



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**20.06.2007 Bulletin 2007/25**

(51) Int Cl.:  
**B27G 11/00 (2006.01) B05C 1/08 (2006.01)**

(21) Application number: **06024600.6**

(22) Date of filing: **28.11.2006**

(84) Designated Contracting States:  
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR**  
Designated Extension States:  
**AL BA HR MK YU**

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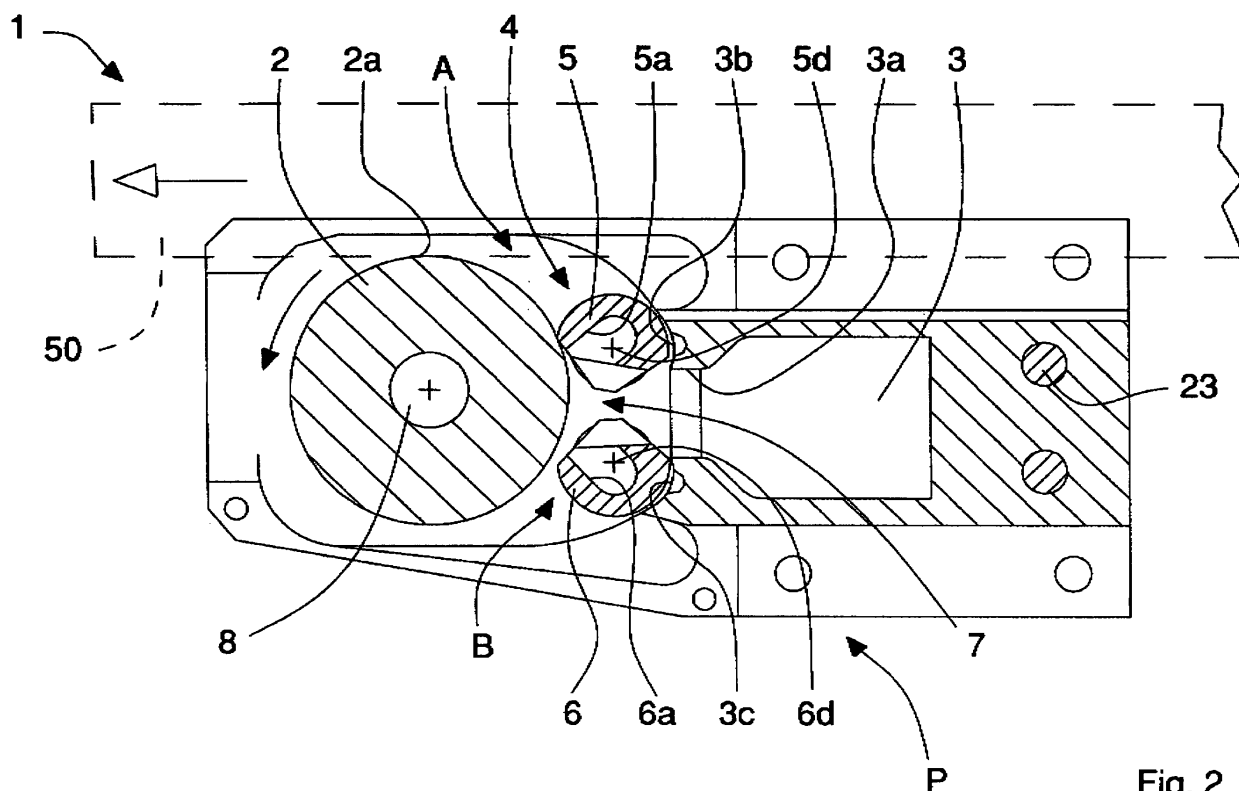
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(30) Priority: **29.11.2005 IT MO20050319**

(54) **Glue distributing apparatus**

(57) A glue distributing apparatus comprises roller means (2) for applying a glue to an element to be glued (50), tank means (3) containing said glue and provided with an opening (3a) for conveying said glue to said roller means (2), and adjusting means (4), interposed between

said roller means (2) and said opening (3a) for adjusting a quantity of glue transferred to/from said roller means (2), said adjusting means (4) comprising doctor blade means (5, 6) provided with respective cavity means (5a, 6a).



**Fig. 2**

## Description

**[0001]** The present invention relates to a glue distributing apparatus, in particular an apparatus for distributing glue in a woodworking machine, such as for example an edgebanding machine or a squaring edgebanding machine.

**[0002]** Such machines, which typically perform edgebanding operations on panels, tables, flat elements of wood or similar material, comprise glue distributing apparatuses or gluing units that deposit or spread a layer of adhesive glue on belts, strips, beads to be applied to edges of panels, or directly to the edges of said panels.

**[0003]** The adhesive used is generally a hot-melt glue that has to be appropriately heated before being applied "hot" to surfaces to be joined. The glue is applied by means of a suitable rotating gluing roller, that has a knurled or rough external surface, which retains and conveys the glue, supplied by a tank or pot. The latter is made of a non-adhering material and is provided with heating elements, such as electric resistances, for uniformly heating and keeping fluid the glue.

**[0004]** In some gluing units the glue tank is positioned below a work area and suitable supplying means, for example screw conveyor, transfers the glue from said lower tank to the gluing roller.

**[0005]** However, such apparatuses have the drawback of heating the work area excessively, as the tank with heat resistances is placed in a position that is such as not to allow produced heat to be dissipated, so that it diffuses to the adjacent areas and particularly upwards, at the gluing roller.

**[0006]** In order to overcome this serious drawback, which may cause malfunction or even breakage of mechanical members of the apparatus, glue distributing apparatuses are known that are provided with glue tanks positioned next to the gluing roller and which extend upwards. In this way the heat generated by the tank resistances can be dissipated to the external environment and does not affect, unless marginally, the work area and in particular the roller and the corresponding movement members.

**[0007]** The tank has a lower portion or chamber provided with an opening through which the glue flows by force of gravity to the gluing roller. The latter partially shuts said opening and, by rotating, transfers and spread the glue on the surfaces of the elements to be joined.

**[0008]** Within the lower chamber, interposed between the roller and the opening, glue adjusting means is generally provided comprising fixed doctor blades for adjusting the quantity of glue to be spread onto the knurled surface of the gluing roller.

**[0009]** In particular, said apparatuses can comprise a first doctor blade, called dosing doctor blade, for depositing or spreading an uniform layer of glue of a fixed thickness on the gluing roller, and a second doctor blade, called return or recovery doctor blade, which recovers the exceeding glue on the roller that has not been trans-

ferred to the surface to be glued. The return doctor blade moreover keeps any foreign bodies outside the chamber.

**[0010]** The doctor blades are arranged parallel to one another at a preset distance, opposite the opening of the lower chamber of the tank in such a way as to form a cavity in which the glue gathers that is taken from the roller.

**[0011]** Each doctor blade comprises an elongated flat element, provided with a edge abutting on the gluing roller along a generatrix thereof, operating substantially as a "spatula" to spread a uniform layer of glue on said roller.

**[0012]** Alternatively, each doctor blade may consist of a cylindrical pivot, arranged parallel to the gluing roller and provided with a longitudinal plane that constitutes a flat surface that conveys and spreads the glue on the roller.

**[0013]** The presence of two distinct doctor blades requires laborious and complex management of the apparatus since adjusting operations for correctly positioning and orienting doctor blades with respect to the roller must be repeated separately for each doctor blade and need skilled operators and also long stops of the machine. The gluing roller can, in fact, rotate both in a clockwise and in an anticlockwise direction, according to whether, for example, strips or belts have to be glued, in the case of so-called "soffforming", or panels to be edgebanded have to be glued, in the case of so-called "straight" forming.

**[0014]** By changing the rotation direction of the roller it is required to replace and/or to separately adjust the two doctor blades that change function and have to be correctly positioned and orientated with respect to the roller.

**[0015]** The doctor blades, because their shape and arrangement, form in the lower chamber of the tank a cavity inside which the rotation of the gluing roller causes the formation of turbulence and vortices in the liquid glue contained therein. Such a turbulent flow causes an uneven distribution of the glue on the roller since said glue is distributed in a nonuniform manner along the height of roller.

