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(54) **A cutting machine for cutting wood panels or alike**

(57) A cutting machine for cutting wood panels (2) or alike has a supporting structure (3), a motorized first feeding device (20) movable along the supporting structure (3) to feed at least one first panel (2) along a supporting surface (P) and through a cutting station (16), a second feeding device (21) movable along the supporting structure (3) to feed at least one second panel (2) along the supporting surface (P) and through the cutting station (16), and two locking devices (36, 37) to lock the second feeding device (21) selectively onto the supporting structure (3) and onto the first feeding device (20), respectively.

ture (3) to feed at least one second panel (2) along the supporting surface (P) and through the cutting station (16), and two locking devices (36, 37) to lock the second feeding device (21) selectively onto the supporting structure (3) and onto the first feeding device (20), respectively.

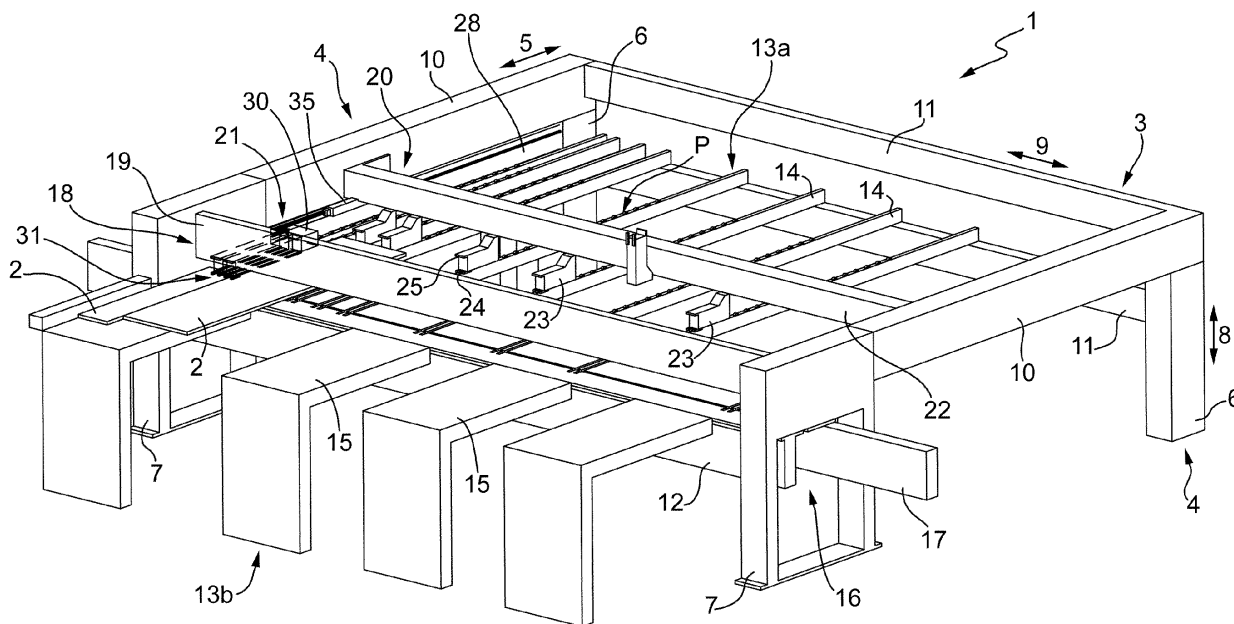


FIG.1

Description

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

[0002] In the wood panel machining sector it is known to make a cutting machine comprising a supporting structure defining a substantially horizontal supporting surface for at least one wood panel or alike; a cutting station; a feeding unit for feeding the panels along the supporting surface and through the cutting station in a given first direction; and a cutting device mounted in the cutting station and movable in a second direction perpendicular to the first direction to cut the panels.

[0003] The feeding unit comprises a motorized first feeding device movable along the supporting structure to feed at least one first panel through the cutting station, and a motorized second feeding device movable along the supporting structure independently from the first feeding device to feed at least one second panel through the cutting station itself.

[0004] There are generally two types of feeding units used to feed the panels along the supporting surface and through the cutting station.

[0005] According to a first type, the first feeding device extends between two side longitudinal members of the supporting structure arranged on opposite sides of the supporting surface in the second direction, and the second feeding device is movable between a resting position, in which the second feeding device is arranged either under the supporting surface or externally to one of the side longitudinal members, and an operating position, in which the second feeding device protrudes over the supporting surface and between the side longitudinal members themselves.

[0006] According to the other of said two known types mentioned above, the two feeding devices are arranged side-by-side and each extend between a respective side longitudinal member and a central longitudinal member mounted between the side longitudinal members.

[0007] In both cases, the feeding unit is relatively complex, cumbersome and costly, it does not allow to implement the second feeding device in cutting machines designed and marketed with a single feeding device, and always requires both feeding devices to be motorized.

[0008] It is an object of the present invention to provide a machine for cutting wood panels or alike, which is free from the above-described drawbacks, and which is simple and cost-effective to make.

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

[0010] The present invention will now be described with reference to the accompanying drawings, which show a non-limitative embodiment thereof, in which:

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

figure 2 is a diagrammatic plan view, with parts removed for clarity, of the cutting machine in figure 1; figure 3 is a diagrammatic side view, with parts removed for clarity, of the cutting machine in figures 1 and 2;

figure 4 is a diagrammatic perspective view, with parts removed for clarity, of a first detail of the machine in figures 1, 2 and 3;

figure 5 is a schematic perspective view, with parts enlarged and parts removed for clarity, of a second detail of the machine in figures 1, 2 and 3;

figure 6 is a diagrammatic front view, with parts removed for clarity, of a first variant of the detail in figure 5;

figure 7 is a diagrammatic front view, with parts removed for clarity, of a second variant of the detail in figure 5;

figure 8 is a diagrammatic front view, with parts removed for clarity, of a third variant of the detail in figure 5; and

figure 9 is a diagrammatic front view, with parts removed for clarity, of a fourth variant of the detail in figure 5.

