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(54) **FURNITURE PIECE COMPRISING A SLIDING AND LIFTING MECHANISM OF A SHELF**

(57) A furniture piece (100, 200, 300) comprises a top (8) and a pull out extension assembly (G) comprising moving means (4) for moving a support top (7) between a lowered position, wherein the support top (7) is under the top (8), and a lifted position, wherein the support top

(7) is disposed side by side with the top (8); said pull out extension assembly (G) comprising a lifting device (D) intended to come in contact with the support top (7) in order to automatically lift the support top (7) from the lowered position to the lifted position.

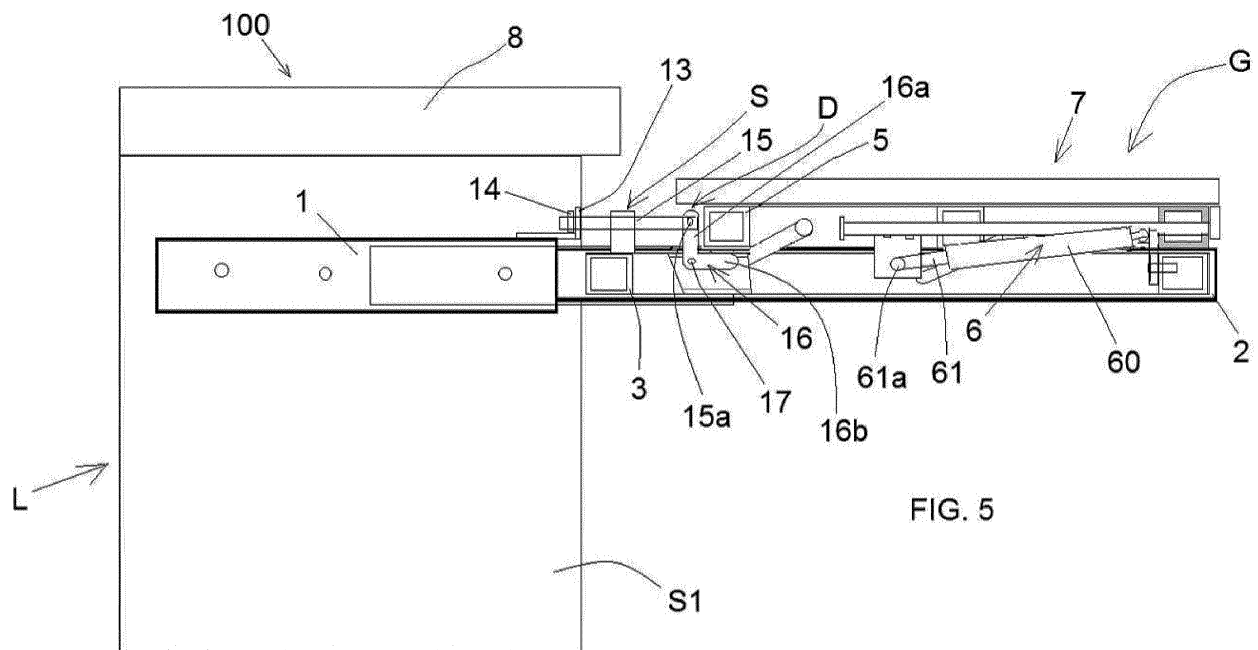


FIG. 5

Description

[0001] The present patent application relates to a furniture piece comprising a pull out extension assembly.

[0002] It is known that furniture with ingenious solutions must be used in small apartments in order to overcome the drawbacks caused by the reduced dimensions of said apartments.

[0003] In view of the above, furniture pieces are known, which comprise a pull out extension assembly that makes it possible to increase the surface of the furniture piece, when necessary.

[0004] Said furniture pieces comprise a frame provided with two edges and one work surface (also defined as top) disposed onto the edges of the frame.

[0005] Moreover, the furniture piece comprises a compartment that is defined laterally by the edges of the frame and by the top.

[0006] The pull out extension assembly of the furniture piece according to the prior art comprises a support top and a support frame that supports the support top and is disposed under the support top.

[0007] Moreover, the pull out extension assembly of the furniture piece according to the prior art comprises a pair of guides used to move the support frame of the pull out extension assembly from a retracted position, wherein the support frame is inside the compartment of the furniture piece, to an extracted position, wherein the support frame is outside the compartment of the furniture piece.

[0008] The pull out extension assembly of the furniture piece according to the prior art comprises moving means used to connect the support frame to the support top of the pull out extension assembly in order to move the support top.

[0009] The moving means normally comprise connecting rods that are hinged to the support top and to the support frame of the pull out extension assembly.

[0010] The moving means are used to move the support top between a lowered position, wherein the support top is under the top of the furniture piece, and a lifted position, wherein the support top is disposed side by side with the top of the furniture piece.

[0011] In particular, when the support top is lifted, the connecting rods rotate and the support top is disposed in contact with the top of the furniture piece.

[0012] Although they have a reduced volume, said furniture pieces of the prior art are impaired by some drawbacks.

[0013] A first drawback consists in the fact that the support top needs to be lifted manually with respect to the support frame of the pull out extension assembly. In view of the above, the user needs to lift the support top upwards in order to extract the pull out extension assembly from the compartment of the furniture piece. These movements are difficult and may be tiring for the user, who may decide not to use the pull out extension assembly in order to avoid such a nuisance.

[0014] A second drawback of the furniture piece according to the prior art consists in the fact that the pull out extension assembly occupies the space that is normally occupied by a drawer in the compartment of the furniture piece. Therefore, the use of said pull out extension assembly eliminates the use of a drawer of the furniture piece and, consequently, reduces the space available for the user to store objects.

[0015] The purpose of the present invention is to remedy the drawbacks of the prior art by disclosing a furniture piece provided with a pull out extension assembly that is simple, practical and comfortable to use.

[0016] Another purpose of the present invention is to disclose a furniture piece comprising a pull out extension assembly that does not reduce the space available to store objects.

[0017] A furniture piece of the invention comprises a frame provided with two edges and one top disposed onto the edges of the frame.

