

(19)



(11)

EP 3 533 573 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
04.09.2019 Bulletin 2019/36

(51) Int Cl.:
B27D 5/00 (2006.01)

(21) Application number: **19160382.8**

(22) Date of filing: **01.03.2019**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **BIESSE S.p.A.**
61100 Pesaro (IT)

(72) Inventor: **VICHI, Alessandro**
61100 PESARO (PU) (IT)

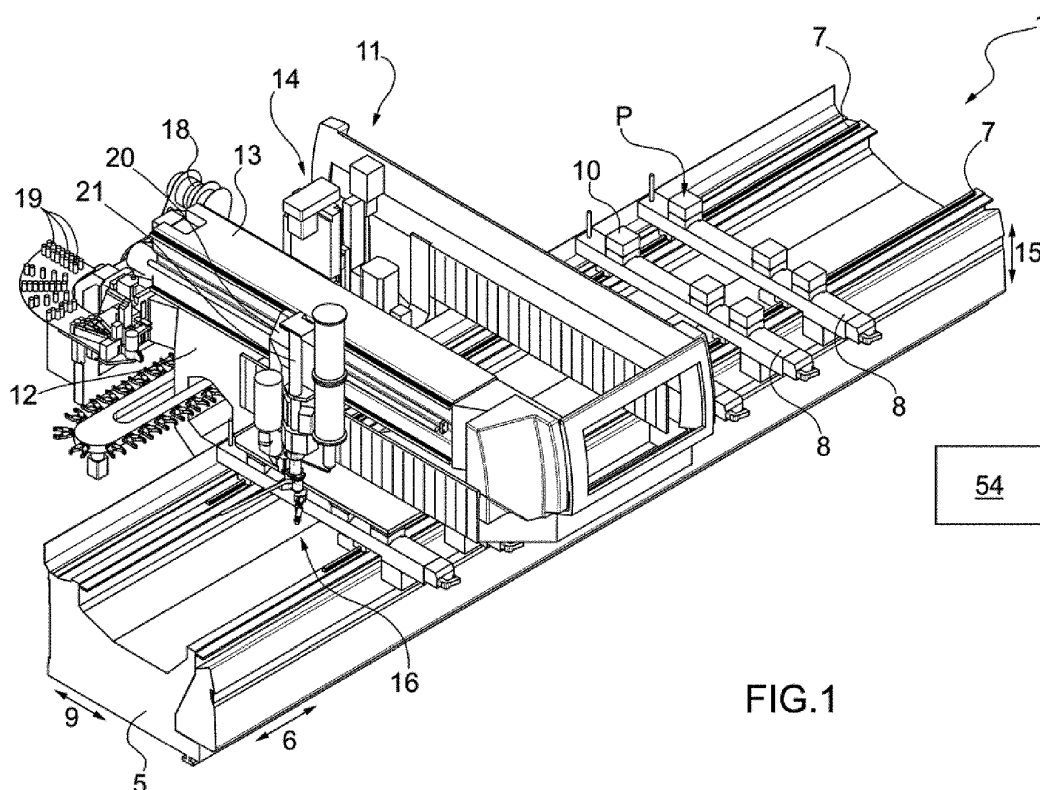
(74) Representative: **Manconi, Stefano et al**
Studio Torta S.p.A.
Via Viotti, 9
10121 Torino (IT)

(30) Priority: **01.03.2018 IT 201800003189**

(54) A MACHINE TO PROCESS PANELS MADE OF WOOD OR THE LIKE

(57) A machine to process panels (2) made of wood or the like comprises an edgebanding assembly (16) to edgeband a lateral profile (4) of the panel (2) with a finishing edge (17); the edgebanding assembly (16) being provided with a gluing device (26) to apply glue onto the lateral profile (4) of the panel (2) and/or on the finishing edge (17), with an activation device (36) to activate a

heat-melting layer of the finishing edge (17), and with a covering device (58) movable from and to an operating position, wherein the covering device (58) is arranged between the gluing device (26) and the finishing edge (17) so as to prevent the finishing edge (17) from coming into contact with the gluing device (26).

**FIG.1****EP 3 533 573 A1**

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 102018000003189 filed on 01/03/2018.

TECHNICAL FIELD

[0002] The present invention relates to a machine to process panels made of wood or the like.

BACKGROUND ART

[0003] In the wood panel processing field, it is known to provide a machine of the type comprising an elongated base provided with two guiding members parallel to a substantially horizontal first direction; a plurality of crossbars mounted between the guiding members parallel to a second direction substantially horizontal and transverse to the first direction; at least one bearing block mounted on each crossbar to block at least one panel; and an overhead crane, which is movable along the base in the first direction and extends above the base in the second direction.

[0004] The overhead crane supports an operating head suitable for chip removal machining of the panel, and an edgebanding assembly for edgebanding a lateral profile of the panel with a finishing edge.

[0005] Generally, the edgebanding assembly comprises both a gluing device to connect the finishing edge and the panel together by gluing, and an activation device to connect the finishing edge and the panel together by activating a heat-melting layer of the finishing edge.

[0006] The gluing device comprises a tank containing glue, a gluing roller or nozzle to apply glue to the lateral profile and/or finishing edge, and a pressing roller to stabilize the finishing edge against the lateral profile.

[0007] The gluing device and the activation device are used alternatively according to the type of finishing edge to be connected to the lateral profile of the panel.

[0008] The known wood panel processing machines of the type described above have some drawbacks mainly due to the fact that the glue used by the gluing device can contaminate the activation device and jeopardize its correct operation.

DISCLOSURE OF INVENTION

[0009] It is an object of the present invention to provide a machine to process panels made of wood or the like, which is free from the previously described drawbacks and which is cheap and easy to use.

[0010] According to the present invention, there is provided a machine to process panels made of wood or the like, as claimed in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] 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 perspective view, with parts enlarged and parts removed for the sake of clarity, of a preferred embodiment of the machine according to the present invention;

Figures 2 and 3 are two schematic perspective views of a detail of the machine of Figure 1;

Figures 4, 5 and 6 are three schematic plan views, with parts shown as cross-sectional views and parts removed for the sake of clarity, of the detail of Figures 2 and 3 illustrated in three different operating positions;

Figures 7 and 8 are two schematic perspective views, with parts removed for clarity, of a detail of Figures 4-6 illustrated in two different operating positions;

Figure 9 is a perspective view, with parts removed for clarity, of a detail of Figures 4-6;

Figure 10 is a longitudinal section of the detail of Figure 9;

Figure 11 is a perspective view of a detail of Figures 9 and 10; and

Figures 12a and 12b are two cross sections of the detail of Figures 9 and 10.

BEST MODE FOR CARRYING OUT THE INVENTION

[0012] With reference to Figure 1, number 1 indicates, as a whole, a machine to process substantially flat panels 2 made of wood 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 the faces 3.

[0013] The machine 1 comprises an elongated base 5, which extends in a horizontal direction 6, is substantially U-shaped, and is provided with two lateral guiding members 7 parallel to the direction 6.

[0014] The base 5 also supports a plurality of crossbars 8, which are referred to in the following description as "working planes", extend between the guiding members 7 in a horizontal direction 9 transverse to the direction 6, and are coupled in a sliding manner to said guiding members 7 so as to be moved, manually or by means of respective conventional drive devices that are known and not illustrated, along said guiding members 7 in the direction 6.

[0015] The working planes 8 support a plurality of bearing blocks 10, which are arranged on the relative working planes 8 substantially according to the dimensions of the panels 2 to be processed and the machining processes to be performed on said panels 2.

[0016] Each block 10 is movable along the relative working plane 8 in the direction 9, is coplanar to the other blocks 10 to define a supporting surface P for at least

one panel 2, and is connected, in this case, with a pneumatic suction device suitable to block the panel 2 on the surface P.

