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(54) **Working machine for wood or similar materials**

(57) A machine for processing components (2) made of wood or the like is provided with an elongated base (3), a plurality of locking devices (19) mounted to the base (3) to hold at least one component (2) to be machined, a bridge crane (8) mobile along the base (3) and

provided with at least one first working head (12), and a second working head (30, 34) and/or a splinter guard device (39) mobile along a cavity (7), which is obtained in the base (3), and opens outwards at an upper surface (5) of the base (3) itself.

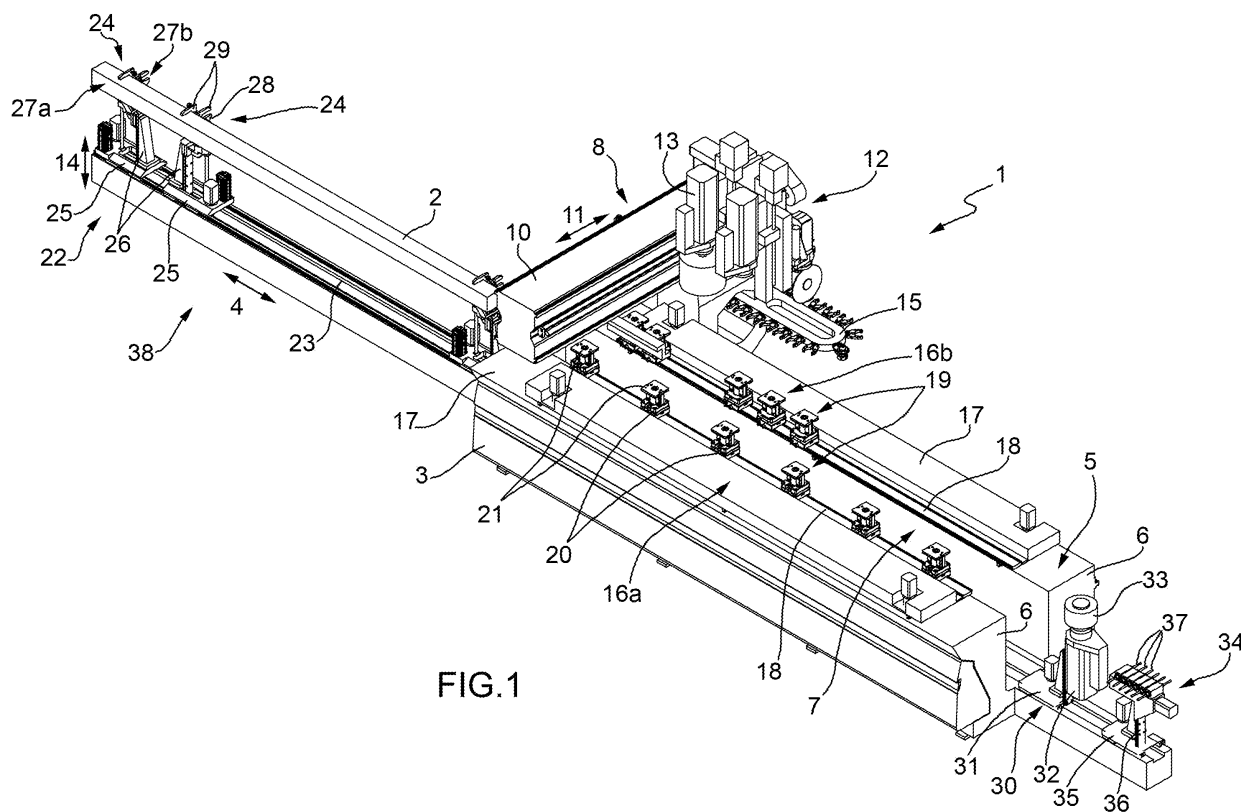


FIG.1

Description

MACHINE FOR PROCESSING COMPONENTS MADE OF WOOD OR THE LIKE

[0001] The present invention relates to a machine for processing components made of wood and the like, in particular elongated components for fixtures.

[0002] Hereinafter, the term "fixture" will be used to identify doors, windows and furniture doors comprising a closing plate or sheet, e.g. made of glass, mounted within an annular supporting frame, normally defined by a plurality of components made of wood or the like and connected to one another.

