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(54) OPERATING ASSEMBLY FOR THE INSERTION OF CONNECTION PINS INTO WOOD COMPONENTS OR THE LIKE

(57) An operating assembly for the insertion of connection pins (2) into wood components (4), or the like, has an electro-spindle (5), an equipment (6) defined by a feeding unit (19) to feed a liquid into a housing hole (3) made in a wood component (4), or the like, and an insertion unit (20) to insert a connection pin (2) into the housing hole (3) and a coupling device (13) to fit the equipment (6) onto the electro-spindle (5) in a removable manner.

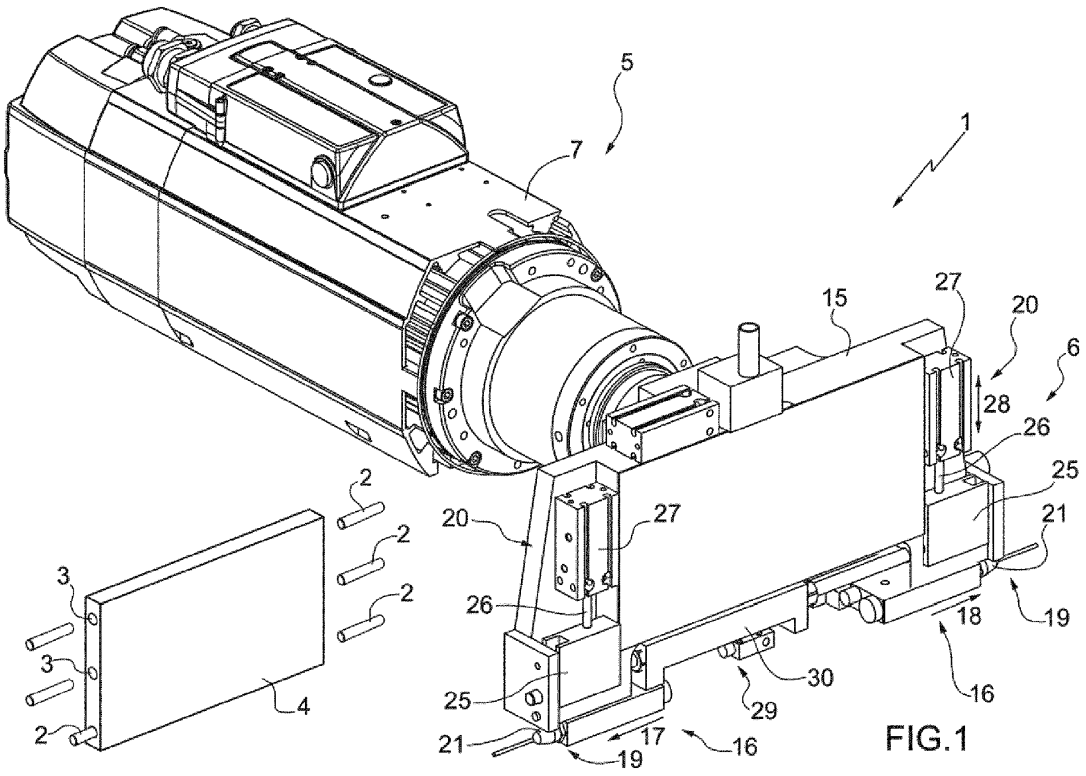

FIG.1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from Italian Patent Application No. 102017000076644 filed on 07/07/2017.

[0002] The present invention relates to an operating assembly for the insertion of connection pins into wood components or the like.

[0003] In particular, the present invention relates to an operating assembly for the insertion of connection pins into wood components or the like of the type comprising a feeding unit to feed a liquid into a housing hole made in a wood component or the like and an insertion unit to insert a connection pin into the housing hole.

[0004] Generally, the operating assembly is used in a machine for machining wooden or similar components comprising a base, a gripping system to receive and hold at least one component and an operating head provided with at least one tool.

[0005] The gripping system and operating head are mutually mobile to allow the tool to perform machining by chip removal of the components.

[0006] The gripping system and operating head are mutually mobile to allow the feeding unit to feed the liquid into the housing hole and the insertion unit to insert the connection pin into the same housing hole.

[0007] When the operating assembly is fixed, the machine has an actuation device to move the gripping system and thus, the component with respect to the operating assembly.

