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

(72) Inventor: **Lattanzi, Lorenzo**  
**61100 PESARO (IT)**

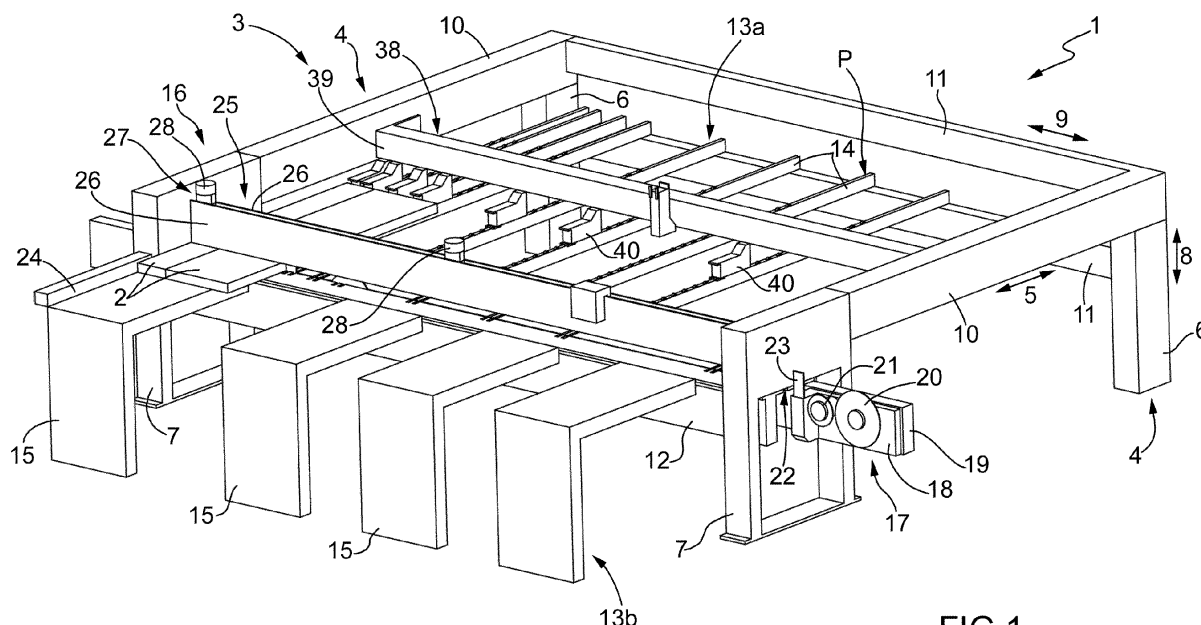
(74) Representative: **Jorio, Paolo et al**  
**Studio Torta S.p.A.**  
**Via Viotti, 9**  
**10121 Torino (IT)**

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(54) **Cutting machine for cutting wood panels or the like**

(57) A cutting machine for cutting wood panels (2) or alike has a feeding device (38), which is mobile in a first direction (5) so as to move at least one panel (2) along a support table (P) and through a cutting station (16) provided with a cutting device (17), which is mobile in a sec-

ond direction (9) transverse to the first direction (5), an auxiliary operating unit (27), which is mobile in the second direction (9), and a hooking device (23; 31; 34), which is mobile between a hooking position of the auxiliary operating unit (27) to the cutting device (17) and a release position.



**FIG.1**

## Description

**[0001]** The present invention relates to a cutting machine for cutting wood panels or alike.

**[0002]** In the field of processing wood panels or alike, it is known to provide a cutting machine comprising a support structure defining a substantially horizontal support table for at least one wood panel or alike; a cutting station; at least one feeding device to move the panels along the support table and through the cutting station in a given first direction; and a cutting device, which is fitted in the cutting station and is mobile in a second direction perpendicular to the first direction so as to perform the cutting of the panels.

**[0003]** The cutting device comprises a motorised carriage fitted beneath the support table and at least one blade, which is mobile in a third direction substantially perpendicular to the support table between a lowered rest position, in which the blade is substantially arranged beneath the support table, and a lifted operating position, in which the blade projects above the support table and slidably engages a cutting channel parallel to the second direction.

**[0004]** The cutting machine further comprises a pressing device, which extends in the second direction and on opposite sides of the cutting channel in the first direction, and is mobile in the third direction between a locking position, in which the panels are locked against the support table, and a release position.