[0003] In the field of processing components made of wood or the like, it is known to provide a machine of the type comprising an elongated base provided with two longitudinal guiding elements parallel to a first, substantially horizontal direction; a plurality of crosspieces mounted between the longitudinal guiding elements parallel to a second, substantially horizontal direction which is transversal to the first direction; at least one clamping vise mounted to each crosspiece to lock at least one component; and a bridge crane extending over the base in the second direction, provided with at least one working head, and mobile along the base in the first direction.

[0004] As the two working heads are provided with all the tools and/or equipments used for processing the components and therefore are relatively large, complex and heavy, the known machines for processing components made of wood and the like of the above-described type have some drawbacks, mainly deriving from the bridge crane being dimensioned to support the two working heads and, therefore, being in turn relatively large, complex and heavy.

[0005] It is an object of the present invention to provide a machine for processing components made of wood or the like which is free from the above-described drawbacks and which is simple and cost-effective to be implemented.

[0006] According to the present invention, there is provided a machine for processing components made of wood or the like as claimed in the appended claims.

[0007] The present invention will now be described with reference to the accompanying drawings, which illustrate a non-limitative embodiment thereof, in which:

figure 1 is a diagrammatic perspective view of a preferred embodiment of the machine of the present invention;

figures 2 and 3 are diagrammatic side views of the machine in figure 1 shown in two different working positions; and

figure 4 diagrammatically shows a plan view of a working mode of the machine in figure 1.

[0008] With reference to figures 1, 2 and 3, numeral 1 indicates as a whole a machine for processing compo-

nents 2 made of wood or the like having an elongated shape, in particular components 2 for fixtures.

[0009] Machine 1 comprises an elongated base 3, which extends in a horizontal direction 4, is substantially U-shaped, is delimited by a substantially horizontal upper surface 5, and has two longitudinal members 6, which extend in direction 4 and are separated from each other by an elongated cavity 7, which is obtained through the base 3 in direction 4, opens outwards at the surface 5, and is longitudinally open at its ends in the direction 4 itself.

[0010] Base 3 supports a bridge crane 8 comprising a vertical upright 9, which is coupled to the base 3 in a known manner to perform rectilinear movements along the base 3 itself in direction 4 under the bias of a known actuating device (not shown), and carries a crosspiece 8 connected to a free end thereof, which extends over the base 3 in a horizontal direction 11 transversal to direction 4.

[0011] The bridge crane 8 supports a working head 12 of known type, which is coupled to the crosspiece 10 in a known manner to perform rectilinear movements in direction 11 along the crosspiece 10 itself, and comprises at least one electrospindle 13 fitted on the head 12 in a known manner to move in a vertical direction 14 orthogonal to directions 4 and 11. The electrospindle 13 is adapted to receive and hold a tool or machining aggregate, which is shaped to perform, for example, milling and/or drilling operations on the components 2, and is adapted to be transferred between the electrospindle 13 and a closed-loop tool magazine 15 extending through the upright 9.

[0012] Machine 1 is further provided with two clamping groups 16a, 16b, each of which is mounted to a corresponding longitudinal member 6, and comprises a supporting plate 17 of elongated rectangular shape, which extends in direction 4, is coupled to the corresponding longitudinal member 6 in a known manner to perform rectilinear movements in direction 11 with respect to the corresponding longitudinal member 6 itself, and supports a rectilinear guide 18 parallel to direction 4 and facing the guide 18 of the other clamping group 16a, 16b.

[0013] A plurality of clamping vises 19 are mounted to the guide 18, each of which comprises a lower jaw 20 slidably coupled to the guide 18 to perform rectilinear movements in direction 4 with respect to the plate 17, and an upper jaw 21 mobile in direction 14 between a clamping position and a releasing position of at least one component 2.

[0014] The vises 19 of each clamping group 16a, 16b define a substantially horizontal supporting surface coplanar to the supporting surface defined by the vises 19 of the other clamping group 16a, 16b, and are arranged along the corresponding guide 18 substantially according to the dimensions of the components 2 to be processed and/or of the operations to be carried out on the components 2 themselves.

[0015] Machine 1 further comprises a feeding device

22 adapted, in this case, to transfer the components 2 to be processed into the vises 19 and to withdraw the processed components 2 from the vises 19.

[0016] Device 22 comprises a guide 23, which extends over a bottom wall of the cavity 7 in direction 4, protrudes outwards the two ends of cavity 7 in the direction 4 itself, and supports a plurality of grip and transport units 24 (three units 24 in this case).