[0017] The base 5 also supports an overhead crane 11 comprising a vertical upright member 12, which is coupled to the base 5 in a conventional manner so as to perform, along said base 5 and under the action of a conventional drive device that is not illustrated, rectilinear movements in the direction 6, and supports a crossbar 13 attached to a free end thereof and extending above the base 5 in the direction 9.

[0018] The overhead crane 11 supports an operating head 14 of a known type suitable for machining the panel 2 by chip removal.

[0019] The head 14 is coupled in a known manner to the crossbar 13 to make, with respect to the cross member 13, rectilinear movements in the direction 9 and in a vertical direction 15 orthogonal to the directions 6 and 9 and to the surface P.

[0020] The overhead crane 11 also supports an edge-banding assembly 16 suitable to edgeband the lateral profile 4 of the panels 2 with a finishing edge 17 (Figures 4 and 5).

[0021] The edge 17 is separated by a band (not shown), which is housed in a storage 18 mounted on the upright member 12 of the overhead crane 11, and is fed to the assembly 16 through a plurality of unwinding rollers 19.

[0022] The assembly 16 comprises a horizontal slide 20 coupled in a known manner to the crossbar 13 to make rectilinear movements along said crossbar 13 in the direction 9; and a vertical slide 21 coupled in a known manner to the slide 20 to make, with respect to the slide 20, rectilinear movements in the direction 15.

[0023] As shown in Figures from 2 to 6, the slide 21 supports a circular plate 22 to which a frame 23 is connected, which is rotatably coupled to the plate 22 in order to rotate, with respect to the plate 22, about a rotation axis 24 substantially parallel to the direction 15, and defines, together with the plate 22, a suction chamber 25 connected with a pneumatic suction device (not shown) of the machine 1.

[0024] The assembly 16 also has a gluing device 26 mounted on the frame 23 and comprising a tank 27 containing glue, a gluing roller 28 to transfer the glue from the tank 27 to the edge 17, and a doctor blade 29 to selectively control the thickness of the layer of glue applied on the edge 17.

[0025] The device 26 cooperates with a pressing roller 30 to keep the edge 17 in contact with the roller 28, and is mounted on the frame 23 to move, with respect to the frame 23, between an operating position (shown by the solid line in Figures 4 and 5) and a rest position (shown by the dotted line in Figures 4 and 5), in which the doctor blade 29 closes in contact with the roller 28.

[0026] The device 26 is heated by means of electrical resistors or by means of an induction device by inserting induction-sensitive elements in specific positions such

as, for example, at the roller 28 and/or at a duct feeding glue to the tank 27.

[0027] The temperature of the roller 28 is measured by contact sensors or by an infrared measuring device for the feedback control of the heating of roller 28.

[0028] The amount of glue in the tank 27 is measured, for example, by means of an optical or ultrasonic sensor suitable to detect the distance from the surface of the glue in the tank 27.

[0029] The position of the doctor blade 29 with respect to the roller 28 is selectively controlled either manually or by a drive device.

[0030] According to some not illustrated variants, the roller 28 is removed and replaced with:

a roller for the application, on the edge 17, of a thermosensitive material in a liquid or solid state suitable to increase the effectiveness in the subsequent melting of a functional layer of the edge 17;

a roller for the application, on the edge 17, of additives to colour the edge 17; and

a dispenser to feed, on the edge 17, a quantity of glue, which is selectively controlled by means of valve devices and/or devices for adjusting the pressure of the glue.

[0031] According to further non-illustrated variations:

a feeding device is mounted downstream of the roller 28, which feeds coloured paint powders or coloured paint for glue colouring on the edge 17, and is configured to mix different types of colours and obtain a given colour according to the signal of an optical sensor capable of detecting the colour of the surface of the panel 2 and/or of the edge 17;

the device 26 is equipped with a dosing device to feed a given quantity of glue in granules to the tank 27, where the glue in granules is melted;

the device 26 is equipped with a melting device to melt a dose of glue and feed melted glue to the tank 27; and

the device 26 is equipped with a drain cock to allow the tank 27 and the glue feeding channels to be discharged.

[0032] The assembly 16 also has a guiding device 31 comprising a plate 32 mounted on the frame 23 to move, with respect to the frame 23, between a rest position (Figure 4) and an operating position (not illustrated). The plate 32 is moved to its rest position when the device 26 is arranged in its operating position, and it is arranged in its operating position instead of the device 26 when the device 26 is moved to its rest position.

[0033] The assembly 16 is also equipped with a heating device 33, which is mounted upstream of the device 26 (when arranged in its operating position) in a direction 34 of advancement of the edge 17 through the assembly 16, and comprises, in this case, two infrared lamps 35

arranged on opposite sides of the edge 17 itself.

[0034] The assembly 16 further comprises an activation device 36, which is mounted downstream of the device 26 (when placed in its operating position) in the direction 34, and is configured to activate with hot air, in particular melt, a heat-melting layer of the edge 17.

[0035] The device 36 comprises a pneumatic circuit 37 for the supply of pressurized air, a heating unit 38 mounted along the circuit 37 to heat the pressurized air, and a releasing nozzle 39 mounted at the end of the circuit 37.

[0036] With reference to Figures 9 to 12, the nozzle 39 comprises a tubular outer jacket 40, which has a longitudinal axis 41, substantially parallel to the direction 15, communicates with the circuit 37 through an inlet hole 42, and is provided with a plurality of feeding holes 43.

[0037] The holes 43 are formed in a portion of a lower segment of the jacket 40 and are distributed according to at least three rows of holes 43 (in this case four rows of holes 43), which are parallel to each other and to the axis 41.

[0038] The rows of holes 43 are arranged so that the distance between each hole 43 and each adjacent hole 43 ranges from 2 to 8 millimetres and that the distance between the first row of holes 43 and the last row of holes 43 is equal to at least 7 millimetres.

[0039] Moreover, the jacket 40 has a longitudinal slit 44, which extends parallel to the axis 41, is formed at an intermediate segment of the jacket 40 arranged above the holes 43, and is circumferentially offset with respect to the holes 43.

[0040] The nozzle 39 further comprises an inner shutter 45, which is screwed into the jacket 40 so as to be moved along the axis 41 with a rotation-translation movement, in particular under the action of a drive device (not shown).

[0041] The shutter 45 has a feeding duct 46, which is formed on the inside of the shutter 45 and extends along part of the shutter 45 parallel to the axis 41.

[0042] The shutter 45 also has a longitudinal slit 47, which is formed through the shutter 45 parallel to the axis 41, extends along the lower segment and the intermediate segment of the jacket 40, and communicates with the duct 46.

[0043] The shutter 45 is movable around the axis 41 between a first operating position, in which the duct 46 communicates with the slit 44 through the slit 47 in order to discharge the pressurized hot air to the outside through the slit 44; a second operating position, in which the slits 44 and 47 are tangentially staggered with respect to one another and the duct 46 communicates exclusively with the holes 43 to discharge the pressurized hot air to the outside through the holes 43; and a third operating position, in which the shutter 45 closes the hole 42 to stop the supply of pressurized hot air through the nozzle 39.

[0044] With regard to the foregoing, it should be pointed out that each slit 44, 47 has a passage cross section greater than the passage cross section of the holes 43.

[0045] The nozzle 39 is also provided with a deflector

48 to intercept the pressurized hot air bounced back from the edge 17.

[0046] The nozzle 39 and the deflector 48 define, between one another, a feeding channel 48a, which is configured to feed the pressurized hot air bounced back from the edge 17 against the panel 2 and has a passage cross section, which increases in a feeding direction of the pressurized hot air along the channel 48a.