**[0016]** In fact, it has been observed that on a top portion of the roller a quantity of glue is deposited that is less than that which is deposited on the lower part. This causes an irregular gluing since a glue layer with an uneven thickness is applied to surfaces to be glued.

**[0017]** Turbulent flow and vortices in the liquid glue intensify as rotation speed of gluing roller increases, for example if it is necessary to spread glue on rapidly moving parts, typically in squaring edgebanding machines that machine straight panels in line, with high rectilinear movement speeds. This drawback of known glue distributing apparatuses often forces to reduce a production speed of the machines.

**[0018]** Another drawback of the known distributing apparatuses consists in glue leakages occurring especially during stop periods of said apparatuses. In fact, as the gluing roller has a knurled or rough external surface, the doctor blades are unable to provide a wet seal abutment

for this surface and thus to close hermetically the lower chamber of the glue tank.

**[0019]** During apparatus operation, a roller rotation provides a dynamic seal between the external surface of the roller and the doctor blades. Nevertheless, during stop periods, in absence of a dynamic seal there is a glue leakage which varies according to glue fluidity, pressure inside the tank, shape and dimensions of the lower chamber opening, etc.

**[0020]** Glue leakage is a serious drawback, both from a financial point of view, as said hot-melt glue is very expensive, and because of problems that the glue may create by spreading and solidifying in the work area.

**[0021]** An object of the invention is to improve known glue distributing apparatuses, in particular for woodworking machines for machining elements of wood or similar materials. Another object is to obtain a glue distributing apparatus that enables a uniform and homogenous distribution of glue on a gluing roller for the entire length thereof.

**[0022]** A further object is to obtain a glue distributing apparatus that is free of glue leakages both in operating conditions and in stop conditions.

**[0023]** Still another object is to obtain a glue distributing apparatus, which allows adjusting and controlling in a simple, fast and effective manner the glue to be spread on surfaces to be glued, regardless of a rotation direction of gluing roller.

**[0024]** In a first aspect of the invention there is provided a glue distributing apparatus comprising roller means for applying a glue to an element to be glued, tank means for containing said glue and provided with an opening for conveying said glue to said roller means, and adjusting means interposed between said roller means and said opening for adjusting a quantity of glue transferred to/from said roller means, characterised in that said adjusting means comprises doctor blade means provided with respective cavity means.

**[0025]** Owing to this aspect of the invention it is possible to obtain a glue distributing apparatus for spreading in a uniform and homogenous manner the glue on the roller means, for the entire length thereof. The presence of cavities made on the doctor blade means in fact substantially reduces, during the apparatus operation, formation of turbulences and vortices in the liquid glue near the roller means. In this way, the glue can regularly reach all the points of roller means, along the entire length thereof. The apparatus further allows adjusting in a precise and effective manner a glue distribution on surface to be glued, especially a thickness of a glue layer to be applied.

**[0026]** In a second aspect of the invention there is provided a glue distributing apparatus comprising roller means for applying a glue to an element to be glued, tank means containing said glue and provided with an opening for conveying said glue to said roller means, characterised in that it comprises shutting means, which are interposed between said roller means and said opening and

which are movable between a closed position, wherein said shutting means closes said opening to prevent a passage of said glue from said tank means to said roller means, and an open position, wherein said shutting means opens said opening to enable a passage of said glue.

**[0027]** Owing to this aspect of the invention it is possible to obtain a glue distributing apparatus that is free of glue leakages during operation and, above all, during stop periods. The shutting means is able, in fact, to hermetically close the opening of tank means, thus preventing the glue from reaching the roller means and to leak through passages and openings on a knurled surface of said roller means.

**[0028]** In a third aspect of the invention there is provided a glue distributing apparatus comprising roller means for applying a glue to an element to be glued, tank means containing said glue and provided with an opening for conveying said glue to said roller means, and adjusting means interposed between said roller means and said opening for adjusting a quantity of glue transferred to/from said roller means, characterised in that said adjusting means comprises movable and interconnected doctor blade means.

**[0029]** Owing to this aspect of the invention it is possible to obtain a glue distributing apparatus that allows adjusting and controlling in a simple, rapid and effective manner a glue distribution on surfaces to be glued, independently of a rotation direction of roller means. As the doctor blade means are interconnected and fixed so as to move together, it is possible to adjust easily and quickly their position according to a rotation direction of roller means. In fact, a rotation of a first doctor blade causes a corresponding rotation of a second doctor blade so that, for example, when first doctor blade is in a first working position, for dosing glue, the second doctor blade is in a second working position, for recovering glue, and vice versa.

**[0030]** The invention can be better understood and carried into effect with reference to the attached drawings in which some embodiments of the inventions are shown by way of nonlimiting example, in which:

Figure 1 is a schematic partial section, taken along a longitudinal plane, of the glue distributing apparatus of the invention;

Figure 2 and 3 are schematic partial sections, taken along a plane II-II of Figure 1, showing doctor blade means in respective different working positions;

Figure 4 is a schematic partial section taken along a longitudinal plane, of a version of the apparatus of the invention;

Figures 5 and 6 are schematic partial sections, taken along a plane v-v of Figure 4, showing doctor blade means in respective different working positions and shutting means in an open position;

Figure 7 is a section like the one in Figure 6, wherein shutting means is in a closed position.

**[0031]** With reference to Figures 1 to 3, there is schematically shown a glue distributing apparatus comprising roller means 2, tank means 3 and adjusting means 4.

**[0032]** Roller means 2 comprises a rotating roller, of known type, having a rough or knurled external surface 2a for removing, conveying and applying a preset layer of glue to an element 50 to be glued.

**[0033]** The roller 2 is rotated by suitable actuating means, of known type and not shown in the Figures, and it can be rotate both clockwise and anticlockwise, depending on elements 50 to be glued. For example, the roller 2 rotates clockwise to glue strips or belts in the so-called "softforming" process, whilst it rotates anticlockwise to glue edges of panels or tables to be edgebanded, in the so-called "straight" process. Tank means 3, which contains the glue and is placed next to the roller means 2, extends upwards and is provided with an opening 3a for conveying said glue to the roller means 2. The tank means 3 is further provided with a plurality of electric heating elements 23 that are able to heat and melt uniformly the glue and to maintain fluid the latter.

**[0034]** The opening 3a of tank means 3 has a height that is almost the same as that of a portion of the roller 2 configured for receiving the glue.

**[0035]** Adjusting means 4 is interposed between the roller means 2 and the opening 3a for regulating a quantity of glue transferred to the roller 2 for a subsequent application on an element 50 to be glued. Adjusting means 4 is further configured so as to recover from the roller 2 the exceeding glue, which has not been spread on element 50.

**[0036]** Adjusting means 4 comprises doctor blade means 5, 6 provided with respective cavity means 5a, 6a. Doctor blade means comprise a first doctor blade 5 and a second doctor blade 6.

**[0037]** Each doctor blade 5, 6 is an element with a longitudinally elongated shape, for example a pin with an approximately cylindrical section, on which a respective cavity 5a, 6a is made, consisting of an open hollow space that extends longitudinally for about the entire length of the element. The cavity 5a, 6a is for example a straight groove with a U-shaped cross section having a concave bottom wall.

**[0038]** The two doctor blade 5, 6 are arranged parallel each other and spaced apart from one another in such a way that the respective cavities 5a, 6a are almost face one another to form a volume or space 7 that is shaped for containing the glue.

**[0039]** It has been find out that such cavities 5a, 6a reduce and limit considerably the formation of turbulences and vortices in the liquid glue during rotation of roller 2. This enables an almost uniform and homogenous distribution of the glue on the whole length of roller 2 to be obtained, regardless of a rotation speed of roller 2.

**[0040]** Each doctor blade 5, 6 comprises an abutting portion 5b, 6b, configured so as to contact the roller 2, and a sealing portion 5c, 6c suitable for abutting on a respective seat 3b, 3c of tank means 3.