[0018] The furniture piece comprises a compartment that is defined by the edges and by the top. The furniture piece comprises a pull out extension assembly, comprising a support top and a support frame that supports the support top and is disposed under the support top.

[0019] The pull out extension assembly comprises moving means that connect the support frame to the support top in order to move the support top.

[0020] The moving means move the support top between a lowered position, wherein the support top is under the top, and a lifted position, wherein the support top is disposed side by side with the top.

[0021] The pull out extension assembly comprises a pair of guides comprising at least a first bar fixed to the frame of the furniture piece, and a second bar fixed to the support frame.

[0022] The first bar and the second bar move one with respect to the other in such a way to move the support frame from a retracted position, wherein the support frame is in the compartment of the furniture piece, to an extracted position, wherein the support frame is outside the compartment of the furniture piece.

[0023] The peculiarity of the furniture piece according to the present invention consists in the fact that the pull out extension assembly comprises a lifting device provided with a pusher that is configured in such a way to be in an idle position and in an operating position. The pusher is intended to come in contact with the support top in order to automatically lift the support top from the lowered position to the lifted position.

[0024] Moreover, the lifting device comprises actuation means that actuate the pusher when the support frame is proximal to its extracted position.

[0025] The advantages of the furniture piece according to the invention are evident, in view of the fact that, because of the provision of the lifting device, the support top can be automatically moved in such a way to lift said support top with respect to the support frame of the pull out extension assembly.

[0026] For the sake of clarity, the description of the furniture piece according to the invention continues with reference to the attached drawings, which have a merely illustrative, not limiting value, wherein:

Fig. 1 is a diagrammatic side view of a first embodiment of the furniture piece of the invention, wherein a pull out extension assembly is outside a compartment of the furniture piece;

Fig. 2 is a diagrammatic side view of a support frame and a support top of the pull out extension assembly of the furniture piece of Fig. 1;

Fig. 3 is the same as Fig. 1, wherein the support frame is lifted with respect to the support top and wherein a drawer is provided;

Fig. 4 is the same as Fig. 1, wherein the pull out extension assembly is inside the compartment and a lifting device of the furniture piece according to the invention is shown;

Fig. 5 is the same as Fig. 4, wherein the pull out extension assembly is outside the compartment;

Fig. 6 is the same as Fig. 5, wherein the support top is being lifted;

Fig. 7 is the same as Fig. 5, wherein the support top is lifted with respect to the support frame;

Fig. 8 is a diagrammatic top view of the furniture piece of Fig. 1, wherein the pull out extension assembly is pulled out from the compartment of the frame;

Fig. 9 is a diagrammatic top view of a second embodiment of the furniture piece of the invention;

Fig. 10 is a diagrammatic side view of the furniture piece of Fig. 9, wherein the support top of the pull out extension assembly is open and lifted with respect to the support frame;

Fig. 11 is a diagrammatic side view of a third embodiment of the furniture piece of the invention, wherein the pull out extension assembly is outside the compartment of the furniture piece;

Fig. 12 is a side view of boards of the support top of the pull out extension assembly of the furniture piece of Fig. 11 during opening;

Fig. 13 is a side view of the boards of the support top of the pull out extension assembly of the furniture piece of Fig. 11, wherein the boards are open;

Fig. 14 is an axonometric view of the furniture piece of Fig. 11, wherein the boards are in open position.

[0027] With reference to Figs. 1 to 8, a furniture piece according to the invention is disclosed, which is generally indicated with reference numeral (100).

[0028] Such a furniture piece (100) is intended to be disposed in a kitchen.

[0029] The furniture piece (100) comprises a frame (L), which comprises two vertical edges (S1) and a top (8) disposed onto the edges (S1) of the frame (L).

[0030] Moreover, the furniture piece (100) comprises a compartment (V) that is laterally defined by the edges

(S1) and by the top (8).

[0031] The furniture piece (100) comprises a pull out extension assembly (G) comprising a support top (7). The support top (7) comprises a horizontal board (70) and a frame (5) fixed under the board (70).

[0032] The pull out extension assembly (G) comprises a support frame (3) disposed under the support top (7) to support the support top (7).

[0033] The pull out extension assembly (G) comprises moving means (4) that connect the support frame (3) to the frame (5) of the support top (7) to move the support top (7).

[0034] The moving means (4) comprise connecting rods (40) comprising a first end (40a) hinged to the support frame (3) and a second end (40b) connected to the frame (5) of the support top (7) in such a way to form a pantograph mechanism.

[0035] The moving means (4) move the support top (7) between a lowered position, which is shown in Figs. 1 and 5, wherein the support top (7) is under the top (8), and a lifted position, which is shown in Fig. 7, wherein the support top (7) is side by side with the top (8).

[0036] In particular, the connecting rods (40) rotate around their first ends (40a). Accordingly, the second ends (40b) of the connecting rods (40) are lifted and lowered.

[0037] The pull out extension assembly (G) comprises a pair of guides (1, 2). Each guide comprises a first bar (1) that is fixed to the frame (L) of the furniture piece (100), and a second bar (2) that is fixed to the support frame (3) of the pull out extension assembly (G).

[0038] The first bar (1) and the second bar (2) can slide in such a way to move the support frame (3) from a retracted position, which is shown in Fig. 4, wherein the support frame (3) is inside the compartment (V) of the furniture piece (100), to an extracted position, which is shown in Figs. 1 and 5, wherein the support frame (3) is outside the compartment (V) of the furniture piece (100).

[0039] When the support top (7) is lifted, the support top (7) acts as stop means for the guides (1, 2). In fact, considering that, when lifted, the support top (7) is disposed side by side with the top (8), the support top (7) prevents the support frame (3) from accidentally returning inside the compartment (V) of the frame (L).

[0040] The pull out extension assembly (G) comprises a linear actuator (6) connected to the support frame (3) and to the support top (7).

[0041] The linear actuator (6) can be a gas spring comprising a cylinder (60) connected to the support frame (3), and a piston (61) with one end (61 a) connected to the support top (7) in order to push the support top (7).