[0008] When the operating assembly is mobile, the machine has an actuation device to move the operating assembly with respect to the gripping system and thus to the component.

[0009] In both cases described above, the machine is relatively complex and expensive and has a relative low level of flexibility and versatility.

[0010] The aim of the present invention is to make an operating assembly for the insertion of connection pins into wood components, or the like, which is free of the drawbacks described above and which is easy and economical to implement.

[0011] According to the present invention an operating assembly for the insertion of connection pins into wood components, or the like, is provided as claimed in the appended Claims.

[0012] The present invention will now be described with reference to the accompanying drawings, which illustrate an example of a non-limiting embodiment, wherein:

- Figure 1 illustrates a schematic perspective view of a preferred embodiment of the operating assembly of the present invention;
- Figure 2 illustrates a schematic side view, with parts in cross-section and parts removed for the sake of clarity, of the operating assembly in Figure 1; and
- Figures 3 and 4 illustrate two schematic perspective views, with parts removed for clarity, of a particular of the operating assembly in Figure 1.

[0013] With reference to Figures 1 and 2, reference numeral 1 globally denotes, an operating assembly for the insertion of connection pins 2 into relative housing holes 3 made in components, in the case in point panels 4, of wood or the like.

[0014] The operating assembly 1 comprises an electro-spindle 5 and equipment 6 fitted on the electro-spindle 5 in a removable manner.

[0015] The electro-spindle 5 comprises an external tubular casing 7 housing an electric motor known and not illustrated inside it provided with a rotor keyed to a tubular output shaft 8, a free end section of which defines a tool-carrier spindle 9 mounted so as to rotate, with respect to the casing 7, around its own longitudinal axis 10.

[0016] The spindle 9 protrudes partially from the casing 7 and has a seat 11 (in this case a conical seat) suitable to receive and center a shank 12 of the equipment 6 by means of a positioning pin 12a.

[0017] The electro-spindle 5 further comprises a coupling device 13 comprising, in turn, a gripping member 14, designed to engage the shank 12 of the equipment and an actuator, known and not illustrated, designed to move the gripping member 14 between a locking position (Figure 1) of the equipment 6 on the spindle 9 and a release position (not illustrated).

[0018] As illustrated in Figures 3 and 4, the equipment 6 comprises a frame 15, which is substantially plate-shaped, is provided with a shank 12, and supports two feeding and insertion systems 16 acting in two opposite, insertion directions 17, 18.

[0019] Each system 16 comprises a feeding unit 19 to feed a liquid into the holes 3 and an insertion unit 20 to insert the connection pins 2 into the same holes 3.

[0020] The feeding unit 19 comprises an injection nozzle 21 that can be connected to a containment tank (not shown), which houses a glue inside when the pins 2 are free of glue and water when the pins 2 are pre-glued.

[0021] The insertion unit 20 comprises a storage 22 of the pins 2 made in the frame 15.

[0022] The storage 22 is in the form of a feed duct 23, which receives the pins 2 from a tubular connection 24 connectable with a feed hopper (not illustrated), and cooperates with a pneumatic feed device (not illustrated) designed to move the pins 2 in succession along said duct 23.

[0023] The unit 20 further comprises a distribution drawer 25 provided with a transfer duct (not illustrated) made through the drawer 25 in the relative direction 17, 18.

[0024] The drawer 25 is attached to an output rod 26 of an actuator cylinder 27, and is moved by the cylinder 27 in a direction 28 transverse to the directions 17, 18 between a first operating position, in which the transfer

duct (not illustrated) is aligned with the duct 23 in the direction 17, 18 to receive in input a pin 2, and a second operating position, in which the transfer duct (not illustrated) is aligned with a pushing device 29 in the direction 17, 18 to release in output said pin 2.

[0025] The device 29 is common to the two systems 16, and comprises a tip 30, which extends in the direction 17, 18, and is moved in the directions 17 and 18 by an actuator cylinder 31 fixed to the frame 15 parallel to the direction 17, 18.

[0026] The tip 30 is moved by the cylinder 31 with a reciprocating rectilinear movement comprising an outward stroke, in which the tip 30 engages the transfer duct (not illustrated) of one of the drawers 25 to push the corresponding pin 2 inside a relative hole 3, and a return stroke, wherein the tip 30 engages the transfer duct (not illustrated) of the other drawer 25 to push the corresponding pin 2 inside a relative hole 3.

