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(54) A MACHINE FOR CUTTING PANELS MADE OF WOOD OR THE LIKE

(57) A machine for cutting panels (2) made of wood or the like has a grip and transfer assembly (8) to move the panels (2) along a supporting surface (P), a gantry (16) extending above the supporting surface (P) transversely to a feeding direction (7) of the panels (2), and a milling cutter (21) and a blade (26) mounted on the gantry (16) to perform the processing of the panels (2).

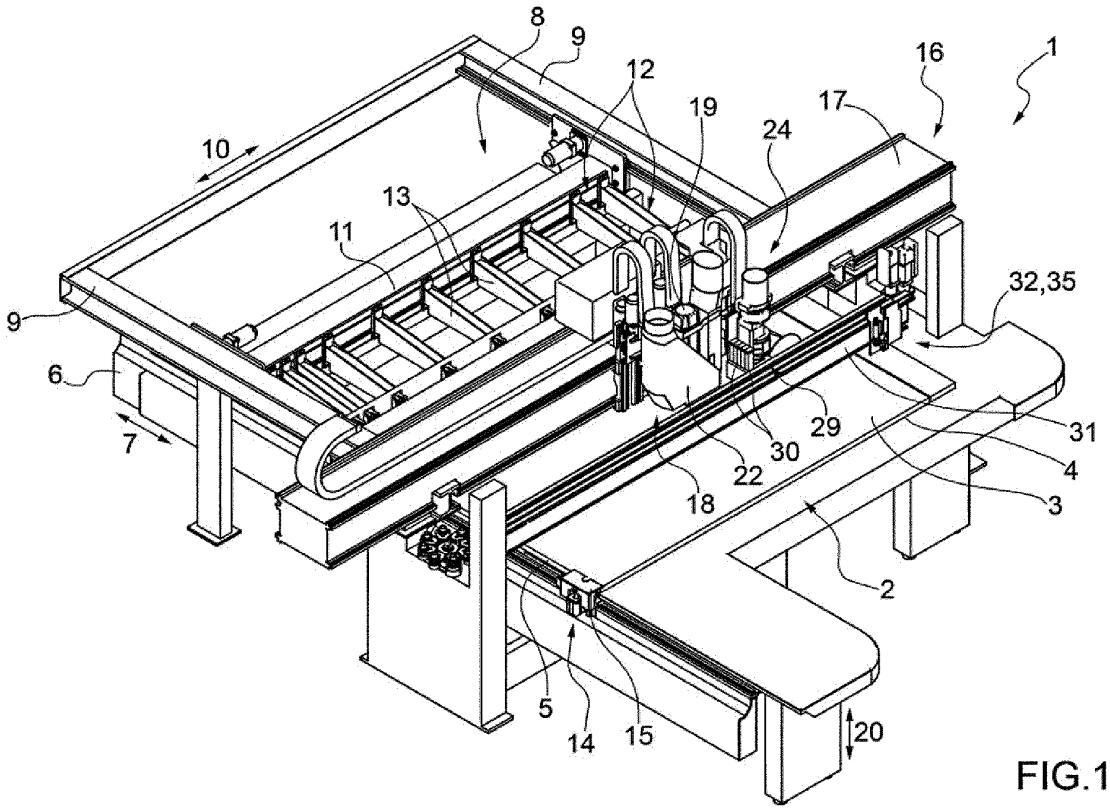

FIG.1

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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 102018000003184 filed on 01/03/2018.

TECHNICAL FIELD

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

[0003] In particular, the present invention relates to a machine for cutting panels made of wood or the like of the type comprising support means defining a supporting surface for at least one panel; a grip and transfer assembly to move the panel along the supporting surface in a first direction; and a cutting station equipped with a gantry extending above the supporting surface in a second direction transverse to the first direction.

[0004] The machine further comprises an operating head movable along the gantry in the second direction; a milling cutter mounted in the operating head to cut the panel; and a pressing device, which extends in the second direction and is mobile between a panel locking position on the supporting surface and a release position.

[0005] By combining the movements of the grip and transfer assembly and, therefore, of the panel in the first direction with the movements of the operating head in the second direction, the milling cutter separates from the panel a plurality of components of different shapes and sizes.

BACKGROUND ART

[0006] The known machines for cutting panels made of wood or the like, of the type described above, have some drawbacks mainly due to the fact that, on the one hand, the milling cutter has a relatively short service life and therefore requires relatively frequent maintenance operations and, on the other hand, it has a relatively large diameter and therefore involves a relatively high consumption of panel material cut from time to time.