**[0005]** Generally, the cutting machine further has an auxiliary operating unit, which is mounted so as to perform rectilinear movements in the second direction.

**[0006]** For example, the auxiliary operating unit comprises a sucking hood carried by a motorised slide mounted on the pressing device or a milling tool carried by a motorised slide mounted at the cutting station beneath the support table.

**[0007]** Since the cutting device and the auxiliary operating device have respective motorisations which are independent of each other, the known cutting machines of the above-described type are relatively complex and costly.

**[0008]** The object of the present invention is to provide a cutting machine for cutting wood panels or alike which is free from the above-described drawbacks and which is simple and cost-effective to be implemented.

**[0009]** According to the present invention, a cutting machine for cutting wood panels or alike is provided as claimed in the appended claims.

**[0010]** The present invention will now be described with reference to the accompanying drawings, which illustrate an embodiment thereof by way of non-limiting example, in which:

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

figure 2 is a diagrammatic frontal view, with parts removed for clarity, of a detail of the cutting machine in figure 1;

figure 3 is a diagrammatic frontal view, with parts removed for clarity, of a first variation of the detail in figure 2; and

figure 4 is a diagrammatic frontal view, with parts removed for clarity, of a second variation of the detail in figure 3.

**[0011]** With reference to figure 1, numeral 1 indicates, as a whole, a cutting machine for cutting wood panels 2 or alike of substantially rectangular shape.

**[0012]** Machine 1 has a support structure 3 comprising two portal-like frames 4 which are parallel to each other, each of which extends in a horizontal direction 5, and comprises two vertical uprights 6, 7 which are parallel to each other and extend in a direction 8 transverse to direction 5, are aligned at the corresponding uprights 6, 7 of the other frame 4 in a horizontal direction 9 orthogonal to directions 5 and 8, and are connected to each other at the upper ends thereof by a horizontal frame member 10 parallel to direction 5 itself.

**[0013]** The two frames 4 are connected to each other, at the uprights 6, by two crosspieces 11 which are parallel to each other and to direction 9 and, at the uprights 7, by a crosspiece 12 which is parallel to direction 9 itself.

**[0014]** Structure 3 further comprises two support devices 13, which are arranged on opposite sides of crosspiece 12 in direction 5, and define, together with the upper face of crosspiece 12, a substantially horizontal support table P for the panels 2, and one of which (indicated with 13a below) comprises a plurality of roller bars 14 which are parallel to each other and to direction 5 and the other (indicated with 13b below) comprises four beds 15 which are parallel to one another and to direction 5 itself.

**[0015]** Machine 1 further comprises a cutting station 16, which is obtained at the uprights 7, and is provided with a cutting device 17 comprising a motorised carriage 18 coupled in a known manner to a guide 19 which is fixed to the uprights 7 parallel to direction 9 so as to perform, with respect to structure 3 and under the thrust of a known actuating device (not shown), rectilinear movements in direction 9 itself.

**[0016]** Carriage 18 supports a blade 20 and an engraver 21 mounted to rotate around respective longitudinal axes which are parallel to each other and to direction 5 and so as to perform rectilinear movements in direction 8 between relative lowered rest positions, in which blade 20 and engraver 21 are arranged below table P so as to allow the movement of the panels 2 along table P, and relative lifted operating positions, in which blade 20 and engraver 21 project through crosspiece 12 above table P itself so as to perform the cut of the panels 2.

**[0017]** Furthermore, blade 20 and engraver 21 are moved by carriage 18 along a cutting channel 22 parallel to direction 9 with an alternative rectilinear motion, comprising an outward stroke, in which engraver 21, arranged

in front of blade 20 in direction 9 of movement of carriage 18, performs the engraving of panel 2 arranged on table P and blade 20 performs the cut of the panels 2, and a return stroke.

**[0018]** Carriage 18 further supports an approach organ 23, which is arranged on the opposite side of blade 20 with respect to engraver 21, and is mobile in direction 8 between a lowered rest position, in which organ 23 is arranged below table P, and a lifted operating position, in which organ 23 projects above table P so as to slidably engage channel 22, arrange itself in contact with the panels 2, and correctly position the panels 2 in direction 9 against a limit stop 24.

**[0019]** Device 17 cooperates with a pressing device 25 comprising two bars 26, which extend above table P in direction 9, are arranged on opposite sides of channel 22 in direction 5, and are slidably coupled to the uprights 7 so as to perform, with respect to the uprights 7 and under the thrust of a known actuating device (not shown), rectilinear movements in direction 8 from and to a lowered operating position, in which the panels 2 are locked on table P and are cut by device 17 parallel to direction 9.