[0047] The nozzle 39 is movable between an operating position (Figure 5), in which the nozzle 39 heats the edge 17, and a rest position (Figure 4), in which the nozzle 39 is arranged inside a suction hood 49 connected with the chamber 25.

[0048] The suction action of the hood 49 is associated with at least one flow of compressed air directed towards the inside of the hood 49.

[0049] The operating position and the rest position of the nozzle 39 are arranged on opposite sides of a feeding path for feeding the edge 17 through the edgebanding assembly 16.

[0050] The nozzle 39 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 17;

a pressure below 1.45 bar and a temperature at least equal to 320°C at the holes 43;

a subsonic output speed ranging from 0.4 to 0.99 Mach in at least some of the holes 43; and

a pressure exceeding 1.5 bar inside the shutter 45 and along the duct 46.

[0051] In addition, it should be pointed out that:

the distance between the edge 17 and the holes 43 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 17; and

the jacket 40 and/or the shutter 45 are heated to a temperature that is at least equal to the supplying temperature of the hot air at the inlet of the duct 46.

[0052] According to a not shown variation, the activation device 36 is removed and replaced with an activation device suitable to melt the heat-melting layer of the edge 17 by means of a flame.

[0053] The assembly 16 is also equipped with a main pressing roller 50, which is mounted to rotate around its own longitudinal axis 51 parallel to the direction 15, is mounted downstream of the gluing device 26 and the heating devices 31, 33, 36 in the direction 34 to stabilize the edge 17 against the profile 4, and cooperates with a secondary pressing roller 52 mounted to rotate about its own longitudinal axis 53 parallel to the axis 51.

[0054] The rollers 50 and 52 apply, on the edge 17, respective thrust forces selectively controlled by an electronic control unit 54, and can be removed and replaced

with pressing devices having different geometries and/or characteristics.

[0055] The rollers 50 and 52 are mounted on a slide (not illustrated), which is coupled in a sliding manner by means of a damping device (not illustrated) to a rotating support (not illustrated) which is in turn rotatably coupled to the frame 23 to rotate, with respect to the frame 23, about a rotation axis (not illustrated) parallel to axis 24.

[0056] According to an alternative embodiment not illustrated, the temperature of the rollers 50, 52 is selectively controlled by a flow of compressed air fed to the external surface of the rollers 50, 52 and/or along at least one cooling channel formed through the rollers 50, 52.

[0057] The assembly 16 also comprises a set of pressing rollers 55, which are hooked in a releasable way to an interface (not illustrated) of the assembly 16, and are mounted to rotate about their respective longitudinal axes 56 parallel to each other and inclined with respect to the surface P according to an angle other than 90°.

[0058] The rotation of the frame 23 about the axis 24 allows to selectively engage the rollers 50 and/or 52 and the rollers 55 on the edge 17 according to the orientation of the profile 4.

[0059] The interface (not shown) is also configured to receive and hold, for example, heating devices, pulsed force actuators, ultrasound, scrapers, dispensers of dyeing, protective, sealing, anti-adhesive, or demoulding material, heat or electromagnetic energy generators, and/or finishing units for edge 17 such as edge trimmers, scrapers, or end cutting devices.

[0060] The interface (not shown) is also configured to receive and hold, for example, an optical or mechanical sensing device to detect the position of the panel 2 and/or the edge 17 and process information which are useful for subsequent processing, for example, trimming, scraping, and/or drilling or checking, for example, the edge quality.

[0061] The assembly 16 is also equipped with a cutting blade 57, which is designed to separate the edge 17 from the aforementioned band (not shown), and is mounted to move through the band (not shown) with an alternative rectilinear motion and separate an edge 17 both during its outward stroke and during its return stroke.

[0062] The assembly 16 also comprises a sensing device, e.g. optical or mechanical, to detect the shape of panel 2 before its edgebanding with the edge 17 in order to selectively check the trajectory of the assembly 16.

[0063] The edge 17 is guided vertically between two guides, movable one relative to the other, under the action of a drive device controlled selectively by the control unit 54.

[0064] The machine 1 and the edgebanding assembly 16 are equipped with electronic devices (not illustrated) for electrical or pneumatic control, and modules (not illustrated) for the input of voltage and/or current signals. The above-mentioned modules (not shown) are connected both to the traditional fieldbus communication channel of the machine 1, and to another wireless communication

channel suitable to ensure a bidirectional flow of information. The flow of information can be used for diagnostic functions of the module (not shown), and to receive or transmit control signals which are not suitable for transmission with the fieldbus communication channel.

[0065] The edgebanding assembly 16 further comprises a device 58 for covering the gluing roller 28.

[0066] As shown in Figures 4, 5, 7, and 8, the device 58 comprises a support bracket 59 hinged to the frame 23 to rotate, with respect to the frame 23, about a fulcrum axis 60 parallel to the direction 15.

[0067] The bracket 59 has a cover 61 connected thereto, which has a substantially rectangular flat shape, has a height, measured parallel to the direction 15, at least equal to a height of the roller 28, also measured parallel to the direction 15, and has a width at least equal to a diameter of the roller 28.

[0068] The device 58 is movable about the axis 60 between an operating position (Figure 8), in which the lid 61 is arranged between the edge 17 and the roller 28 to prevent the edge 17 from coming into contact with the same roller 28, and a rest position (Figure 7), in which the lid 61 uncovers the roller 28 and the device 58 is arranged outside the feeding path of the edge 17 through the edgebanding assembly 16.

[0069] The bracket 59 and the cover 61 are connected to each other so as to define an opening 62 configured to be engaged in a sliding manner from the edge 17 when the device 58 is in its operating position.

[0070] Obviously, according to variations not illustrated, the lid 61 has shapes other than the rectangular flat shape.

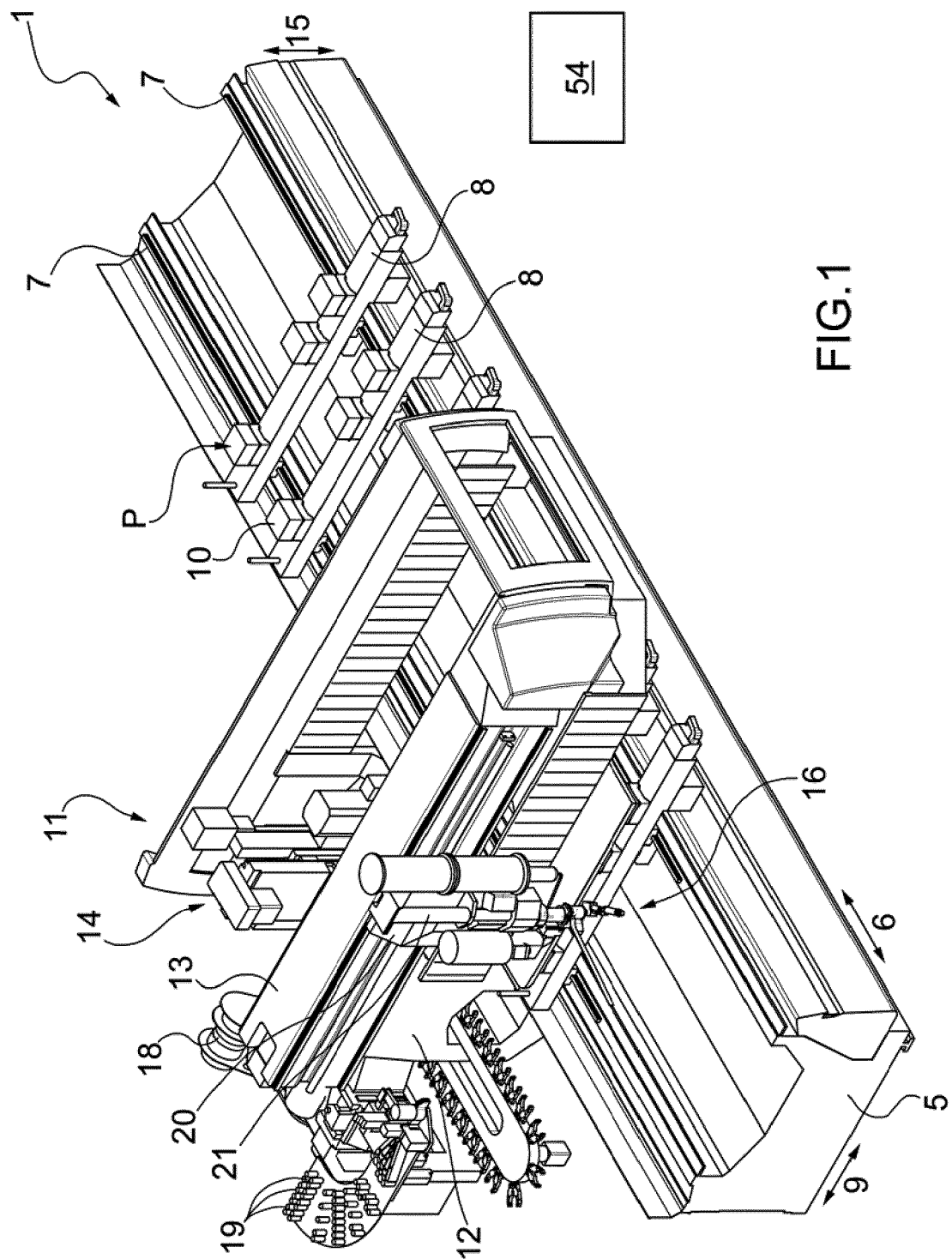
[0071] In use, the operation of the gluing device 26 and the activation device 36 is selectively controlled by the control unit 54 in such a way that:

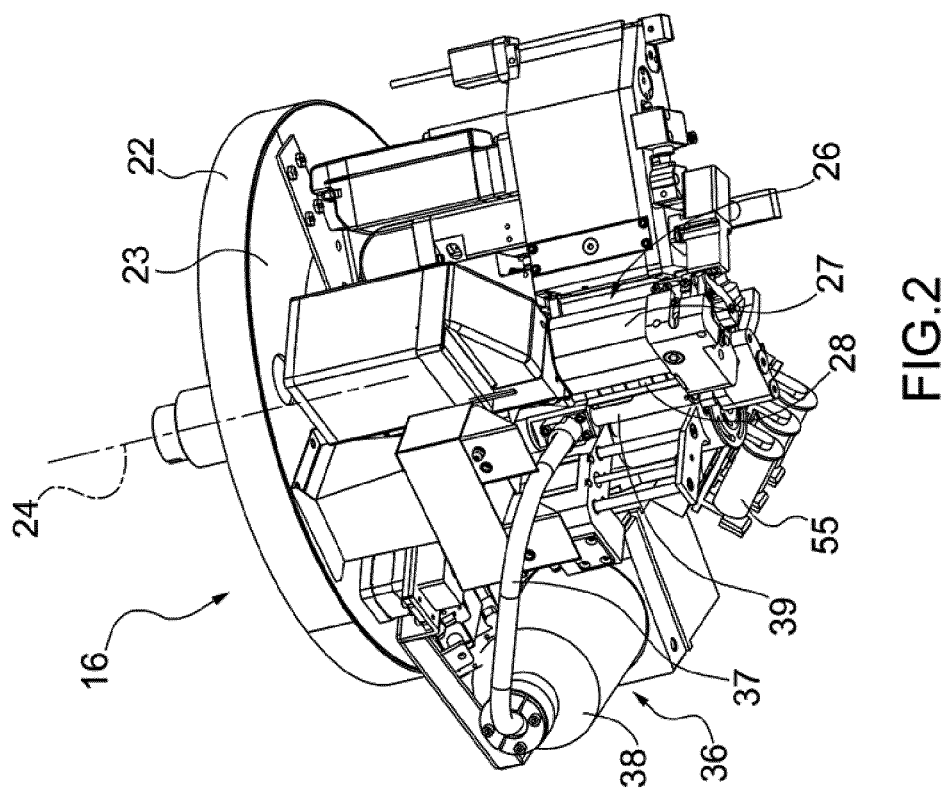
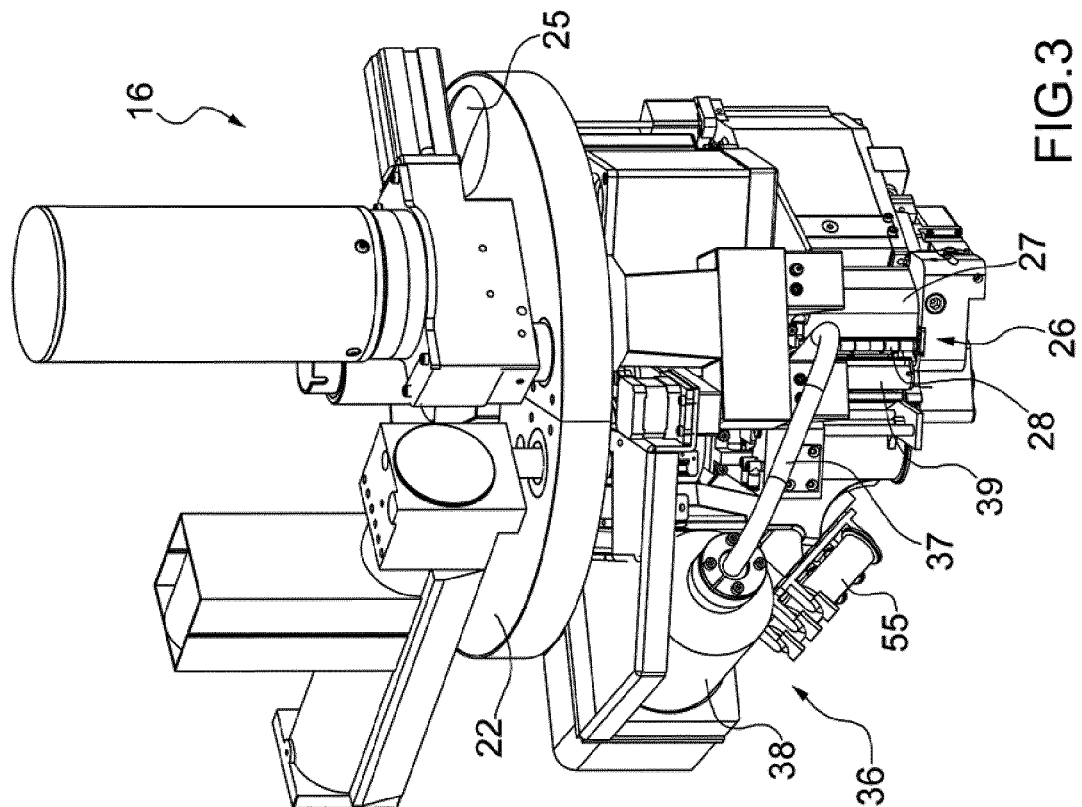
when the edge 17 is connected with the profile 4 of the panel 2 by the gluing device 26, the covering device 58 is moved to its rest position; and
when the edge 17 is connected to the profile 4 of the panel 2 by the activation device 36, the covering device 58 is moved to its operating position to prevent the edge 17 from coming into contact with the roller 28 and transferring glue to the releasing nozzle 39.