[0027] The coupling between the electro-spindle 5 and the equipment 6 via the coupling device 13 allows use of the equipment 6 in a machine for machining wooden panels 4, or the like, by making use of actuation devices of the electro-spindle 5 already present in the machine. In addition, the equipment 6 can be stored in a machine tool-holder magazine and can be mounted on the electro-spindle 5 manually or via an automatic tool change device.

Claims

1. An operating assembly for the insertion of connection pins (2) into wood components (4), or the like, the operating assembly comprising an equipment (6) comprising, in turn, a feeding unit (19) to feed a liquid into a housing hole (3) made in a wood component (4), or the like, and an insertion unit (20) to insert a connection pin (2) into the housing hole (3); and **being characterized in that** it comprises, furthermore, an electro-spindle (5) and a coupling device (13) to fit the equipment (6) on the electro-spindle (5) in a removable manner.

2. The operating assembly, according to Claim 1, wherein the electro-spindle (5) comprises a tool-carrier spindle (9), and the equipment (6) comprises a shank (12), that is configured to be inserted into the tool-carrier spindle (9); the coupling device (13) being movable between a locking position, in which the shank (12) is locked on the tool-carrier spindle (9), and a release position.

3. The operating assembly, according to Claim 2, wherein the coupling device (13) comprises a gripping member (14), that is designed to engage the shank (12) of the equipment (6), and actuator means to move the gripping member (14) between said locking and release positions.

4. The operating assembly, according to anyone of the preceding Claims, wherein the feeding unit (19) comprises at least one injection nozzle (21) to feed the liquid into the housing hole (3).

5. The operating assembly, according to Claim 4, wherein the injection nozzle (21) can be connected to a liquid containing tank.

6. The operating assembly, according to anyone of the preceding Claims, wherein the insertion unit (20) comprises at least one storage (22) to contain a plurality of connection pins (2), and a distribution drawer (25), that is movable between a first operating position, wherein the distribution drawer (25) is designed to receive, at the input, a connection pin (2) from the storage (22), and a second operating position, wherein the distribution drawer (25) is designed to release, at the output, the connection pin (2).

7. The operating assembly, according to Claim 6, wherein the storage (22) has the shape of a feeding channel (23) and is associated with a pneumatic device, which is designed to feed the connection pins (2) along the feeding channel (23).

8. The operating assembly, according to Claim 6 or to Claim 7, wherein the insertion unit (20) comprises, furthermore, a pushing device (29) to transfer the connection pin (2) from the distribution drawer (25) into the relative housing hole (3) of the component (4), when the distribution drawer (25) is arranged in its second operating position.

9. The operating assembly, according to Claim 8, wherein the pushing device (29) comprises a push rod (30), that extends and is movable in an insertion direction (17, 18) wherein the connection pin (2) is inserted into the housing hole (3) of the component (4).

10. The operating assembly, according to anyone of the preceding Claims, and comprising two feeding and insertion systems (16), that are each provided with a respective feeding unit (19) and with a respective insertion unit (20); the two feeding and insertion systems (16) being arranged so as to act in two insertion directions (17, 18), which are opposite to one another.

