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(54) **METHOD AND MACHINE TO MANUFACTURE COMPONENTS MADE OF WOOD OR THE LIKE**

(57) In a machine for making wooden or similar components starting from a substantially rectangular panel (2), the panel (2) is held at two its lateral faces (4, 4*) parallel to each other through two holding devices (25,

28), and is advanced by the two holding devices (25, 28) through a cutting station (31) to allow at least one operating head (33; 38) to separate at least one component from the panel (2) itself.

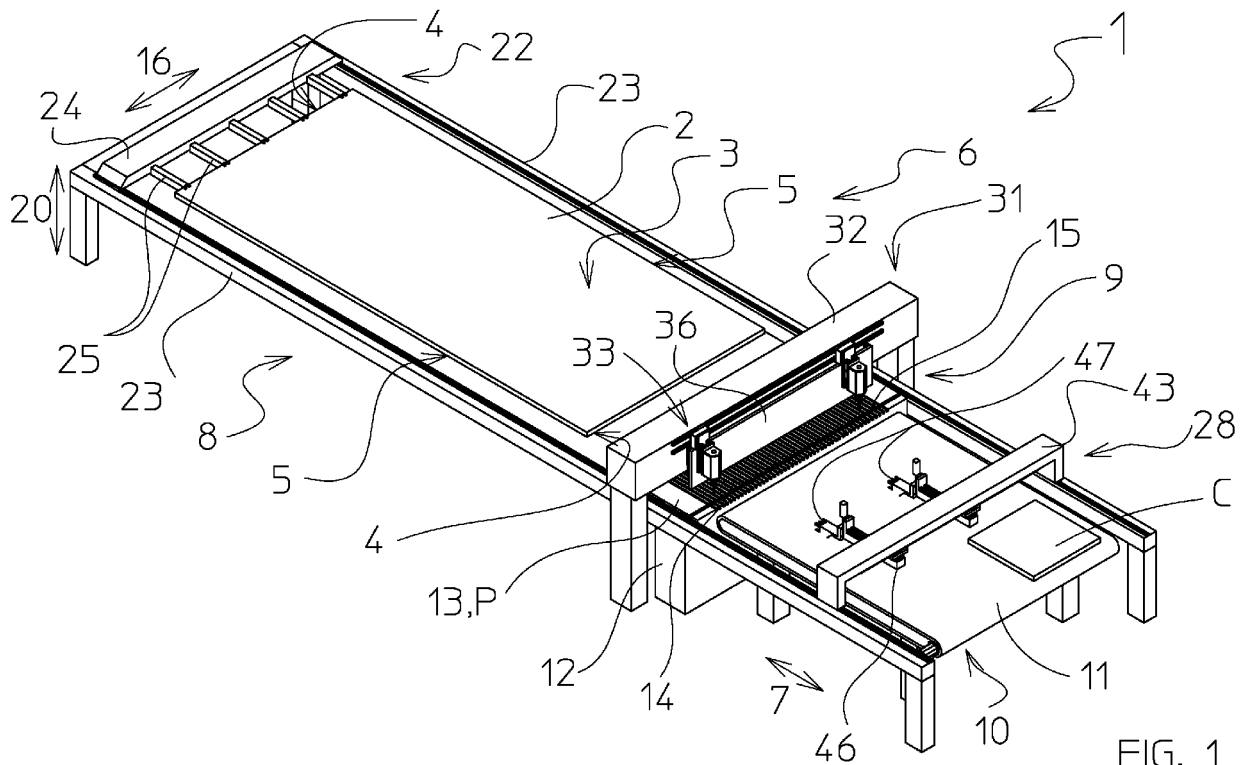


FIG. 1

Description

[0001] The present invention relates to a machine to manufacture for components made of wood or the like.

[0002] In particular, the present invention relates to a machine for manufacturing wooden or similar components of the type comprising a base defining a support surface for a wooden panel or the like; a holding device, which is adapted to hold the panel in correspondence with one of its lateral faces, and is movable in a first horizontal direction to advance the panel on the supporting surface; and at least one operating head movable in a second horizontal direction transverse to the first direction to allow a tool engaged on the operating head to separate at least one component from the panel itself.

[0003] Since the panel is held by the holding device only in correspondence with the aforementioned side face, the known machines for manufacturing wooden components or the like of the type described above have some drawbacks mainly due to the fact that, when the tool penetrates into the panel, the panel can laterally flex on the support surface due to the thrust exerted by the tool itself and due to residual tensions inside the material, thus compromising the correct cutting of the components.