Claims

1. A machine to process panels (2) made of wood or the like comprising a base (5); a locking device (10) to hold at least one panel (2) on the base (5); an overhead crane (11), which is movable along the base (5) in a first direction (6) and extends above the base (5) in a second direction (9), which is substantially transverse to the first direction (6); and an edgebanding assembly (16), which is designed to edgeband a lateral profile (4) of the panel (2) with a finishing edge (17), is mounted on the overhead

- crane (11) so as to move, relative to the overhead crane (11), in the second direction (9) and in a third direction (15), which is orthogonal to said first and second directions (6, 9), and comprises, in turn, a gluing device (26) to apply glue on the lateral profile (4) of the panel (2) and/or on the finishing edge (17) and an activation device (36) to activate a heat-melting layer of the finishing edge (17); and **characterized in that** it further comprises a covering device (58), which is movable between an operating position, in which the covering device (58) is arranged between the gluing device (26) and the finishing edge (17) so as to prevent the finishing edge (17) from coming into contact with the gluing device (26), and a rest position, in which the finishing edge (17) comes into contact with the gluing device (26).
2. The machine according to claim 1, wherein the activation device (36) is movable between an operating position for the activation of the heat-melting layer of the finishing edge (17) and a rest position; said operating and rest positions being arranged on opposite sides of a feeding path of the finishing edge (17) through the edgebanding assembly (16).
 3. The machine according to claim 2, wherein the activation device (36) is arranged in its rest position when the covering device (58) is arranged in its rest position.
 4. The machine according to claim 2 or 3, wherein the edgebanding assembly (16) further comprises a sucking hood (49); the rest position of the activation device (36) being arranged inside the suction hood (49).
 5. The machine according to any one of the claims from 2 to 4, wherein the operating position of the activation device (36) is arranged downstream of the gluing device (26) in a feeding direction (34) of the finishing edge (17).
 6. A machine according to any one of the preceding claims, wherein the covering device (58) comprises a plate (59, 61), which is configured to define a lid (61) to cover the gluing device (26) and an opening (62) formed through the plate (59, 61) to be engaged by the finishing edge (17) in a sliding manner when the covering device (58) is arranged in its operating position.
 7. The machine according to any one of the preceding claims, wherein the activation device (36) comprises a releasing nozzle (39) to release a hot gas onto the finishing edge (17).
 8. The machine according to claim 7, wherein the releasing nozzle (39) comprises an outer jacket (40), which has a longitudinal axis (41) and is provided with a plurality of feeding holes (43), and an inner shutter (45), which is movable along the outer jacket (40) so as to close and open the feeding holes (43) and is provided with a feeding channel (46), which is formed parallel to the longitudinal axis (41), to feed the hot gas to the feeding holes (43).
 9. The machine according to any one of the claims from 1 to 6, wherein the activation device comprises a releasing nozzle, which is configured to generate a flame for the activation of the heat-melting layer of the finishing edge (17).
 10. The machine according to any one of the preceding claims, wherein the edgebanding assembly (16) further comprises at least one slide (20, 21) mounted on the overhead crane (11) and a support frame (23) mounted so as to rotate around a rotation axis (24) and define, together with the slide (20, 21), a suction chamber (25) connected to a pneumatic sucking device.
 11. The machine according to any one of the preceding claims, wherein the edgebanding assembly (16) further comprises at least one interface for the releasable connection of a device for the treatment of the finishing edge (17) or of a device for the detection of the position of the panel (2) and/or of the finishing edge (17).
 12. The machine according to any one of the preceding claims, wherein the gluing device (26) comprises a gluing roller (28) to apply glue on the finishing edge (17), and wherein the covering device (58) comprises a lid (61) having a height that is at least equal to a height of the gluing roller (28) and a width that is at least equal to a diameter of the gluing roller (28).