[0042] When the support top (7) is lowered, the gas spring is inclined in such a way that the end (61 a) of the piston (61) is lower than the cylinder (60), as shown in Fig. 5.

[0043] When the support top (7) is lifted, the gas spring is inclined in such a way that the free end (61 a) of the piston (61) is higher than the cylinder (60), as shown in

Figs. 6 and 7.

[0044] In order to go from the lowered position to the lifted position, the support top (7) must go beyond a "dead position", wherein the gas spring is in horizontal position.

[0045] In such a case, the support top (7) is not pushed either upwards or downwards because, being in horizontal position, the gas spring pushes the support top (7) in parallel direction to the support top (7).

[0046] Otherwise said, when the support top (7) is lower than its "dead position" - that is to say that the free end (61 a) of the piston (61) is lower than the cylinder (60) - the gas spring pushes the support top (7) to its lowered position, in such a way to prevent the support top (7) from being lifted.

[0047] When the support top (7) is higher than its "dead position" - that is to say that the free end (61 a) of the piston (61) is higher than the cylinder (60) - the gas spring pushes the support top (7) to its lifted position.

[0048] Advantageously, the pull out extension assembly (G) comprises two linear actuators (6) that are disposed in lateral position.

[0049] As shown in Figs. 4 to 7, the pull out extension assembly (G) comprises a lifting device (D) to automatically lift the support top (7) with respect to the support frame (3) of the pull out extension assembly (G).

[0050] The lifting device (D) comprises a pusher (16) disposed in the vicinity of the frame (5) of the support top (7). The pusher (16) is an oscillating lever that is advantageously shaped as an "L", which comprises a first arm (16a), a second free arm (16b) perpendicular to the first arm (16a), and a pivoting pin (17) that pivots the lever to the support frame (3).

[0051] The lifting device (D) comprises actuation means (S) that drive the pusher (16) into rotation around the pivoting pin (17), when the support frame (3) of the pull out extension assembly (G) is in the vicinity of its pulled out position.

[0052] Therefore the pusher (16) can rotate around the pivoting pin (17), being successively:

- in a first idle position, wherein the second arm (16b) of the pusher (16) is not in contact with the frame (5) of the support top (7), having a horizontal position, and the first arm (16a) of the pusher (16) has a substantially vertical position, as shown in Fig. 5;
- in an operating position, wherein the pusher (16) is in contact with the support top (7) of the pull out extension assembly (G) to automatically lift the support top (7) from its lowered position to its lifted position, making it possible for the support top (7) to go beyond its "dead position";
- in a second idle position, wherein the second arm (16b) of the pusher (16) is not in contact with the frame (5) of the support top (7), having a horizontal position, and the first arm (16a) of the pusher (16) is inclined with respect to the frame (5), as shown in Fig. 6 and 7.

[0053] The actuation means (D) comprise a horizontal rod (15) that is integral with the support frame (3) and comprises a first enlarged end (14) and a second end (15a) connected to the first arm (16a) of the pusher (16). Being integral with the support frame (3), the rod (15) translates together with the support frame (3) inside and outside the compartment (V) of the frame (L) of the furniture piece.

[0054] Moreover, the actuation means (D) comprise a stop device (13) that is integral to the frame (L) of the furniture piece (100). The first end (14) of the rod (15) is intended to be stopped against the stop device (13) when the support frame (3) is in the vicinity of its extracted position.

[0055] Therefore the translation of the rod (15) is locked immediately before the support frame (3) stops sliding.

[0056] The first arm (16a) of the pusher (16) stops sliding because of the locking of the rod (15), whereas the pivoting pin (17) continues on sliding until the support frame (3) has reached its extracted position. Such an additional sliding of the support frame (3) with respect to the rod (15) generates a rotation of the pusher (16) around the pivoting pin (17). The pusher (16) goes from its first idle position to its operating position.

[0057] The pusher (16) hits the frame (5) of the support top (7) from below, in such a way to move the support top (7) from its lowered position to its lifted position, allowing the support top (7) to go beyond the "dead position".

[0058] The pusher (16) loses contact with the support top (7), going from its operating position to its second idle position.

[0059] The support top (7) continues on lifting and reaches its lifted position.

[0060] The pull out extension assembly (G) comprises a locking device (12) connected to the support frame (3) and to the support top (7) to lock the support top (7) in its lifted position. The locking device (12) comprises a rod (12a), which is shown in Fig. 3, revolvably mounted on the support frame (3). The rod (12a) of the locking device (12) comprises a free end that is intended to be stopped against the frame (5) of the support top (7) in such a way to prevent the support top (7) from lowering when the support top (7) is in lifted position.

[0061] In particular, the rod (12a) of the locking device (12) can rotate from a horizontal idle position to a vertical operating position, wherein the locking device (12) locks the frame (5) of the support top (7) in lifted position.

[0062] Optionally, as shown in Fig. 3, the pull out extension assembly (G) comprises a drawer (C) disposed under the support frame (3).

[0063] The drawer (C) is integral with the support frame (3) in such a way that when moving the support frame (3) from the extracted position to the retracted position (or vice versa), the drawer (C) slides together with the support frame (3).

[0064] The drawer (C) comprises a container (11) that

is intended to contain tools, brackets (9) fixed under the support frame (3) to support the container (11) and guides (10, 10a) comprising a first rod connected to the brackets (9) and a second rod connected to the container (11). The first rod and the second rod of the guides (10, 10a) of the drawer (C) are slidably mounted in order to move the container (11) with respect to the brackets (9). The container (11) of the drawer (C) can slide, translating from under the support frame (3) until it projects from one edge of the support frame (3).

[0065] Although it is not shown in the attached figures, the pull out extension assembly (G) can comprise more than one drawer. Moreover, the drawers can slide in such a way to protrude from a front edge of the support frame (3) or from lateral edges of the support frame (3).

[0066] Figs. 9 and 10 show a second embodiment of the furniture piece according to the invention, which is generally indicated with reference numeral (200).