DISCLOSURE OF INVENTION

[0007] It is an object of the present invention to provide a machine to cut panels made of wood or the like, which is free from the previously described drawbacks and which is cheap and easy to implement.

[0008] According to the present invention, there is provided a machine to cut panels made of wood or the like, as claimed in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] 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 removed for the sake of clarity, of a preferred embodiment of the machine according to the present invention;

Figure 2 is a schematic plan view of the machine of Figure 1, with some parts removed for the sake of clarity;

Figure 3 is a schematic perspective view of a first detail of the machine in Figures 1 and 2, with parts removed for clarity;

Figure 4 is a schematic front view of a second detail of the machine in Figures 1 and 2, with parts removed for the sake of clarity; and

Figure 5 is a schematic perspective view of a third detail of the machine in Figures 1 and 2, with parts removed for clarity.

BEST MODE FOR CARRYING OUT THE INVENTION

[0010] With reference to Figures 1 and 2, designated as a whole by number 1 is a machine for cutting a panel 2 made of wood or the like, having a substantially rectangular shape.

[0011] The panel 2 is limited by two bigger faces 3 parallel to each other, by two smaller lateral faces 4 parallel to each other and perpendicular to faces 3, and by two smaller lateral faces 5 parallel to each other and perpendicular to faces 3 and 4.

[0012] The machine 1 comprises an elongated base 6, which extends in a horizontal direction 7, and is configured to define a supporting surface P, on which the panel 2 is placed with the faces 5 parallel to the direction 7 and with the faces 4 perpendicular to the direction 7.

[0013] The machine 1 also comprises a grip and transfer device 8, which is configured to move panel 2 in the direction 7, and has two parallel longitudinal guiding members 9, which extend in the direction 7, and are arranged on opposite sides of the surface P in a horizontal direction 10 transverse to the direction 7.

[0014] The guiding members 9 support a crossbar 11, which extends in the direction 10, and is slidably coupled to the guiding members 9 in order to make, with respect to the guiding members 9, straight movements in both sides of the direction 7.

[0015] The device 8 further comprises a plurality of main gripping members 12, which are distributed along the crossbar 11 to grasp the panel 2 at one of the faces 4, and are defined by respective pincers 13, each movable between a respective clamping position and a respective release position of the panel 2.

[0016] The device 8 is also equipped with at least one auxiliary gripping member 14 (in this case two members 14), which is slidably coupled to the base 6 in order to make straight movements along the base 6 in the direction 7, is facing the panel 2 in the direction 10, and is defined by a pincer 15 movable between a clamping po-

sition and a release position of one of the faces 5.

[0017] The machine 1 is further equipped with a gantry 16 comprising a crossbar 17, which extends above the base 6 and the surface P in the direction 10, and supports a first operating head 18 movable along the crossbar 17 in the direction 10.

[0018] The head 18 is equipped with a drive spindle 19, which is slidably coupled to the head 18 in order to make, with respect to the head 18 itself, straight movements in a vertical direction 20 orthogonal to the directions 7 and 10, has a milling tool 21 attached to it (Figure 3), and is also associated with a suction hood 22 connected with a pneumatic suction device (not shown) to collect chips and/or scraps produced by the tool 21 itself.

[0019] As shown in Figure 3, the tool 21 cooperates with an auxiliary pressing device 23, which has the shape of a fork, extends around the tool 21, and is able to stabilise the panels 2 during processing performed by tool 21 itself.

[0020] With reference to Figure 4, the gantry 16 further supports a second operating head 24 which is mobile along the crossbar 17 in the direction 10 and comprises a blade carrier 25 slidably coupled to the head 24 in order to perform, with respect to the head 24, straight movements in the direction 20.

[0021] The two heads 18, 24 are movable along the crossbar 17 in the direction 10 independently of each other under the action of respective drive devices (not shown). According to an alternative embodiment not illustrated, the head 18 is mobile along the crossbar 17 in the direction 10 under the action of a drive device, while the head 24 is moved along the crossbar 17 in the direction 10 after being hooked to the head 18 and under the action of the drive device of the head 18 itself.

[0022] The blade carrier 25 is equipped with a blade 26 and a scoring tool 27 mounted to rotate about respective axes of rotation 28 parallel to each other and to the direction 7, and is movable in the direction 20 to move the blade 26 and the scoring tool 27 between a raised rest position, in which the blade 26 and the scoring tool 27 allow the panels 2 to move along the surface P in the direction 7, and a lowered operating position, in which the blade 26 and the scoring tool 27 perform the cutting of the panels 2.

