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(54) **EDGEBANDING ASSEMBLY AND METHOD FOR EDGEBANDING PANELS OF WOOD OR THE LIKE**

(57) An edgbanding assembly and a method for edgbanding panels (2) made of wood or the like with respective finishing edges (7), according to which each finishing edge (7) is heated by a hot gas supplied through a dispensing nozzle (17) provided with an outer liner (20) having a plurality of supplying holes (23) and an inner

shutter (25), which is movable within the outer liner (20) so as to open and close the supplying holes (23), and has a supplying channel (26), which is obtained through the inner shutter (25) so as to supply the hot gas to the supplying holes (23).

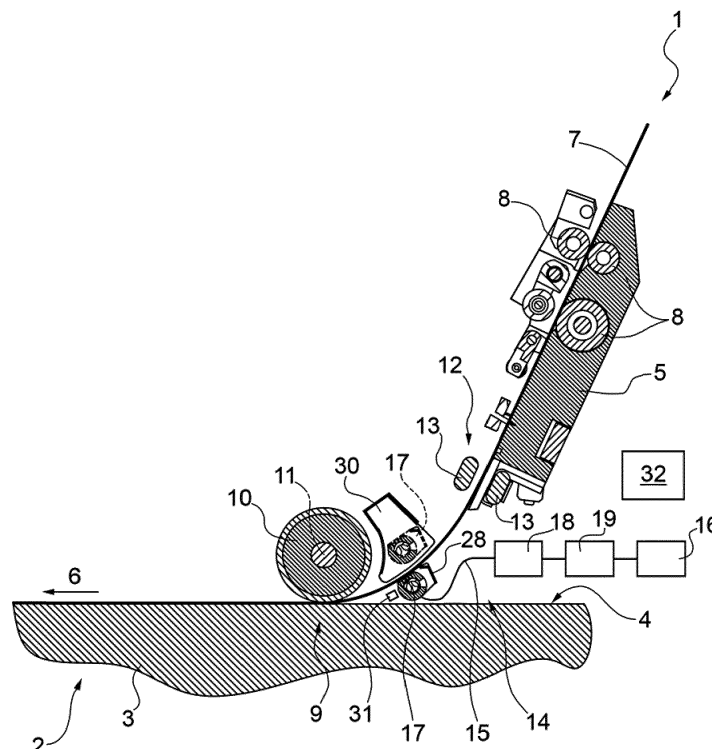


FIG.1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 102018000001761 filed on 24/01/2018.

TECHNICAL FIELD

[0002] The present invention relates to an edgebanding assembly for edgebanding panels of wood or the like.

BACKGROUND ART

[0003] The manufacturing of an edgebanding assembly for edgebanding panels of wood or the like, each having two main faces, which are parallel and opposite to one another, and a lateral profile extending between the main faces, is well known in the wood panel machining field.

[0004] The edgebanding assembly comprises a feeding device to guide a finishing edge to a connection station, where the finishing edge is connected along at least part of the lateral profile of a panel; a pressing device to stabilize the finishing edge on the panel; and a supplying device to supply a hot gas onto the finishing edge and/or onto the lateral profile of the panel, so as to activate either a glue present on the finishing edge and/or the lateral profile of the panel, or a functional layer of the finishing edge in case of multilayer finishing edges.

[0005] The supplying device is provided with a dispensing nozzle comprising a distribution block provided with a hot gas supplying channel and a hot gas discharge channel.

[0006] The supplying channel is substantially perpendicular to the main faces of the panel and is provided with a plurality of supplying holes, which are distributed along the supplying channel and face the finishing edge and/or the lateral profile of the panel.

[0007] The discharge channel is inclined with respect to the supplying channel, is connected to one end of the supplying channel, and communicates with the outside via the interposition of a valve device.

[0008] The dispensing nozzle further comprises a shutter movable along the supplying channel to selectively open and close the supplying holes. When the supplying holes are completely closed by the shutter, the hot gas is discharged to the outside along the discharge duct and through said valve device.

[0009] Known edgebanding assemblies of the type described above have some drawbacks mainly due to the fact that the supply of hot gas along the supplying channel and through the supplying holes is relatively noisy and not very efficient.