[0067] The support top (7) of the pull out extension assembly (G) of the furniture piece (200) comprises a main board (70) that rests on the frame (5) and a secondary board (71) that is connected to the main board (70).

[0068] The support top (7) comprises a hinge (29) to hinge the secondary board (71) to the main board (70).

[0069] The secondary board (71) can be in closed position, wherein the secondary board (71) is stopped above the main board (70), and in opened position, wherein the secondary board (71) is disposed side by side with the main board (70).

[0070] Advantageously, the hinge (29) is fixed to a front edge of the main board (70) of the support top (7), in such a way that the secondary board (71) protrudes frontally with respect to the main board (70).

[0071] Although it is not shown in the attached figures, the hinge (29) can be also fixed to a lateral edge of the main board (70) in such a way that the secondary board (71) protrudes laterally with respect to the main board (70).

[0072] The support top (7) also comprises two rods (19, 19a) and one crosspiece (22) that is integral with the rods (19, 19a). The rods (19, 19a) and the crosspiece (22) are disposed under the main board (71). The crosspiece (22) connects the rods (19, 19a) together.

[0073] The rods (19, 19a) are slidably mounted in the frame (5) of the support top (7), in such a way to be in a backward position and in a forward position wherein the rods (19, 19a) protrude from the frame (5) of the support top (7), acting as support top for the secondary board (71).

[0074] Advantageously, the rods (19, 19a) have an enlarged end (23, 23a) intended to be stopped against the frame (5) of the support top (7) to stop the sliding of the rods (19, 19a) with respect to the frame (5) of the support top (7).

[0075] Because of the provision of the secondary board (71), of the rods (19, 19a) and of the crosspiece (22), the support top (7) can be additionally enlarged.

[0076] Figs. 11, 12, 13 and 14 show a third embodiment of the furniture piece according to the invention, which is generally indicated with reference numeral (300).

[0077] The support top (7) of the pull out extension assembly (G) of the furniture piece (200) comprises four boards (27, 27a, 27b, 27c) that are connected together.

[0078] The support top (7) comprises hinges (29) to hinge the boards (27, 27a, 27b, 27c) together.

[0079] Moreover, the support top comprises an additional hinge (26) to revolvably connect the boards (27, 27a, 27b, 27c) to the frame (5) of the support top (7) by means of a bar (24) disposed inside the frame (5), in such a way that the boards (27, 27a, 27b, 27c) can rotate between a first position, wherein the boards (27, 27a, 27b, 27c) are disposed under the frame (5) of the support top (7), and a second position, wherein the boards (27, 27a, 27b, 27c) are disposed onto the frame (5) of the support top (7).

[0080] In particular, after extracting the pull out extension assembly (G) from the compartment (V) of the frame (L), the boards (27, 27a, 27b, 27c) are rotated by 180° around the additional hinge (26), in such a way to dispose the boards (27, 27a, 27b, 27c) onto the frame (5) of the support top (7).

[0081] The boards (27, 27a, 27b, 27c) can be sequentially opened in book-like mode by rotating the boards (27, 27a, 27b, 27c) around the hinges (29).

[0082] Although it is not shown in the attached figures, the boards (27, 27a, 27b, 27c) can be more or less than four in number.

[0083] Because of the provision of the boards (27, 27a, 27b, 27c) that open in book-like mode, the support top (7) can be additionally enlarged.

Claims

1. Furniture piece (100, 200, 300) comprising:

- a frame (L) comprising two edges (S1);
- a top (8) disposed onto the edges (S1) of the frame (L);
- a compartment (V) defined by the edges (S1) and by the top (8);
- a pull out extension assembly (G);

said pull out extension assembly (G) comprising:

- a support top (7);
- a support frame (3) that supports said support top (7) and is disposed under the support top (7);
- moving means (4) that connect the support frame (3) to the support top (7) to move the support top (7); said moving means (4) moving said support top (7) between a lowered position, wherein said support top (7) is disposed under the top (8), and a lifted position, wherein said support top (7) is disposed side by side with the

top (8);

- a pair of guides (1, 2) comprising at least a first bar (1) fixed to the frame (L) of the furniture piece (100, 200, 300), and a second bar (2) fixed to the support frame (3); said first bar (1) and second bar (2) being able to slide one respect to the other, in order to move the support frame (3) from a retracted position, wherein the support frame (3) is inside the compartment (V) of the furniture piece (100, 200, 300), to an extracted position, wherein the support frame (3) is outside the compartment (V) of the furniture piece (100, 200, 300),

furniture piece (100, 200, 300) **characterized in that** said pull out extension assembly (G) comprises a lifting device (D) comprising:

- a pusher (16) configured in such a way to be in an idle position and in an operating position; said pusher (16) being intended to come in contact with the support top (7) to automatically lift the support top (7) from its lowered position to its lifted position;

- actuation means (S) that actuate the pusher (16) when the support frame (3) is in the vicinity of its extracted position.

2. The furniture piece (100, 200, 300) of claim 1, wherein said pusher (16) is an oscillating lever, which is advantageously shaped as an "L", comprising a first arm (16a), a second arm (16b) and a pivoting pin (17) that pivots said lever to the support frame (3); said actuation means (S) comprising:

- a rod (15) that is connected to the support frame (3) and comprises a first enlarged end (14);

- a stop device (13) integral with the frame (L) of the furniture piece (100; 200; 300); said first end (14) of the rod (15) being intended to be stopped against the stop device (13) when the support frame (3) is in the vicinity of its extracted position.

3. The furniture piece (100, 200, 300) of claim 1 or 2, wherein said pull out extension assembly (G) comprises a linear actuator (6) connected to the support frame (3) and to the support top (7); said linear actuator (6) being configured in such a way to push the support top (7) downwards when the support top (7) is in lowered position, to push the support top (7) upwards when the support top (7) is in lifted position and not to push the support top (7) when the support top (7) is in a "dead position"; said pusher (16) moving the support top (7) from its lowered position to its lifted position, going beyond said "dead position".

4. The furniture piece (100, 200, 300) of any one of the

preceding claims, comprising at least one drawer (C) disposed under the support frame (3); said drawer (C) being integral with the support frame (3).