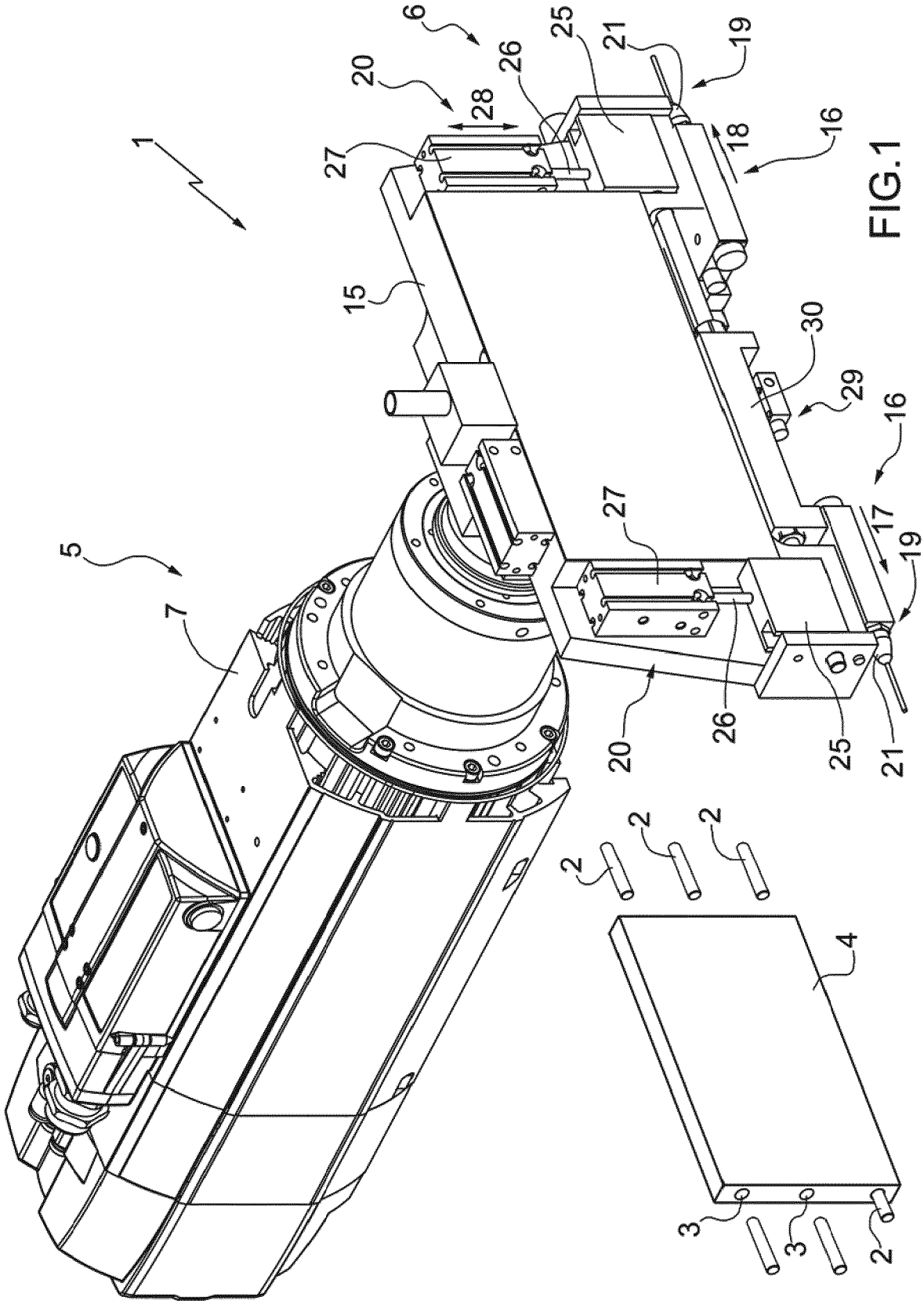
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FIG.1