[0017] Each unit 24 comprises a horizontal slide 25 slidably coupled to the guide 23 to perform rectilinear movements in direction 4 with respect to the base 3, and a vertical slide 26 coupled to the slide 25 in a known manner to perform rectilinear movements in direction 14 with respect to the slide 25.

[0018] The slide 26 supports a pair of grip and transport members 27a, 27b opposite to each other, each of which faces the vises 19 of a corresponding clamping group 16a, 16b, and comprises a lower jaw 28 fixed to the slide 26 and an upper jaw 29 mobile in direction 14 between a clamping position and a releasing position of at least one component 2.

[0019] The members 27a, 27b of the units 24 define respective substantially horizontal supporting surfaces parallel to the supporting surfaces defined by the vises 19, and are moved by the corresponding slides 26 between a raised position, in which the supporting surfaces of the members 27a, 27b are substantially coplanar with the supporting surfaces of the vises 19, and a lowered position in which the supporting surfaces of the members 27a, 27b extend under the supporting surfaces of the vises 19.

[0020] The guide 23 further supports a milling unit 30 comprising a horizontal slide 31 slidably coupled to the guide 23 to perform rectilinear movements in direction 4 with respect to the base 3, a vertical slide 32 coupled to the slide 31 in a known manner to perform rectilinear movements in direction 14 with respect to the slide 31, and a milling tool 33 mounted to the slide 32.

[0021] The guide 23 further supports a drilling/milling unit 34 comprising a horizontal slide 35 slidably coupled to the guide 23 to perform rectilinear movements in direction 4 with respect to the base 3, a vertical slide 36 coupled to the slide 35 in a known manner to perform rectilinear movements in direction 14 with respect to the slide 35, and a plurality of drilling/milling tools 37, which are mounted to the slide 36 parallel to direction 11, and are divided into two groups of tools 37 one facing the clamping group 16a and the other facing the clamping group 16b.

[0022] The operation of machine 1 will now be described with reference to figures 1, 2 and 3 and starting from when at least one component 2 to be processed is loaded, in this case, into the members 27a of the grip and transport units 24 in a feeding station 38 provided at a portion of guide 23 outside the cavity 7.

[0023] The considered component 2 is firstly fed by the members 27a, arranged in their lowered positions, along the cavity 7 in direction 4, is then raised from the

slides 26 and released into the vises 19 of the clamping group 16a, is processed by the working head 12 and/or by the milling unit 30 and/or by the drilling/milling units 34 at a first longitudinal face thereof orthogonal to direction 11, and is possibly processed by the working head 12 and/or by the milling unit 30 at its head faces orthogonal to direction 4.

[0024] Once the mentioned first longitudinal face has been processed, the component 2 is firstly transferred from the vises 19 of the group 16a into the vises 19 of the group 16b, is then processed by the working head 12 and/or by the milling unit 30 and/or by the drilling/milling unit 34 at a second longitudinal face thereof opposite to the first longitudinal face, and is finally transferred from the vises 19 of group 16b to the members 27b.

[0025] The newly processed component 2 is thus transferred from the units 24 into the feeding station 38 and downloaded from the members 27b.

[0026] As shown in figure 3, the drilling/milling unit 34 may drill/mill two components held in the vises 19 of the two clamping groups 16a, 16b at the same time.

[0027] According to a variant (not shown), the drilling/milling unit 34 comprises a plurality of drilling/milling tools at variable centre distance.

[0028] As regards the above, it is worth specifying that:

the transfers of the components 2 between the units 24 and the vises 19 of groups 16a, 16b, and between the vises 19 of group 16a and the vises 19 of group 16b are performed by moving the groups 16a, 16b in direction 11 between corresponding forward and retracted positions; and

the units 24 are free to withdraw a new component 2 in the feeding station 30 once the considered component 2 has been transferred to the vises 19 of group 16a, and to transfer the new component 2 to the vises 19 of group 16a once the considered component 2 has been transferred from the vises 19 of group 16a into the vises 19 of group 16b.

[0029] The variant shown in figure 4 differs from that shown in the previous figures only in that the milling operation is carried out by combining the action of a milling tool carried by the working head 12 with the action of a splinter guard 39 of known type and mobile along the cavity 7, or by combining the action of the milling unit 30 with the action of a splinter guard 39 mounted to the bridge crane 8. In either case, the splinter guard 39 is mobile in direction 14.