5. The furniture piece (100, 200, 300) of claim 4, wherein said drawer (C) comprises:

- a container (11) intended to contain tools;

- brackets (9) fixed under the support frame (3) to support the container (11);

- guides (10, 10a) comprising a first rod connected to the brackets (9) and a second rod connected to the container (11); said first rod and second rod of the guides (10, 10a) of the drawer (C) being slidably mounted in order to move the container (11) with respect to the brackets (9).

6. The furniture piece (100, 200, 300) according to any one of the preceding claims, wherein said pull out extension assembly (G) comprises a locking device (12) connected to the support frame (3) and to the support top (7) to lock the support top (7) in its lifted position.

7. The furniture piece (200, 300) according to any one of the preceding claims, wherein said support top (7) comprises at least two boards (70, 71; 27, 27a, 27b, 27c) and at least one hinge (29) to hinge said boards (70, 71; 27, 27a, 27b, 27c) together.

8. The furniture piece (200) of claim 7, wherein said support top (7) comprises a main board (70), a frame (5) whereon said main board (70) rests, and a secondary board (71) that is hinged to the main board (70) by means of the hinge (29), in such a way to be in a closed position, wherein the secondary board (71) is stopped against the main board (70), and in an opened position, wherein the secondary board (71) is disposed side by side with the main board (70); said frame (5) of the support top (7) comprising at least one rod (19, 19a) and one crosspiece (22), connected to said at least one rod (19, 19a); said at least one rod (19, 19a) being slidably mounted in said frame (5) of the support top (7), in such a way to be in a backward position and in a forward position wherein said at least one rod (19, 19a) protrudes from said frame (5) of the support top (7), acting as support top for the secondary board (71).

9. The furniture piece (300) of claim 7, wherein said support top (7) comprises a frame (5) and at least one additional hinge (26) to revolvably connect the boards (27, 27a, 27b, 27c) to the frame (5) of the support top (7) by means of a bar (24) disposed inside the frame (5), in such a way that said boards (27, 27a, 27b, 27c) can rotate between a first position, wherein said boards (27, 27a, 27b, 27c) are disposed under the frame (5) of the support top (7),

and a second position wherein said boards (27, 27a, 27b, 27c) are disposed onto the frame (5) of the support top (7).