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

[0012] The machine 1 has a supporting structure 3 comprising two reciprocally parallel gantry frames 4, each of which extends in a horizontal direction 5, and comprises two reciprocally parallel vertical uprights 6, 7, which extend in a direction 8 transversal to direction 5, are aligned with the 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 their upper ends by a horizontal longitudinal member 10 parallel to direction 5 itself.

[0013] The two frames 4 are connected to each other at uprights 6 by two crossmembers 11 parallel to each other and to direction 9 and, at uprights 7 by a crossmember 12 parallel to direction 9 itself.

[0014] The structure 3 further comprises two supporting devices 13, which are arranged on opposite sides of the crossmember 12 in direction 5, and define, along with the upper face of the crossmember 12, a substantially horizontal supporting surface P for the panels 2. One supporting device 13 (hereinafter indicated by numeral 13a) comprises a plurality of roller bars 14 parallel to one another and to direction 5, while the other supporting device 13 (hereinafter indicated by numeral 13b) comprises four beds 15 parallel to one another and to the direction 5 itself.

[0015] The machine 1 further comprises a cutting station 16, which is obtained at the uprights 7 and is provided with a cutting assembly (known and not shown) coupled in known manner to a guide 17 fixed to the uprights 7 parallel to direction 9 to carry out rectilinear displacements in direction 9 itself with respect to the structure 3

and under the bias of an actuating device (known and not shown).

[0016] The cutting assembly (not shown) has a blade and an engraver mounted to turn about respective longitudinal axes parallel to each other and to direction 5 and to carry out rectilinear displacements in direction 8 between respective lowered resting positions, in which the blade and the engraver are arranged under the supporting surface P to allow the feeding of the panels 2 along the supporting surface P, and respective raised operating positions, in which the blade and the engraver protrude through the crossmember 12 over the supporting surface P itself to cut the panels 2.

[0017] Furthermore, the blade and the engraver are displaced by the cutting assembly (not shown) in direction 9 and along a cutting plane T orthogonal to direction 5 with a reciprocating rectilinear motion comprising an outward stroke, in which the engraver, arranged downwards of the blade in the feeding direction 9 of the cutting assembly, engraves the panel 2 arranged on the supporting surface P and the blade cuts the panels 2, and a return stroke.

[0018] The cutting assembly (not shown) cooperates with a pressing device 18 of known type comprising a bar 19, which extends over the supporting surface P in direction 9, is fork-shaped, is provided with two arms (not shown) parallel to each other arranged on opposite sides of the cutting plane T in direction 5, and is slidingly coupled to the uprights 7 to carry out rectilinear displacements in direction 8 with respect to the uprights 7 and under the bias of an actuating device (known and not shown) between a raised resting position and a lowered operating position, in which the panels 2 are blocked on the supporting surface P and cut by the cutting assembly (not shown) parallel to direction 9.

[0019] The machine 1 further comprises two gripping and conveying units 20, 21 of the panels 2 to feed the panels 2 along the supporting surface P and through the station 16 in both senses of direction 5.

[0020] The unit 20 comprises a motorized supporting bar 22, which extends between the two longitudinal members 10 in direction 9, is slidingly coupled to the two longitudinal members 10 to carry out rectilinear displacements in direction 5 with respect to the longitudinal members 10 themselves and under the bias of an actuating device (known and not shown), and supports a plurality of gripping members 23 distributed along the bar 22 in direction 9 itself.

[0021] Each member 23 is mounted on the bar 22 in fixed position in direction 9, is movable with respect to the bar 22 between a raised resting position and a lowered operating position, and comprises a lower jaw 24 and an upper jaw 25 movable with respect to each other between a clamping position and a releasing position of at least one panel 2.

[0022] As regards the above, it is worth specifying that:

the unit 20 is movable in direction 5 within a space

defined between the two longitudinal members 10 and having a width L, measured parallelly to direction 9, substantially equal to the width of the bar 22 also measured parallel to direction 9; and

the members 23 are fixed to the bar 22 so as to be displaced in direction 5 within a space having a width L1 smaller than width L, measured parallel to direction 9.

[0023] As shown in figures 2 and 3, unit 21 comprises a gantry frame 26, which is mounted substantially within one of the frames 4, is arranged outside the space with width L and in contact with the ground, and has two vertical uprights 27 parallel to direction 8 connected to one another, at the upper ends thereof, by a horizontal longitudinal member 28, which extends in direction 5, is arranged at a given distance from the corresponding longitudinal member 10 in direction 8, and has a guide 29 (figure 5) obtained on a side face of the longitudinal member 10 parallel to direction 5 itself.

[0024] With reference to figures 4 and 5, guide 29 is slidingly engaged by a supporting bar 30, which protrudes from the longitudinal member 10 in direction 9, extends within the space with width L, and supports, in the case in hand, two gripping members 31, which protrude from the bar 30 towards the station 16 in direction 5, are arranged within the space with width L, and are fixed to the bar 30 in a lowered operating position.

[0025] The members 31 are movable in direction 5 within a space having width L2 smaller than width L, measured parallel to direction 9, and each comprise a respective lower jaw 32 and a respective upper jaw 33 movable with respect to one another between a clamping position and a releasing position of at least one panel 2.

[0026] The bar 30 further has a guide 34 which extends in direction 5, protrudes from the bar 30 from side opposite to the members 31 in direction 5, and is slidingly engaged by a shoe 35 fixed to a lower face of the bar 22 parallel to direction 5 itself.

[0027] The machine 1 further comprises a stop device (not shown) interposed between the guide 34 and the shoe 35 and shaped so as to prevent the decoupling of the shoe 35 from the guide 34 in one sense or in both senses of direction 5.