Claims

1. Machine for processing components (2) made of wood or the like, the machine comprising an elongated base (3) which extends in a first direction (4) and has an elongated cavity (7), which extends in the first direction (4), is longitudinally open in the first

- direction (4) in correspondence to at least one of its ends, and opens outwards in correspondence to an upper surface (5) of the base (3); a bridge crane (8) which extends above the base (3) in a second direction (11) substantially transversal to the first direction (4), is provided with at least a first working head (12), and is mobile along the base (3) in the first direction (4); a plurality of locking devices (19) mounted on the upper surface (5) to keep at least a component (2) to be processed; and a second working head (30, 34) and/or a splinter guard (39); and being **characterized in that** the cavity (7) is provided with a guide (23), which extends along the cavity (7) in the first direction (4), and is slidingly engaged by the second working head (30, 34) and/or to the splinter guard (39).
2. Machine according to Claim 1, wherein the guide (23) protrudes outside the base (3) in the first direction (4).
 3. Machine according to Claim 1 or 2, wherein the splinter guard (39) is mounted on the bridge crane (8).
 4. Machine according to any one of the preceding Claims, wherein the second working head (30, 34) comprises a milling unit (30) and/or a drilling/milling unit (34).
 5. Machine according to Claim 4, wherein the milling/drilling unit (34) comprises a plurality of drilling/milling tools (37) with a variable centre distance.
 6. Machine according to any one of the preceding Claims, and further comprising a feeding device (22) to take each component (2) from the relative locking devices (19) and/or feed each component (2) to the relative locking devices (19); the feeding device (22) being mobile along the cavity (7) in the first direction (4).
 7. Machine according to Claim 6, wherein the guide (23) is slidingly engaged by the feeding device (22), and protrudes outside both ends of the cavity (7) in the first direction (4).
 8. Machine according to any one of the preceding Claims, wherein the locking devices (19) comprise at least two groups (16a, 16b) of clamping vises (19) mounted on the base (3) on opposite sides of the cavity (7) in the second direction (11).
 9. Machine according to Claim 8, wherein the clamping vises (19) are mobile, with regard to the base (3), in the second direction (11).
 10. Machine according to Claim 8 or 9, wherein the second working head (30, 34) comprises a drilling/milling unit (34) in turn comprising a group of drilling/milling tools (37) faced to each group (16a, 16b) of clamping vises (19).
 11. Machine according to any one of the preceding Claims, wherein the second working head (30, 34) and/or the splinter guard (39) are mobile in a third direction (14) substantially orthogonal to said first and second directions (4, 11).