[0023] The blade 26 and the scoring tool 27 are also moved by the head 24 in the direction 10 with an alternative rectilinear motion comprising a forward stroke, in which the scoring tool 27, placed in front of the blade 26 in the feeding direction 10 of the head 24, performs the scoring of the panel 2 and the blade 26 performs the cutting of the panel 2 itself, and a return stroke.

[0024] The head 24 also comprises a drilling unit 29 which is slidably coupled to the head 24 to perform, with respect to the head 24 itself, straight movements in the direction 20 and is equipped with a plurality of tool-carrying spindles 30 mounted parallel to the direction 20 to receive and hold respective drilling bits, known and not illustrated.

[0025] As shown in Figures 1 and 2, the machine 1 further comprises a main pressing device 31, which extends in the direction 10, is mounted above the surface P, and is movable in the direction 20 between a clamping position, in which the panel 2 is clamped against the surface P to allow the tool 21 or blade 26 to cut the panel 2 in the direction 10, and a release position.

[0026] In other words, the pressing device 31 is arranged in its release position when the panel 2 is cut parallel to the direction 7 by tool 21, and is arranged in its clamping position when the panel 2 is cut in the direction 10 by tool 21 or blade 26.

[0027] With reference to Figure 5, the pressing device 31 also supports a closing and blowing device 32 comprising a slide 33, which is slidably coupled to the pressing device 31 to perform, with respect to the pressing device 31 itself, straight movements in the direction 10, and is equipped with a blowing rod 34 which extends in the direction 20, and has a diameter approximating the diameter of the tool 21 to the nearest size below.

[0028] The rod 34 is movable, with respect to slide 33, in the direction 20 between a lowered operating position, in which the rod 34 engages with a feed channel (not shown) made by the tool 21 through the panel 2 parallel to the direction 7, and a raised rest position, in which the rod 34 disengages from the feed channel (not shown).

[0029] The rod 34 has at least one opening (not shown) facing tool 21, and is connected with a known compressed air pneumatic device, not shown.

[0030] In use, the rod 34 is moved to its lowered operating position when the panel 2 is cut by the tool 21 in the direction 7, in order to at least partially close the feed channel (not shown), prevent chips and/or machining scraps from escaping from the feed channel (not shown), and feed along the feed channel (not shown) a flow of compressed air oriented so as to convey chips and/or machining scraps towards the suction hood 22.

[0031] With regard to the above, it should be pointed out that, when the tool 21 or the blade 26 have to separate from the panel 2 a component (not shown) with a width, measured parallel to the direction 10, which is relatively small, the pressing device 31 cooperates with a locking device 35 configured to prevent the component (not shown) from rotating about an axis of rotation (not shown) perpendicular to the surface P when the pressing device 31 is arranged in its clamping position and the tool 21 or blade 26 is moved in the direction 10.

[0032] The device 35 comprises a slide 36 slidably coupled to the pressing device 31 to perform, with respect to the pressing device 31 itself, straight movements in the direction 10, and a locking member 37 mounted on the slide 36 to move, with respect to the slide 36 itself, in the direction 20 between a lowered operating position, in which the member 37 engages with the component (not shown) to prevent its rotation about the aforementioned axis of rotation (not shown), and a raised rest position, in which the member 37 disengages from the component (not shown).

[0033] Since the blade 26 has a lower thickness than the diameter of the milling tool 21 and is subject to less wear than the tool 21, the blade 26 allows that at least part of the cuts parallel to the direction 10 are made without the use of tool 21 and, therefore, avoiding a relatively high material consumption and a relatively high wear of the tool 21.

[0034] According to an alternative embodiment not illustrated, the blade carrier 25 is mounted to rotate about an axis of rotation parallel to the direction 10 so as to allow the blade 25 and the scoring tool 26 to perform cuts of the panels 2 inclined with respect to the faces 3.

Claims

1. A machine to cut panels (2) made of wood or the like, the machine comprising support means (6) defining a supporting surface (P) for at least one panel (2); a grip and transfer assembly (8) to move the panel (2) along the supporting surface (P) in a first direction (7); a main pressing device (31), which extends in a second direction (10) transverse to the first direction (7), and is movable between a locking position, in which the panel (2) is locked on the supporting surface (P), and a release position; a gantry (16) extending above the supporting surface (P) in the second direction (10); and a first operating head (18), which is mounted on the gantry (16) above the supporting surface (P), is provided with a milling cutter (21) to process the panel (2), and is movable in the second direction (10); and being **characterized in that** it further comprises a second operating head (24), which is mounted on the gantry (16) above the supporting surface (P), is provided with a blade (26) to process the panel (2), and is movable in the second direction (10).