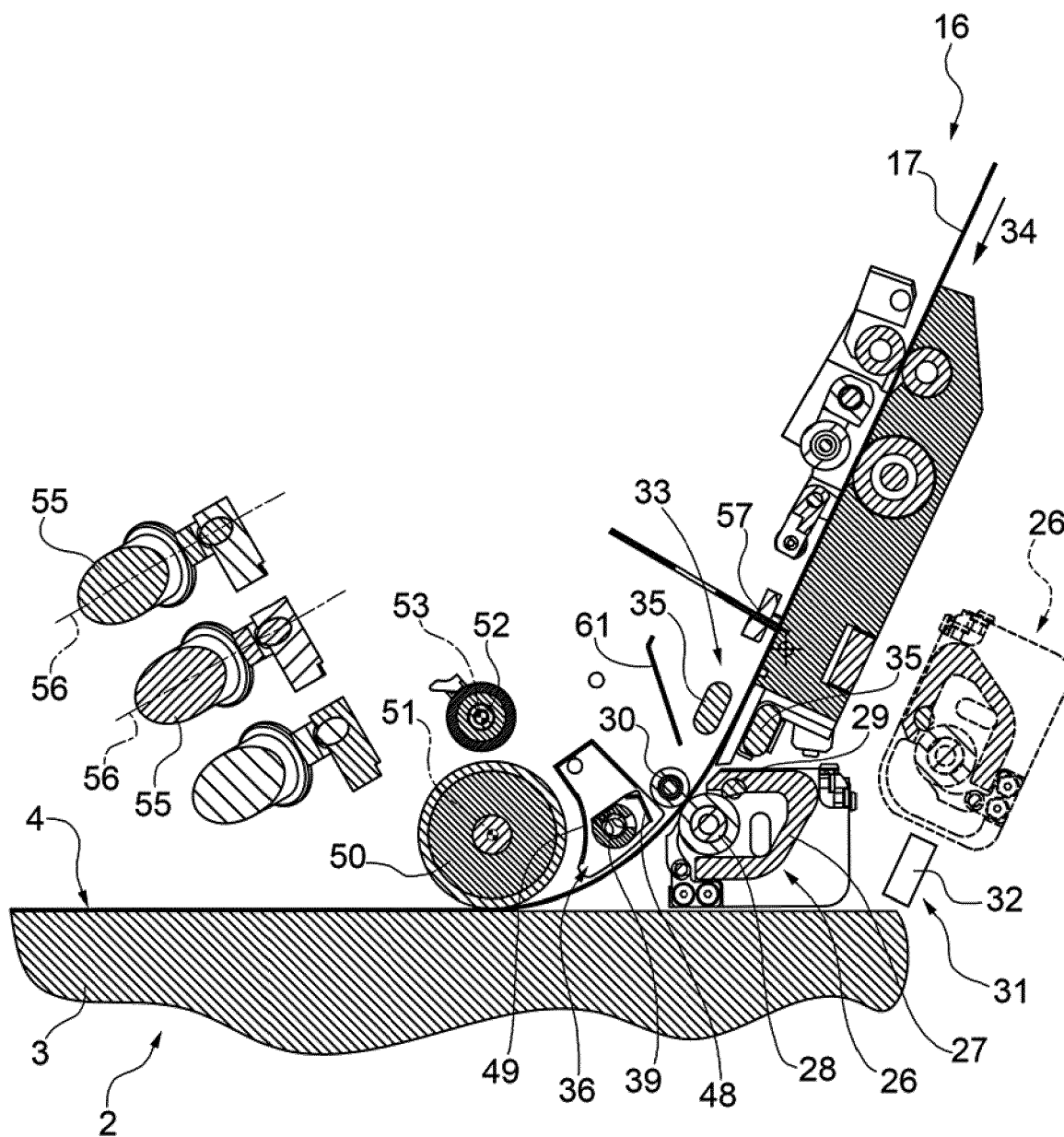


FIG.4

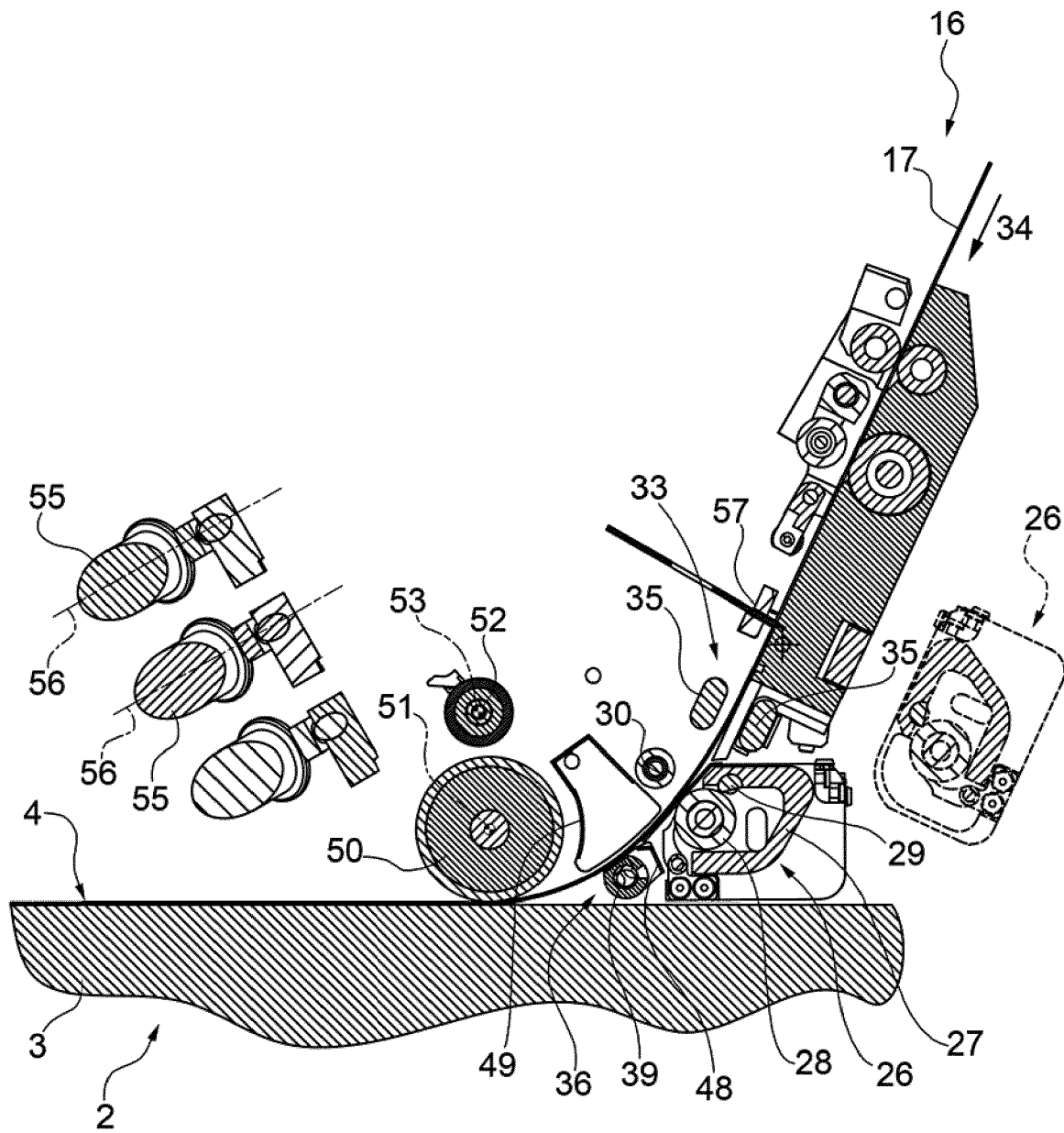
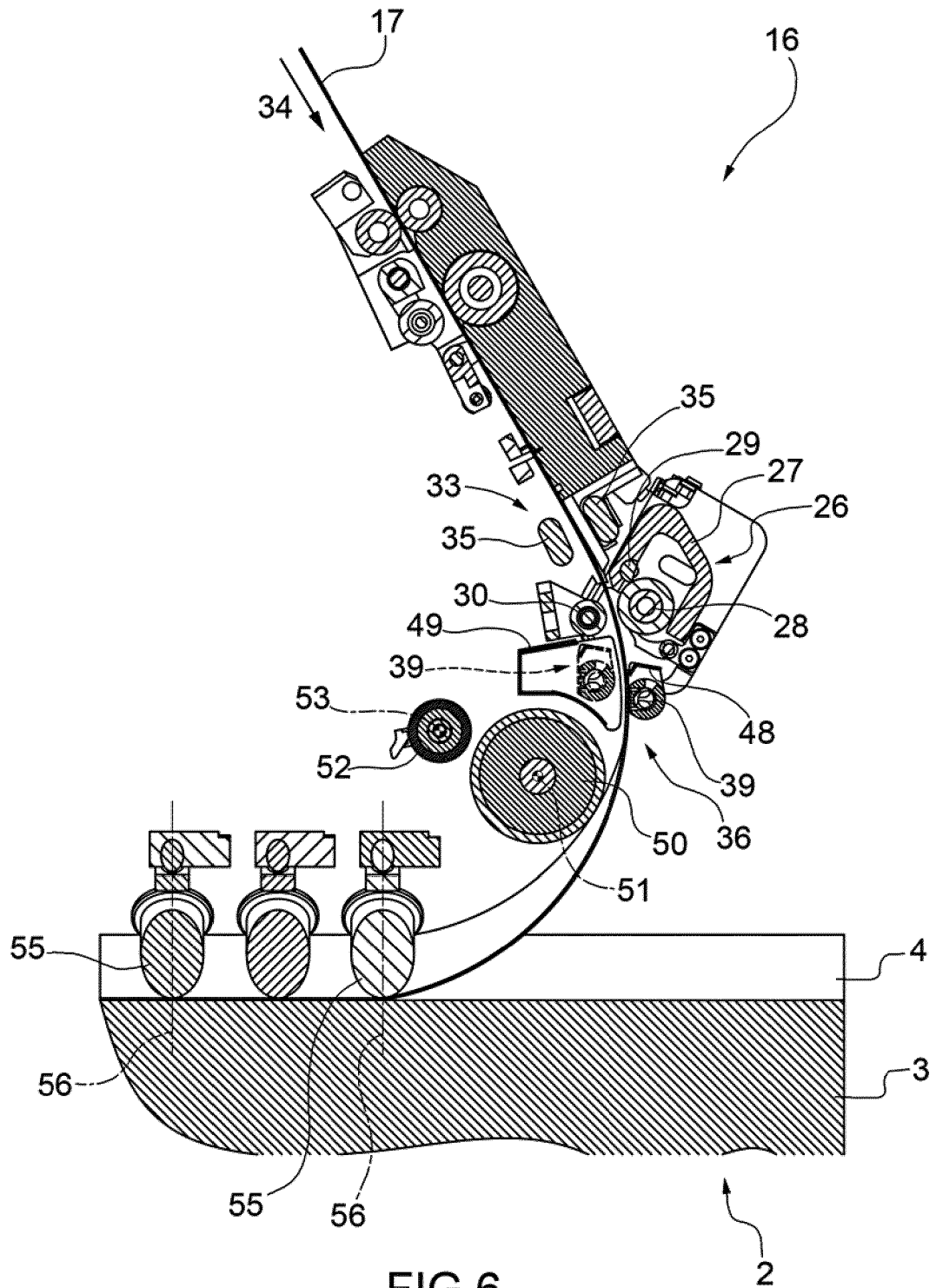