[0004] The object of the present invention is to provide a machine for making wooden components or the like, which has not the drawbacks described above, and which is simple and economical to implement.

[0005] According to the present invention, a machine is provided for making wooden components or the like as claimed in the attached claims.

[0006] The present invention will now be described with reference to the attached drawings, which illustrate a non-limiting embodiment thereof, wherein:

figure 1 is a schematic perspective view, with parts removed for clarity, of a preferred embodiment of the machine of the present invention;

figures 2, 3, 4, 6 are four schematic perspective views, with parts removed for clarity, of a first detail of the machine of figure 1; and

figures 5 and 7 are schematic perspective views of two variants of the machine of figure 1.

[0007] With reference to figure 1, 1 indicates, as a whole, a machine for manufacturing components C starting from a panel 2 of wood or the like of substantially rectangular shape limited by two major faces 3 parallel to each other, by two

minor lateral faces 4 parallel to each other and perpendicular to the faces 3, and by two minor lateral faces 5 parallel to each other and perpendicular to faces 3 and 4. The machine 1 comprises an elongated base 6, which extends along a horizontal direction 7, and comprises, in its turn, three support devices 8, 9, and 10, which are arranged in succession to one another along the direction 7, and are

coplanar to each other to define a resting plane P, on which the panel 2 is arranged with the faces 5 parallel to the direction 7 and with the faces 4 perpendicular to the direction 7 itself. The device 8 comprises a plurality of roller bars (not shown) parallel to each other and to the direction 7; the device 10 comprises a conveyor belt 11 covered with horizontal brushes;

and the device 9 is arranged between the devices 8 and 10 and comprises a horizontal pallet 12. According to what is illustrated in figure 1, the pallet 12 is limited at the top by a flat surface 13 coplanar with the plane P, and has a plurality of parallel feeding channels 14, which extend in the direction 7, and open outwards the at the surface 13. With reference to figures 1 and 2, the machine 1 also comprises a holding and transport device 22 suitable for advancing the panel 2 in direction 7.

[0008] The device 22 comprises two longitudinal guide members 23 parallel with each other, which extend along the direction 7, that are arranged on opposite bands of the devices 8 and 9 in the direction 16, and support a crosspiece 24, which extends in the direction 16, and is slidingly coupled to the longitudinal members 23 to perform, with respect to the longitudinal members 23 themselves, rectilinear displacements in both directions of the direction 7.

[0009] The device 22 also comprises a plurality of holding members 25, which are distributed along the crosspiece 24 to hold the panel 2 at one of the faces 4, and each comprise a respective lower jaw 26 and a respective upper jaw 27 movable between a clamping position and a release position of the panel 2. Each member 25 extends between two roller bars (not shown) of the device 8, and each jaw 26 extends below the plane P, and is aligned with a relative channel 14 in the direction 7. According to what is illustrated in figure 1, the machine 1 also comprises a second holding and transporting device 28, facing the panel 2 in direction 7.

[0010] The device 28 comprises a crosspiece 43, which is supported by the longitudinal guide members 23, extends in the direction 16, and is slidingly coupled to the longitudinal members 23, in order to perform rectilinear displacements with respect to the longitudinal members 23 themselves in both directions of the direction 7. The device 28 further comprises, in this case, two slides 46 slidingly coupled to the crosspiece 43, to perform rectilinear displacements with respect to the crosspiece 43 in both directions of direction 16. The device 28 comprises in its turn two slides 44, which extend in the direction 7, that are slidingly coupled to the respective slides 46, to perform relative displacements with respect to slides 46 in the direction 7. The device 28 further comprises two holding devices 47 for the panel 2 slidingly coupled to the respective slides 44, to perform displacements along the direction 20, between a working position holding the panel 2 and a raised position, to allow the

device 28 itself bypassing the component C transferred by it to the conveyor belt 11 and gripping the panel 2. The two holding devices 47 are, in this case, constituted by an upper jaw 29 and a lower jaw 30, movable between a clamping position and a release position of one of faces 4 (4*). It should be pointed out that the faces 4* are parallel or coincident with the face 4 of the panel 2 and are generated by the cuts of the panel 2 along direction 16.