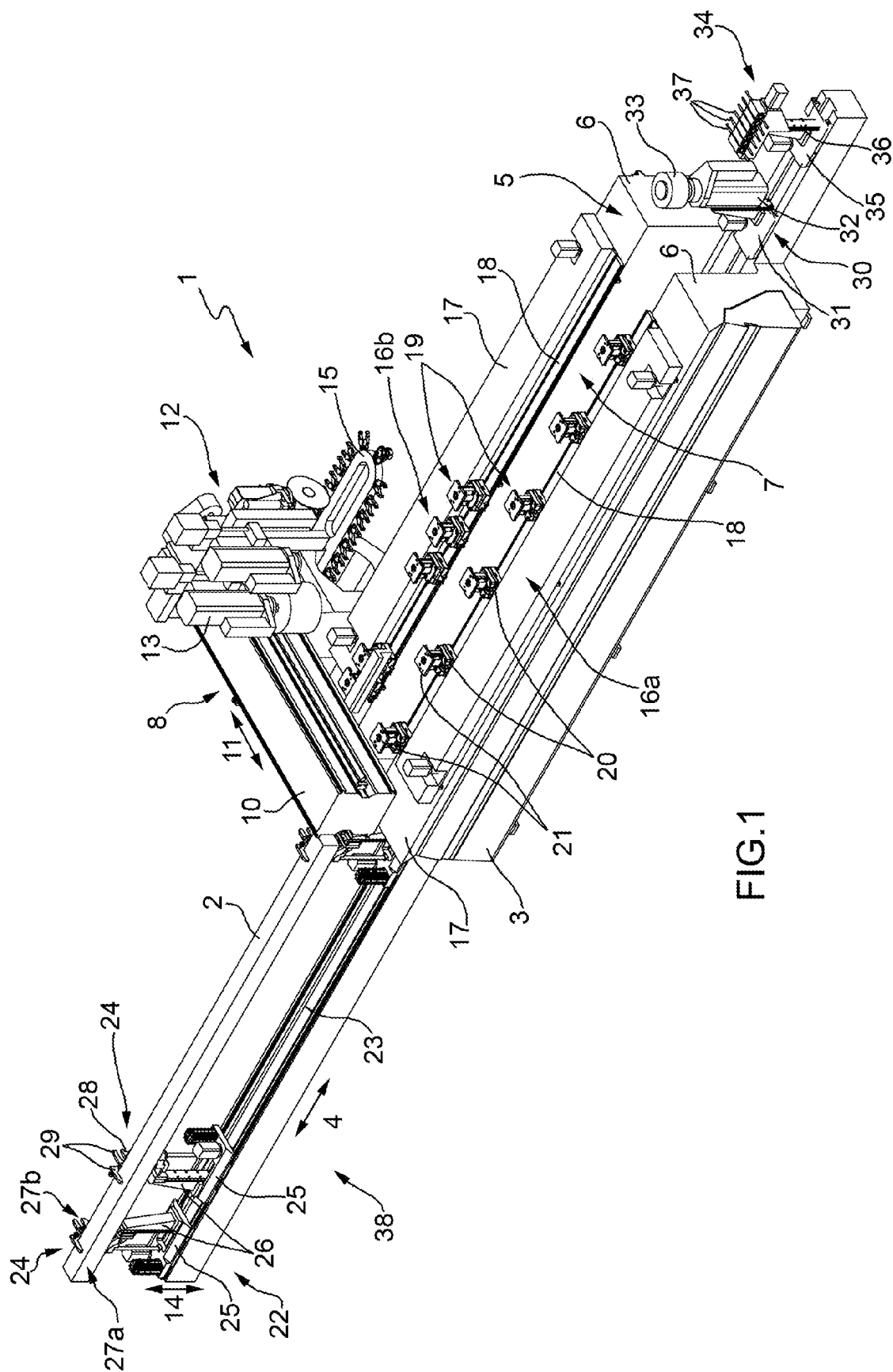


FIG.1