FIG.5



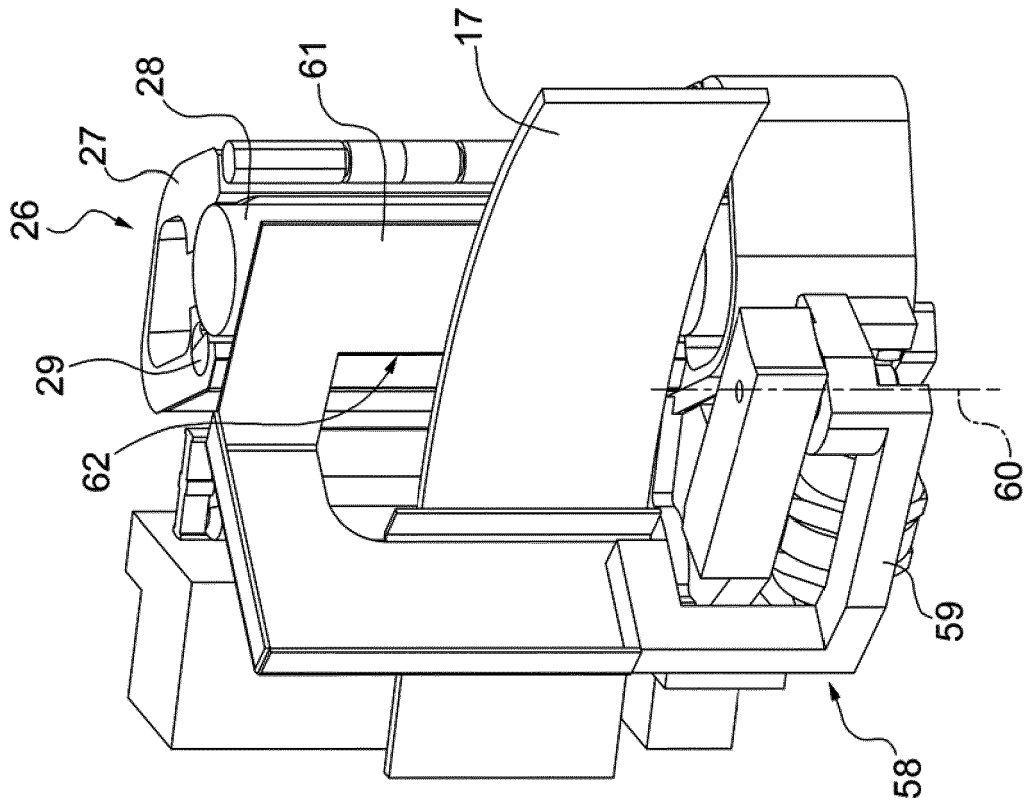


FIG. 8

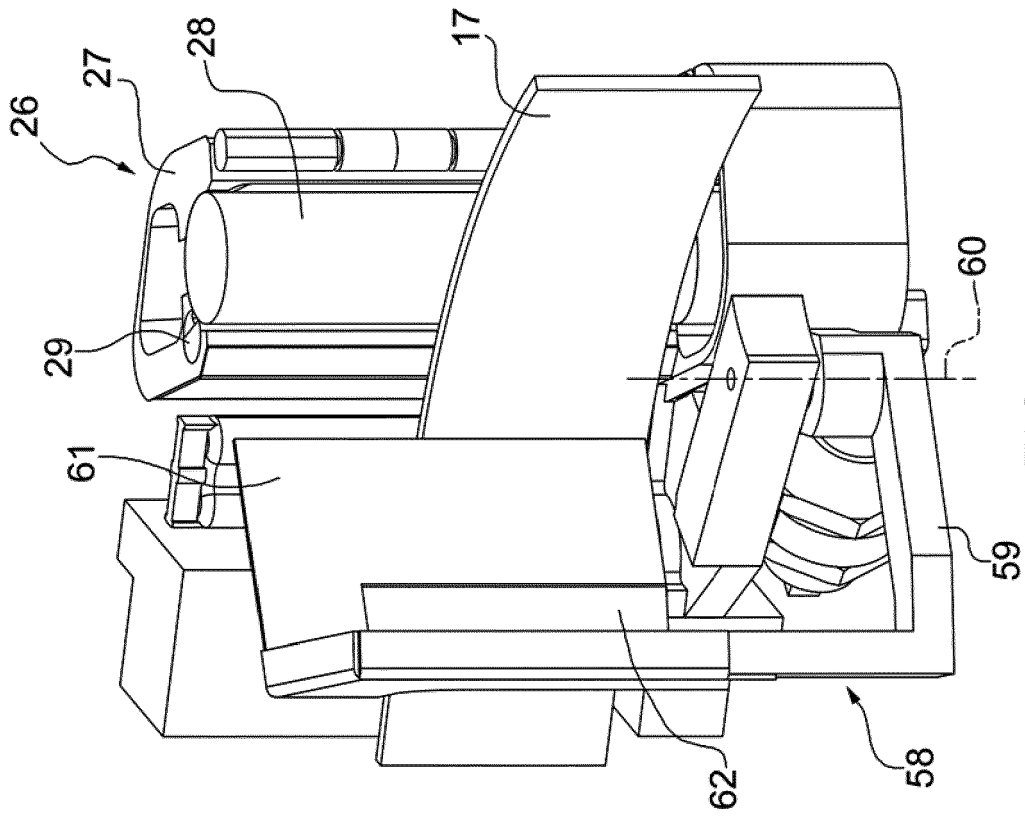


FIG. 7

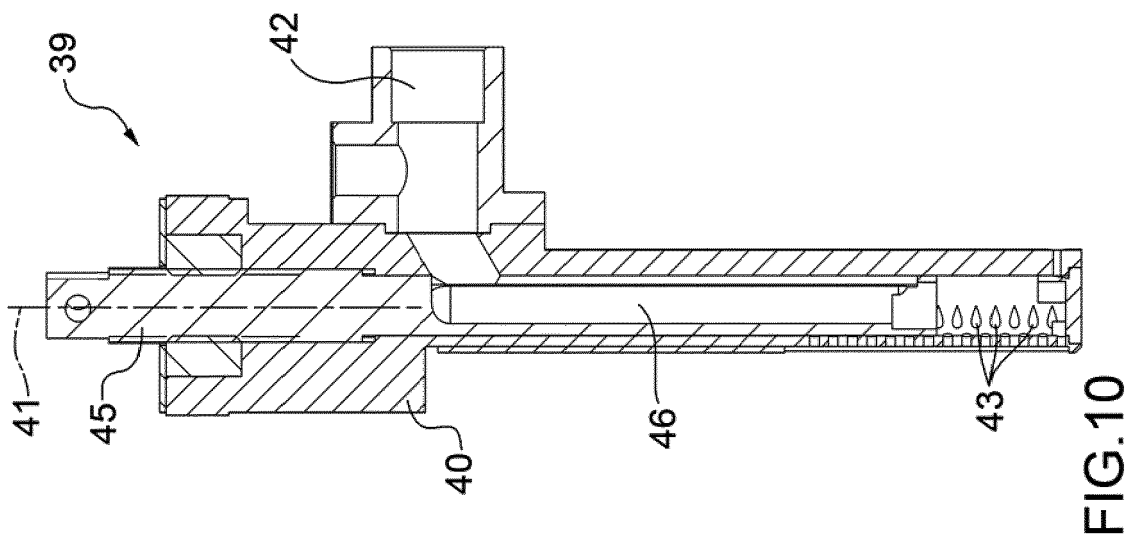


FIG. 9

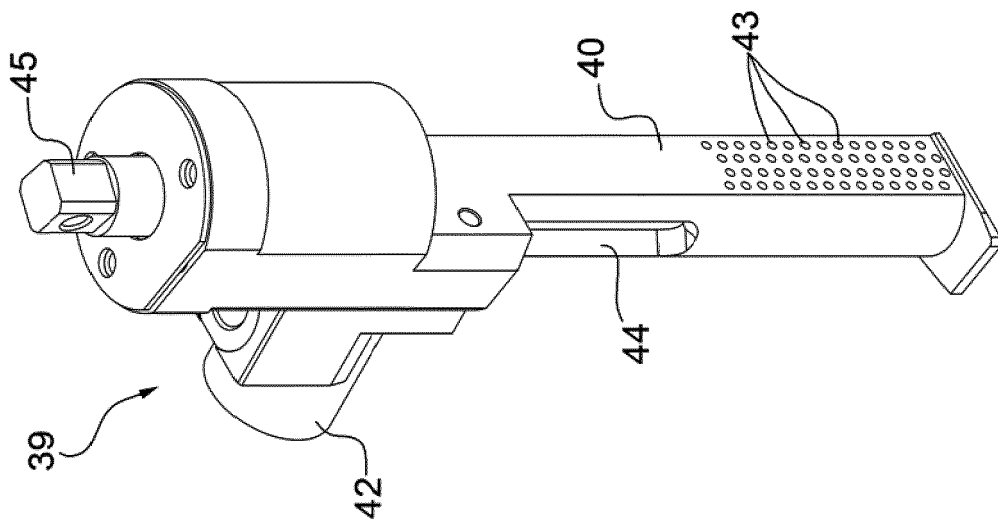
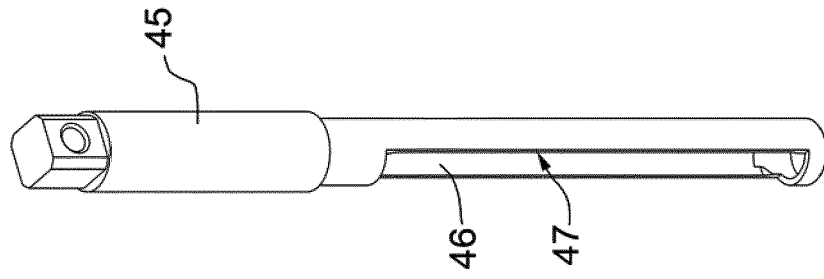


FIG. 11



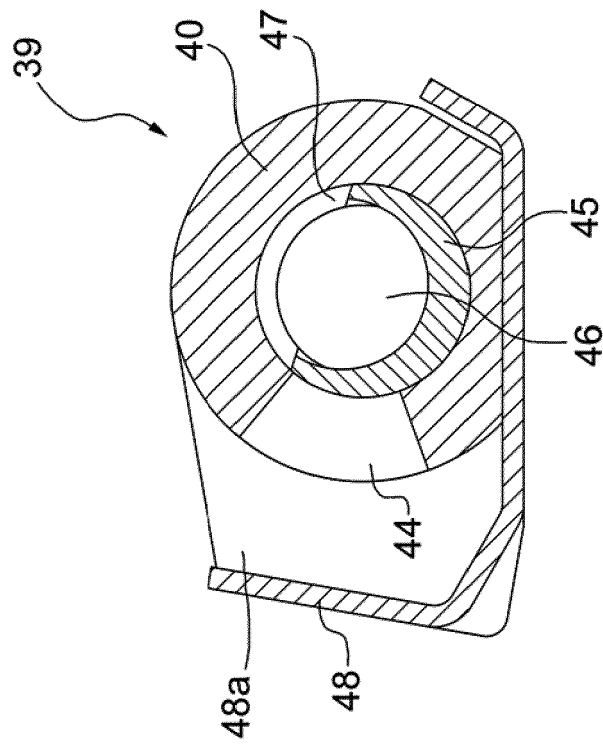


FIG. 12a

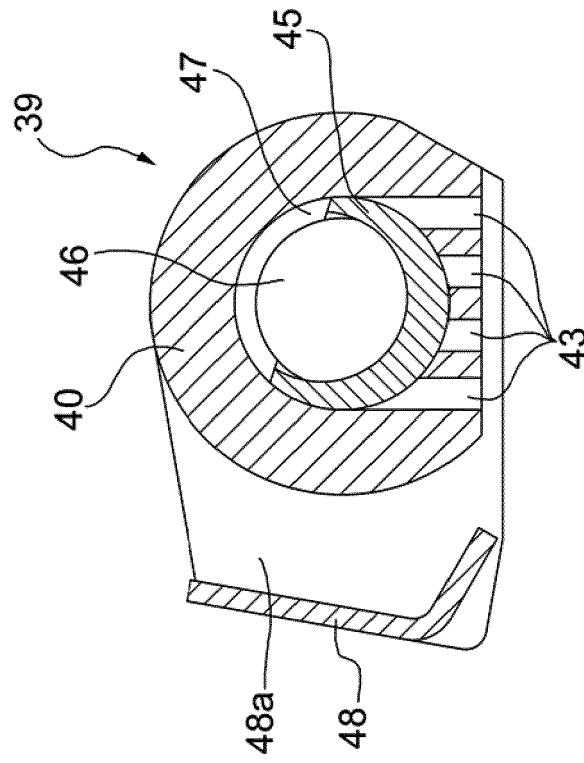


FIG. 12b



EUROPEAN SEARCH REPORT

Application Number
EP 19 16 0382

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	EP 2 835 237 A1 (BIESSE SPA [IT]) 11 February 2015 (2015-02-11) * claims 1,2; figures *	1,7-12	INV. B27D5/00
Y	EP 0 945 235 A2 (SCM GROUP SPA [IT]) 29 September 1999 (1999-09-29) * paragraph [0041] - paragraph [0045]; figures 4,23,24 *	1,7-12	
Y	DE 20 2015 005290 U1 (FELDER KG [AT]) 24 August 2015 (2015-08-24) * paragraph [0019] - paragraph [0022] * * paragraph [0030]; figures *	7,8	
Y	WO 2017/123101 A1 (HYFUSE LTD [NZ]) 20 July 2017 (2017-07-20) * claim 1 *	9	
Y	US 9 724 905 B2 (HOMAG HOLZBEARBEITUNGSSYSTEME GMBH [DE]) 8 August 2017 (2017-08-08) * claims 8,9,13 *	10	
A	DE 10 2014 104034 A1 (WEGOMA GMBH [DE]) 24 September 2015 (2015-09-24) * paragraph [0042] - paragraph [0046]; figure 2 *	1	TECHNICAL FIELDS SEARCHED (IPC)
