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(54) **Machine for working wood panels or similar**

(57) A machine, for working wood panels (2) or similar, has an air-cushion table (13, 39, 41) for supporting at least one panel (2); the table (13, 39, 41) housing a chamber (13a), which communicates with the outside through a number of holes (16) formed through the table

(13, 39, 41), and is connected pneumatically to a compressed-air source (S) for supplying the chamber (13a) with a given amount of compressed air, which is supplemented with an additional amount of outside air drawn in by at least one air-amplifying device (15).

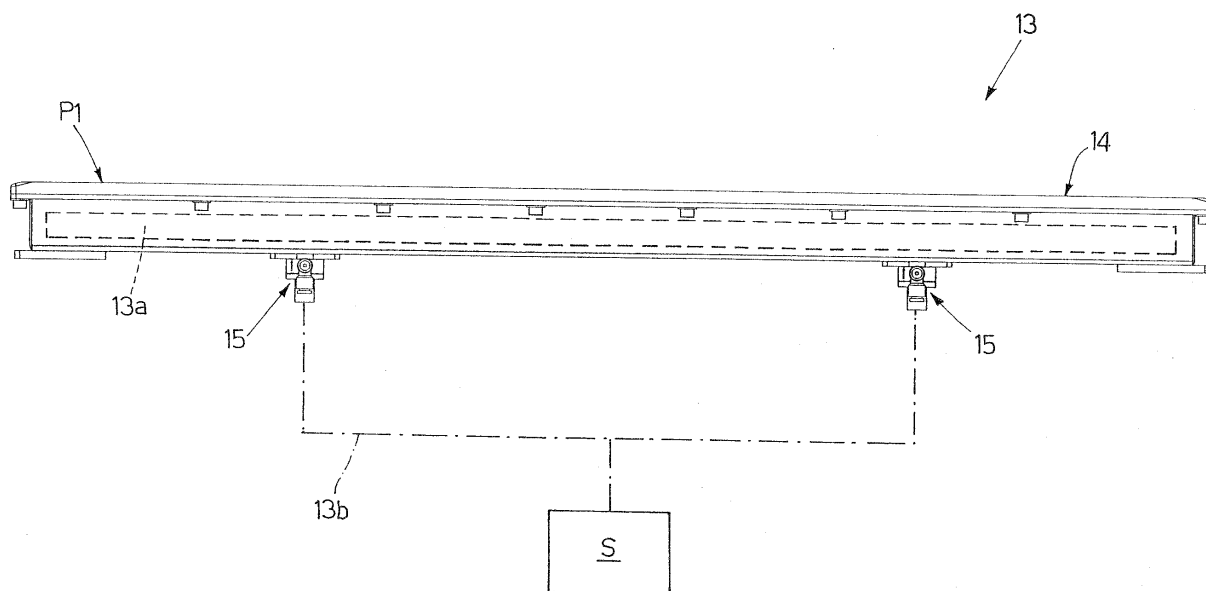


Fig.3

Description

[0001] The present invention relates to a machine for working wood panels or similar.

[0002] More specifically, the present invention relates to a machine, for working wood panels or similar, of the type comprising a table for at least one panel; and a machining head for machining the panel. The table houses a chamber connected pneumatically to a compressor and communicating with the outside through a number of holes formed through a top face of the table to form an air cushion by which to reduce friction between the panel and the table, and so move the panel easily along the table.

[0003] Known machines of the above type for working wood panels or similar have several drawbacks, mainly due to their requiring compressors capable of producing relatively large amounts of compressed air, and so being unsuitable for installation in plants equipped with relatively low-power compressors.

[0004] It is an object of the present invention to provide a machine for working wood panels or similar, designed to eliminate the above drawbacks, and which is cheap and easy to produce.

[0005] According to the present invention, there is provided a machine for working wood panels or similar, as claimed in the accompanying Claims.

[0006] A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a schematic view in perspective of a preferred embodiment of the machine according to the present invention;

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

Figure 3 shows a schematic side view, with parts removed for clarity, of a second detail in Figure 1;

Figure 4 shows a schematic view in perspective of a wood panel or similar;

Figure 5 shows a schematic longitudinal section of a detail in Figure 3.