**[0041]** With reference to Figures 2 and 3, the abutting portion 5b, 6b is, for example, an edge made on an external surface of the doctor blade, whilst the sealing portion 5c, 6c is a portion of said external surface, having a concave shape, complementary to a shape of seat 3b, 3c, for example a portion of cylindrical surface.

**[0042]** Each doctor blade 5, 6 is rotatably mounted around a respective rotation axis 5d, 6d, so as to be movable between a first working position A and a respective second working position B. Said rotation axes 5d, 6d are parallel to one another and also parallel to a rotation shaft 8 of roller 2.

**[0043]** In the first working position A, the abutting portion 5b, 6b of the doctor blade 5, 6 substantially abuts on the external surface 2a of the roller 2 in such a way as to adjust the passage of glue to be deposited onto the roller and to uniformly extend said glue onto said outside surface 2a.

**[0044]** In the second working position B the abutting portion 5b, 6b of doctor blade 5, 6 is spaced from a respective external surface 2a of roller 2 to enable the exceeding glue on the roller 2 to be recovered and at the same time to prevent possible foreign bodies entering the volume 7.

**[0045]** Driving means, of known type and not shown in the Figures, is provided for rotating the doctor blades 5, 6 between the two working positions.

**[0046]** The doctor blades 5, 6 can be mounted so as to independently rotate, driven separately by respective driving means.

**[0047]** Alternatively, the doctor blades 5, 6 can be mounted linked together and connected by suitable interconnecting means, in such a way as to rotate together. Said interconnecting means can be of mechanical type, for example pulley or gear mechanisms, or of electronic type, for example electronic control means of actuating means.

**[0048]** When the doctor blades 5, 6 are interconnected, a rotation of a doctor blade is matched by a same rotation of the other doctor blade. More specifically and with reference to Figures 2 and 3, when for example the first doctor blade 5 is in the respective first working position A, the second doctor blade 6 is in the respective second working position B. In this case, the apparatus 1 is in a first operating configuration P in which the roller 2 rotates in an anticlockwise direction, for example to apply glue to an edge of a panel 50.

**[0049]** Rotation of first doctor blade 5 in the respective second working position B coincides with rotation of second doctor blade 6 in the respective first working position A. In this case, the apparatus 1 is in a second operating configuration Q wherein the roller 2 rotates in a clockwise direction, for example to apply glue to a strip or belt 50.

**[0050]** The doctor blade 5, 6 can also be made as a single body. In this case, the respective rotation axes 5d, 6d are coincident.

**[0051]** Figures 4 to 7 show a version of the apparatus 1 which comprises shutting means 10, that is movable

and interposed between the roller 2 and the opening 3a of the tank means 3 for closing and/or opening said opening 3a.

[0052] In particular, shutting means 10 can be inserted between the adjusting means 4 and said opening 3a.

[0053] Shutting means 10 is movable between a closed position C, in which it shuts said opening 3a to prevent the glue passing from the tank means 3 to the roller 2 (Figure 7), and a complete open position D, in which it opens said opening 3a and enables the glue to pass through (Figures 5, 6).

[0054] In an intermediate position, which is not illustrated in Figures, the shutting means 10 can adjust a glue flow to the roller 2, partially closing the opening 3a.

[0055] Shutting means 10 comprises an elongated element, substantially cylindrical, rotatably mounted on a rotating pin 11.

[0056] Shutting means 10 further has a passage 12 comprising a longitudinal through opening that enables the glue to transit and which has a length that is almost equal to a height of the opening 3a.

[0057] Shutting means 10 is contained in a suitable respective seat 3d made in the tank means 3, inside which it can rotate.

[0058] In this version of the apparatus 1, the adjusting means 4 comprises a couple of doctor blades 15, 16 made of a single body and rotatable around respective rotation axes 15d, 16d that in this case coincide.

[0059] More precisely, the adjusting means 4 comprises an elongated tubular element 19 that is substantially cylindrical with open section, provided with two facing and opposite portions 15, 16 acting as doctor blades.

[0060] Each doctor blade 15, 16 has a respective abutting portion 15b, 16b, configured so as to abut on the external surface 2a of the roller 2, and a respective sealing portion 15c, 16c configured so as to abut on said respective seat 3d of tank means 3.

[0061] As shown in Figures 5 and 6, it is sufficient to rotate the tubular body 19 of the adjusting means 4 in order to position the two doctor blades 15, 16 at the same time and with precision in the respective working positions. In particular, when the apparatus 1 is in a first operating configuration P, the first doctor blade 15 is in a respective first working position, i.e. substantially abutting on the roller 2 to adjust a glue passage on the roller, and the second doctor blade 16 is in a respective second working position, i.e. spaced from the roller 2 to enable the exceeding glue to be recovered. On the other hand, when the apparatus 1 is in a second operating configuration Q, the first doctor blade 15 is in a respective second working position and the second doctor blade 16 is in a respective first working position.

[0062] The tubular body 19 of the adjusting means 4 has an internal cylindrical cavity 17 into which the shutting means 10 is inserted coaxially.

[0063] There is further provided a through slot 18, made on a wall of said tubular element 19 and facing said abutting edges 15b, 16b. Glue coming from the tank

means 3 can pass through the slot 18 to reach roller means 2.

[0064] This version of the distributing apparatus 1 thus comprises adjusting means 4 and shutting means 10 in a very compact structure.

[0065] Adjusting means 4 that comprises two doctor blades 15, 16, that are integral and movable at the same time, allows adjusting and controlling in a simple, rapid and effective manner a distribution of the glue on surfaces to be glue, regardless of a rotation direction of the roller 2.

[0066] At the same time, shutting means 10 can close hermetically the opening 3a, thus preventing glue from reaching the roller 2 and leaking through passages and openings of the external surface 2a of said roller during stop phases of the apparatus.

[0067] Shutting means 10 comprises a couple of recesses 13, 14, made on an internal wall of the passage 12 for an entire extent of the latter.

[0068] Recesses 13, 14 are substantially the same and symmetrically arranged with respect to a longitudinal plane of symmetry S of shutting means 4. In particular, said recesses 13, 14, which have an almost U-shaped section, are arranged so as to form a respective cavity 20 converging on roller means 2.

[0069] By means of recesses 13, 14 it is possible to reduce considerably the formation of turbulences or vortices in the liquid glue during the rotation of roller 2, so as to obtain an almost uniform and homogenous distribution of glue on the entire length of the roller 2, regardless of speed rotation thereof.

[0070] In a further version of the apparatus 1 not shown in Figures, respective cavities can be provided on the walls of the tubular body 19 of adjusting means 4 at the doctor blades 15, 16.

## Claims

1. Glue distributing apparatus comprising roller means (2) for applying a glue to an element to be glued (50), tank means (3) containing said glue and provided with an opening (3a) for conveying said glue to said roller means (2), and adjusting means (4) interposed between said roller means (2) and said opening (3a) for adjusting a quantity of glue transferred to/from said roller means (2), **characterised in that** said adjusting means (4) comprises doctor blade means (5, 6) provided with respective cavity means (5a, 6a).
2. Apparatus according to claim 1, wherein said doctor blade means (5, 6) is mounted movable in such a way as to be movable between a respective first working position (A), for regulating a passage of glue to be spread on said roller means (2), and a respective second working position (B), for recovering exceeding glue from said roller means (2).
3. Apparatus according to claim 2, wherein said doctor

blade means (5, 6) is rotatably mounted around a respective rotation axis (5d, 6d).