**[0020]** According to what is shown in figures 1 and 2, machine 1 is provided with an auxiliary operating unit 27 comprising, in this case, two sucking hoods 28, which are arranged between the bars 26 and above table P and channel 22 so as to suck shavings and/or swarf produced by device 17, extend in direction 8, and are slidably coupled to the bars 26 so as to perform, with respect to the bars 26 themselves, rectilinear movements in direction 9.

**[0021]** Each hood 28 has a lower inlet mouth which is shaped so as to be engaged by organ 23 following a movement of organ 23 into the lifted operating position thereof. Hood 28 is selectively moved along the bars 26 in direction 9 when hooked to carriage 18 by means of organ 23, while it is locked along the bars 26 by friction or by means of a known locking device (not shown) once released by organ 23 itself.

**[0022]** From what is described above, it follows that organ 23 carries out both the function of approach device for the panels 2 against the limit stop 24, and the function of hooking device for the hoods 28.

**[0023]** According to a variation (not shown), each hood 28 of at least part of the hoods 28 is provided with a deflector adapted to divert the processing shavings and/or swarf produced by device 17 during the cutting of the panels 2 into hood 28 itself.

**[0024]** The variation shown in figure 3 differs from what is shown in the preceding figures solely in that auxiliary operating unit 27 comprises an approach device 29 alternative or auxiliary to organ 23 and/or the hoods 28.

**[0025]** Device 29 is mounted between the bars 26, extends in direction 8, and comprises a slide 30 which is slidably coupled to the bars 26 so as to perform, with respect to the bars 26 themselves, rectilinear movements in direction 9.

**[0026]** Slide 30 supports an approach organ 31 which is mobile in direction 8 between a lifted rest position (not

shown), in which organ 31 extends above table P and the panels 2, and a lowered operating position (figure 3), in which organ 31 hooks carriage 18 and is moved by carriage 18 along channel 22 so as to arrange itself in contact with the panels 2 and correctly position them against the limit stop 24 in direction 9.

**[0027]** Consequently, organ 31 carries out both the function of approach device for the panels 2 against limit stop 24, and the function of hooking device for hooking auxiliary operating unit 27 to cutting device 17.

**[0028]** The variation shown in figure 4 differs from what is shown in figures 1 and 2 solely in that auxiliary operating unit 27 comprises an approach device 32, which is mounted between the bars 26, and comprises a first slide 33 which is slidably coupled to the bars 26 so as to perform, with respect to the bars 26 themselves, rectilinear movements in direction 9.

**[0029]** Slide 33 is hooked to carriage 18 by means of a hooking organ 34, which is mounted on carriage 18, and is mobile in direction 8 between a lowered rest position (not shown), in which organ 34 extends below table P and the panels 2, and a lifted operating position (figure 4) of hooking slide 33 with carriage 18 itself.

**[0030]** Device 32 further comprises a second slide 35, which is slidably coupled to the bars 26, and is slidably coupled, furthermore, to slide 33 so as to perform, with respect to slide 33 and under the thrust of at least one actuating cylinder 36 housed within slide 33 itself, rectilinear movements in direction 9.

**[0031]** Slide 35 supports an approach organ 37, which is fork-shaped, extends on opposite sides of channel 22 in direction 5, and is mobile in direction 8 between a lifted rest position (not shown), in which organ 37 extends above table P and the panels 2, and a lowered operating position (figure 4), in which organ 37 is arranged in contact with the panels 2 so as to correctly position them against limit stop 24 in direction 9.

**[0032]** In use, once slide 33 is moved close to the panels 2 by means of carriage 18, slide 33 is unhooked from carriage 18 and locked on the bars 26, organ 37 is moved and kept in contact with the panels 2 by cylinder 36, and device 17 performs the cut of the panels 2 by moving through the organ 37 itself.

**[0033]** Machine 1 finally comprises a gripping and transport unit 38 to move the panels 2 along table P and through station 16 in both ways of direction 5.

**[0034]** Unit 38 comprises a motorised support bar 39, which extends between the two frame members 10 in direction 9, is slidably coupled to the two frame members 10 so as to perform, with respect to the frame members 10 themselves and under the thrust of a known actuating device (not shown), rectilinear movements in direction 5, and supports a plurality of gripping organs 40 distributed along bar 39 in direction 9 itself.