[0010] Moreover, the dispensing nozzle is relatively bulky and quite expensive.

DISCLOSURE OF INVENTION

[0011] The object of the present invention is to provide an edgebanding assembly for edgebanding panels of wood or the like, which is free from the drawbacks described above and simple and inexpensive to implement.

[0012] According to the present invention, an edgebanding assembly for edgebanding panels of wood or the like is provided as claimed in claims 1 to 16.

[0013] The present invention also relates to a method for edgebanding panels of wood or the like.

[0014] According to the present invention, a method for edgebanding panels of wood or the like is provided as claimed in claims 17 to 23.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The present invention will now be described with reference to the accompanying drawings, which illustrate a non-limiting embodiment thereof, in which:

Figure 1 is a schematic plan view, with parts removed for clarity, of a preferred embodiment of the edgebanding assembly of the present invention;

Figure 2 is a perspective view, with parts removed for clarity, of a detail of the edgebanding assembly in Figure 1;

Figure 3 is a longitudinal section of the detail of Figure 2;

Figure 4 is a perspective view of a detail of Figures 2 and 3; and

Figures 5a and 5b are two cross sections of the detail of Figures 2 and 3.

BEST MODE FOR CARRYING OUT THE INVENTION

[0016] With reference to Figure 1, number 1 indicates, as a whole, an edgebanding assembly for edgebanding substantially flat panels of wood 2 or the like, each of which is bounded by two parallel main faces 3 and by an annular lateral profile 4, which is substantially perpendicular to said faces 3.

[0017] The edgebanding assembly 1 comprises a support frame 5 and a supplying device, known and not shown, suitable for feeding panels 2 successively in a horizontal direction 6.

[0018] Each panel 2 is edgebanded with a finishing edge 7, which is separated from a band roll (not shown) housed in a storage warehouse, which is known and not shown.

[0019] The edge 7 is fed by a plurality of unwinding rollers 8 mounted on the frame 5 to a connection station 9, where the edge 6 is connected along at least part of the lateral profile 4 of the panel 2 and is stabilized against said profile 4 by a pressing roller 10 mounted on the frame 5 to rotate about a rotation axis 11 substantially vertical and transverse to the direction 6.

[0020] The edgebanding assembly 1 is also provided

with a heating device 12, which is mounted between the unwinding rollers 8 and the pressing roller 10, and in this case comprises two infrared lamps 13 arranged on opposite sides of the edge 7 so as to heat said edge 7 to a temperature below its melting temperature.

[0021] The edgebanding assembly 1 also comprises a supplying device 14 to supply a hot gas flow onto the edge 7, in this case a flow of hot air under pressure.

[0022] The hot air under pressure is supplied onto the edge 7, so as to activate either a glue present on the edge 7 or a functional layer of the edge 7 if the edge 7 is a multilayer edge.

[0023] Obviously, according to a variant, not shown, when the glue is applied onto the profile 4, the hot air under pressure is supplied onto the profile 4 to activate the glue itself.

[0024] The device 14 comprises a pneumatic supply circuit 15 extending between a source 16 of pressurised air and a dispensing nozzle 17 mounted between the heating device 12 and the pressing roller 10.

[0025] The circuit 15 also extends through a heating unit 18 for heating the pressurised air coming from the source 16 and through a flow rate adjusting device 19 mounted between the source 16 and the unit 18 for selectively controlling the flow rate of air supplied to the nozzle 17.

[0026] With reference to Figures 2 to 4, the nozzle 17 comprises a tubular outer liner 20, which has a substantially vertical, longitudinal axis 21, communicates with the circuit 15 through an inlet hole 22, and is provided with a plurality of supplying holes 23.

[0027] The holes 23 are formed in a portion of a lower segment of the liner 20 and are distributed according to at least three rows of holes 23 (in this case four rows of holes 23), which are parallel to each other and to the axis 21.

[0028] The rows of holes 23 are arranged so that the distance between each hole 23 and each adjacent hole 23 ranges from 2 to 8 millimetres and that the distance between the first row of holes 23 and the last row of holes 23 is equal to at least 7 millimetres.