2. The machine according to claim 1, wherein the second operating head (24) is further provided with a scoring tool (27) cooperating with the blade (26).

3. The machine according to claim 1 or 2, wherein said first and second operating heads (18, 24) are movable along the gantry (16) in the second direction (10) either independently of one another, or integrally with one another.

4. The machine according to any one of the preceding claims and further comprising a drive device to move the first operating head (18) along the gantry (16) in the second direction (10), and a hooking device to hook the second operating head (24) to the first operating head (18) and move the two operating heads (18, 24) along the gantry (16) in the second direction (10) under the action of the drive device.

5. The machine according to any one of the preceding claims, wherein the second operating head (24) is further provided with a drilling unit (29).

6. The machine according to any one of the preceding claims, wherein the main pressing device (31) is provided with a closing device (32), which is movable from and to a lowered operating position, in which the closing device (32) is arranged inside of - and at least partially closes - a feeding channel created by the milling cutter (21) through the panel (2) parallel to the first direction (7).

7. The machine according to claim 6, wherein the closing device (32) is movable along the main pressing device (31) in the second direction (10) and comprises a rod (34), which extends in a third direction (20) perpendicular to the supporting surface (P), and is movable between the lowered operating position and a raised rest position.

8. The machine according to any one of the preceding claims and further comprising a first auxiliary pressing device (35), which is mounted on the main pressing device (31) so as to prevent a component separated from the panel (2) from rotating around a rotation axis, perpendicular to the supporting surface (P), when the main pressing device (31) is arranged in its locking position and the milling cutter (21) is moved in the second direction (10).

9. The machine according to any one of the preceding claims, wherein the first operating head (18) is further provided with a second auxiliary pressing device (23), which extends around the milling cutter (21) so as to lock the panel (2) during the processing of the milling cutter (21) .

10. The machine according to any one of the preceding claims, wherein the grip and transfer assembly (8) comprises at least one first gripping member (12), which is mounted so as to hold a first side (4) of the panel (2), which is parallel to the second direction (10), and at least one second gripping member (14), which is mounted so as to hold a second side (5) of the panel (2), which is parallel to the first direction (7).

11. The machine according to any one of the preceding claims, wherein the second operating head (24) comprises a blade carrier (25), which is mounted so as to rotate around a first rotation axis, which is parallel to the second direction (10); the blade (26) being mounted on the blade carrier (25) so as to rotate about a second rotation axis (28), which is transverse to the first rotation axis.