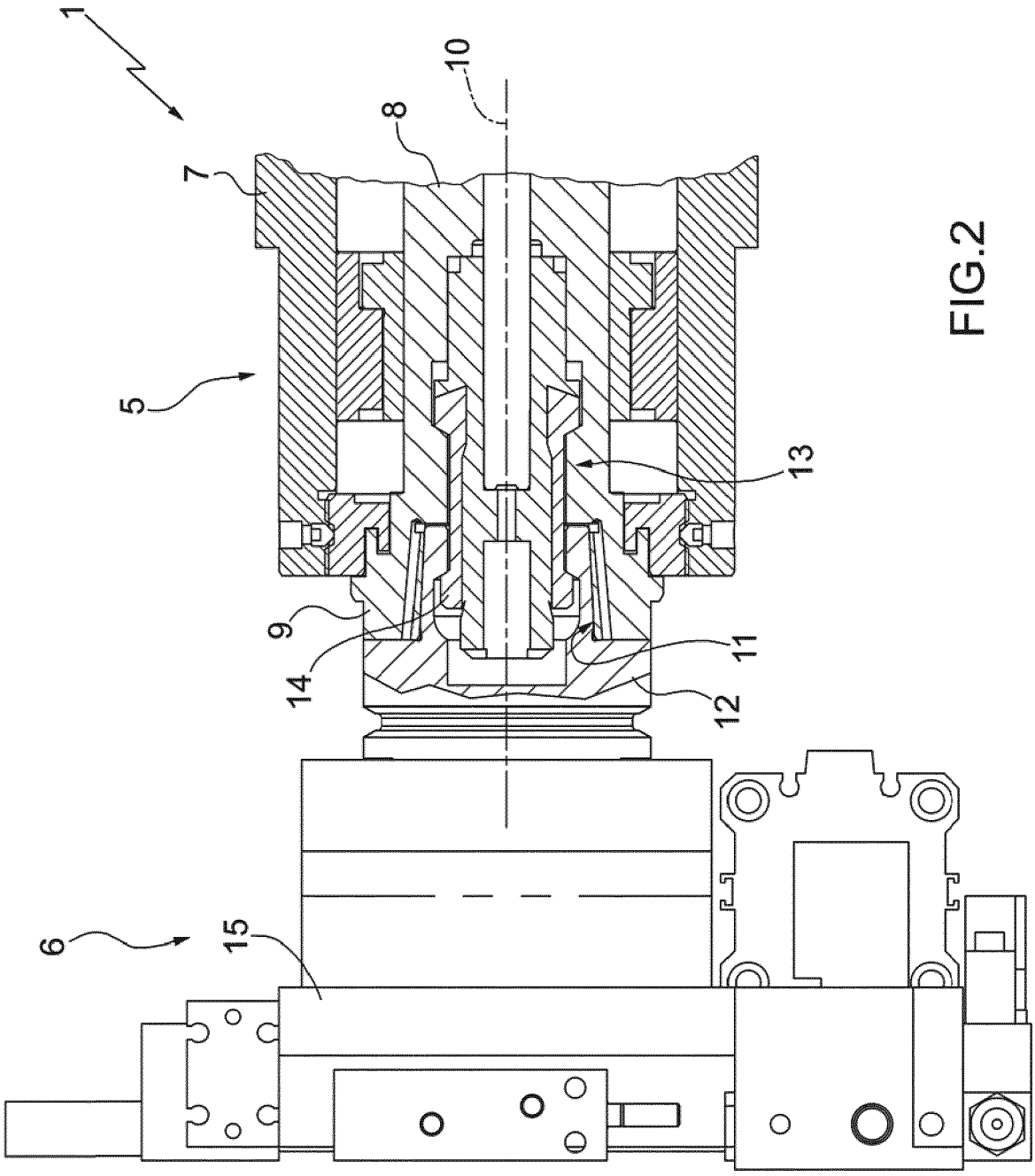

FIG.2

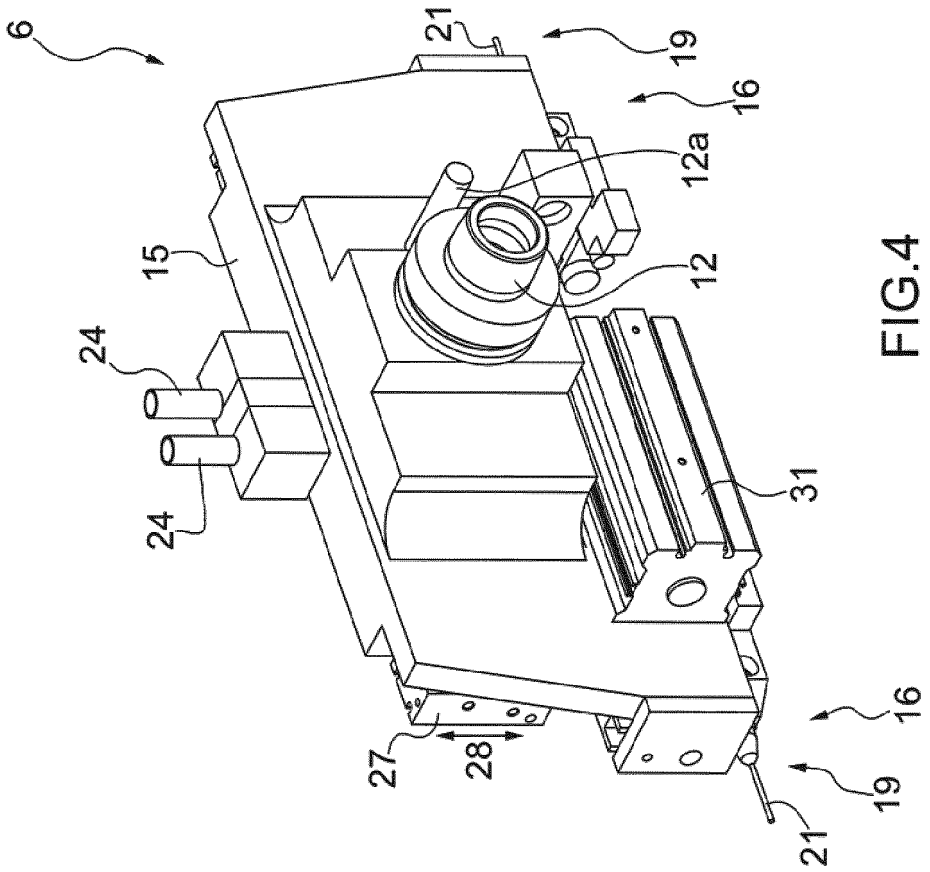
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FIG.4