[0011] The machine 1 also comprises an operating unit 31, which is mounted in correspondence with the cutting channel 15, and has a crosspiece 32, which extends in the direction 16, and supports, in this case, an operating head 33.

[0012] The head 33 is movable along the crosspiece 32 in the direction 16, and supports an electro-spindle 34, which extends in the direction 20, is coupled in a sliding manner to the head 33, to perform, with respect to the head 33 itself, rectilinear movements in the direction 20, and a tool 35 is engaged, aligned with the channel 15 in the direction 20.

[0013] The electro-spindle 34 is arranged alongside the presser 36 in direction 7, which extends in direction 16, is mounted between the crosspiece 24 and the channel 15 in the direction 7, and is movable in the direction 20 between a clamping position, in which the panel 2 is blocked against the plane P to allow the tool 35 to work the panel 2 in the direction 16, and a release position.

[0014] In use, by combining the displacements of the panel 2 in direction 7 with the displacements of the head 33 in direction 16, the tool 35 separates a plurality of components C from the panel 2.

[0015] The presence of the holding device 28, in addition to the members 25, allows holding the panel 2 in correspondence with both faces 4 (4*), guarantees a correct action of the tool 35, and prevents the panel 2 from flexing laterally on the plane P, in particular when the tool 35 penetrates the panel 2, during the advancement of the panel along the direction 7; moreover it allows transferring the component C separated from the panel 2 onto the conveyor belt 11, keeping it on hold, with benefits in productivity and economy terms.

[0016] The variant illustrated in figure 7 differs from what is illustrated in figures 1, 2, 3, 4, and 6 only in that, in it, the operating head 33 is eliminated and replaced with two operating heads 38 movable along the crosspiece 32 in a manner independent of each other.

[0017] Each head 38 supports an electro-spindle 39, which is completely similar to the electro-spindle 34, it has a tool 40 inserted completely similar to the tool 35. In use, following the advancement of the panel 2 in direction 7, the tools 40 of the two heads 38 define two faces 42 of a component (not shown) parallel to each other and to direction 7 itself. The member 28 holds the panel 2, in correspondence with the faces 4 (4*) and guarantees a correct action of the tools 40 preventing the panel 2 from flexing laterally on the plane P, during the advancement of the panel 2 in direction 7.

[0018] It is useful to specify that when the two holding

devices move the panel 2 together, the device 28 moves with the same law of motion as the device 22.

[0019] In the variant of figure 5, the device 28 consists of the device 45, namely, a suction blocking member in fluid dynamic communication with a suction device, through a supply duct.

Claims

1. A machine to manufacture components made of wood or the like starting from a flat panel (2) delimited by a first side face (5), which is parallel to a first direction (7), and by a pair of second side faces (4, 4*), which are opposite one another and parallel to a second direction (16) perpendicular to the first direction (7), the machine comprising support means (8, 9, 10) defining a support surface (P) for the panel (2); a first holding device (25), which is designed to hold the panel (2) in the area of a second side face (4); and at least one operating head (33; 38) to process the panel (2); the first holding device (25) and the operating head (33; 38) being movable relative to one another at least in the first direction (7), so as to allow the operating head (33; 38) to separate at least one component from the panel (2); and being **characterized in that** it further comprises a second holding device (28), which is designed to hold the panel (2) in the area of the other second side face (4, 4*).
2. The machine according to claim 1, wherein the operating head (33; 38) and the second holding device (28) are movable relative to one another in the first direction (7).
3. The machine according to claim 1 or 2, wherein each one of said first and second holding devices (25, 28) comprises at least one clamping member provided with two jaws (26, 27, 29, 30), which are movable between a clamping position and a release position to clamp and release the panel (2).
4. The machine according to any one of the preceding claims, wherein each operating head (33; 38) is fixed in the first direction (7), and said first and second holding devices (25, 28) are movable in the first direction (7).
5. The machine according to any one of the preceding claims and comprising two operating heads (38) to separate, from the panel (2), a component delimited by two third side faces (42), which are parallel to the first direction (7); each operating head (38) comprising a tool (40), which is designed to manufacture a relative third side face (42).
6. The machine according to claim 1 or 2, wherein the

second holding device (28) consist of a sucking holding member (45), which is in fluid-dynamic communication with a suction device.