[0007] With reference to Figures 1 and 4, number 1 indicates as a whole a machine for working wood panels 2 or similar, each of which is substantially parallelepiped-shaped with a substantially rectangular cross section, and has two substantially parallel major lateral faces 3, two parallel minor lateral faces 4 perpendicular to faces 3, and two parallel minor lateral faces 5 perpendicular to faces 3 and 4.

[0008] Machine 1 comprises a substantially C-shaped bed 6 supporting a grip-and-carry unit 7 for gripping and transporting panels 2, and which in turn comprises an elongated cross member 8 which extends in a horizontal direction 9, projects laterally from bed 6 in direction 9, and is fitted in known manner to bed 6 to move linearly,

with respect to bed 6 and under the control of a known actuating device not shown, in a horizontal direction 10 perpendicular to direction 9.

[0009] Cross member 8 supports two supporting devices 11, 12 for supporting panels 2 and located on opposite sides of bed 6 in direction 9; device 11 is a pneumatic supporting device, and device 12 a roller supporting device.

[0010] As shown in Figures 1 and 3, device 11 comprises a table 13, which is bounded on top by a substantially horizontal face 14 defining a supporting surface P1 for panels 2, and houses a chamber 13a, which is connected pneumatically to a compressed-air source S by a pneumatic circuit 13b having two air-amplifying devices 15, and communicates with the outside through a number of holes 16 formed through face 14 to form, on face 14, an air cushion by which to reduce friction between panels 2 and table 13, and so move panels 2 easily on supporting surface P1.

[0011] With reference to Figure 5, each device 15 comprises an axially-open, cylindrical coupling 17, which has a longitudinal axis 18, a radial fitting 19 connected to circuit 13b, a first end 20 communicating with the outside, and a second end 21 for housing a sleeve 22. Sleeve 22 fits inside coupling 17, coaxially with axis 18, and has an endpiece 23 projecting outwards of end 21 and connected pneumatically to chamber 13a.

[0012] Coupling 17 and sleeve 22 are designed to define between them an annular chamber 24, which communicates pneumatically with fitting 19, and is open radially inwards, so that the compressed air fed into chamber 24 through fitting 19 flows into coupling 17 and sleeve 22 and towards endpiece 23, and so forms, inside coupling 17 and sleeve 22, a strong depression by which to draw a relatively large amount of outside air through end 20.

[0013] Air-amplifying devices 15 therefore also enable table 13 to be used with compressed-air sources S capable of only producing relatively small amounts of compressed air, which are combined with the outside air drawn in by devices 15.

[0014] As shown in Figure 1, device 12 comprises a number of parallel supporting bars 25 projecting from cross member 8 in direction 10, and each supporting a respective number of supporting rollers 26, which are fitted idly to relative bars 25 to rotate, with respect to relative bars 25, about respective longitudinal axes (not shown) parallel to direction 10, and define a supporting surface P2 substantially coplanar with supporting surface P1.

[0015] Cross member 8 is also bounded on top by a flat horizontal surface 27, and has two guides 28 fitted to surface 27, in a direction parallel to direction 9, and supporting, in the example shown, two grip-and-carry devices 29 for moving panels 2 on surfaces P1 and P2 and through bed 6.

[0016] Each device 29 comprises a slide 30, which is fitted in known manner to guides 28 to move linearly in

direction 9 along guides 28 under the control of a known actuating device not shown, and supports a gripper 31 comprising a bottom jaw 32 and a top jaw 33, both parallel to surfaces P1 and P2.

[0017] Jaws 32 and 33 project from cross member 8 in direction 10, engage at least one panel 2 by one of faces 4 or 5, and are fitted in known manner to slide 30 to move - with respect to slide 30, under the control of a known actuating device not shown, and in a vertical direction 34 perpendicular to directions 9 and 10 - between a gripping position and a release position gripping and releasing panels 2 respectively.