[0029] Moreover, the liner 20 has a longitudinal slit 24, which extends parallel to the axis 21, is formed through an intermediate portion of the liner 20 arranged above the holes 23, and is circumferentially offset with respect to the holes 23.

[0030] The nozzle 17 further comprises an inner shutter 25 screwed into the liner 20 so as to be moved along the axis 21 with a rotation-translation movement, in particular under the thrust of an operating device (not shown).

[0031] The shutter 25 has a supplying channel 26, which is formed on the inside of the shutter 25 and extends along part of the shutter 25 parallel to the axis 21.

[0032] The shutter 25 also has a longitudinal slit 27, which is obtained through the shutter 25 parallel to the axis 21, extends along the lower portion and the intermediate portion of the liner 20, and communicates with

the channel 26.

[0033] The shutter 25 is movable around the axis 21 between a first operating position, in which the channel 26 communicates with the slit 24 through the slit 27 in order to discharge the pressurized hot air to the outside through the slit 24; a second operating position, in which the slits 24 and 27 are tangentially staggered with respect to one another and the channel 26 communicates exclusively with the holes 23 to discharge the pressurized hot air to the outside through the holes 23; and a third operating position, in which the shutter 25 closes the hole 22 to stop the supply of pressurized hot air through the nozzle 17.

[0034] With regard to the foregoing, it should be pointed out that each slit 24, 27 has a passage cross section greater than the passage cross section of the holes 23.

[0035] The nozzle 17 is also provided with a deflector 28 to intercept the pressurized hot air bounced back from the edge 7.

[0036] The nozzle 17 and the deflector 28 define, between one another, a feeding channel 29, which is configured to feed the pressurized hot air bounced back from the edge 7 against the panel 2 and has a passage cross section, which increases in a feeding direction of the pressurized hot air along said channel 29.

[0037] The nozzle 17 is movable between an operating position (shown by the solid line in Figure 1), in which the nozzle 17 heats the edge 7, and a rest position (shown by the dashed line in Figure 1), in which the nozzle 17 is arranged inside a sucking hood 30.

[0038] The operating position and the rest position of the nozzle 17 are arranged on opposite sides of a feeding path for feeding the edge 7 to the connection station 9.

[0039] The nozzle 17 is supplied and configured so that the hot air has:

- a pressure below 0.99 bar, in particular below 0.6 bar, on the edge 7;
- a pressure below 1.45 bar and a temperature at least equal to 320°C at the holes 23;
- a subsonic output speed ranging from 0.4 to 0.99 Mach in at least some of the holes 23; and
- a pressure exceeding 1.5 bar inside the shutter 25 and along the channel 26.

[0040] In addition, it should be pointed out that:

- the distance between the edge 7 and the holes 23 ranges from 0.5 mm to 3 mm;
- a fluid can be added to the hot air, the former being transformed into superheated steam and allowing a greater supply of energy to the edge 7; and
- the liner 20 and/or the shutter 25 are heated to a temperature that is at least equal to the supplying temperature of the hot air at the inlet of the channel 26.

[0041] Lastly, the edgebanding assembly 1 comprises

a measuring device 31 to measure the temperature of the edge 7 and an electronic control unit 32 to selectively control the operation of the flow rate adjusting device 19 in response to a signal from the measuring device 31.

[0042] The relatively low speed of the hot air at the outlet of the holes 23, the presence of the channel 26 inside the shutter 25, and the arrangement of the holes 23 make the supplying device 14 relatively noiseless and relatively efficient.

[0043] The supplying device 14 also has further advantages mainly due to the fact that:

the dispensing nozzle 17 is relatively simple, inexpensive and compact;
the supplying channel 26 allows the hot air to be both supplied to the holes 23 and discharged to the outside; and the inner shutter 25 allows the flow rate of hot air supplied to the holes 23 to be adjusted in a relatively simple and quick way, through its rotation about the axis 21.