A	WO 2015/022362 A1 (HOMAG HOLZBEARBEITUNGSSYSTEME [DE]) 19 February 2015 (2015-02-19) * abstract; figures *	1	B27D B27G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 27 June 2019	Examiner Huggins, Jonathan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		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	

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 19 16 0382

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

27-06-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2835237 A1	11-02-2015	NONE	
EP 0945235 A2	29-09-1999	DE 69905305 T2 EP 0945235 A2 IT B0980189 A1 US 6263938 B1	16-10-2003 29-09-1999 24-09-1999 24-07-2001
DE 202015005290 U1	24-08-2015	NONE	
WO 2017123101 A1	20-07-2017	AU 2017207190 A1 BR 112018014045 A2 CN 109070380 A EP 3402640 A1 US 2019017702 A1 WO 2017123101 A1	12-07-2018 11-12-2018 21-12-2018 21-11-2018 17-01-2019 20-07-2017
US 9724905 B2	08-08-2017	BR 102014010656 A2 CN 104132454 A DE 102013208127 A1 EP 2799793 A1 US 2014326413 A1	23-12-2014 05-11-2014 06-11-2014 05-11-2014 06-11-2014
DE 102014104034 A1	24-09-2015	DE 102014104034 A1 WO 2015144696 A1	24-09-2015 01-10-2015
WO 2015022362 A1	19-02-2015	CN 105451949 A DE 102013216113 A1 EP 3033205 A1 US 2016200036 A1 WO 2015022362 A1	30-03-2016 05-03-2015 22-06-2016 14-07-2016 19-02-2015

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- IT 102018000003189 [0001]