[0018] Gripper 31 also has at least one locating member 35, which extends in direction 34, crosswise to surfaces P1 and P2, to position panels 2 correctly in direction 10, and is associated with at least one further known locating member (not shown) for positioning panels 2 correctly in direction 9.

[0019] With reference to Figure 2, bed 6 also supports a machining head 36 fixed in directions 9 and 10 and comprising a bottom machining unit 37 extending substantially beneath surfaces P1 and P2, and a top machining unit 38 extending substantially over surfaces P1 and P2.

[0020] Machining unit 37 comprises a table 39 substantially coplanar with table 13, identical with table 13, and therefore fitted with two air-amplifying devices 15; and a number of vertical tool spindles (not shown), which are mounted to rotate about respective longitudinal axes parallel to direction 34, are designed to receive and retain respective drill bits, and are movable, in direction 34, between a lowered position, in which the respective drill bits are substantially located beneath table 39, and a raised position, in which the respective drill bits project above table 39 to perform respective drilling operations on faces 3 of panels 2.

[0021] Machining unit 37 also comprises a number of horizontal tool spindles 40, which are mounted to rotate about respective longitudinal axes parallel to direction 9 and/or 10, are designed to receive and retain respective drill bits (not shown), and are movable, in direction 34, between a lowered position, in which the respective drill bits (not shown) are substantially located beneath table 39, and a raised position, in which the respective drill bits (not shown) project above table 39 to perform respective drilling operations on faces 4 and/or 5 of panels 2.

[0022] Like machining unit 37, machining unit 38 comprises a table 41, which engages panels 2 on top, is identical with tables 13 and 39, and is therefore fitted with two air-amplifying devices 15; a number of vertical tool spindles (not shown), which are mounted to rotate about respective longitudinal axes parallel to direction 34, are designed to receive and retain respective drill bits, and are movable, in direction 34, between a lowered work position and a raised rest position; and/or a number of horizontal tool spindles (not shown), which are mounted to rotate about respective longitudinal axes parallel to direction 9 and/or 10, are designed to receive and retain

respective drill bits, and are movable, in direction 34, between a lowered work position and a raised rest position.

[0023] Tables 13, 39, 41 may, obviously, be installed on other types of machines for working wood panels or similar, such as cutting machines.

Claims

1. A machine for working wood panels (2) or similar, the machine comprising an air-cushion table (13, 39, 41) for supporting at least one panel (2), the table (13, 39, 41) housing a chamber (13a) communicating with the outside through a number of holes (16) formed through a face (14) of the table (13, 39, 41); and a pneumatic circuit (13b) for connecting the chamber (13a) pneumatically to a source (S) supplying the chamber (13a) with a given amount of compressed air; and being **characterized by** also comprising at least one air-amplifying device (15) cooperating with the source (S) to supplement the compressed air from the source (S) with an additional amount of outside air.
2. A machine as claimed in Claim 1, wherein the table (13, 39) is a bottom table defining a supporting surface (P1) for said panel (2).
3. A machine as claimed in Claim 1, wherein the table (41) is a top table located over said panel (2).
4. A machine as claimed in any one of the foregoing Claims, wherein the air-amplifying device (15) is located along said pneumatic circuit (13b).
5. A machine as claimed in any one of the foregoing Claims, wherein the air-amplifying device (15) comprises a conduit (17, 22), which has a given longitudinal axis (18), a first end (20) communicating with the outside, and a second end (23) connected pneumatically to said chamber (13a); an annular further chamber (24) open radially inwards of the conduit (17, 22); and a radial fitting (19) connecting said further chamber (24) pneumatically to said source (S).