[0028] The bar 30, and thus the unit 22, are selectively locked onto the frame 26 and onto the bar 22 by means of respective locking devices 36, 37.

[0029] The device 36 comprises two actuator cylinders (not shown), which are accommodated within the bar 30 on opposite sides of the guide 29 in direction 8, and have respective outlet rods 38 movable in direction 8 between an extracted locking position of the bar 30 on the guide 29 and a retracted releasing position.

[0030] The device 37 comprises two actuator cylinders (not shown), which are accommodated within the shoe 35 on opposite sides of the guide 34 in direction 8, and have respective outlet rods 39 movable in direction 8 between an extracted locking position of the bar 30 on

the bar 22 and a retracted releasing position.

[0031] In use, the displacement of the device 36 in its locking position and of the device 37 in its releasing position causes the locking of the unit 21 onto the frame 26 and the feeding through the cutting station 16 of the panels 2 carried by unit 20 only, while the displacement of the device 36 in its releasing position and of the device 37 in its locking position causes the locking of unit 21 onto unit 20 and the feeding through the station 16 of panels 2 carried by unit 20 and of panels 2 carried by unit 21.

[0032] With unit 21 locked onto the unit 20, the two units 20, 21 are fed in direction 5 under the bias of a single actuating device, i.e. the actuating device (not shown) of unit 20.

[0033] The displacement of unit 20 with respect to unit 21 is controlled by means of a measuring device (not shown) comprising, for instance, a magnetic band fixed to the guide 34 parallel to direction 5 and a sensor mounted on the shoe 35.

[0034] The variant shown in figure 6 differs from that shown in the preceding figures only in that the gantry frame 26 is not present and the bar 30 is slidingly coupled to a guide 40 obtained on a lower face of one of the longitudinal members 10 parallel to direction 5. The bar 30 protrudes between the longitudinal members 10, and the members 31 are arranged within the space with width L.

[0035] The variant shown in figure 7 differs from that shown in figure 6 only in that the bar 30 and the members 31 extend under the respective longitudinal member 10 and are thus arranged outside the space with width L.

[0036] The variant shown in figure 8 differs from that shown in the previous figures from 1 to 5 only in that:

the portal frame 26 is not present;
the bar 30 is slidingly coupled to an upper guide 41 obtained on a lower face of the bar 22 and to a lower guide 42 obtained on an upper face of a bar 43 arranged between two roller bars 14 parallel to direction 5; and
the two locking devices 36, 37 are carried by the bar 30.

[0037] The bar 30 is thus arranged underneath the bar 22, and the members 31 are arranged within the space with width L.

[0038] The variant shown in figure 9 differs from that shown in the previous figures from 1 to 5 only in that:

the portal frame 26 is not present;
the bar 30 is slidingly coupled to an upper guide 44 obtained on a lower face of the bar 22 and to a side guide 45 obtained along one of the longitudinal members 10 parallel to direction 5; and
the two locking devices 36, 37 are carried by bar 30.

[0039] Bar 30 is thus arranged underneath bar 22, and

members 31 are arranged within the space with width L.

[0040] With regards to that explained above, it is worth specifying that in all three variants illustrated in figures 1-5, in figure 6, in figure 7, in figure 8 and in figure 9, respectively, the two spaces with width L1 and L2 are arranged side-by-side and parallel to each other and direction 5, and are not superimposed on each other.

[0041] According to some variants (not shown):

the members 23 of the unit 20 and/or the members 31 of the unit 21 are movable in direction 9 with respect to the respective supporting bars 22 and/or 30; the device 36 is not present and is replaced by locking by friction between the guide 29 and the bar 30; the members 31 of the unit 21 are movable between a lowered operating position and a raised resting position; and

the frame 26 is turned upside down and coupled to one of the longitudinal members 10 by means of the two uprights 27.

[0042] The machine 1 is relatively simple and cost-effective and allows to implement the unit 21 in machines designed and marketed only with unit 20 without requiring any changes to the electric cabinet or causing any operating assembly difficulties of unit 21.

Claims

1. A cutting machine for cutting wood panels (2) or alike, the machine comprising a supporting structure (3) defining a supporting surface (P) for the panels (2); a cutting station (16); a first feeding device (20), comprising a first slide (22) movable along the supporting structure (3) so as to displace at least one first panel (2) along the supporting surface (P) and through the cutting station (16) in a given first direction (5); an actuating device for displacing the first feeding device (20) along the supporting structure (3) in the first direction (5); a second feeding device (21), comprising a second slide (30) movable along the supporting structure (3) so as to displace at least one second panel (2) along the supporting surface (P) and through the cutting station (16) in the first direction (5); and a cutting device mounted in the cutting station (16) and movable in a second direction (9), substantially perpendicular to the first direction (5) to cut the panels (2); and being **characterized in that** it further comprises a first locking device (36) to lock the second slide (30) onto the supporting structure (3) and prevent the displacement of the second feeding device (21) in the first direction (5), and a second locking device (37) to lock the second slide (30) on the first slide (22) and to allow said actuating device to displace the two feeding devices (20, 21) in the first direction (5).