**[0035]** Each organ 40 is mobile, with respect to bar 39, between a lifted rest position and a lowered operating position, and comprises two jaws which are mobile with respect to each other between a locking position and a

releasing position of at least one panel 2.

**[0036]** Machine 1 has several advantages which mainly derive from the fact that, when auxiliary operating unit 27 is hooked to carriage 18, the former is moved along pressing device 25 in direction 9 using the same actuating device as carriage 18.

**[0037]** According to several variations (not shown):

the auxiliary operating unit 27 is slidably coupled to a crosspiece which is parallel, and distinct from the bars 26 of pressing device 25;

unit 27 is mobile along, or above a feeding channel which is parallel to, and distinct from channel 22; unit 27 comprises a labeller;

unit 27 comprises a spacer organ adapted to follow blade 20, when hooked to carriage 18 and during the outward stroke of carriage 18 itself, so as to slidably engage a cutting channel obtained through the panels 2 by blade 20 and prevent the deformation of the panels 2 and of the components just separated from the panels 2 themselves; and

the gripping organs 40 are hooked to carriage 18 and moved along bar 39.

## Claims

1. A cutting machine for cutting wood panels (2) or alike, the machine comprising a support structure (3) defining a support table (P) for the panels (2); a cutting station (16); at least one feeding device (38), which is mobile along the support structure (3) so as to move at least one panel (2) along the support table (P) and through the cutting station (16) in a given first direction (5); a cutting device (17), which is fitted to the cutting station (16) and is mobile in a second direction (9), substantially perpendicular to the first direction (5), so as to perform the cut of the panels (2); and an auxiliary operating unit (27), which is mounted so as to perform rectilinear movements in the second direction (9); and being **characterised in that** it comprises, furthermore, a hooking device (23; 31; 34), which is mobile between a hooking position of the auxiliary operating unit (27) to the cutting device (17) and a release position.

2. A cutting machine according to claim 1, wherein the cutting station (16) presents a cutting channel (22) obtained through the support table (P) in the second direction (9); the cutting device (17) comprising a motorised carriage (18) fitted beneath the support table (P) and at least one blade (20, 21), which is mobile in a third direction (8) substantially perpendicular to the support table (P) between a lowered rest position, in which the blade (20, 21) is substantially arranged beneath the support table (P), and a lifted operating position, in which the blade (20, 21) projects above the support table (P) and engages in

a sliding manner the cutting channel (22).

3. A cutting machine according to claim 2, wherein, when the hooking device (23; 31; 34) is arranged in its hooking position, the cutting device (17) and the auxiliary operating unit (27) are mobile in the second direction (9) with laws of motion that are identical to each other under the thrust of the motorised carriage (18).

4. A cutting machine according to claim 2 or 3 and comprising, furthermore, a pressing device (25), which extends in the second direction (9) and on opposite sides of the cutting channel (22) in the first direction (5), and is mobile in the third direction (8) between a locking position, in which the panels (2) are locked against the support table (P), and a release position; the auxiliary operating unit (27) being mounted on the pressing device (25).

5. A cutting machine according to claim 2 or 3 and comprising, furthermore, a crosspiece, which is parallel to the pressing device (25) and distinct from the latter; the auxiliary operating unit (27) being mounted on said crosspiece.

6. A cutting machine according to any of the previous claims, wherein the auxiliary operating unit (27) is mounted above the support table (P).

7. A cutting machine according to any of the previous claims, wherein the auxiliary operating unit (27) comprises at least one sucking hood (28) for sucking shavings and/or swarf generated by the cutting device (17).

8. A cutting machine according to claim 7, wherein the cutting device (17) is provided, furthermore, with an approach organ (23), which is mobile between a lowered rest position and a lifted operating position, in which the approach organ (23) is suited to engage the panels (2) so as to correctly position them in the second direction (9) and/or to hook the sucking hood (28) so as to move it in the second direction (9) itself.

9. A cutting machine according to any of the claims from 1 to 6, wherein the auxiliary operating unit (27) comprises an approach device (29) for correctly positioning the panels (2) in the second direction (9); the hooking device (31) being interposed between the cutting device (17) and the approach device (29).