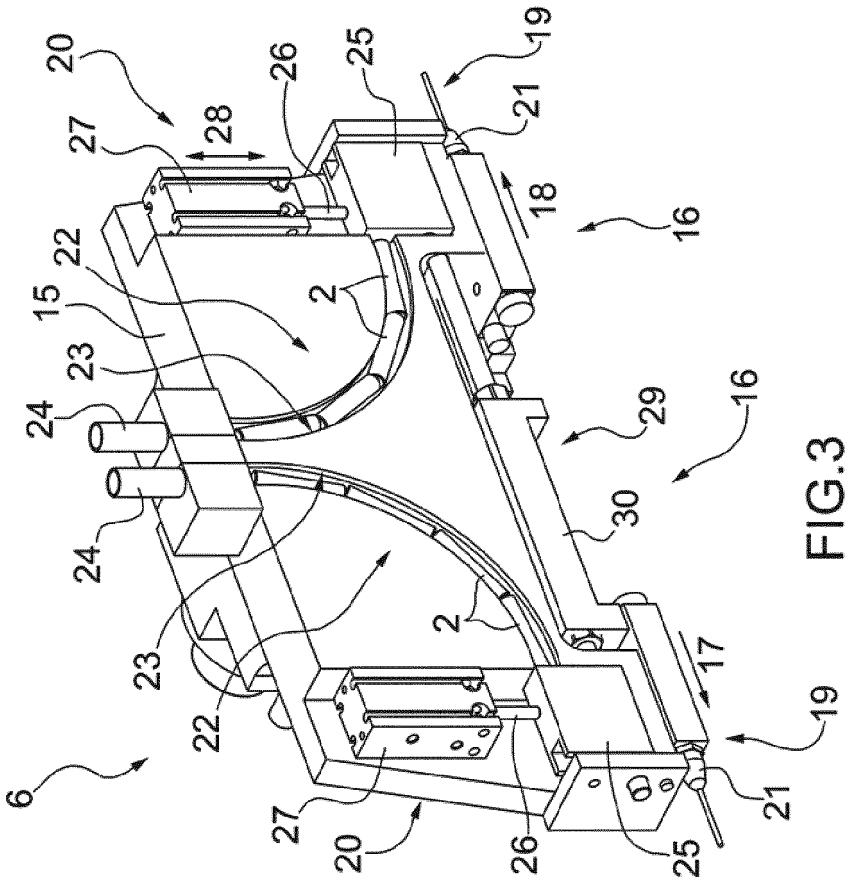
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FIG.3

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EUROPEAN SEARCH REPORT

Application Number
EP 18 18 2203

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	EP 2 172 318 A1 (ABEMAKA GMBH [DE]) 7 April 2010 (2010-04-07) * paragraph [0022] - paragraph [0028]; claim 10; figures 3-6 *	1-6,8,9 7	INV. B27F4/00 B23Q3/155
Y	DE 103 18 875 A1 (WEEKE BOHRSYSTEME GMBH [DE]) 18 November 2004 (2004-11-18) * paragraph [0021]; figure 1 *	7	
A	DE 196 37 177 A1 (FRAUNHOFER GES FORSCHUNG [DE]) 19 March 1998 (1998-03-19) * abstract; figures *	1	

TECHNICAL FIELDS SEARCHED (IPC)

B27F
B23Q

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26 September 2018	Huggins, Jonathan

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EP 2172318 A1	07-04-2010	DE 102008050416 A1	08-04-2010
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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