Claims

1. An edgebanding assembly for edgebanding panels (2) of wood or the like, each having two main faces (3), which are parallel and opposite to one another, and a lateral profile (4) extending between the main faces (3), the edgebanding assembly comprising a feeding device (8) to guide a finishing edge (7) to a connection station (9), where the finishing edge (7) is connected along at least part of the lateral profile (4) of a panel (2); a pressing device (10) to stabilize the finishing edge (7) on the panel (2); and a supplying device (14) to supply a hot gas onto the finishing edge (7) and/or onto the lateral profile (4); the supplying device (14) comprising a dispensing nozzle (17) comprising, in turn, an outer liner (20), which is provided with a plurality of supplying holes (23), and an inner shutter (25), which is movable in the outer liner (20) so as to open and close the supplying holes (23); and being **characterized in that** the inner shutter (25) has a supplying channel (26), which is obtained through the inner shutter (25) so as to supply the hot gas to the supplying holes (23).
2. The edgebanding assembly according to claim 1, wherein the supplying channel (26) extends at least partly along a longitudinal axis (21) of the outer liner (20).
3. The edgebanding assembly according to claim 1 or 2, wherein the inner shutter (25) is movable along the outer liner (20) with a rotation-translation movement, in particular due to the thrust of an operating device.
4. The edgebanding assembly according to any one of the preceding claims, wherein the outer liner (20) has a first slit (24), which extends parallel to a longitudinal axis (21) of the outer liner (20) and is designed to connect the supplying channel (26) to the outside; the inner shutter (25) having a second slit (27), which extends parallel to the longitudinal axis (21), communicates with the supplying channel (26) and is designed to be radially aligned with the first slit (24) following a rotation of the inner shutter (25) around the longitudinal axis (21).
5. The edgebanding assembly according to claim 4, wherein each first and second slit (24, 27) has a respective passage cross section, which is greater than the passage cross section of the supplying holes (23).
6. The edgebanding assembly according to claim 4 or 5, wherein the first slit (24) and the supplying holes (23) are circumferentially offset around said longitudinal axis (21) so as to alternatively communicate with the second slit (27) in different angular positions of the inner shutter (25) around the longitudinal axis (21).
7. The edgebanding assembly according to any one of the preceding claims, wherein the supplying holes (23) are distributed according to at least three rows of supplying holes (23), which are parallel to a longitudinal axis (21) of the outer liner (20).
8. The edgebanding assembly according to claim 7, wherein the distance between each supplying hole (23) and each adjacent supplying hole (23) ranges from 2 to 8 millimetres.
9. The edgebanding assembly according to claim 7 or 8, wherein the distance between the first row of supplying holes (23) and the last row of supplying holes (23) is equal to at least 7 millimetres.
10. The edgebanding assembly according to any one of the preceding claims, wherein the dispensing nozzle (17) is mounted between the finishing edge (7) and the panel (2), is oriented so as to supply the hot gas onto the finishing edge (7) and is further provided with a deflector (28) to intercept the hot gas bounced back from the finishing edge (7).
11. The edgebanding assembly according to claim 10, wherein the dispensing nozzle (17) and the deflector (28) define, between one another, a feeding channel (29), which is configured to feed the hot gas bounced back from the finishing edge (7) against the panel (2) and has a passage cross section, which, in particular, increases in a feeding direction of the hot gas along the feeding channel (29).