2. A cutting machine according to claim 1, wherein the first locking device (36) is interposed between the second slide (30) and the supporting structure (3), and is movable between a locking position of the second slide (30) on the supporting structure (3) and a releasing position, and wherein the second locking device (37) is interposed between said first and second slide (22, 30), and is movable between a locking position of the second slide (30) on the first slide (22) and a releasing position.
3. A cutting machine according to claim 1, wherein the first locking device (36) is a locking by friction of the second slide (30) on the supporting structure (3), and wherein the second locking device (37) is interposed between said first and second slides (22, 30), and is movable between a locking position of the second slide (30) on the first slide (22) and a releasing position.
4. A cutting machine according to any one of the preceding claims, wherein the supporting structure (3) comprises a first and a second longitudinal guide member (10), which are parallel to each other, extend in the first direction (5), and are slidingly engaged by the first slide (22), and at least one third longitudinal guide member (28), which extends in the first direction (5), is distinct from said first and second longitudinal members (10), and is slidingly engaged by the second slide (30).
5. A cutting machine according to claim 4, wherein the supporting structure (3) comprises a first and a second gantry frame (4), which are arranged on opposite sides of the supporting surface (P) in the second direction (9), and have the first and the second longitudinal member (10), respectively, and a third gantry frame (26), which is inserted within the first gantry frame (4), and has the third longitudinal member (28).
6. A cutting machine according to any one of the claims from 1 to 3, wherein the supporting structure (3) comprises a first and a second longitudinal guide member (10), which are parallel to each other, extend in the first direction (5), and are slidingly engaged by the first slide (22); the second slide (30) being slidingly engaged in the first longitudinal member (10).
7. A cutting machine according to any one of the preceding claims, wherein each of said first and second feeding devices (20, 21) comprises a respective supporting bar (22, 30) defining the respective said slide (22, 30), and at least one respective gripping and/or pushing member (23, 31) mounted on the supporting bar (22, 30) itself; the first feeding device (20) being movable within a space having a width (L), measured parallel to the second direction (9), substantially equal to a width of the supporting bar (22) of the first feeding device (20).
8. A cutting machine according to claim 7, wherein the gripping and/or pushing members (31) of the second feeding device (21) are arranged within said space with width (L).
9. A cutting machine according to claim 7, wherein the gripping and/or pushing members (31) of the second feeding device (21) are arranged outside said space with width (L).
10. A cutting machine according to any one of the claims from 7 to 9, wherein the supporting bars (22, 30) of the two feeding devices (20, 21) are slidingly coupled to each other; a stop device being provided to prevent the supporting bars (22, 30) from decoupling from one another in at least one sense of the first direction (5).
11. A cutting machine according to any one of the claims from 7 to 10, wherein each gripping and/or pushing member (23, 31) of at least some of the gripping and/or pushing members (23, 31) of the first feeding device (20) and/or of the second feeding device (21) is movable between a lowered operating position and a raised resting position.
12. A cutting machine according to any one of the claims from 7 to 11, wherein the gripping and/or pushing members (23, 31) of said first and second feeding device (20, 21) are mounted on the respective supporting bars (22, 30) in a fixed position in the second direction (9), and are movable in the first direction (5) within respective spaces, which are parallel to each other, are arranged reciprocally side-by-side and are not reciprocally superimposed.
13. A cutting machine according to any one of the preceding claims, wherein each said first and second feeding device (20, 21) comprises at least one gripping and/or pushing member (23, 31) mounted on the respective slide (22, 30).
14. A cutting machine according to any one of the preceding claims, wherein said first and second slide (22, 30) are coupled in reciprocally sliding manner to each other.