4. Apparatus according to claim 3, comprising driving means for moving said doctor blade means (5, 6). 5
5. Apparatus according to any preceding claim, wherein said doctor blades means (5, 6) comprises two doctor blades, each provided with a respective cavity (5a, 6a). 10
6. Apparatus according to claim 5, wherein said doctor blades (5, 6) are made in single body.
7. Apparatus according to claim 5, comprising means for interconnecting said doctor blade means (5, 6). 15
8. Apparatus according to any one of claims 5 to 7, wherein said doctor blades (5, 6) are mounted in such a way that when a doctor blade (5, 6) is in the first working position (A) the remaining doctor blade (6, 5) is in the second working position (B) and vice versa. 20
9. Apparatus according to any one of claims 5 to 8, wherein each doctor blade (5, 6) comprises an elongated element, in particular a shaped pin. 25
10. Apparatus according to any one of claims 5 to 9, wherein each doctor blade (5, 6) comprises an abutting portion (5b, 6b) suitable for abutting on said roller means (2). 30
11. Apparatus according to any one of claims 5 to 10, wherein each doctor blade (5, 6) comprises an external portion (5c, 6c) suitable for abutting on a respective seat (3b, 3c) of tank means (3). 35
12. Apparatus according to any one of claims 5 to 11, wherein each cavity (5a, 6a) extends longitudinally almost along a length of the respective doctor blade (5, 6). 40
13. Apparatus according to one of claims 5 to 12, wherein each cavity (5a, 6a) has a substantially U-shaped section. 45
14. Apparatus according to any one of claims 5 to 13, wherein said doctor blades (5, 6) are mounted in such a way that said respective cavities (5a, 6a) almost face one another and are substantially turned towards said roller means (2). 50
15. Apparatus according to any one of claims 5 to 14, wherein said doctor blades (5, 6) are substantially parallel. 55
16. Apparatus according to claim 15, wherein said doctor

blades (5, 6) are substantially parallel to said roller means (2).

17. Apparatus according to any preceding claim, comprising shutting means (10), which is movable and interposed between said roller means (2) and said opening (3a) for closing and/or opening said opening (3a).
18. Apparatus according to claim 17, wherein said shutting means (10) is interposed between said adjusting means (4) and said opening (3a).
19. Apparatus according to claim 17 or 18, wherein said shutting means (10) is rotatably mounted around a rotating pin (11).
20. Apparatus according to any one of claims 17 to 19, wherein said shutting means (10) comprises an elongated element, in particular a substantially cylindrical pivot.
21. Apparatus according to any one of claims 17 to 20, wherein said shutting means (10) comprises a passage (12) enabling a passage of said glue between said tank means (3) and said roller means (2).
22. Apparatus according to any one of claims 17 to 21, wherein said tank means (3) comprises a housing (3d) for receiving said shutting means (10).
23. Apparatus according to any one of claims 17 to 22, wherein said shutting means (10) comprises recess means (13, 14).
24. Apparatus according to claims 21 and 23, wherein said recess means (13, 14) is made on internal walls of said passage (12).
25. Apparatus according to claim 23 or 24, wherein said recess means (13, 14) extends for a length almost corresponding to a height of said passage (12).
26. Apparatus according to any one of claims 23 to 25, wherein said recess means (13, 14) has an almost U-shaped section.
27. Apparatus according to any one of claims 23 to 26, wherein said recess means (13, 14) comprises two recesses arranged almost facing one another and substantially turned towards said roller means (2).
28. Glue distributing apparatus comprising roller means (2) for applying a glue to an element to be glued (50), tank means (3) containing said glue and provided with an opening (3a) for conveying said glue to said roller means (2), **characterised in that** it comprises shutting means (10), interposed between said roller

- means (2) and said opening (3a) and movable between a closed position (C), wherein said shutting means (10) closes said opening (3a) to prevent a passage of said glue from said tank means (3) to said roller means (2), and an open position (D), wherein said shutting means (10) opens said opening (3a) to enable a passage of said glue.
29. Apparatus according to claim 28, wherein said shutting means (10) is rotatably mounted around a rotating pin (11).
30. Apparatus according to claim 28 or 29, wherein said shutting means (10) comprises an elongated element, in particular a substantially cylindrical pivot.
31. Apparatus according to any one of claims 28 to 30, wherein said shutting means (10) comprises a passage (12) enabling a passage of said glue between said tank means (3) and said roller means (2).
32. Apparatus according to any one of claims 28 to 31, wherein said tank means (3) comprises a housing (3d) for receiving said shutting means (10).
33. Apparatus according to any one of claims 28 to 32, comprising adjusting means (4) interposed between said roller means (2) and said opening (3a) for adjusting a quantity of glue transferred to/from said roller means (2).
34. Apparatus according to claim 33, wherein said adjusting means (4) is interposed between said roller means (2) and said shutting means (10).
35. Apparatus according to claim 33 or 34, wherein said adjusting means (4) comprises doctor blade means (5, 6; 15, 16).
36. Apparatus according to claim 35, wherein said doctor blade means (5, 6; 15, 16) is mounted movably in such a way as to be movable between a respective first working position (A), for regulating a passage of glue to be spread on said roller means (2), and a respective second working position (B), for recovering exceeding glue from said roller means (2).
37. Apparatus according to claim 36, wherein said doctor blade means (5, 6; 15, 16) is mounted rotatably around a respective rotation axis (5d, 6d; 15d, 16d).
38. Apparatus according to any one of claims 35 to 37, comprising driving means for moving said doctor blade means (5, 6; 15, 16).
39. Apparatus according to any one of claims 35 to 38, wherein said doctor blade means comprises two doctor blades (5, 6; 15, 16).
40. Apparatus according to claim 39, wherein said doctor blades (5, 6; 15, 16) are made of a single body.
41. Apparatus according to claims 39, comprising means for interconnecting said doctor blades (5, 6; 15, 16).
42. Apparatus according to any one of claims 39 to 41, wherein said doctor blades (5, 6; 15, 16) are mounted in such a way that when a doctor blade (5, 6; 15, 16) is in the respective first working position (A) the remaining doctor blade (6, 5; 16, 15) is in the respective second working position (B) and vice versa.
43. Apparatus according to any one of claims 39 to 42, wherein each doctor blade (5, 6) comprises an elongated element, in particular a shaped pivot.
44. Apparatus according to any one of claims 39 to 42, wherein said doctor blades (15, 16) comprise respective portions, facing and opposite, of a tubular element (19) of said adjusting means (4).
45. Apparatus according to claim 44, wherein said tubular element (19) is substantially cylindrical.
46. Apparatus according to claim 44 or 45, wherein said tubular element (19) comprises an internal cavity (17) suitable for receiving said shutting means (10).
47. Apparatus according to any one of claims 39 to 46, wherein each doctor blade (5, 6; 15, 16) comprises an abutting portion (5b, 6b; 15b, 16b) configured so as to abut on said roller means (2).
48. Apparatus according to any one of claims 39 to 47, wherein each doctor blade (5, 6; 15, 16) comprises a sealing portion (5c, 6c; 15c, 16c) configured so as to abut on a respective seat (3b, 3c; 3d) of said tank means (3).
49. Apparatus according to any one of claims 39 to 48, wherein each doctor blade (5, 6) comprises a respective cavity (5a, 6a).
50. Apparatus according to claim 49, wherein said cavity (5a, 6a) has a substantially U-shaped section.
51. Apparatus according to claim 49 or 50, wherein said cavity (5a, 6a) extends longitudinally for almost a whole length of the respective doctor blade (5, 6).
52. Apparatus according to any one of claims 49 to 51, wherein said doctor blades (5, 6) are mounted in such a way that said respective cavities (5a, 6a) almost face one another and are substantially turned towards said roller means (2).