10. A cutting machine according to any of the claims from 1 to 6, wherein the auxiliary operating unit (27) comprises a first slide (33), which is mobile in the second direction (9), and an approach organ (37), which is coupled in a sliding manner to the first slide (33) so as to move, with respect to the first slide (33),

in the second direction (9), and is suited to correctly position the panels (2) in the second direction (9) itself; the hooking device (34) being interposed between the cutting device (17) and the first slide (33).

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11. A cutting machine according to claim 2 or 3, wherein the auxiliary operating unit (27) comprises a second slide, which is coupled in a sliding manner to the support structure (3) beneath the support table (P), and an operating device, which is mounted on the second slide and is mobile in the third direction (8) between a lowered rest position, in which the operating device is substantially arranged beneath the support table (P), and a lifted operating position, in which the operating device projects above the support table (P) itself. 10
12. A cutting machine according to claim 11, wherein the support structure (3) presents, furthermore, a feeding channel, which is parallel to the cutting channel (22) and distinct from the latter; the operating device engaging in a sliding manner the cutting channel (22) or the feeding channel, when it is arranged in its lifted operating position. 15
13. A cutting machine according to any of the claims from 2 to 5, wherein the auxiliary operating unit (27) comprises a spacing organ, which, when it is hooked to the cutting device (17), is suited to follow the blade (20, 21), so as to engage in a sliding manner a further cutting channel obtained through the panels (2) by the blade (20, 21) itself. 20
14. A cutting machine according to any of the previous claims, wherein the hooking device (23; 31; 34) is mounted on the cutting device (17) and is releasably engageable to the auxiliary operating unit (27). 25
15. A cutting machine according to any of the claims from 1 to 13, wherein the hooking device (23; 31; 34) is mounted on the auxiliary operating unit (27) and is releasably engageable to the cutting device (17). 30

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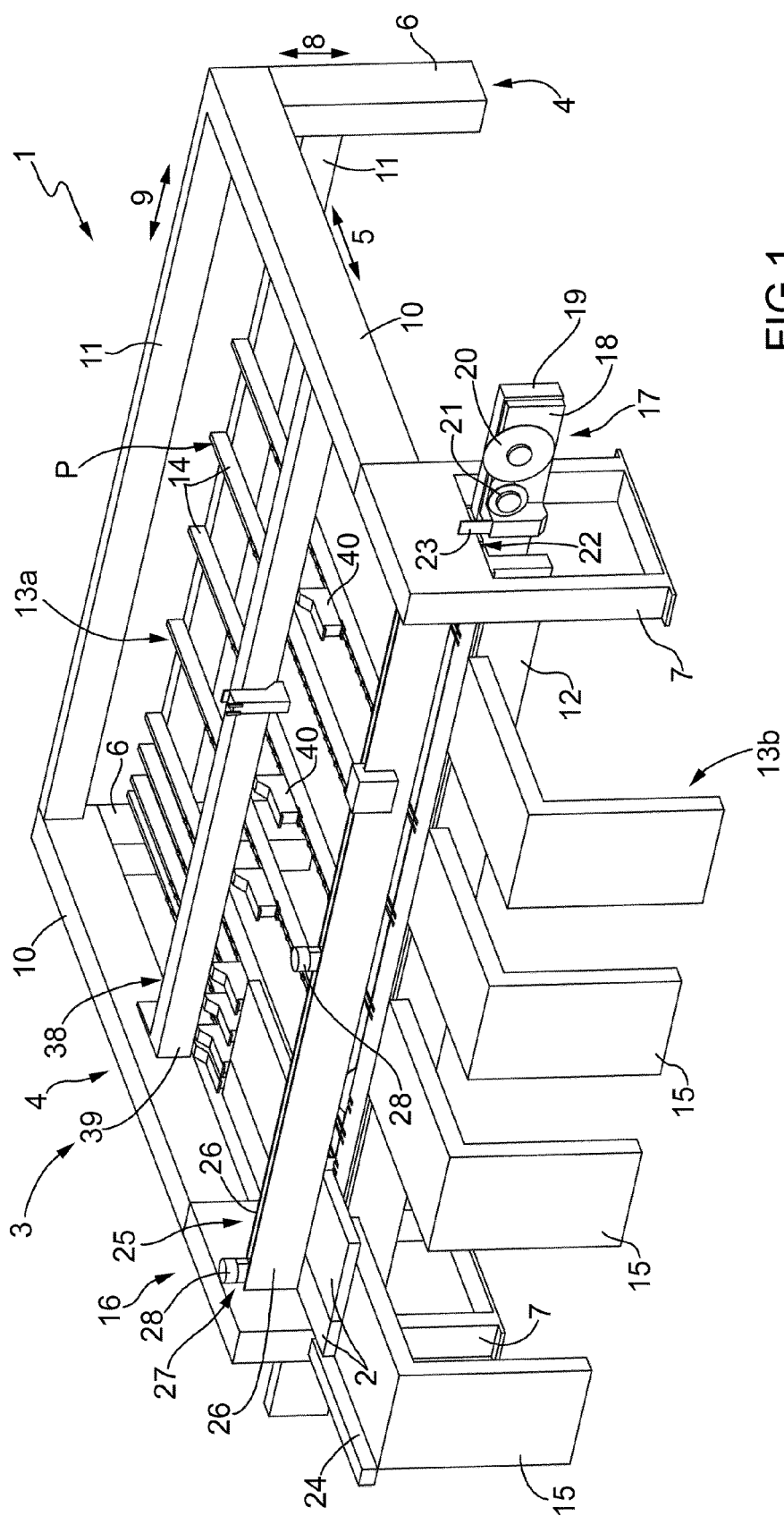