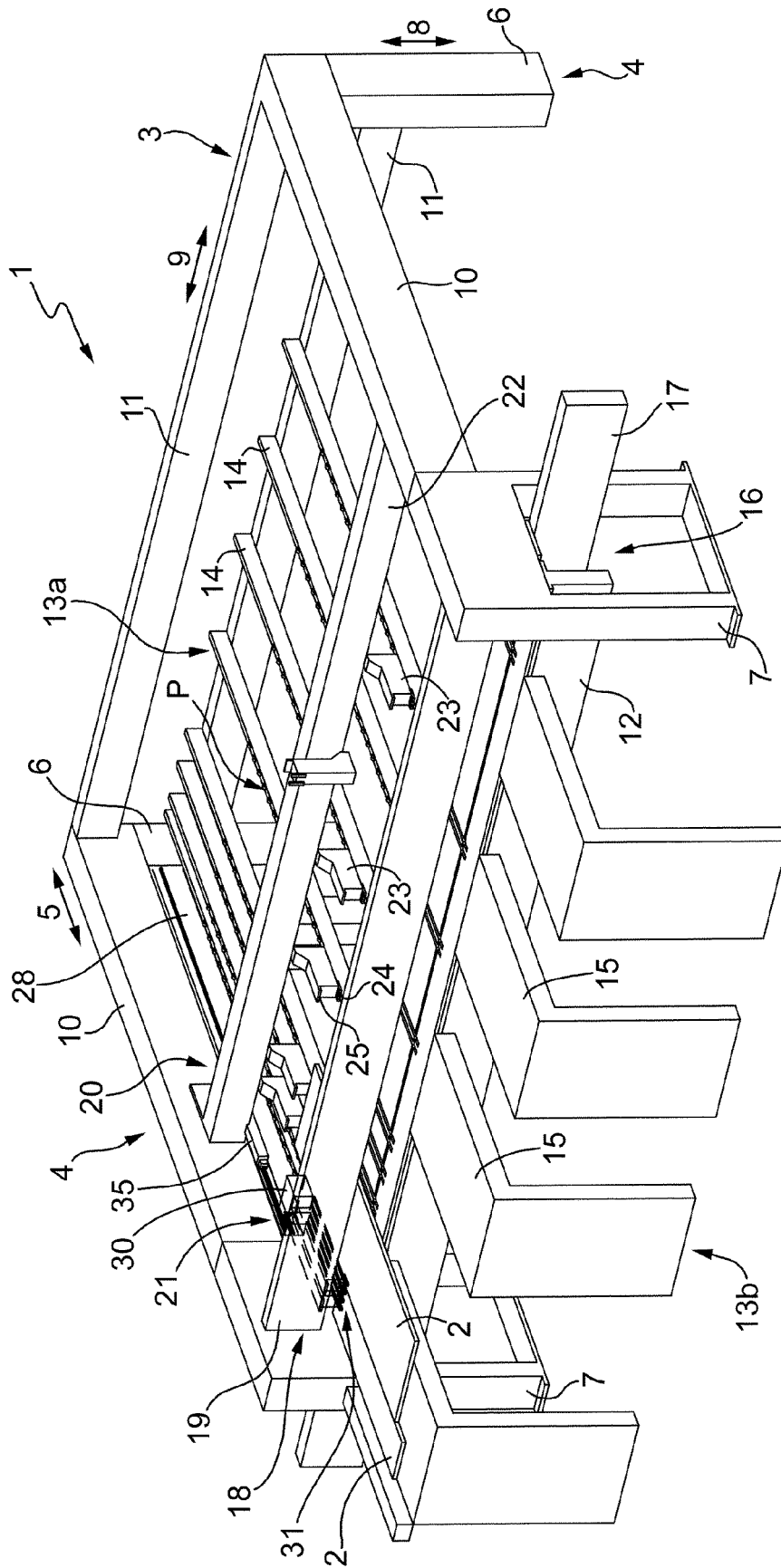


FIG.1

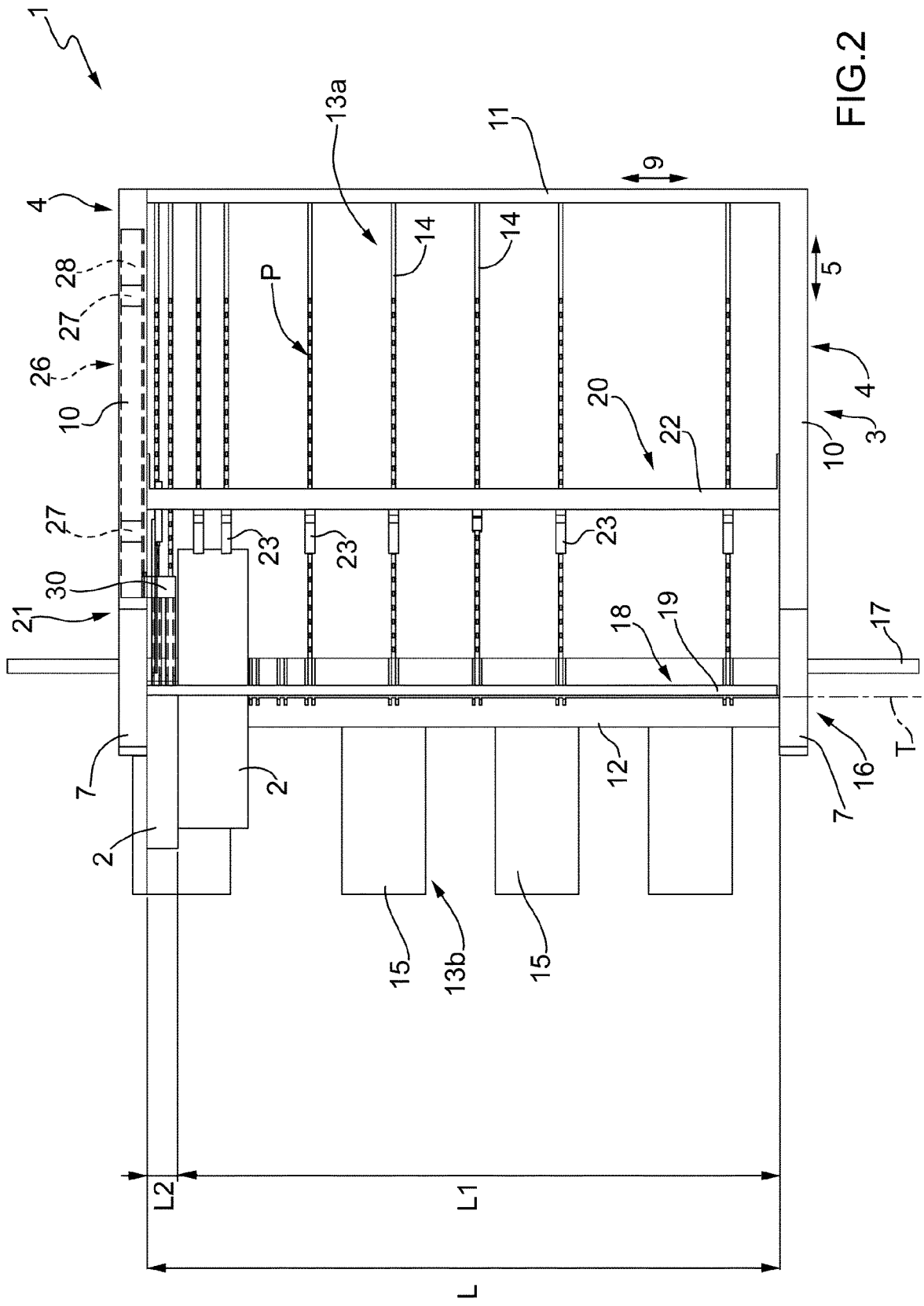


FIG. 2

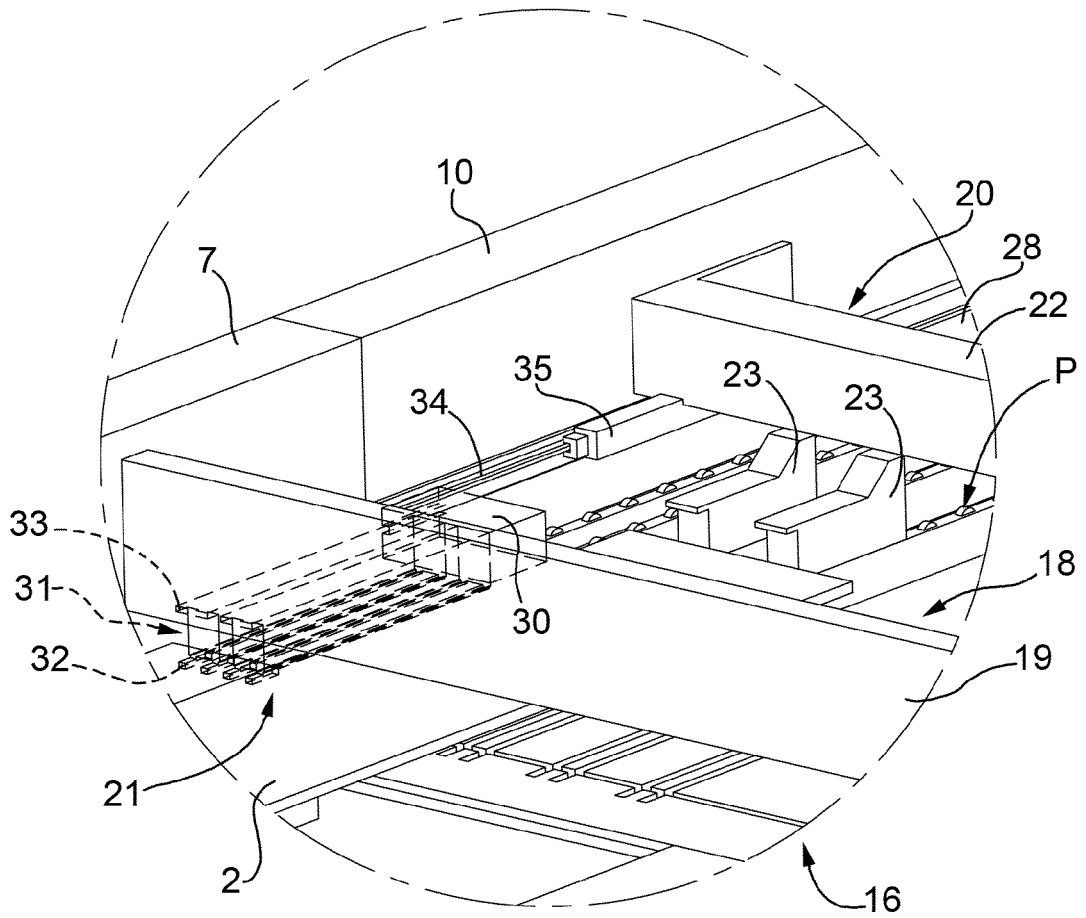


FIG. 4

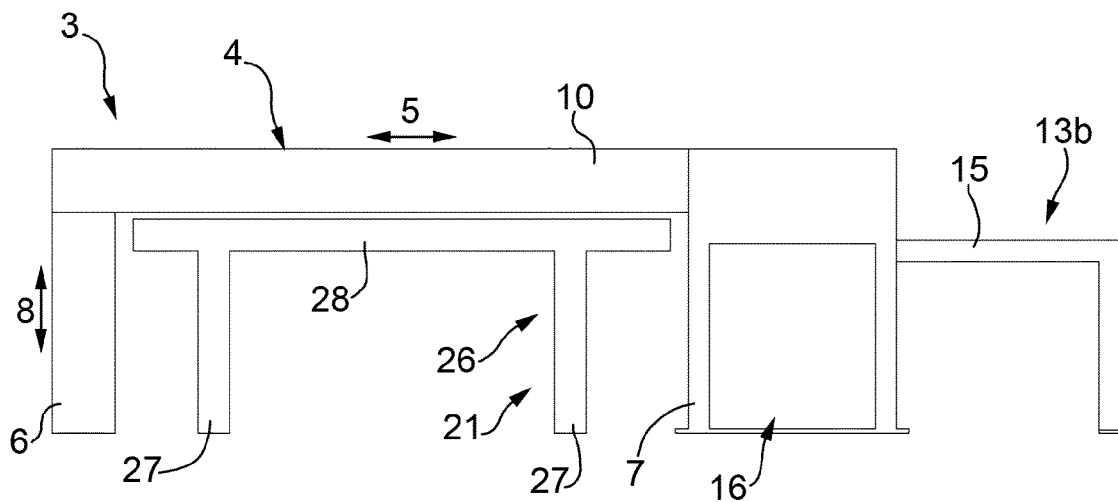


FIG. 3

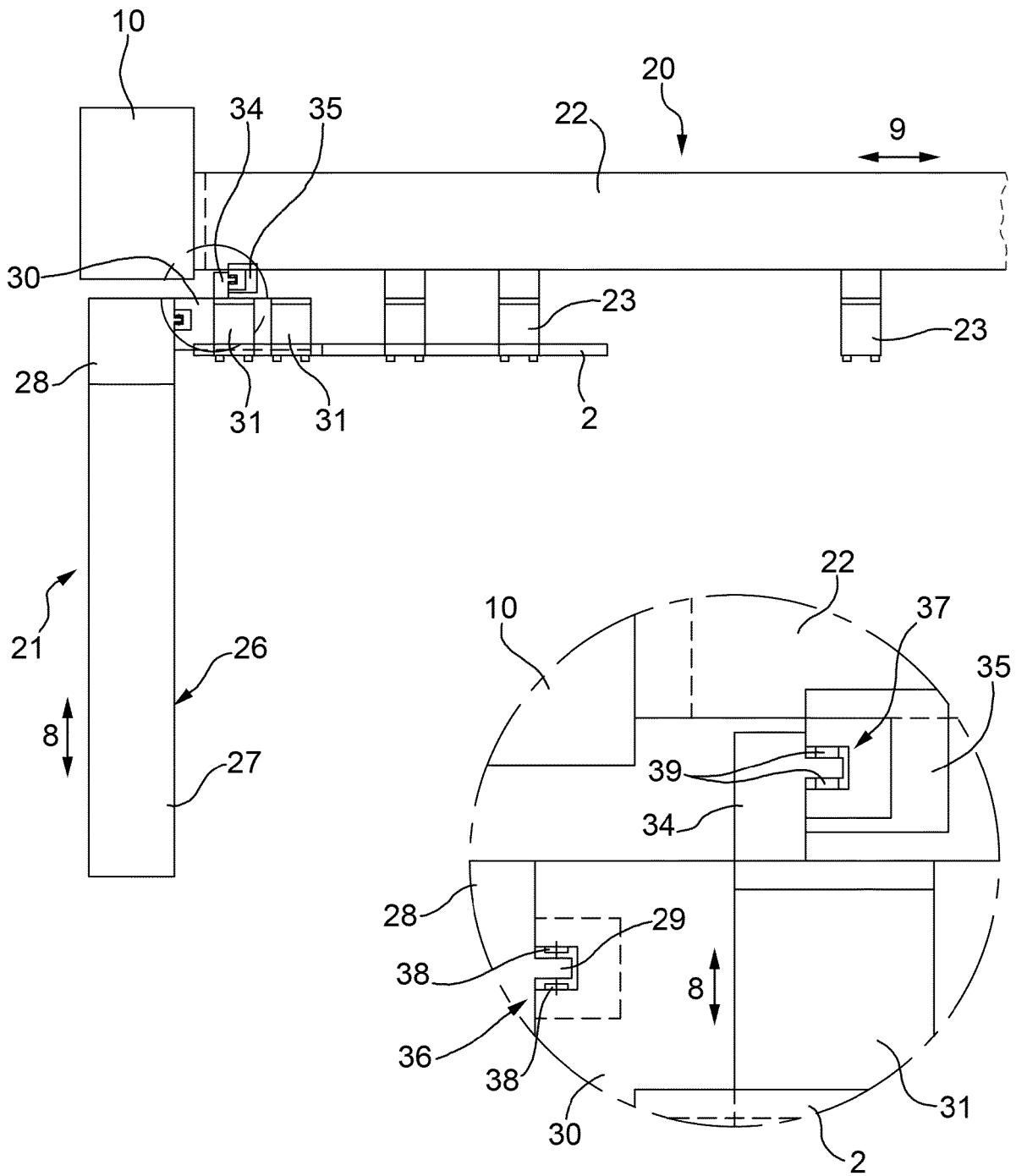


FIG.5

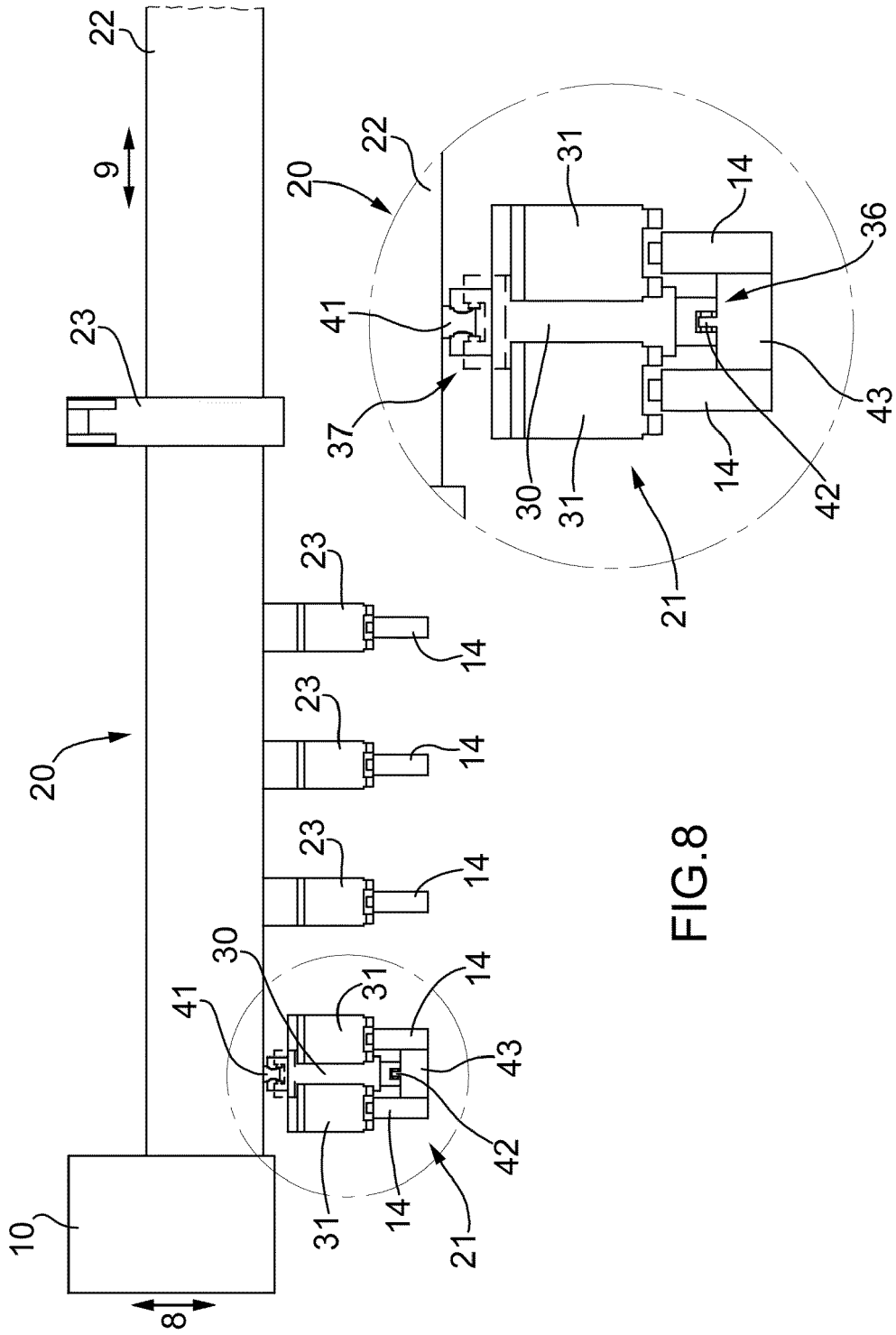


FIG.8

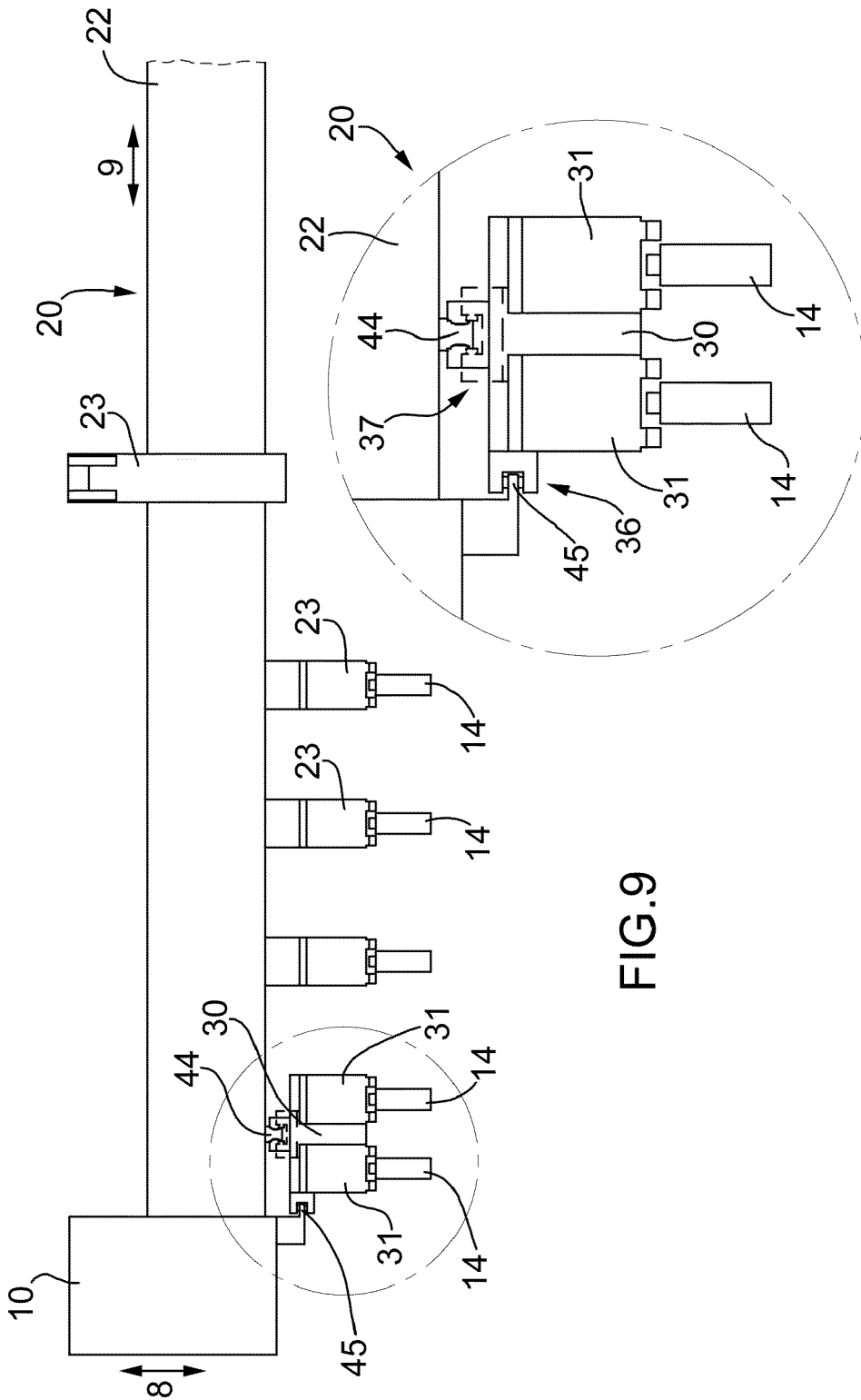


FIG.9



EUROPEAN SEARCH REPORT

Application Number
EP 12 17 4674

