122b
118b
123b
116
100
124

FIG. 4

FIG. 5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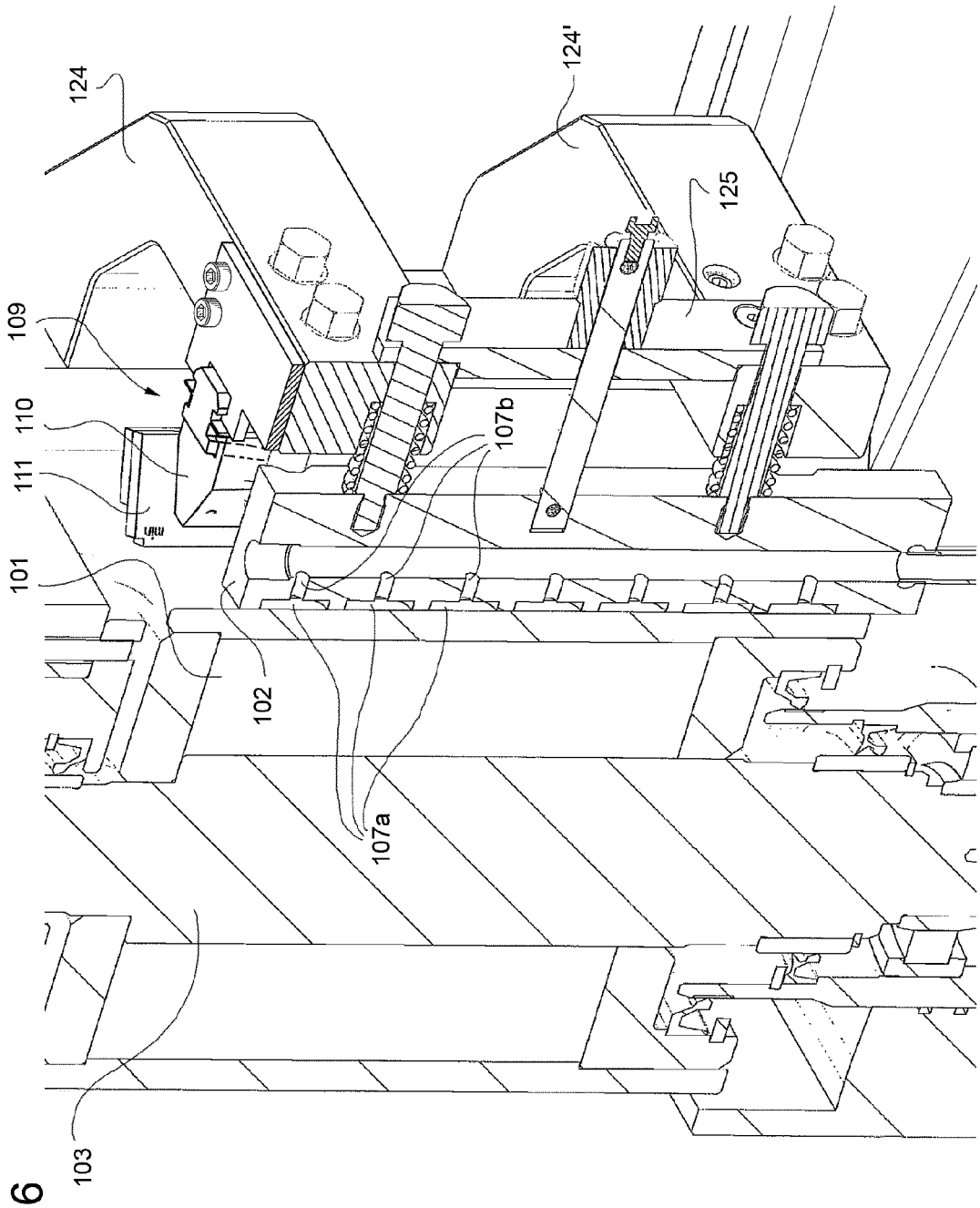
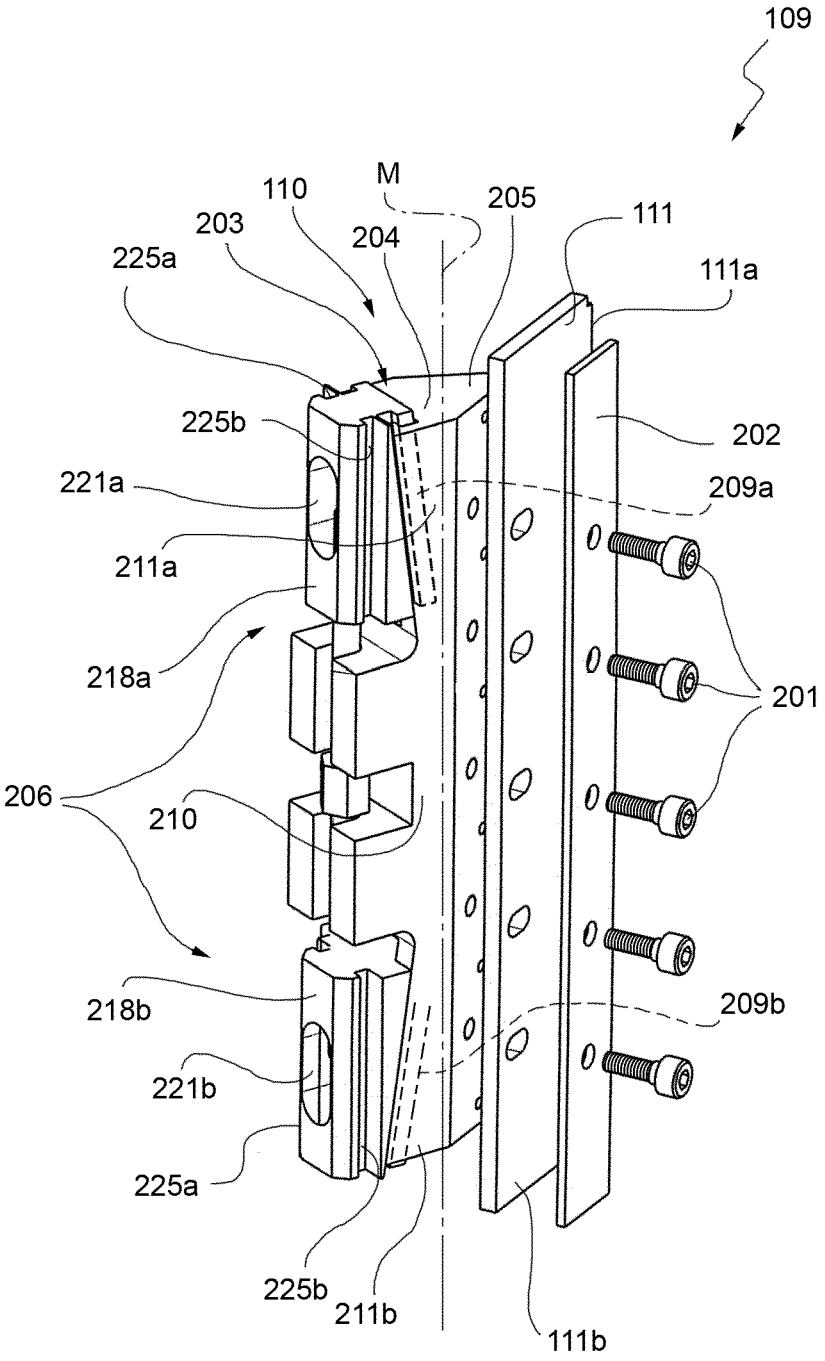