10. Kitchen comprising a furniture piece (100; 200; 300) according to any one of the preceding claims.

11. Pull out extension assembly (G) according to any one of claims 1 to 8.

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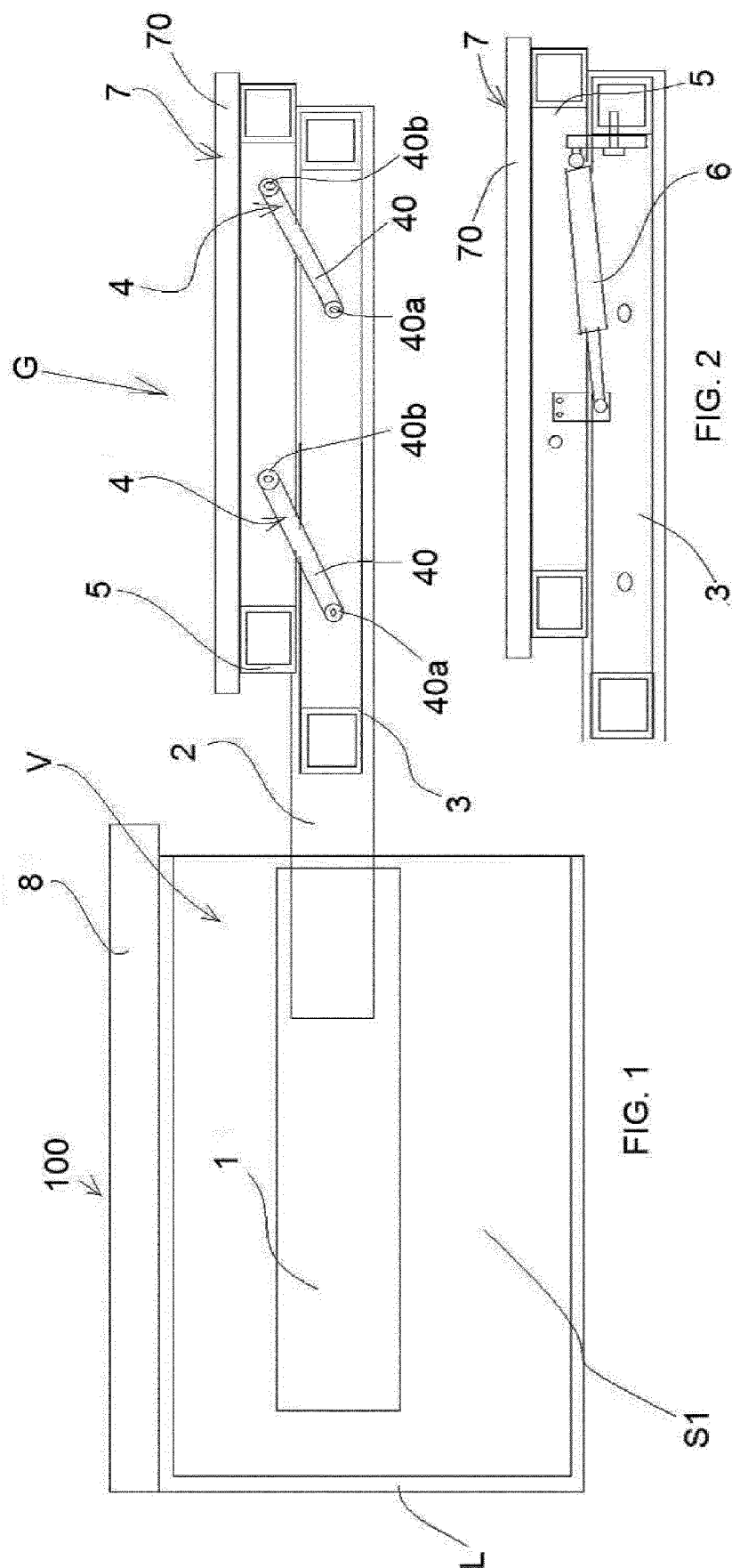
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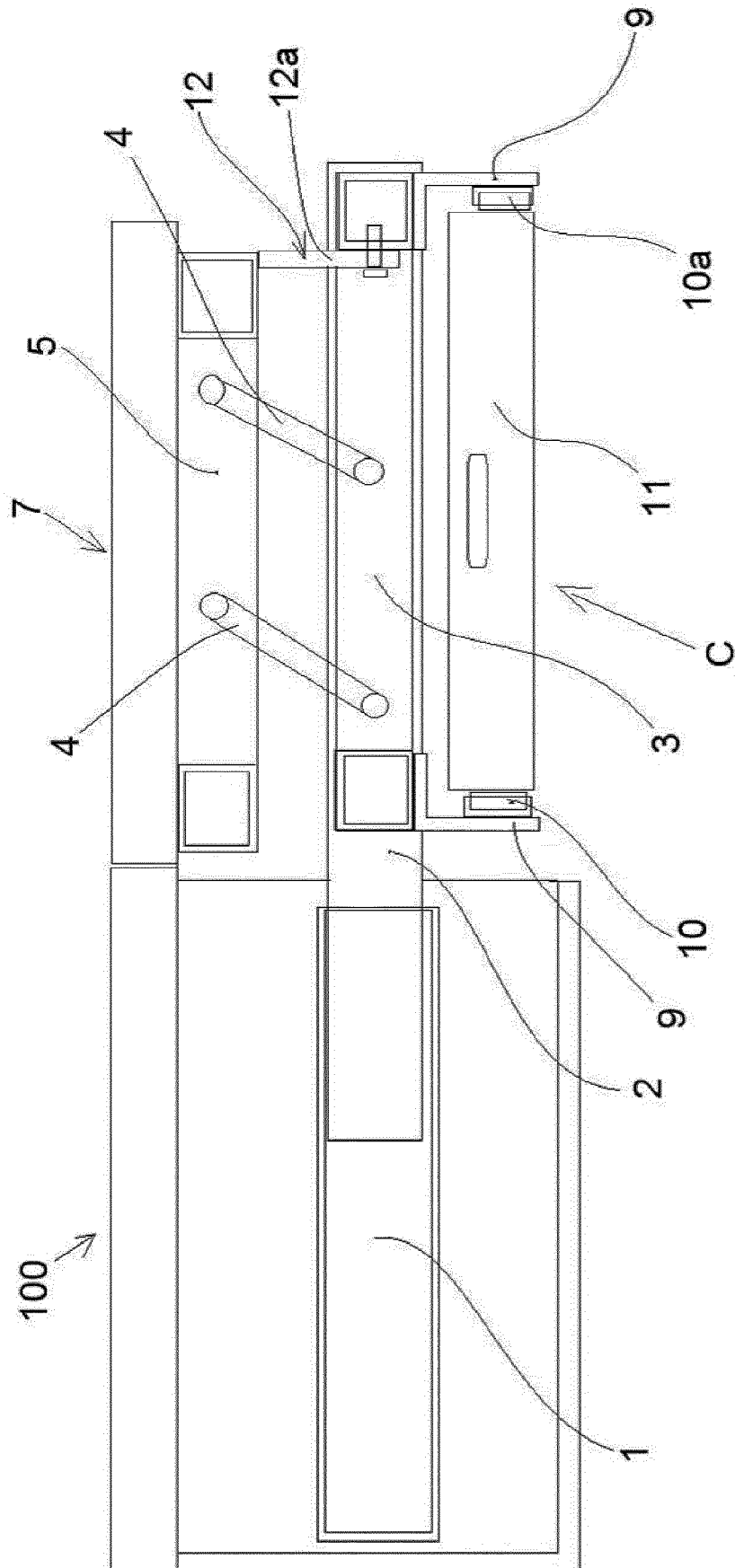