12. The edgebanding assembly according to any one of the preceding claims, wherein the dispensing nozzle (17) is movable between an operating position, in which the dispensing nozzle (17) is arranged between the finishing edge (7) and the panel (2), and a rest position. 5
13. The edgebanding assembly according to claim 12, wherein the operating position and the rest position of the dispensing nozzle (17) are arranged on opposite sides of a feeding path of the finishing edge (7). 10
14. The edgebanding assembly according to claim 12 or 13 and comprising, furthermore, a sucking hood (30); the rest position of the dispensing nozzle (17) being arranged inside the sucking hood (30). 15
15. The edgebanding assembly according to any one of the preceding claims and comprising, furthermore, a gas source (16), in particular for a gas under pressure, a heating device (18) to heat the gas and a flow rate adjusting device (19), which is mounted, in particular, between the gas source (16) and the heating device (19) so as to selectively control the gas flow rate supplied to the dispensing nozzle (17). 20 25
16. The edgebanding assembly according to claim 15 and comprising, furthermore, a measuring device (31) to measure the temperature of the finishing edge (7) and an electronic control unit (32) to selectively control the operation of the flow rate adjusting device (19) and/or of the heating device (18) in response to a signal from the measuring device (31). 30
17. A method for edgebanding panels (2) of wood or the like by means of an edgebanding assembly according to any one of the preceding claims, the method comprising the step of:
supplying the hot gas through the supplying holes (23) of the outer liner (20), so that the hot gas comes into contact with the finishing edge (7) with a pressure below 0.99 bar, in particular below 0.6 bar. 35 40
18. The method according to claim 17, wherein the hot gas is supplied through the supplying holes (23) of the outer liner (20) with a pressure below 1.45 bar and a temperature that is at least equal to 320°. 45
19. The method according to claim 17 or 18, wherein the hot gas is supplied through at least some of the supplying holes (23) of the outer liner (20) with a subsonic supplying speed ranging from 0.4 to 0.99 Mach. 50
20. The method according to any one of the claims from 17 to 19, wherein the hot gas is supplied along the supplying channel (26) of the inner shutter (25) with a pressure exceeding 1.5 bar. 55
21. The method according to any one of the claims from 17 to 20 and comprising, furthermore, the step of: mounting the dispensing nozzle (17) in such a way that the distance between the supplying holes (23) of the outer liner (20) and the finishing edge (7) ranges from 0.5 to 3 millimetres.
22. The method according to any one of the claims from 17 to 21 and comprising, furthermore, the step of: heating the finishing edge (7) to a temperature below its melting temperature upstream of the dispensing nozzle (17) .
23. The method according to any one of the claims from 17 to 22 and comprising, furthermore, the step of: heating the outer liner (20) and/or the inner shutter (25) of the dispensing nozzle (17) to a temperature that is at least equal to the supplying temperature of the hot gas at the inlet of the supplying channel (26).