FIG. 1

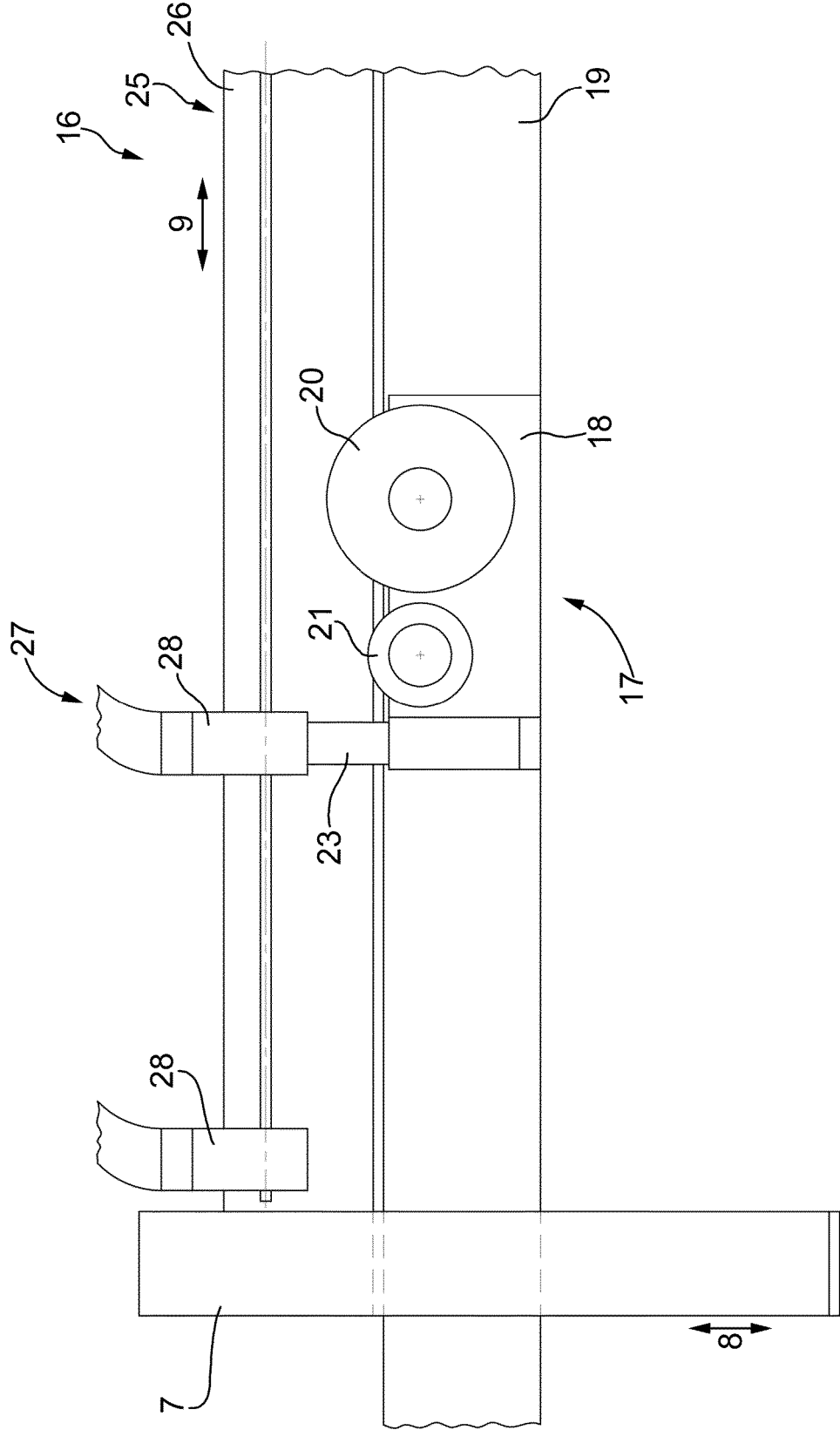


FIG.2

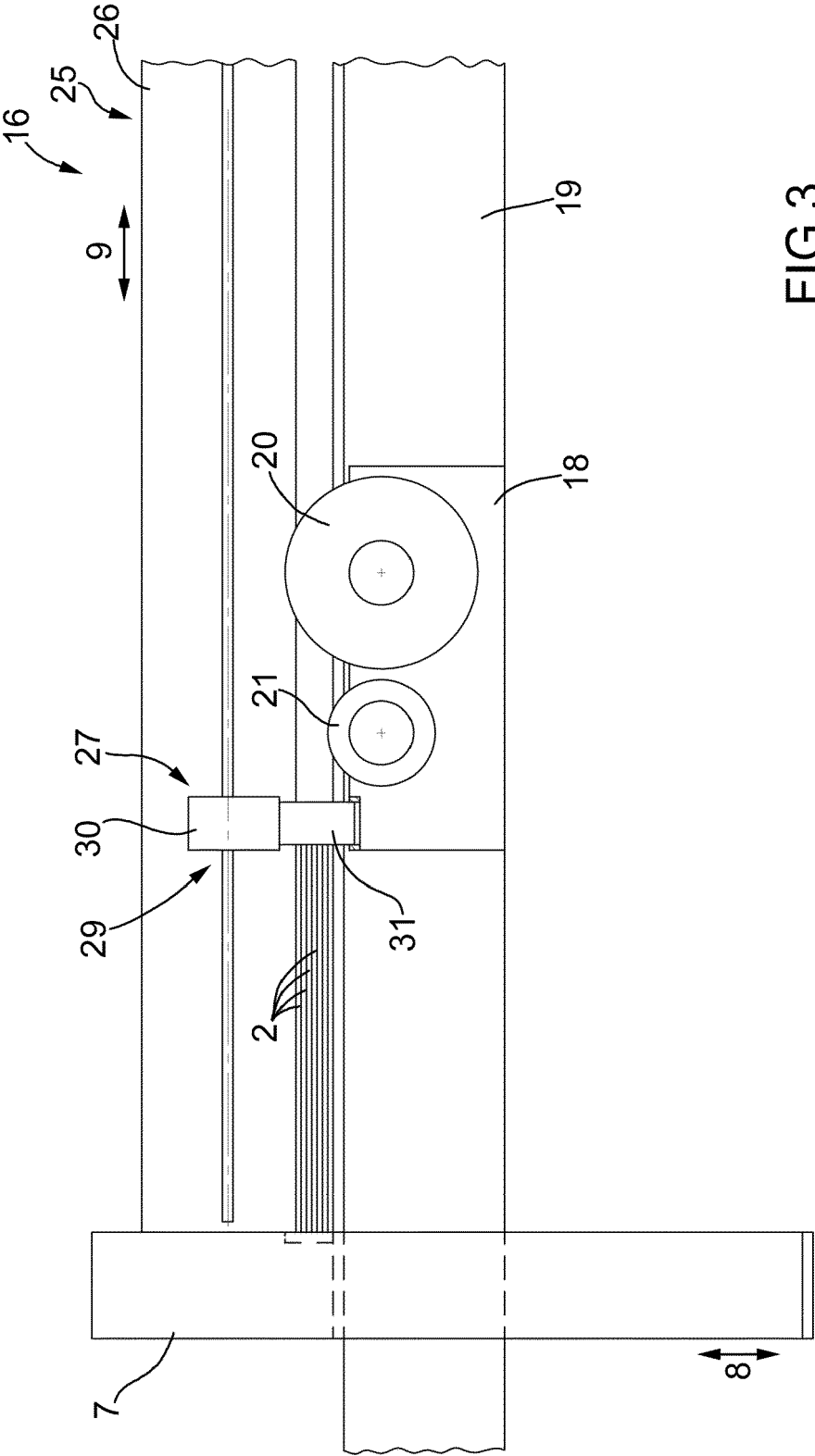
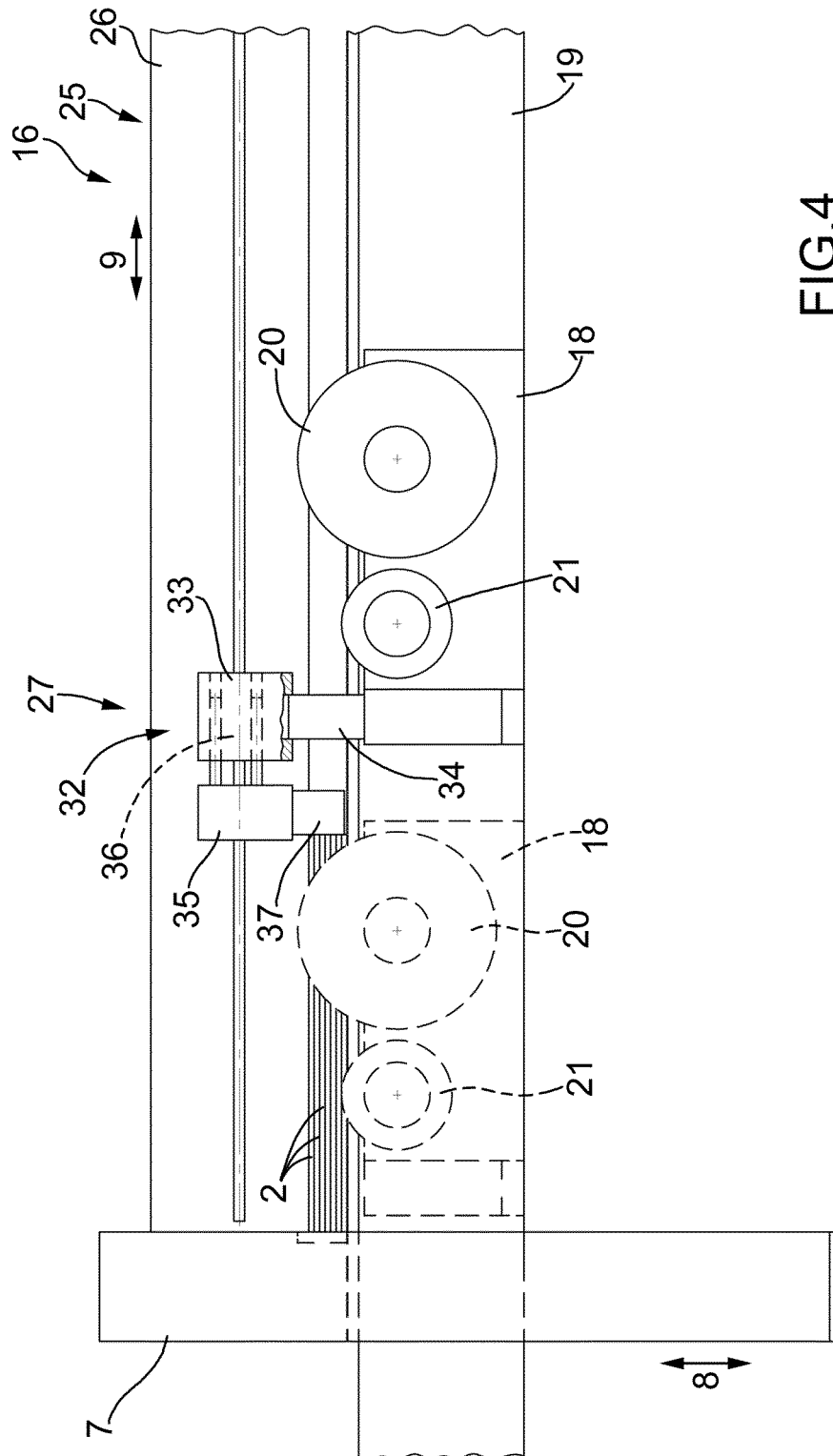


FIG.3







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Application Number  
EP 12 18 6742

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 5 December 2012	Examiner Chariot, David
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	

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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