7. The machine according to any one of the preceding claims, wherein each operating head (33; 38) is movable in the second direction (16); a pressing device (36) being provided in order to clamp the panel (2) against the support surface (P) at least during the cut of the panel (2) in the second direction (16). 5
8. The machine according to claim 3, wherein the first holding device (25) and the second holding device (28) comprises at least one clamping member comprising, in turn, a lower jaw (26, 29) and an upper jaw (27, 30), which are movable between a clamping position and a release position to clamp and release the panel (2); the support means (9) having a plurality of feeding channels (14), which extend in the first direction (7), open up towards the outside in the area of the support surface (P) and are engaged by the lower jaws (26,29) of the respective clamping members in a sliding manner. 10 15 20
9. The machine according to claim 8, wherein the support means (9) further have a cutting channel (15), which extends in the second direction (16) and through said further feeding channels (14), and is engaged by a tool (35; 40) of at least one operating head (33; 38). 25 30
10. The machine according to any one of the preceding claims, wherein the second holding device (28) comprises a holding member (45,47), which is movable in the second direction (16). 35
11. A method to manufacture components (C) made of wood or the like starting from a flat panel (2) delimited by a first side face (5), which is parallel to a first direction (7), and by a pair of second side faces (4,4*), which are opposite one another and parallel to a second direction (16) perpendicular to the first direction (7), and in a machine comprising a cutting station provided with at least one operating head (33; 38) to process the panel (2); 40 45

the method comprising the step of:

holding the panel (2) in the area of a second side face (4) by means of a first holding device (22); 50
and being **characterized in that** it further comprises the steps of:

holding the panel (2) in the area of the other second side face (4,4*) by means of a second holding device (28); 55
moving the operating head (33,38) and an as-

sembly defined by the panel (2), by the first holding device (22) and by the second holding device (28) relative to one another in at least one of said first and second directions (7,16) so as to allow the operating head (33, 38) to separate at least one component from the panel (2).

12. The method according to claim 11, wherein the machine further comprises a transfer station for the components separated from the panel (2); the method further comprising the step of:

- moving the component from the cutting station to the transfer station by means of the second holding device (28).

13. The method according to claim 12, wherein the component is transferred, by means of the second holding device, from the cutting station to a conveyor device of the transfer station.