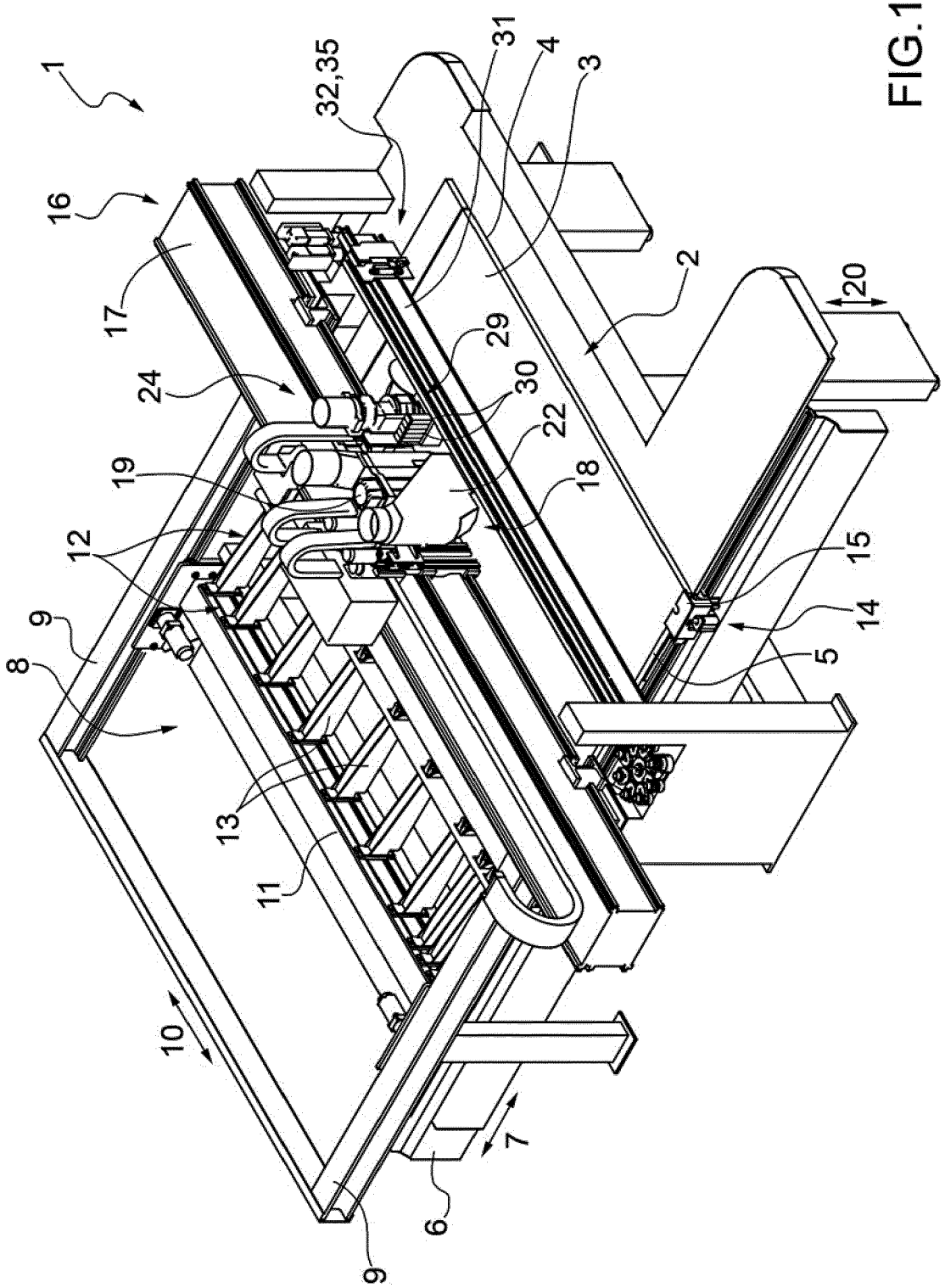

FIG.1

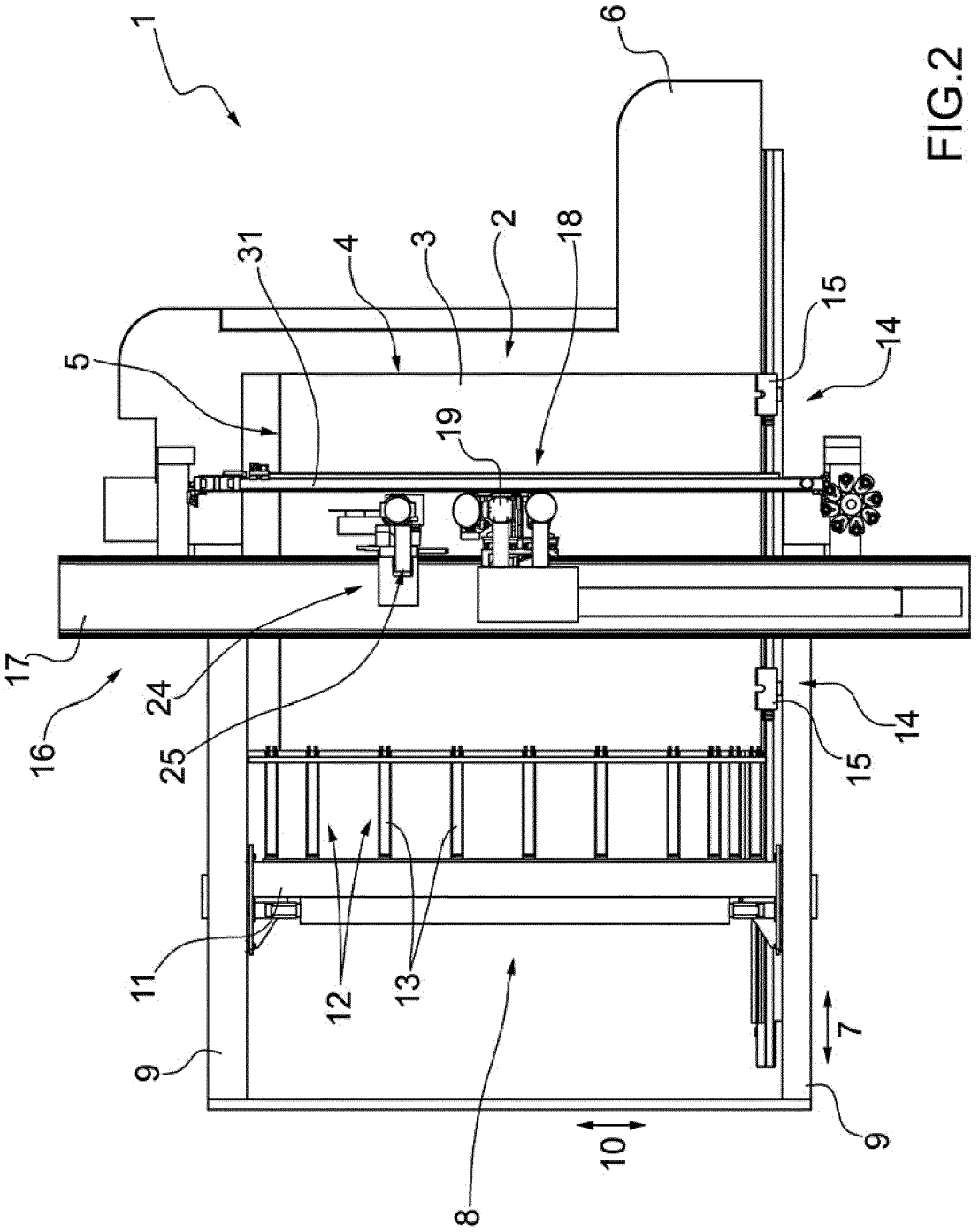

FIG.2

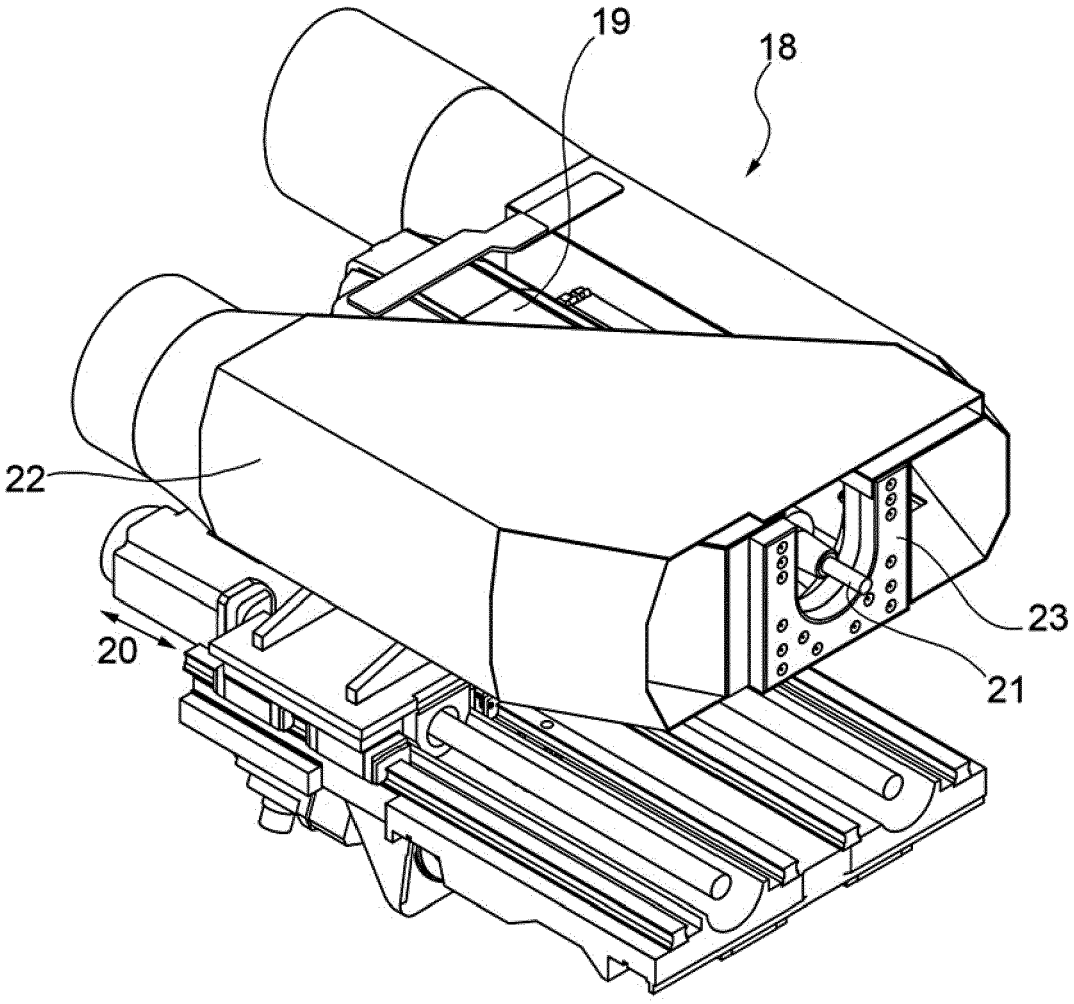

FIG.3