53. Apparatus according to any one of claims 39 to 52, wherein said doctor blades (5, 6; 15, 16) substantially face one another and are substantially parallel.
54. Apparatus according to any one of claims 35 to 53, wherein said doctor blade means (5, 6; 15, 16) are almost parallel to said roller means (2). 5
55. Apparatus according to any one of claims 28 to 54, wherein said shutting means (10) comprises recess means (13, 14). 10
56. Apparatus according to claims 31 and 55, wherein said recess means (13, 14) is made on internal walls of said passage (12). 15
57. Apparatus according to claim 56, wherein said recess means (13, 14) extends for a length almost corresponding to a height of said passage (12). 20
58. Apparatus according to any one of claims 55 to 57, wherein said recess means (13, 14) has an almost U-shaped section.
59. Apparatus according to any one of claims 55 to 59, wherein said recess means (13, 14) comprises two recesses arranged substantially facing one another and substantially turned towards said roller means (2). 25
60. Glue distributing apparatus comprising roller means (2) for applying a glue to an element to be glued (50), tank means (3) containing said glue and provided with an opening (3a) for conveying said glue to said roller means (2), and adjusting means (4) interposed between said roller means (2) and said opening (3a) for adjusting a quantity of glue transferred to/from said roller means (2), **characterised in that** said adjusting means (4) comprises movable and interconnected doctor blade means (5, 6; 15, 16). 30
61. Apparatus according to claim 60, wherein said doctor blade means (5, 6; 15, 16) are rotatably mounted on respective rotation axes (5d, 6d; 15d, 16d). 35
62. Apparatus according to claim 60 or 61, comprising driving means suitable for moving said doctor blade means (5, 6). 40
63. Apparatus according to any one of claims 60 to 62, wherein said doctor blade means (5, 6; 15, 16) comprises two doctor blades. 45
64. Apparatus according to claim 63, wherein said doctor blades (5, 6; 15, 16) are interconnected in such a way that when a doctor blade (5, 6; 15, 16) is in a respective first working position (A), for regulating a passage of glue to be spread on said roller means (2), the other doctor blade (6, 5; 16, 15) is in a respective second working position (B), for recovering exceeding glue from said roller means (2), and vice versa. 50
65. Apparatus according to claims 63 or 64, wherein said doctor blades (5, 6; 15, 16) are made of a single body.
66. Apparatus according to claim 65, wherein said doctor blades (15, 16) consist of respective facing and opposite portions of a tubular element (19) of said adjusting means (4).
67. Apparatus according to any one of claims 63 to 66, comprising means for interconnecting said doctor blades (5, 6).
68. Apparatus according to any one of claims 63 to 67, wherein each doctor blade (5, 6; 15, 16) comprises an abutting portion (5b, 6b; 15b, 16b) configured so to abut on said roller means (2).
69. Apparatus according to any one of claims 63 to 68, wherein each doctor blade (5, 6; 15, 16) comprises a sealing portion (5c, 6c; 15c, 16c) configured so to abut on a respective seat (3b, 3c; 3d) of tank means (3). 55
70. Apparatus according to any one of claims 63 to 69, wherein said doctor blades (5, 6; 15, 16) substantially face one another and are substantially parallel.
71. Apparatus according to claim 70, wherein said doctor blades (5, 6; 15, 16) are substantially parallel to said roller means (2).
72. Apparatus according to any one of claims 60 to 71, wherein doctor blade means (5, 6; 15, 16) comprise respective cavity means (5a, 6a).
73. Apparatus according to claim 72, wherein said cavity means (5a, 6a) has a substantially U-shaped section.
74. Apparatus according to claim 72 or 73, wherein said cavity means (5a, 6a) extends longitudinally for almost a whole length of said doctor blade means (5, 6; 15, 16).
75. Apparatus according to any one of claims 72 to 74, wherein said doctor blade means (5, 6; 15, 16) are mounted so that said respective cavity means (5a, 6a) are substantially face one another and substantially turned towards said roller means (2).
76. Apparatus according to any one of claims 60 to 75, comprising shutting means (10), interposed between said adjusting means (4) and said opening (3a) and



movable between a closed position (C), wherein said shutting means (10) closes said opening (3a) to prevent a passage of said glue from said tank means (3) to said roller means (2), and an open position (D), wherein said shutting means (10) opens said opening (3a) to enable a passage of said glue. 5

77. Apparatus according to claim 76, wherein said shutting means (10) is rotatably mounted around a rotating pin (11). 10

78. Apparatus according to claim 76 or 77, wherein said shutting means (10) comprises an elongated element, in particular a substantially cylindrical pivot. 15

79. Apparatus according to any one of claims 76 to 78, wherein said shutting means (10) comprises a passage (12) enabling a passage of said glue between said tank means (3) and said roller means (2). 20

80. Apparatus according to any one of claims 76 to 79, wherein said tank means (3) comprises a respective seat (3d) for receiving said shutting means (10).

81. Apparatus according to any one of claims 76 to 80, wherein said shutting means (10) comprises recess means (13, 14). 25

82. Apparatus according to claims 79 and 81, wherein said recess means (13, 14) is made on internal walls of said passage (12). 30

83. Apparatus according to claim 82, wherein said recess means (13, 14) extends for a length almost corresponding to a height of said passage (12). 35

84. Apparatus according to any one of claims 81 to 83, wherein said recess means (13, 14) has an almost U-shaped section. 40

85. Apparatus according to any one of claims 81 to 84, wherein said recess means (13, 14) comprises two recesses arranged substantially facing one another and substantially turned towards said roller means (2). 45

86. Apparatus according to claim 66 and any one of claims 76 to 85, wherein said tubular element (19) of said adjusting means (4) comprises an internal cavity (17) for receiving said shutting means (10). 50