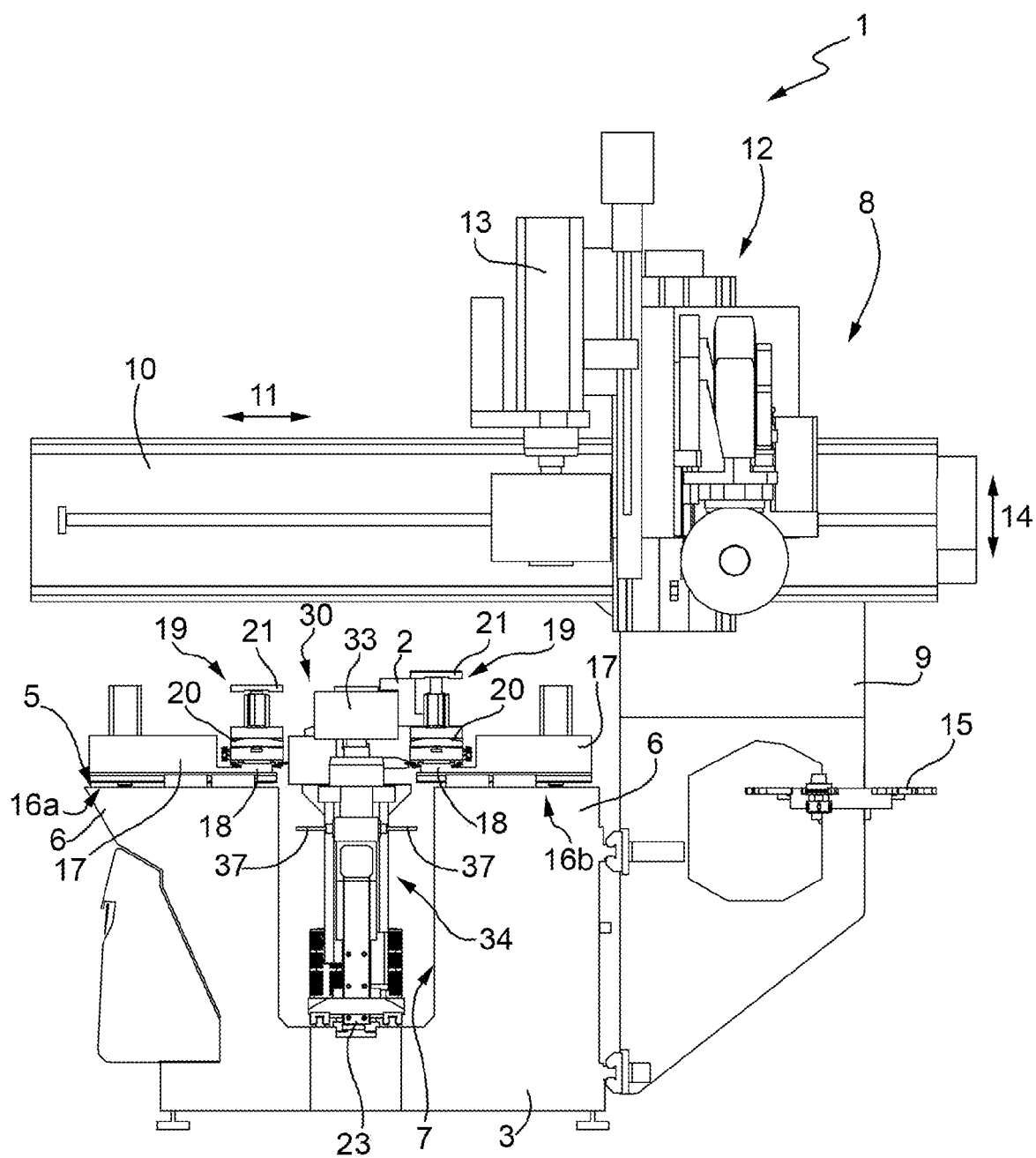


FIG.2

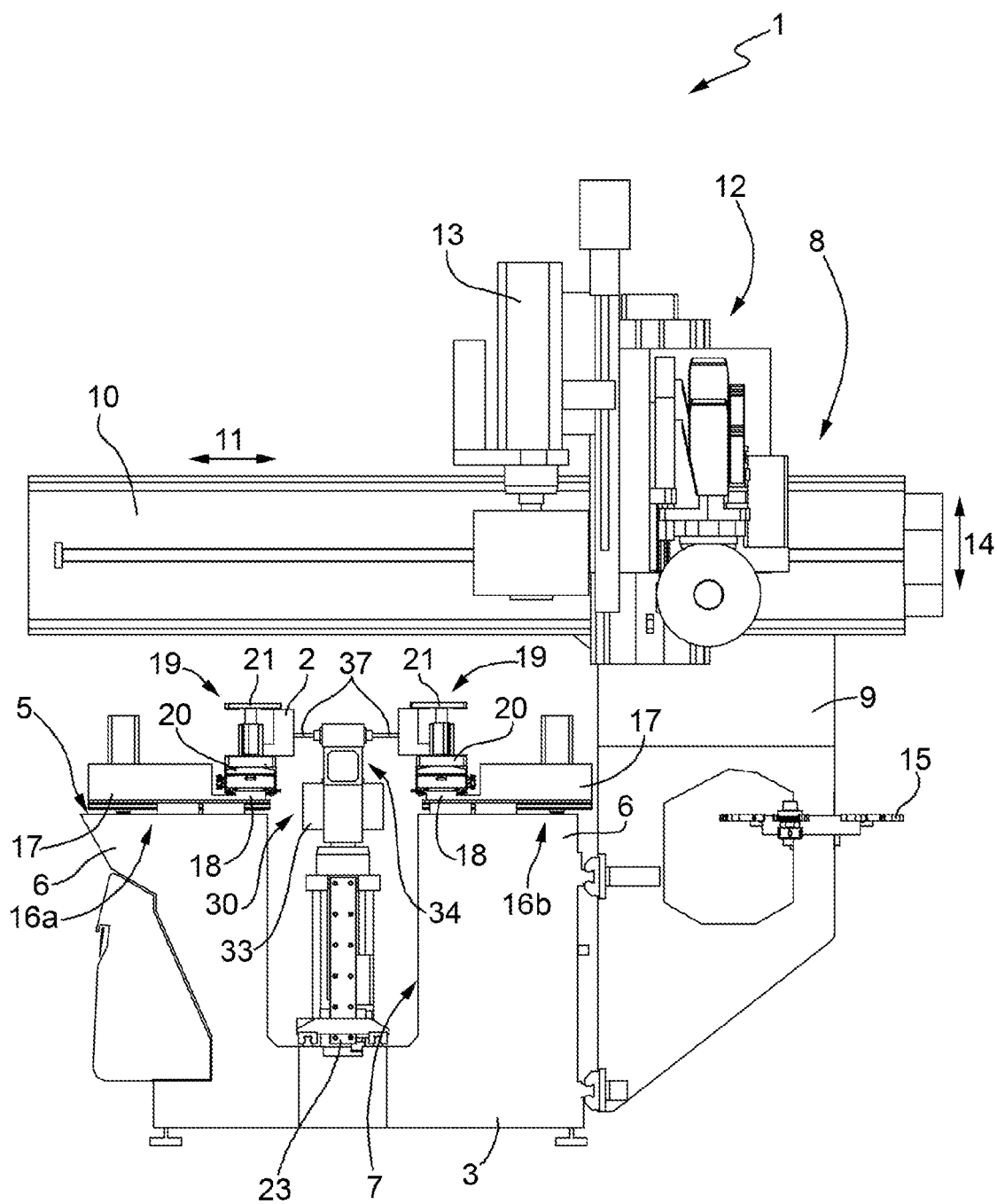