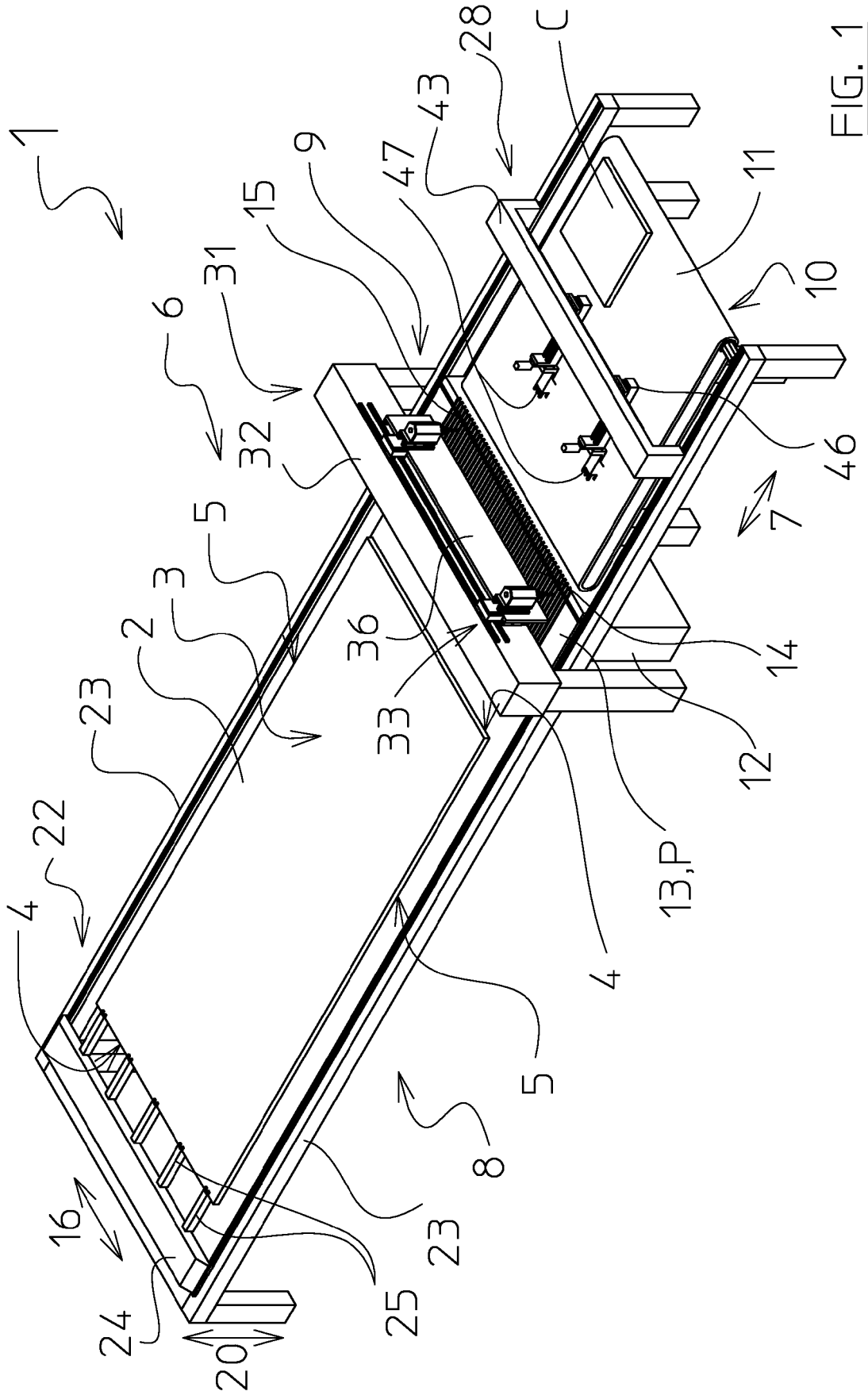


FIG. 1

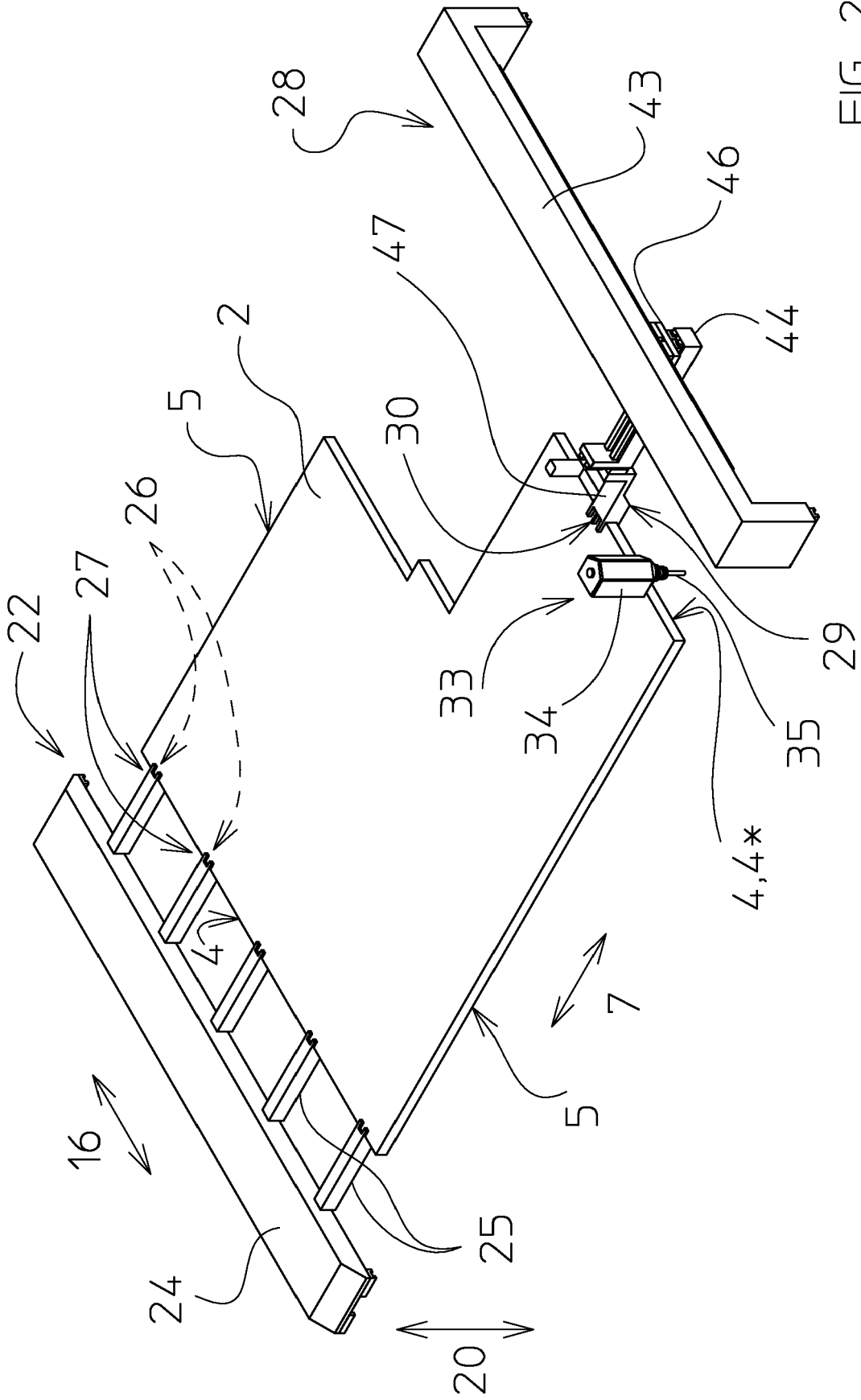


FIG. 2

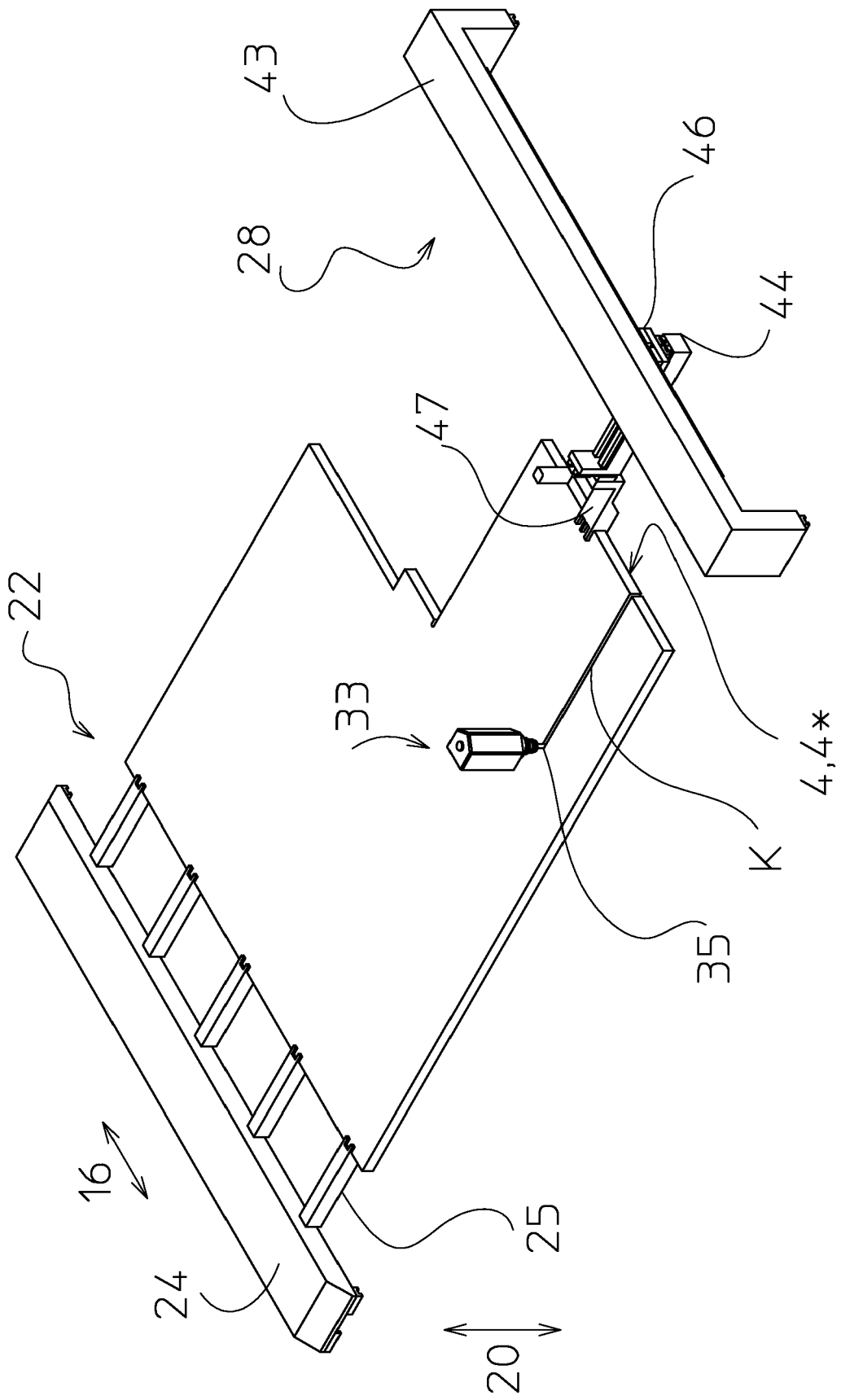