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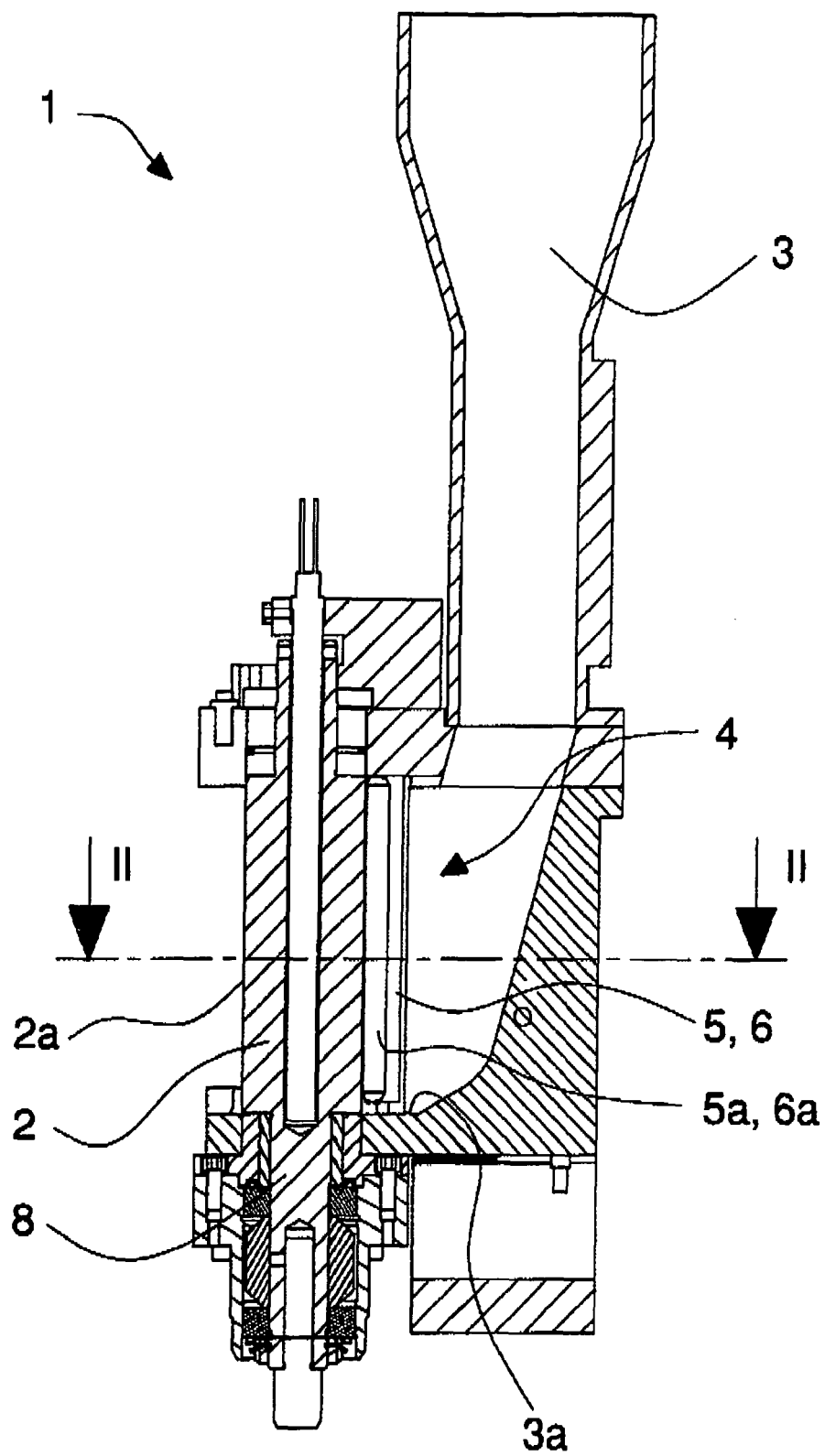