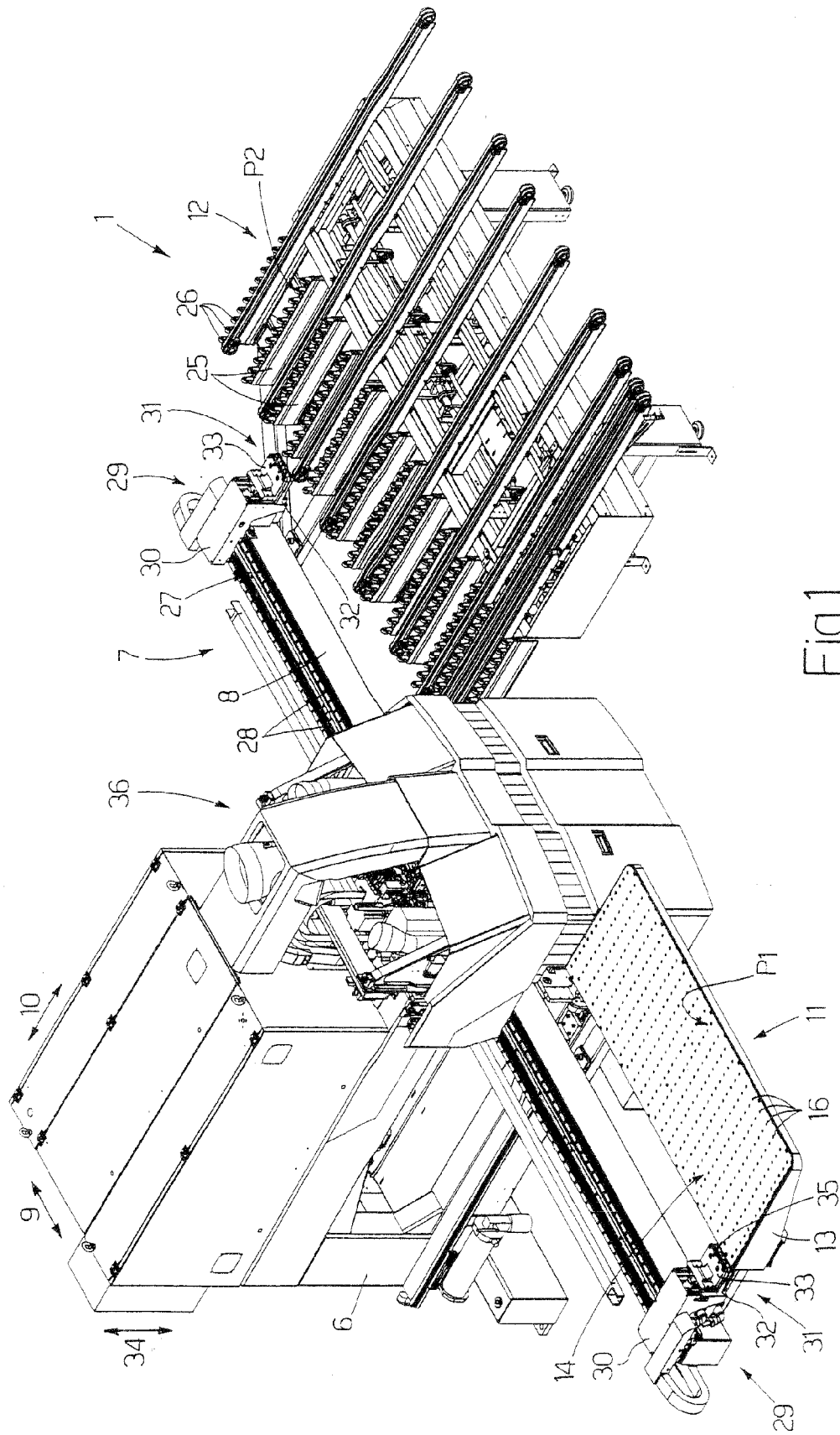


Fig.1

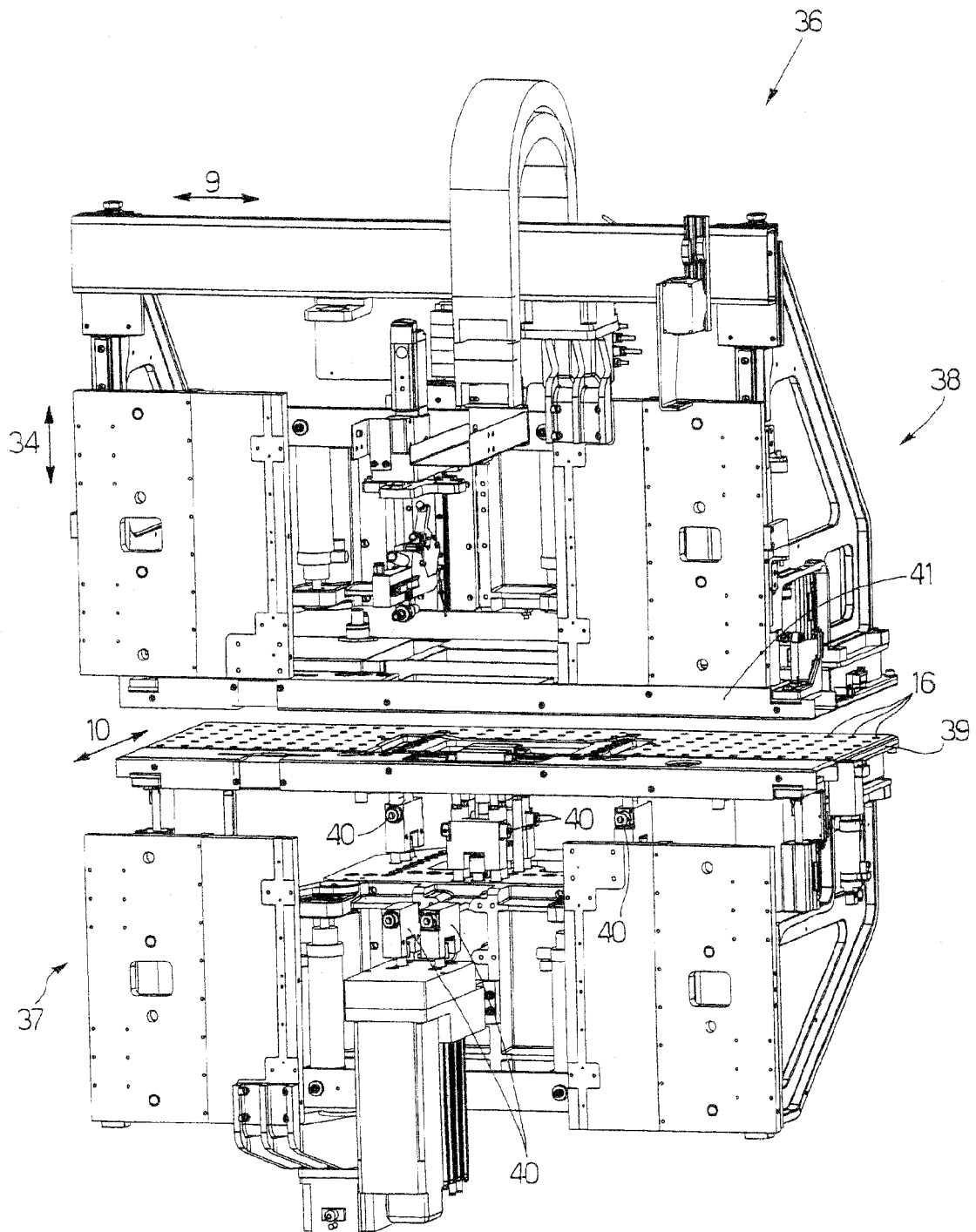


Fig.2

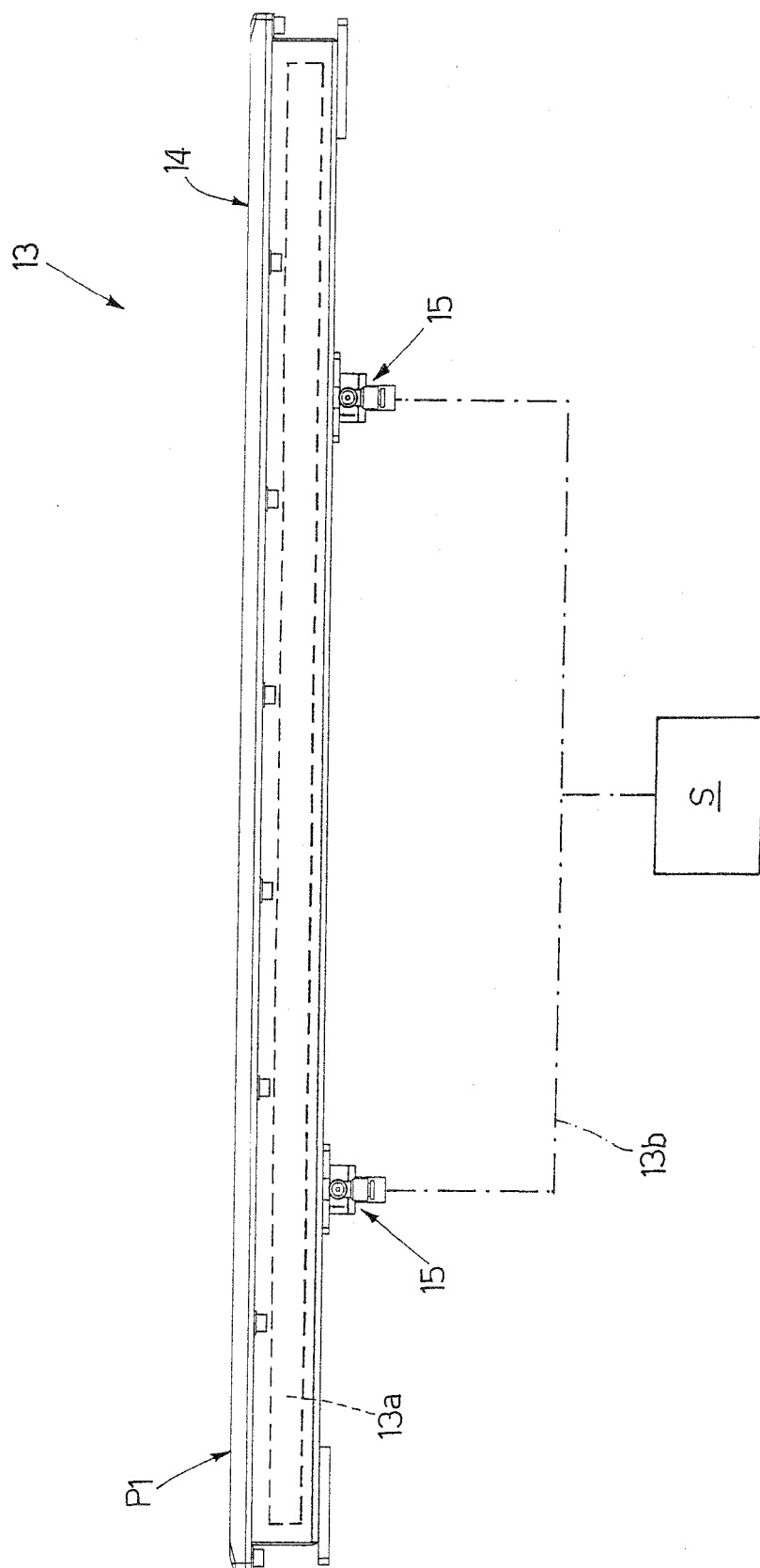
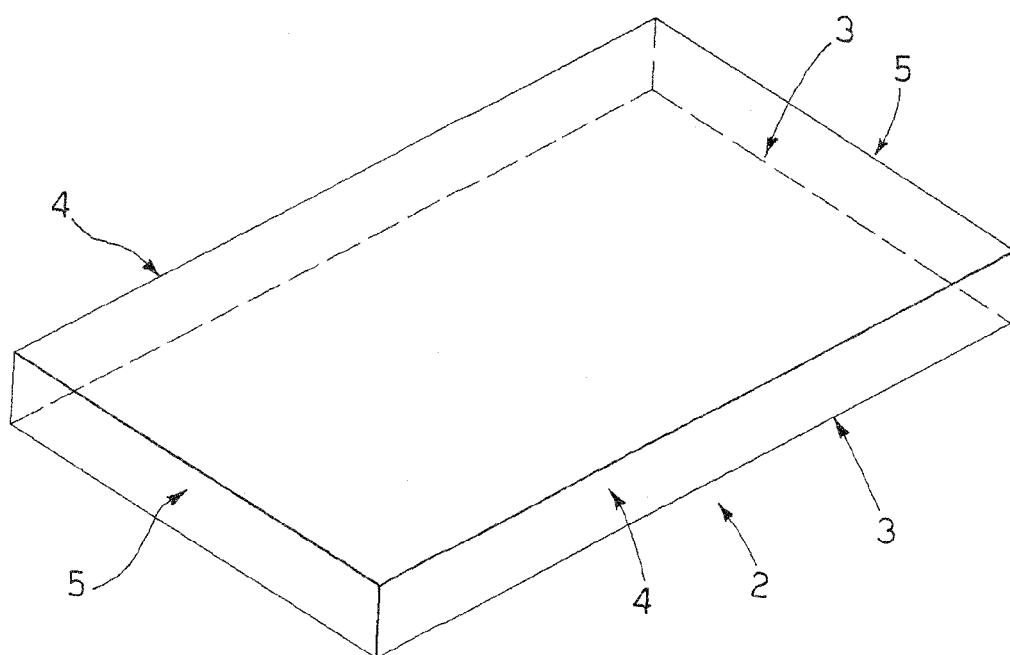
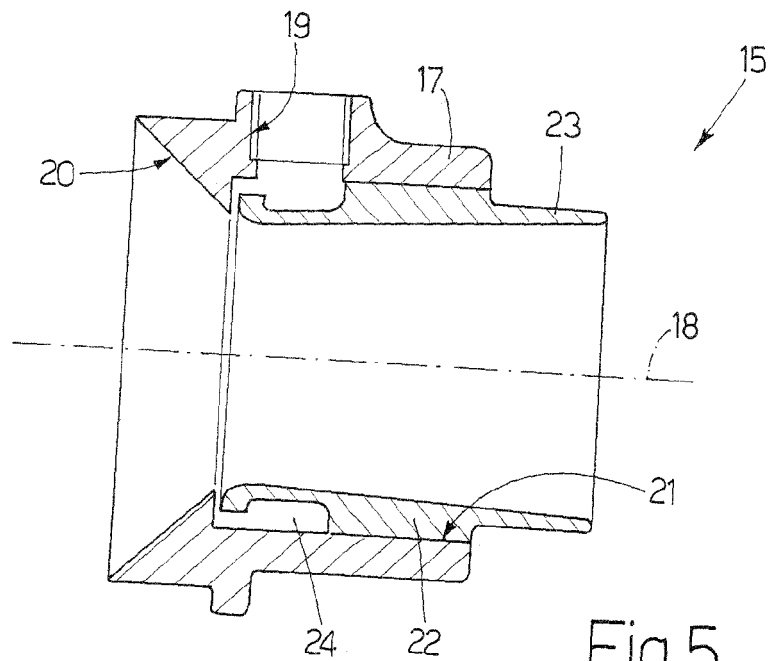


Fig. 3





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 07 11 8318

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	DE 25 14 051 A1 (TRANSINTOP) 7 October 1976 (1976-10-07)	1-4	INV. B27C5/02 B27C9/04 B23Q1/38
A	* page 6, line 13 - page 7, line 3; figures 1,2 *	5	
A	----- DE 44 42 896 C1 (KEUSCH SIEGFRIED [DE]) 11 July 1996 (1996-07-11) * column 2, lines 13-21; figures 1,2 *	1-5	
A	----- US 6 289 956 B1 (SHRIVER EARL [US]) 18 September 2001 (2001-09-18) * column 2, line 64 - column 3, line 6 * * column 4, line 57 - column 5, line 14; figures 1,2 * * column 6, lines 5-29; figure 7 * -----	1,4,5	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			B27C B23Q B23D B26D B65G
Place of search		Date of completion of the search	Examiner
Munich		21 January 2008	Meritano, Luciano
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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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 11 8318

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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21-01-2008

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