FIG. 6

FIG. 7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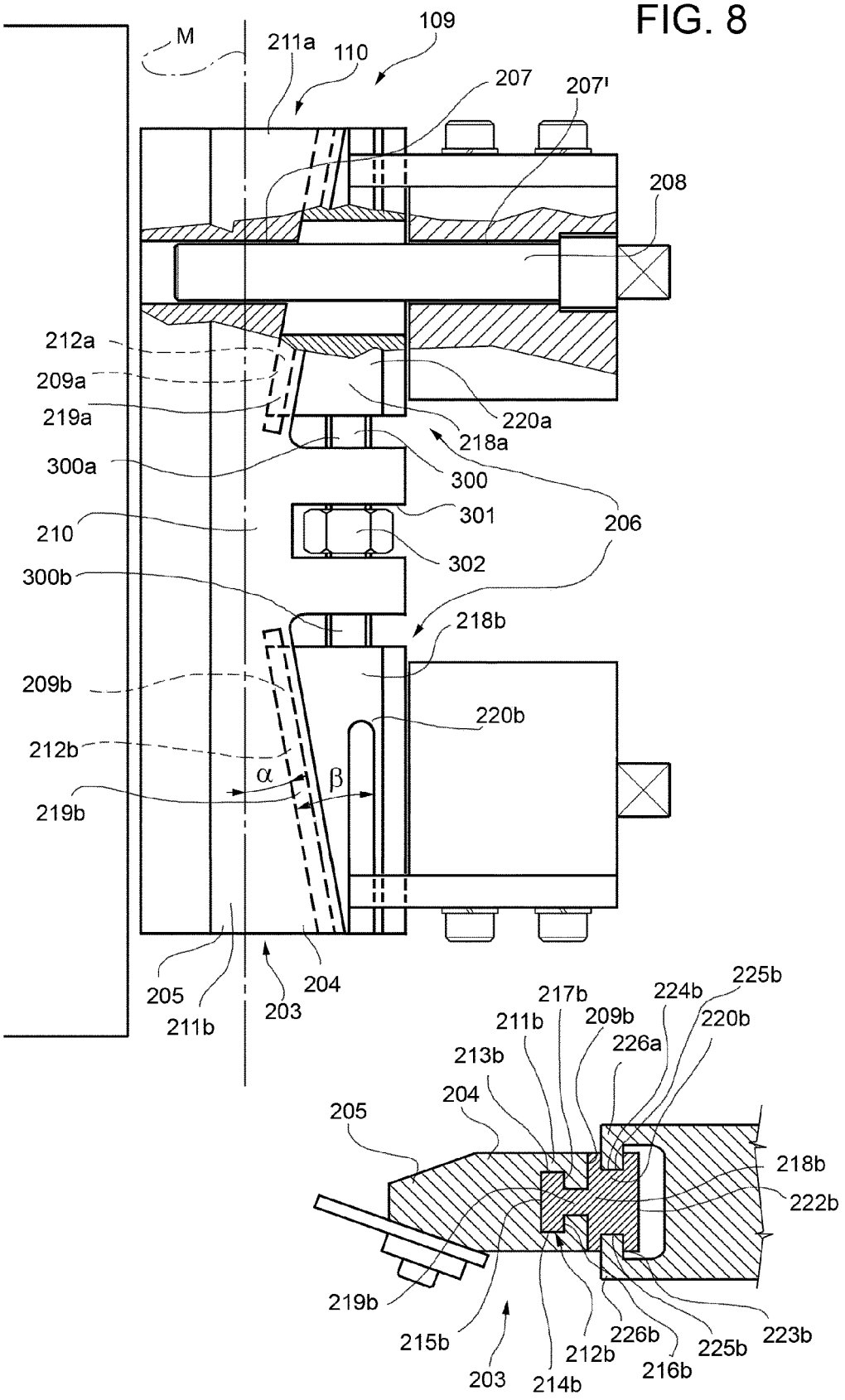
225b
211b
111b

FIG. 8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223b
216b

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EUROPEAN SEARCH REPORT

Application Number
EP 13 19 9894

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Place of search	Date of completion of the search	Examiner
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1

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