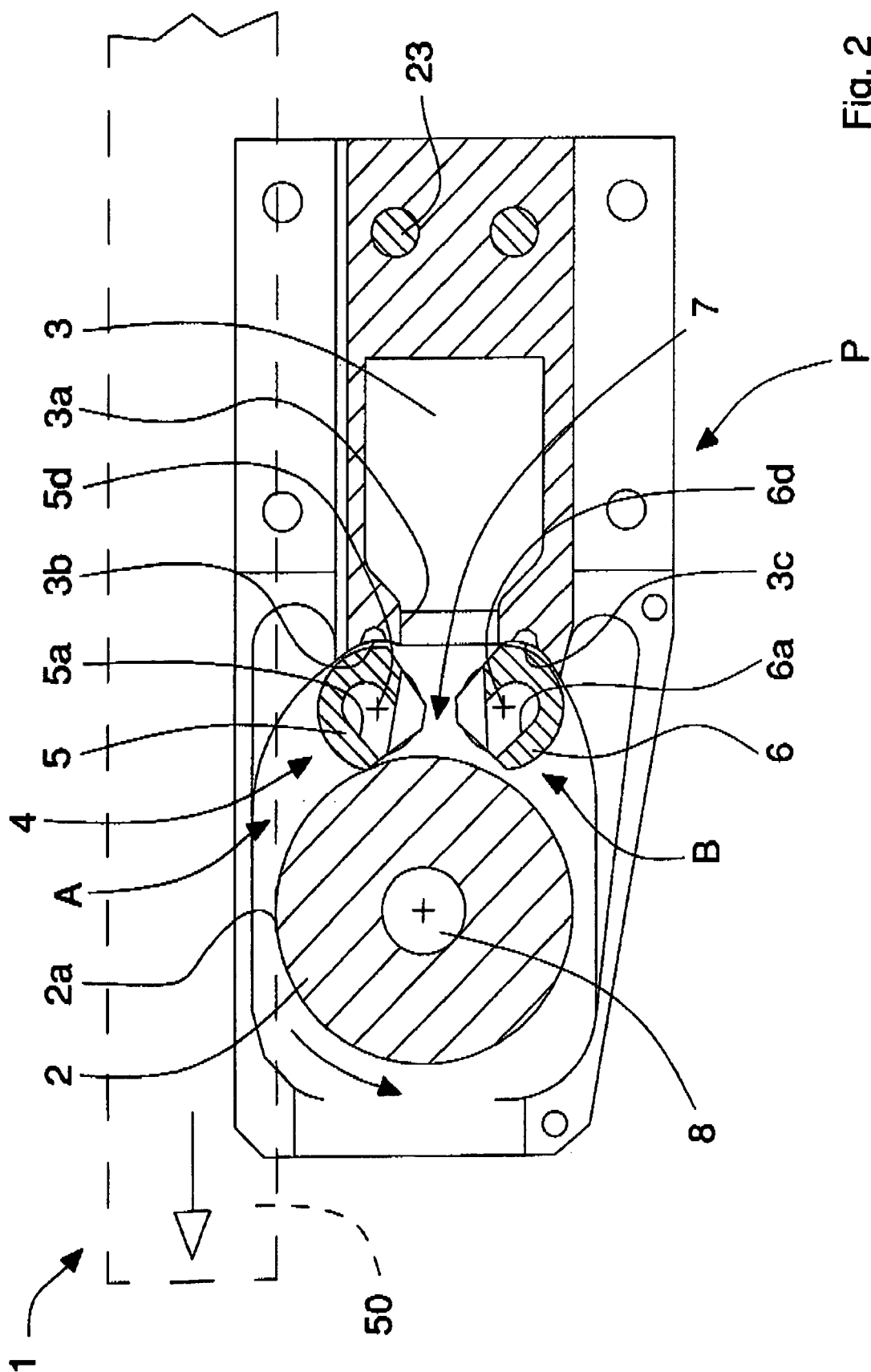
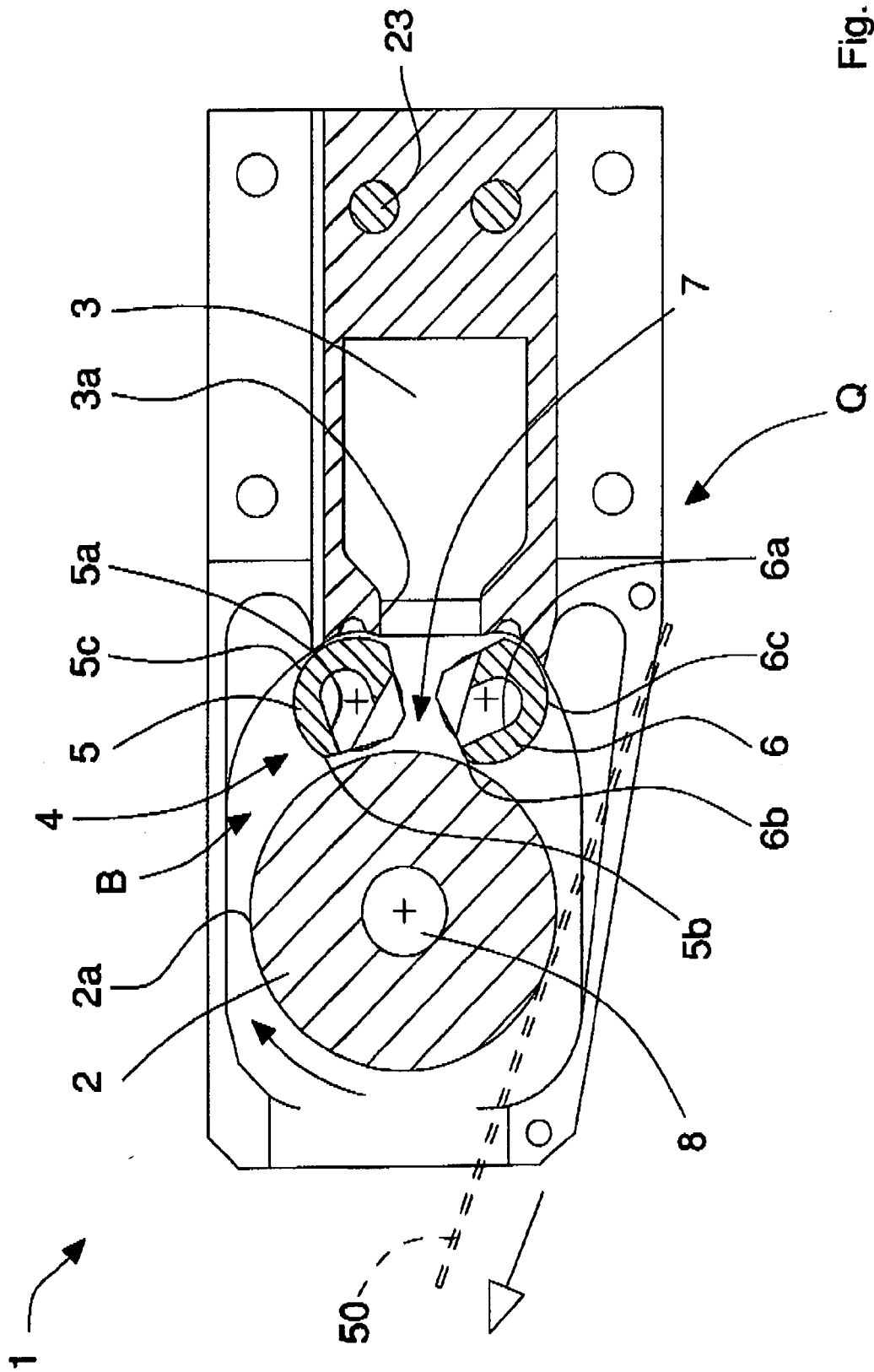
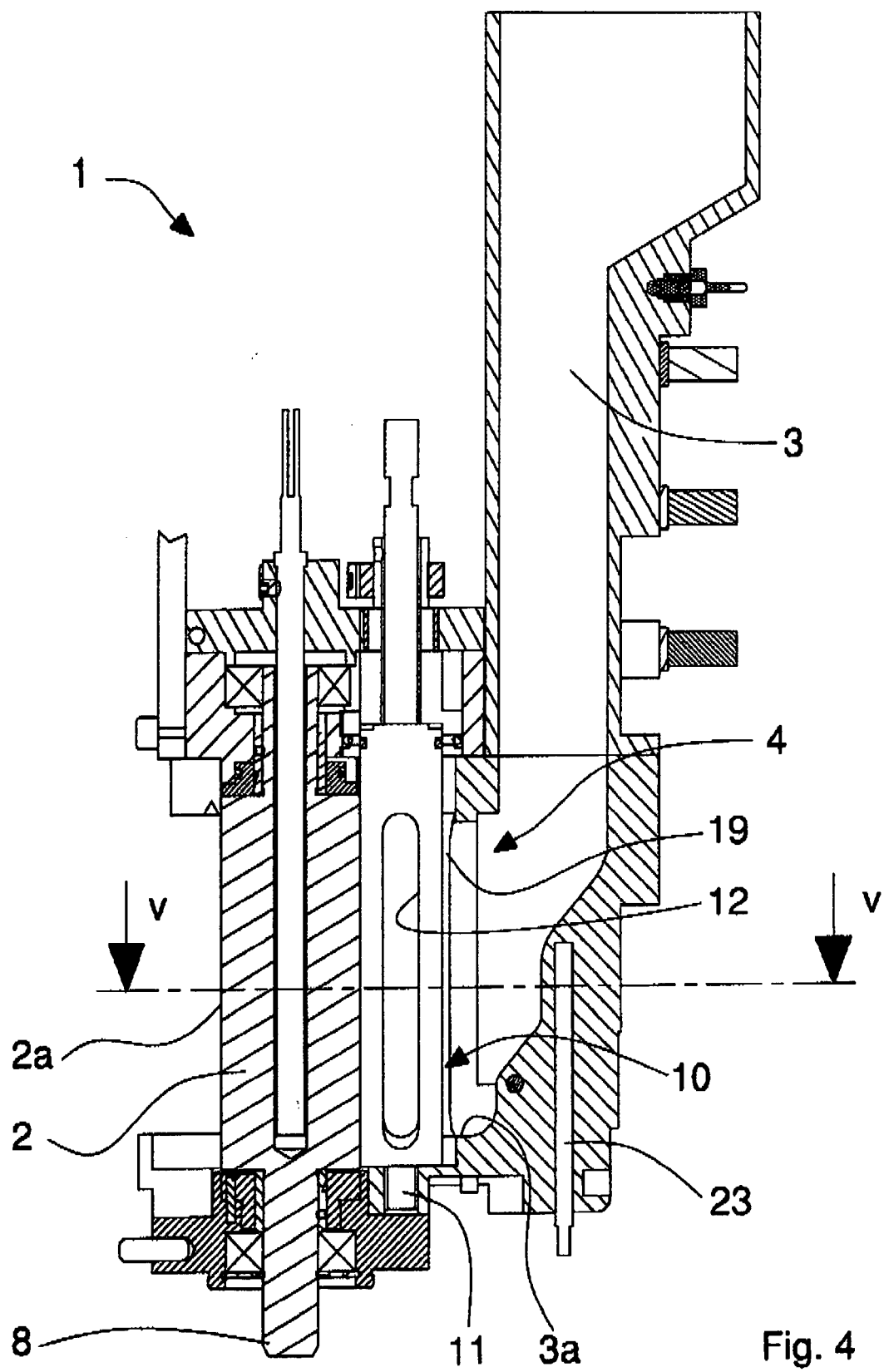