FIG. 3

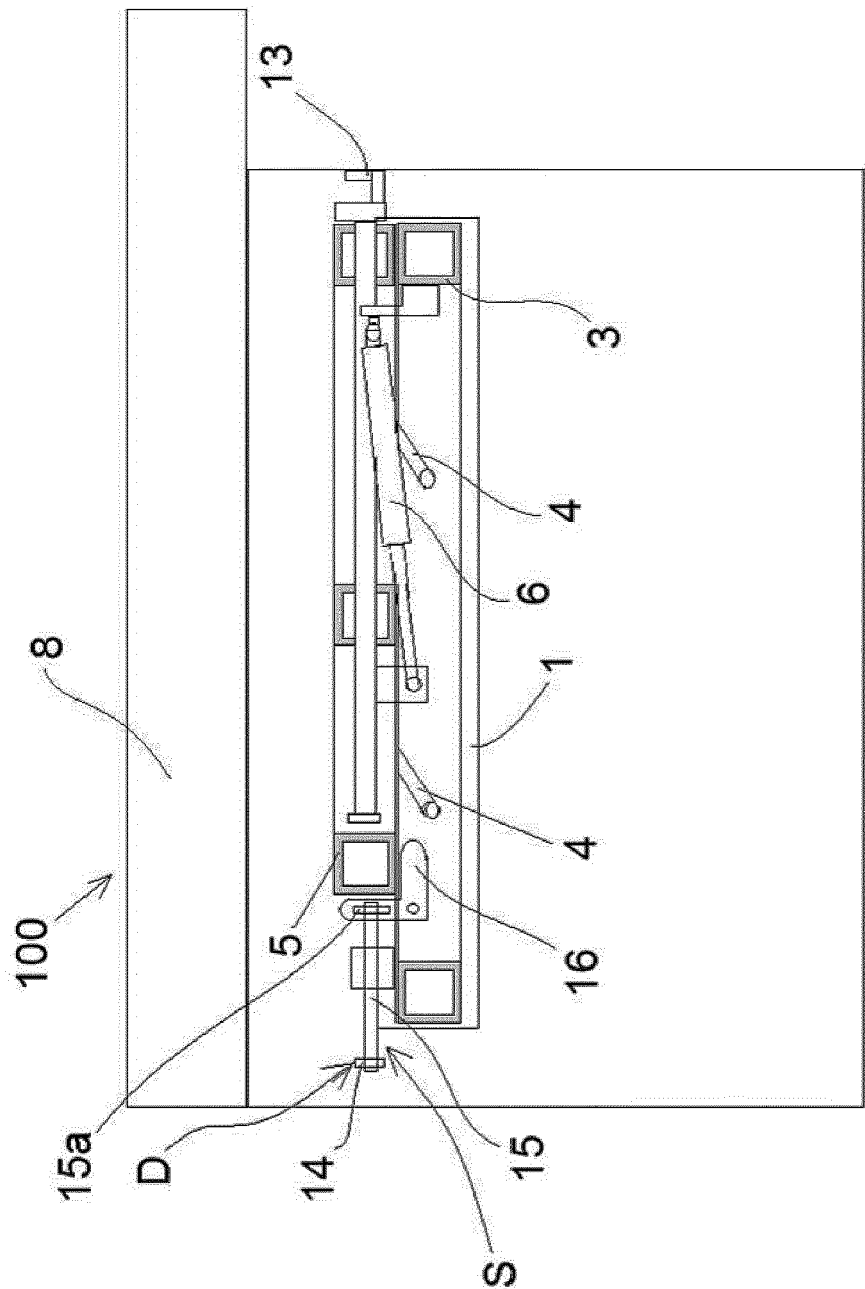
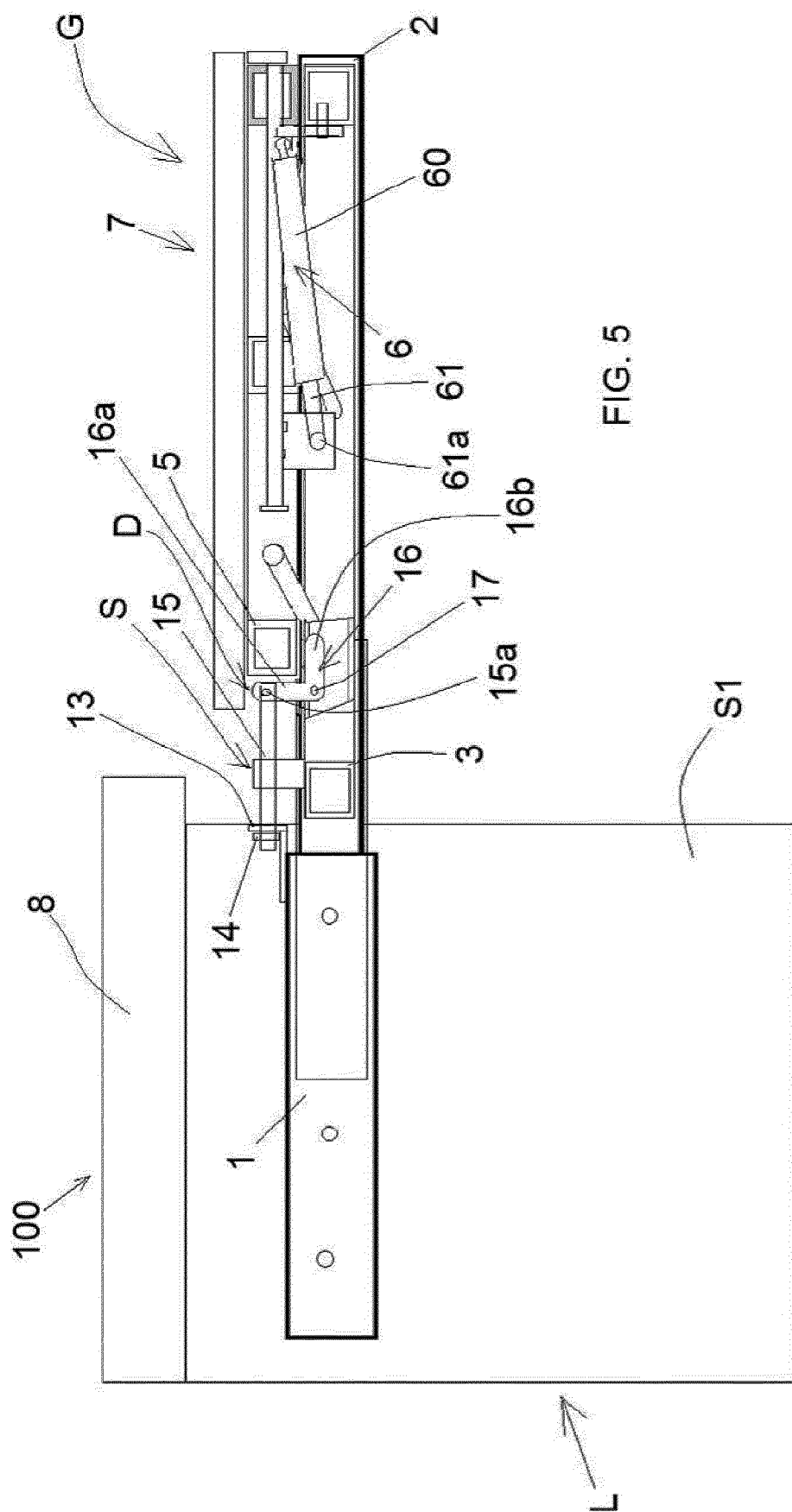