FIG.3

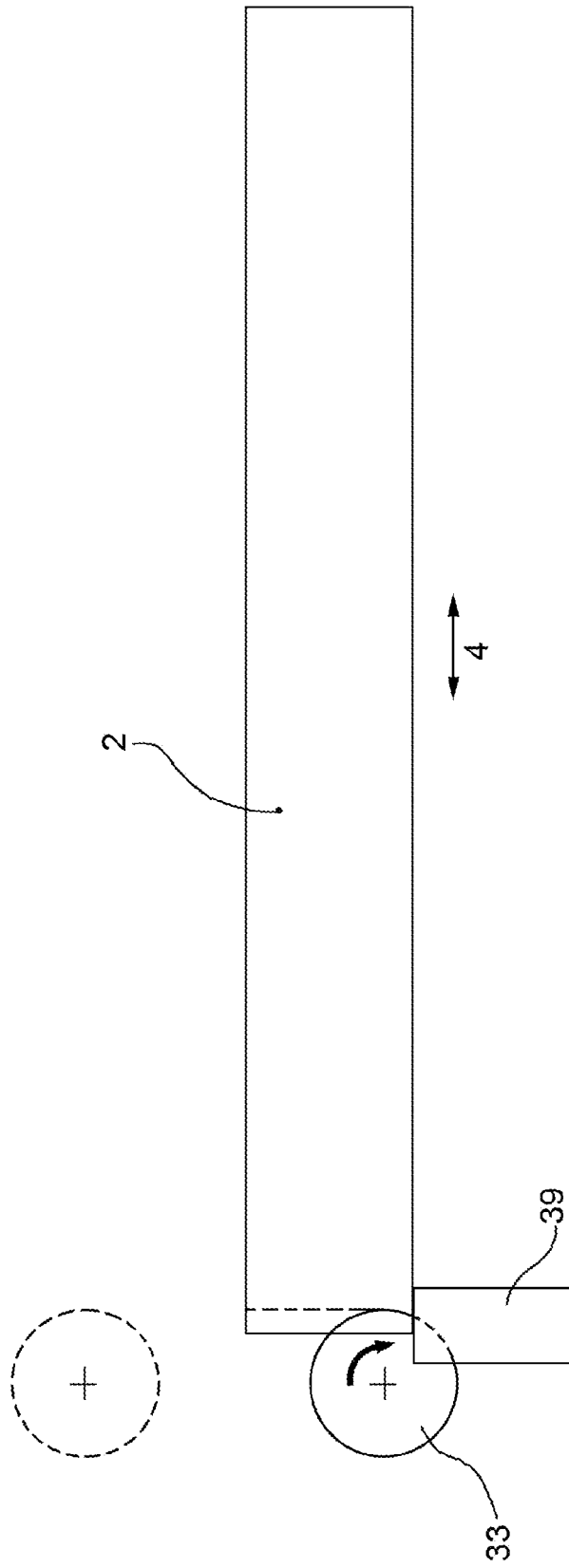


FIG. 4