Fig. 1



**Fig. 2**





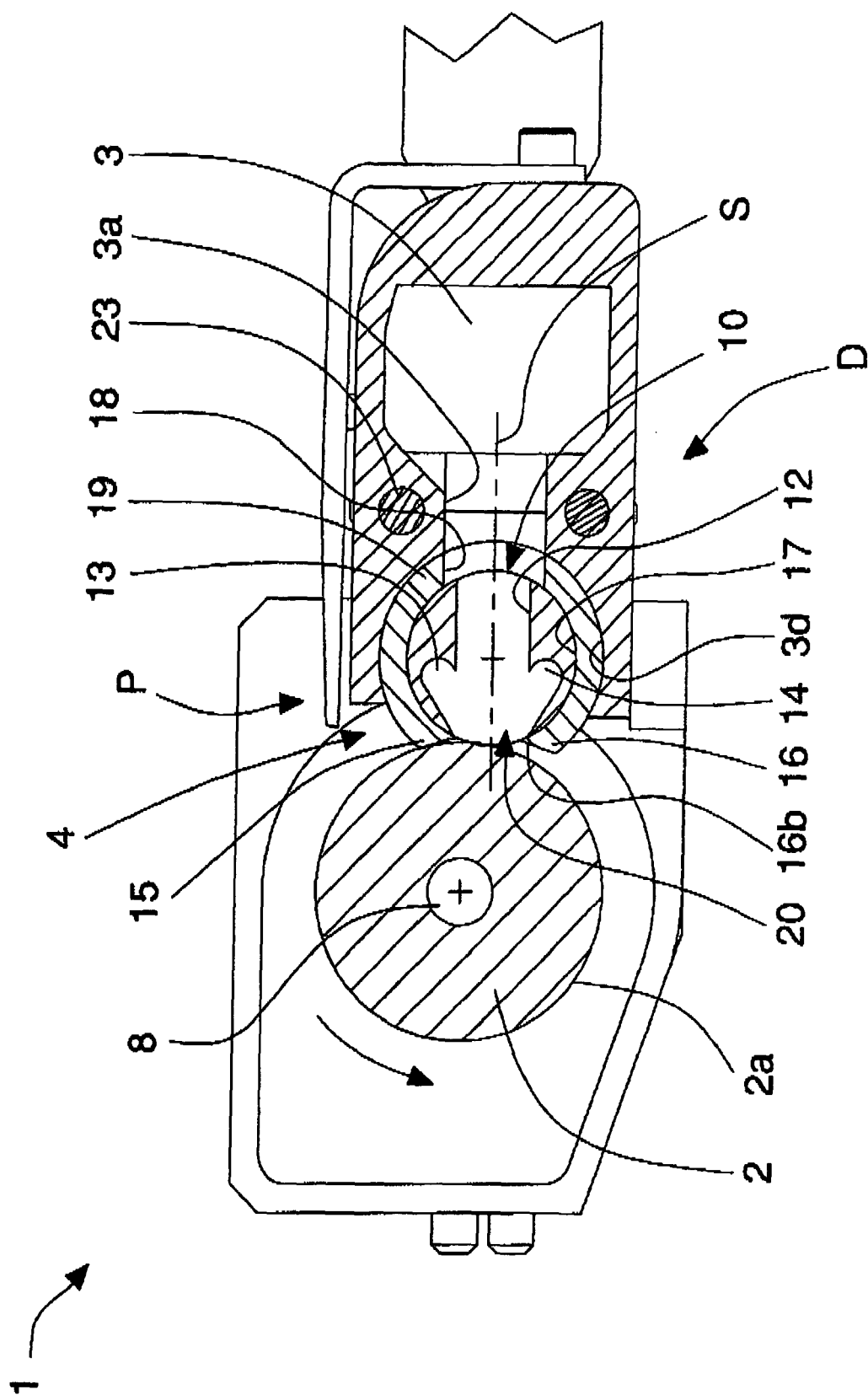


Fig. 5

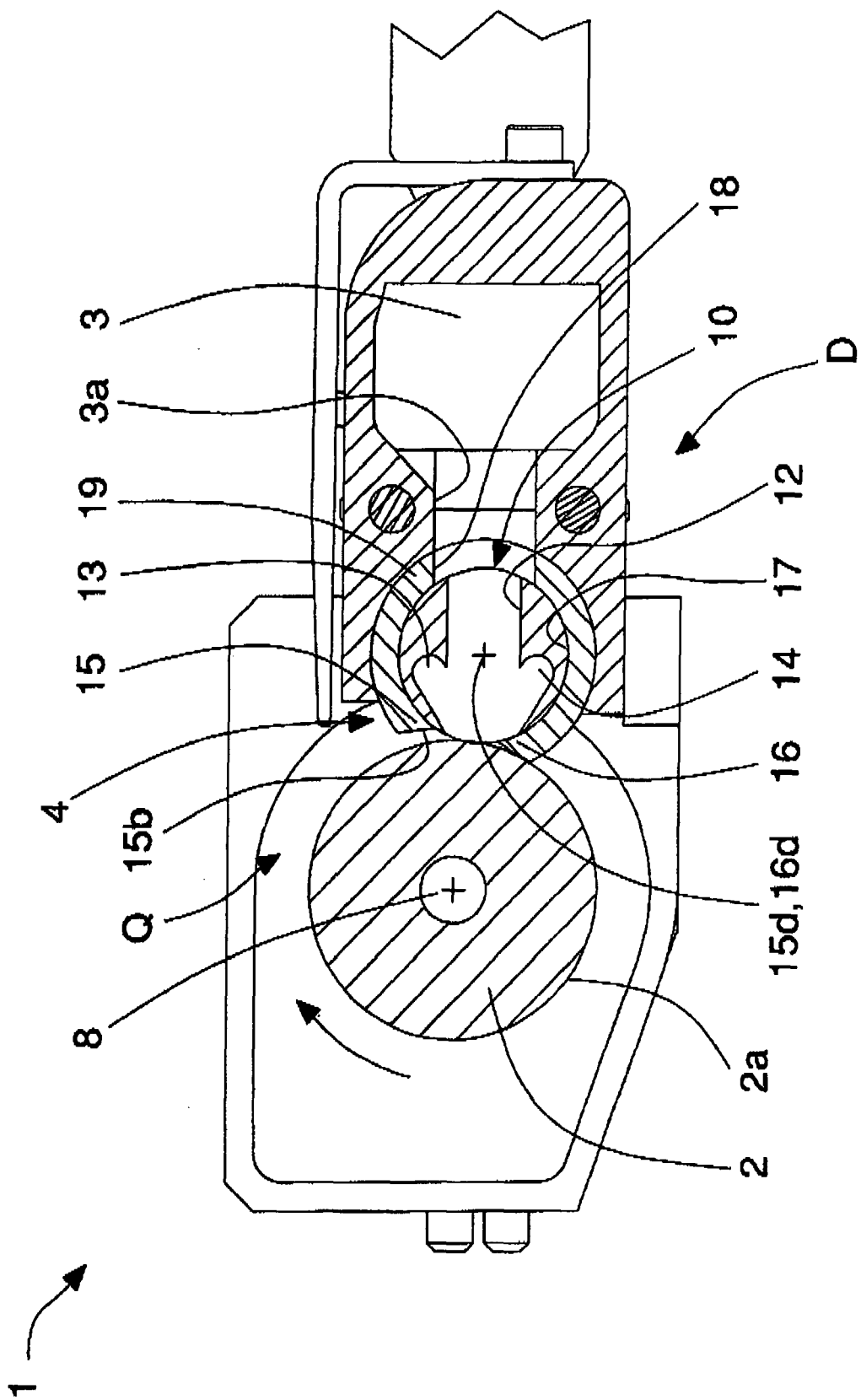


Fig. 6

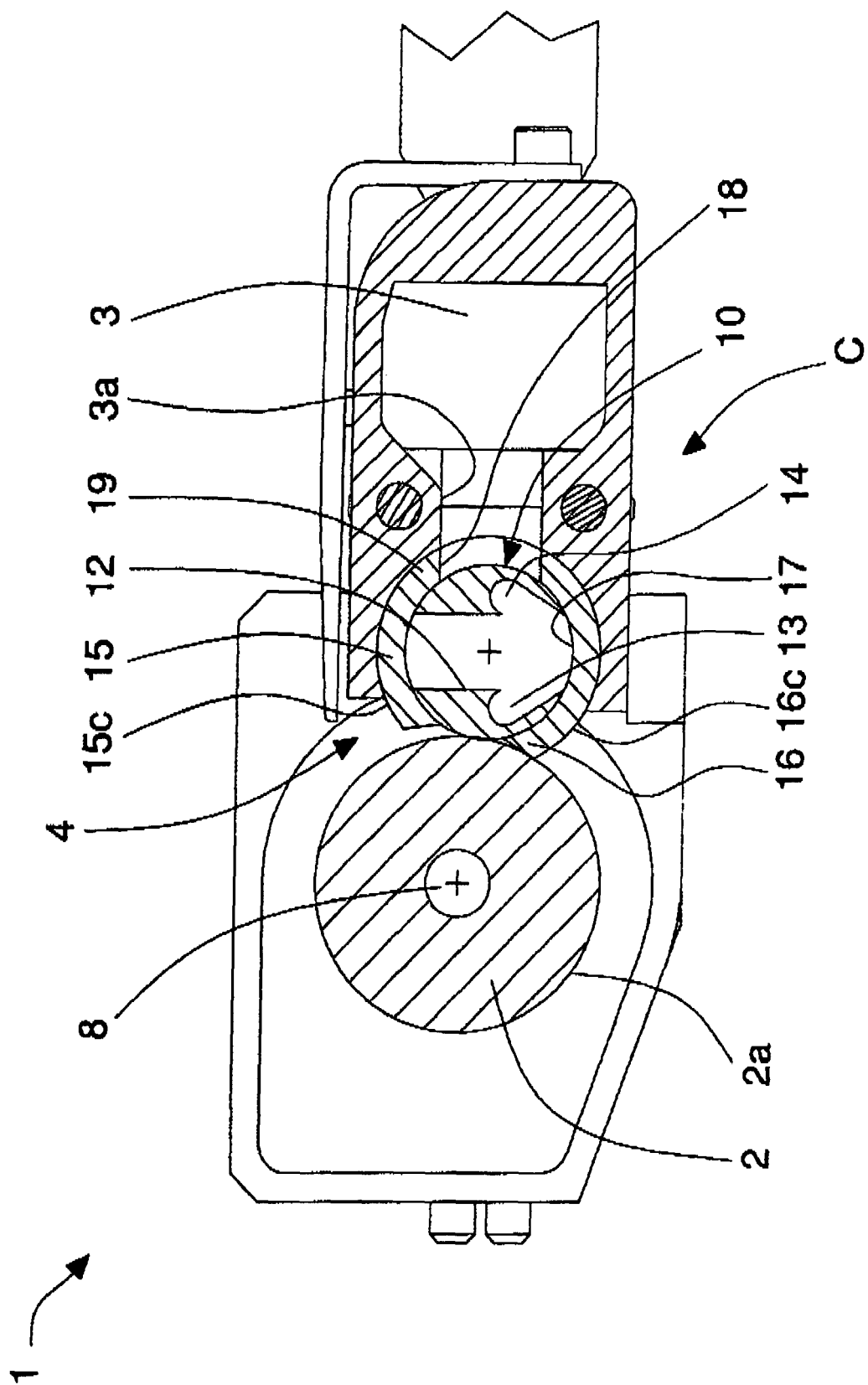


Fig. 7





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			B27G B05C B27D B42C
Place of search		Date of completion of the search	Examiner
Munich		4 May 2007	Meritano, Luciano
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
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04-05-2007

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