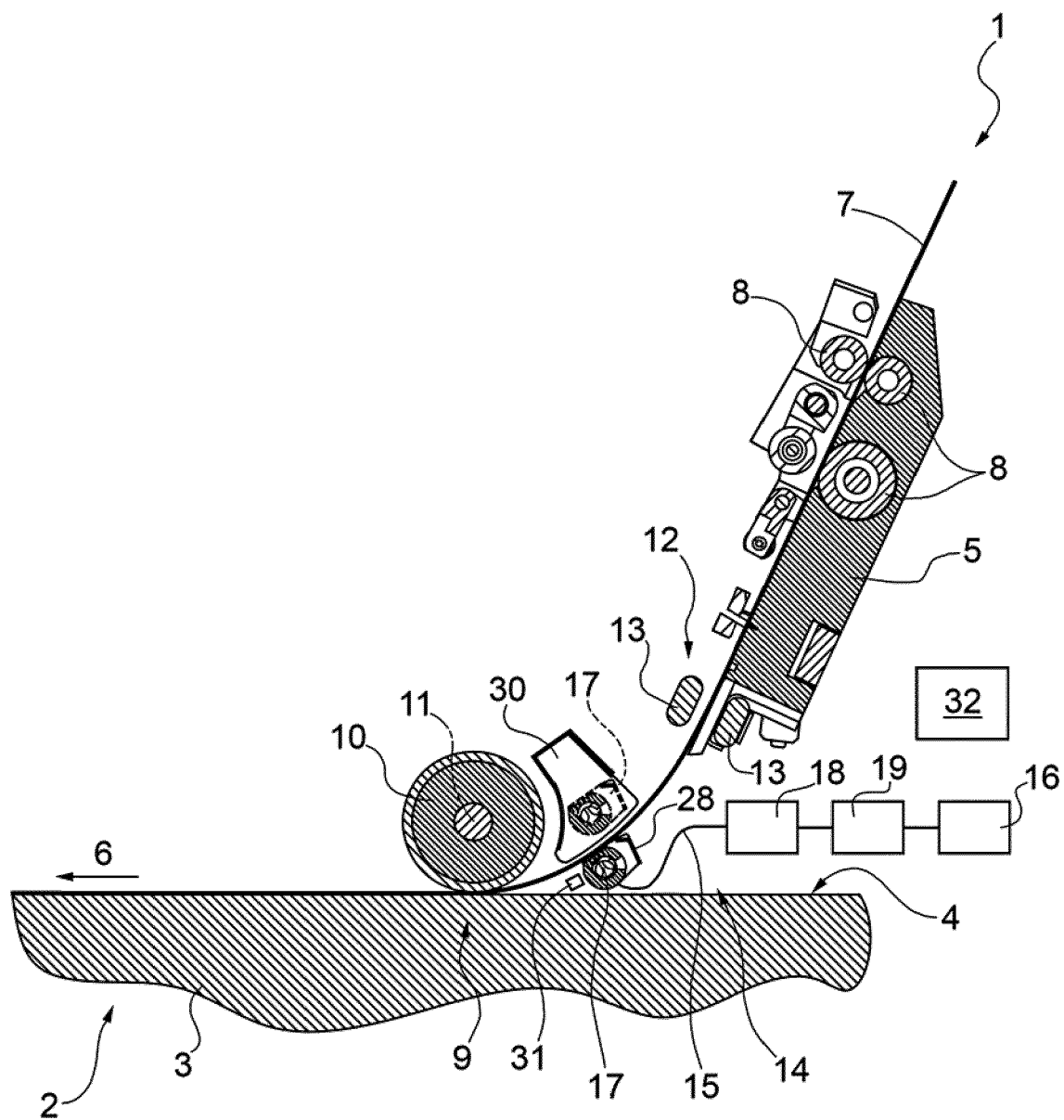
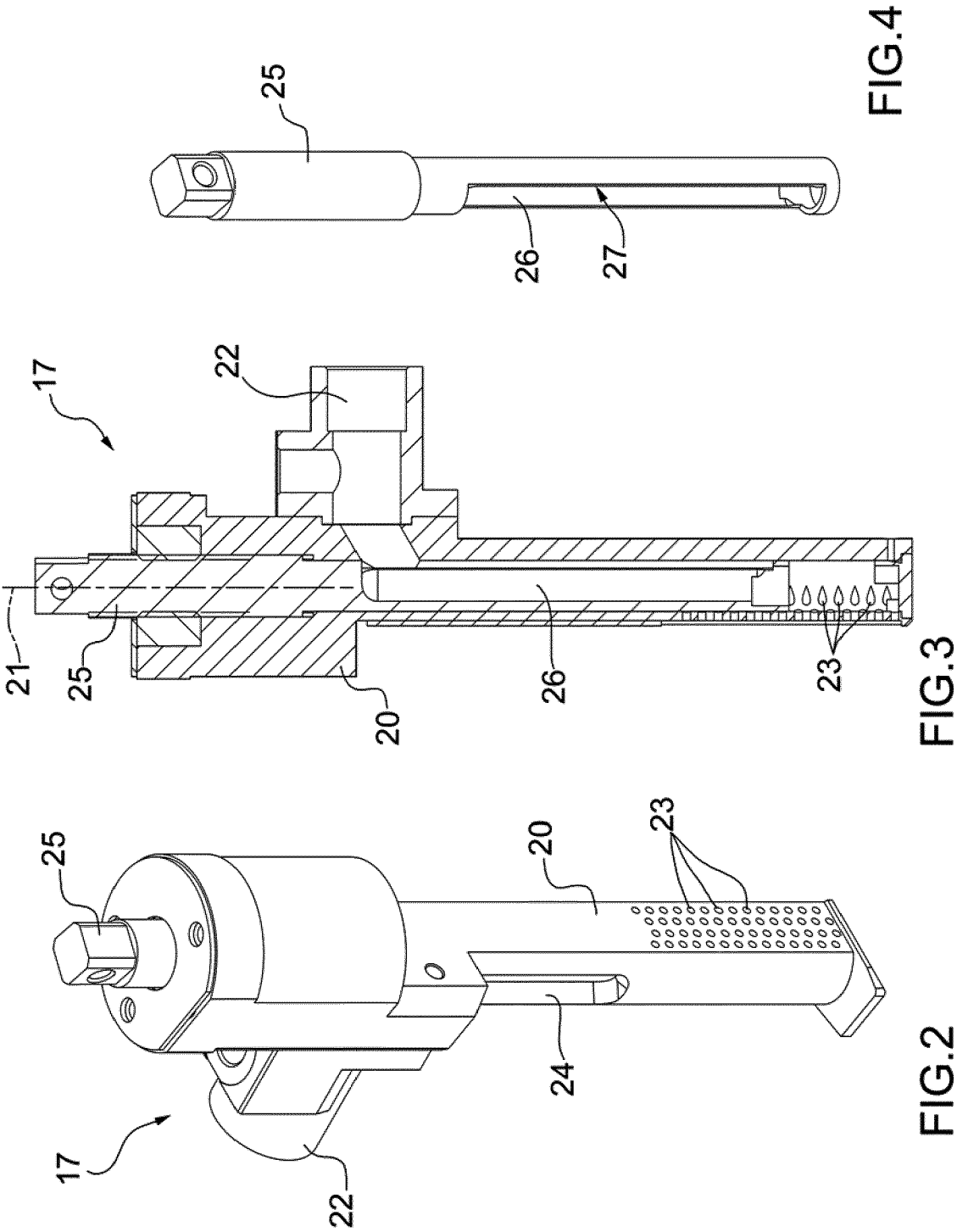