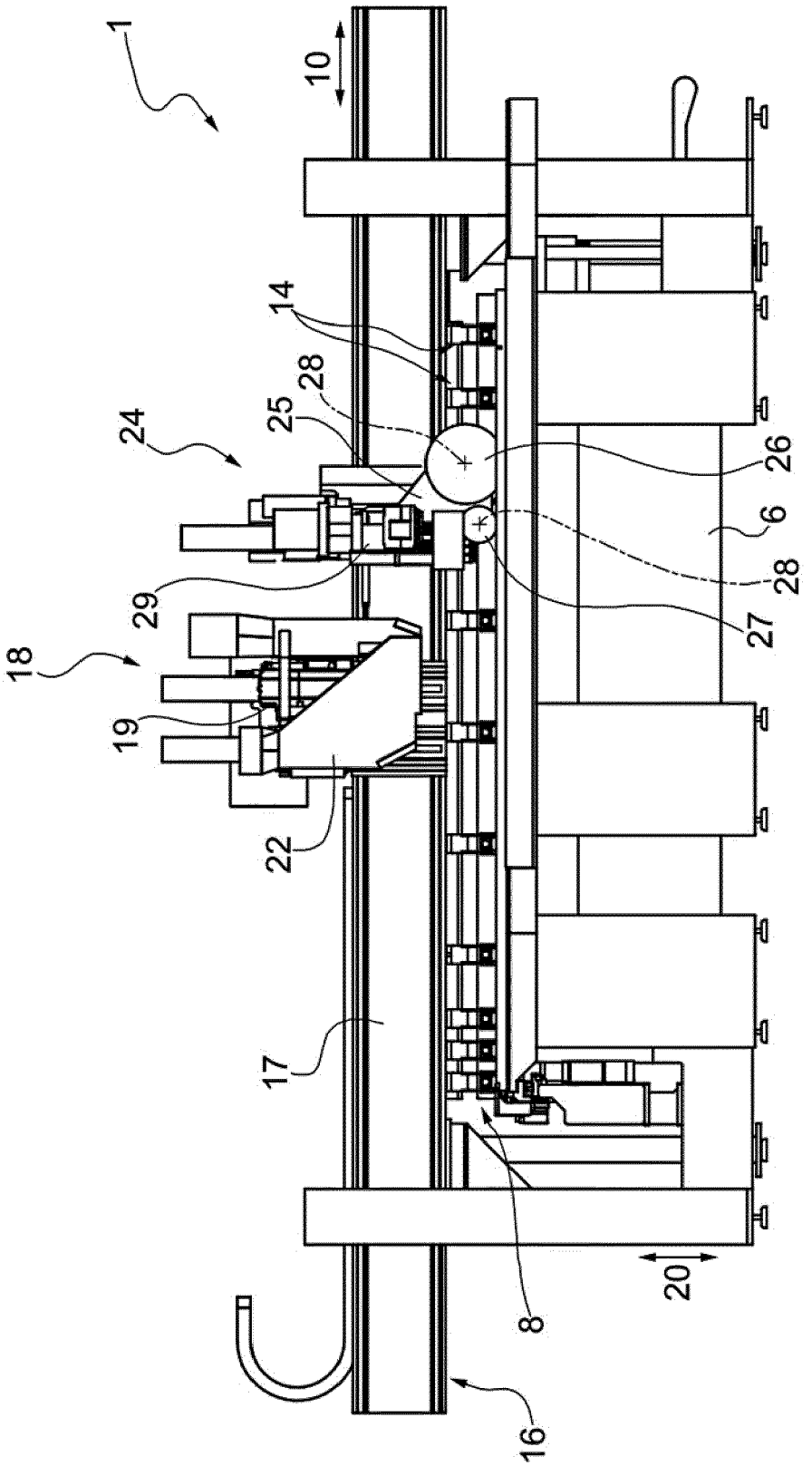

FIG.4

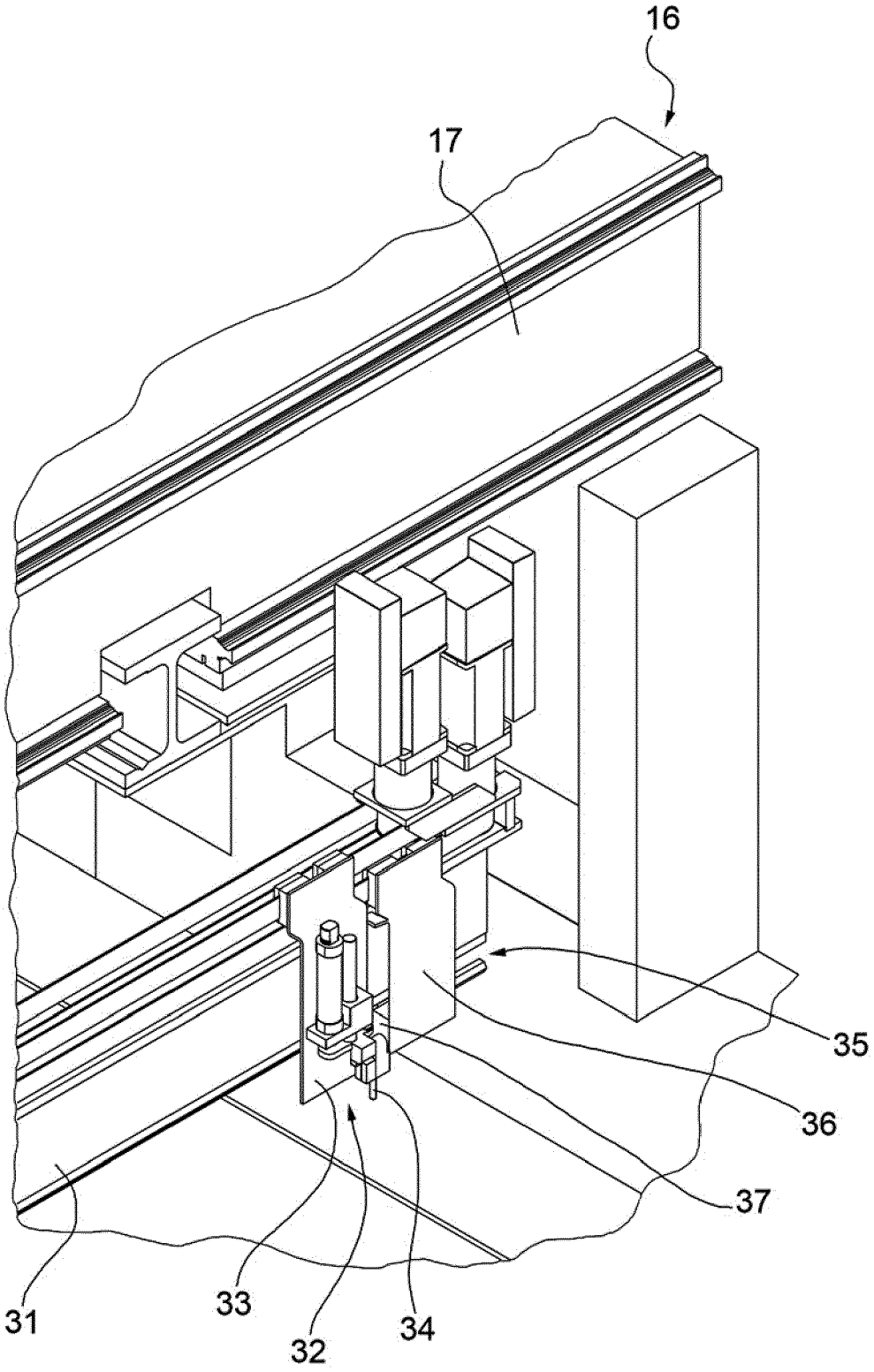

FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 19 16 0380

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 July 2019	Chariot, David

CATEGORY OF CITED DOCUMENTS

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EUROPEAN SEARCH REPORT

Application Number
EP 19 16 0380

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	4 July 2019	Chariot, David

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