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	US 3 946 631 A (MALM JOHN A) 30 March 1976 (1976-03-30) * the whole document * -----	1,2,6-9, 12-14	INV. B23D47/02 B27B5/29 B23D47/04
X	EP 0 911 105 A1 (SELCO SPA [IT] BIESSE SPA [IT]) 28 April 1999 (1999-04-28) * claims 1-3; figures 1,2 * -----	1,2,6-8	
A	US 2 945 517 A (SOWER ALBERT J ET AL) 19 July 1960 (1960-07-19) * column 5, last paragraph - column 7, line 30; figures 1,2 * -----	1,3,4	
A	US 2 657 680 A (HAROLD EVANS) 3 November 1953 (1953-11-03) * column 6, line 1 - column 7, line 1; figures 1,2,3,4 * -----	1-12	
			TECHNICAL FIELDS SEARCHED (IPC)
			B23D B27B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 10 September 2012	Examiner Herbreteau, D
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
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 17 4674

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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10-09-2012

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3946631	A	30-03-1976	NONE	

EP 0911105	A1	28-04-1999	AT 256522 T	15-01-2004
			DE 69820564 D1	29-01-2004
			DE 69820564 T2	25-11-2004
			EP 0911105 A1	28-04-1999
			ES 2213867 T3	01-09-2004
			IT 1295636 B1	24-05-1999
			US 6029555 A	29-02-2000

US 2945517	A	19-07-1960	NONE	

US 2657680	A	03-11-1953	NONE	