FIG.1



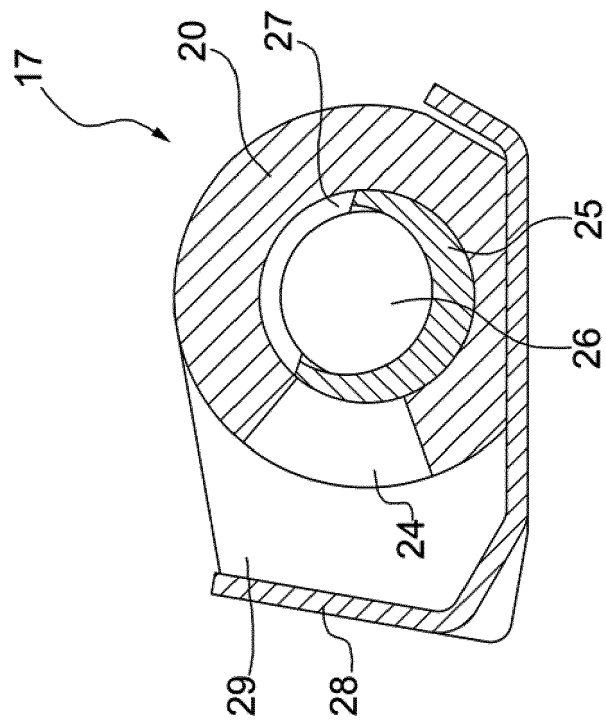


FIG. 5a

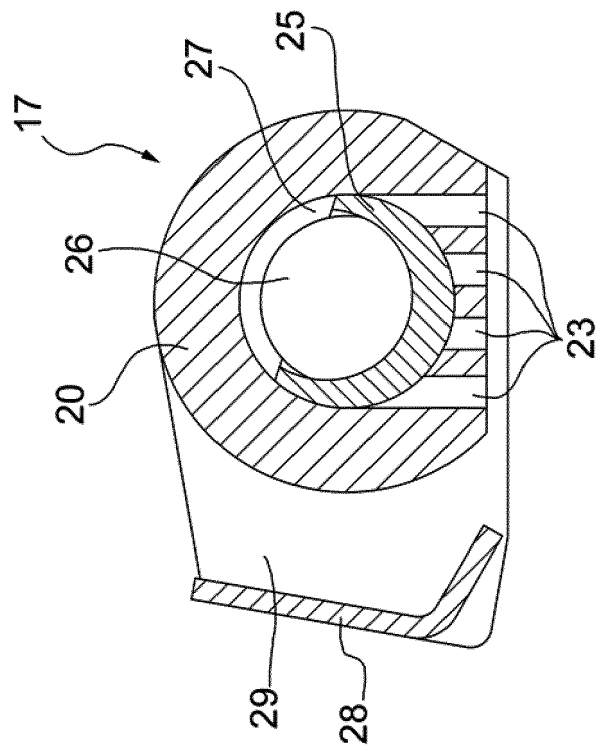


FIG. 5b



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Application Number
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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