FIG. 3

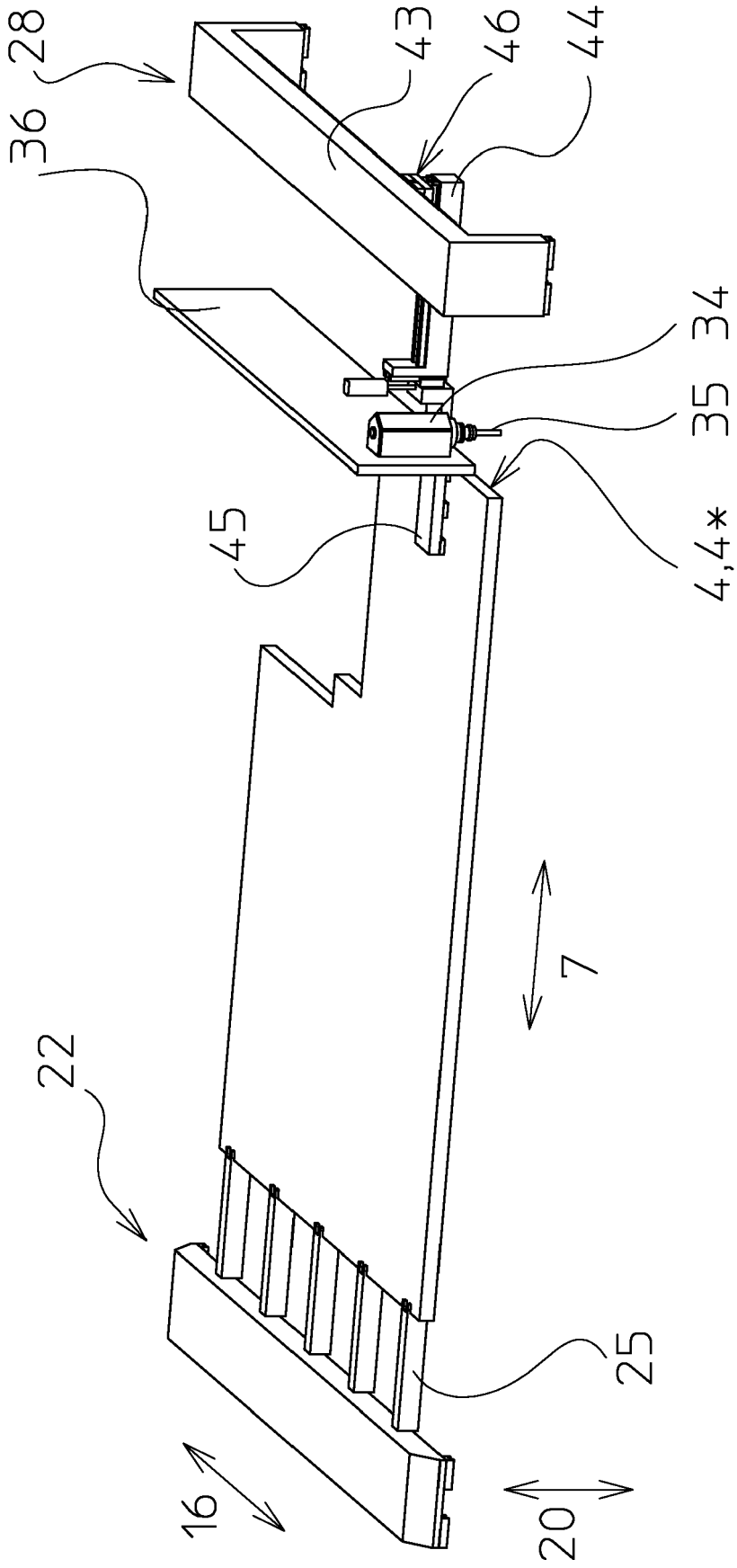


FIG. 5

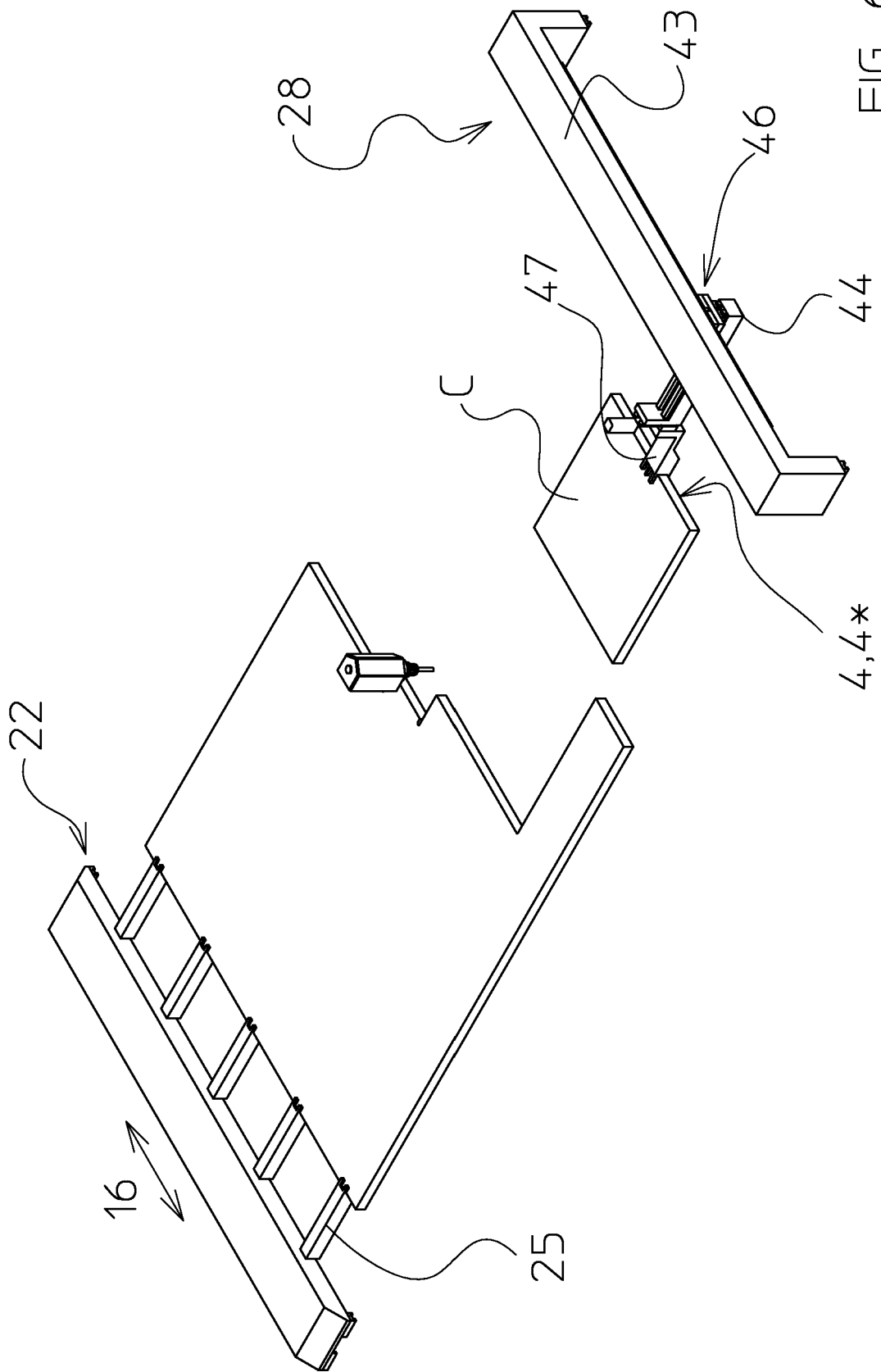


FIG. 6



EUROPEAN SEARCH REPORT

Application Number
EP 21 20 3173

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2 The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 18 February 2022	Examiner Hamel, Pascal
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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