FIG. 4



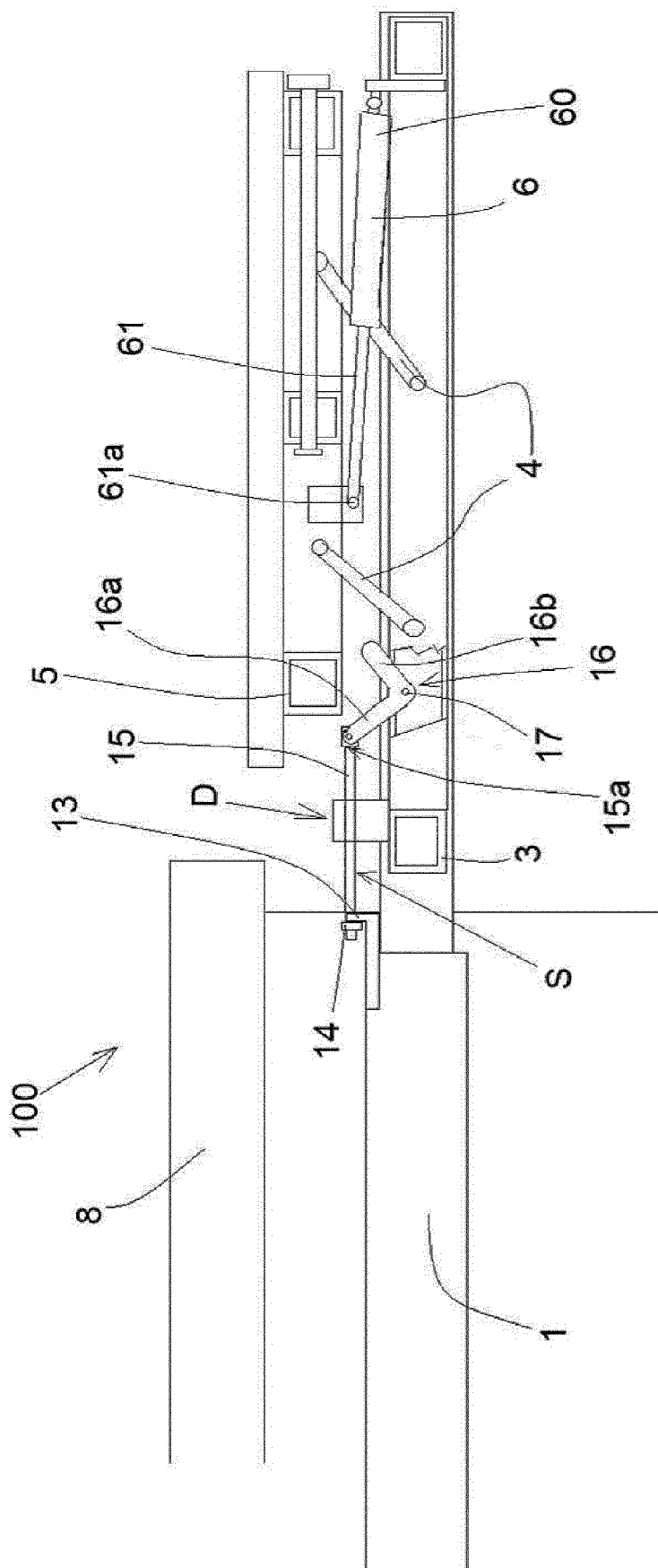


FIG. 6

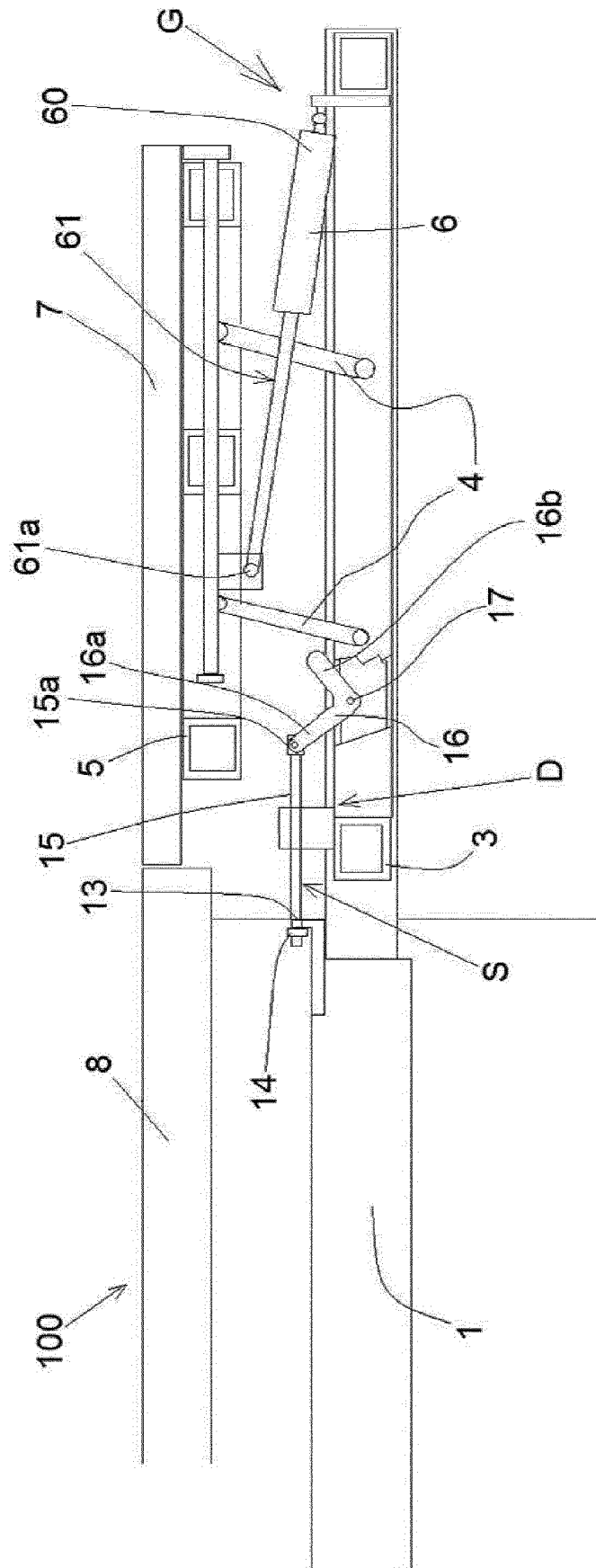


FIG. 7

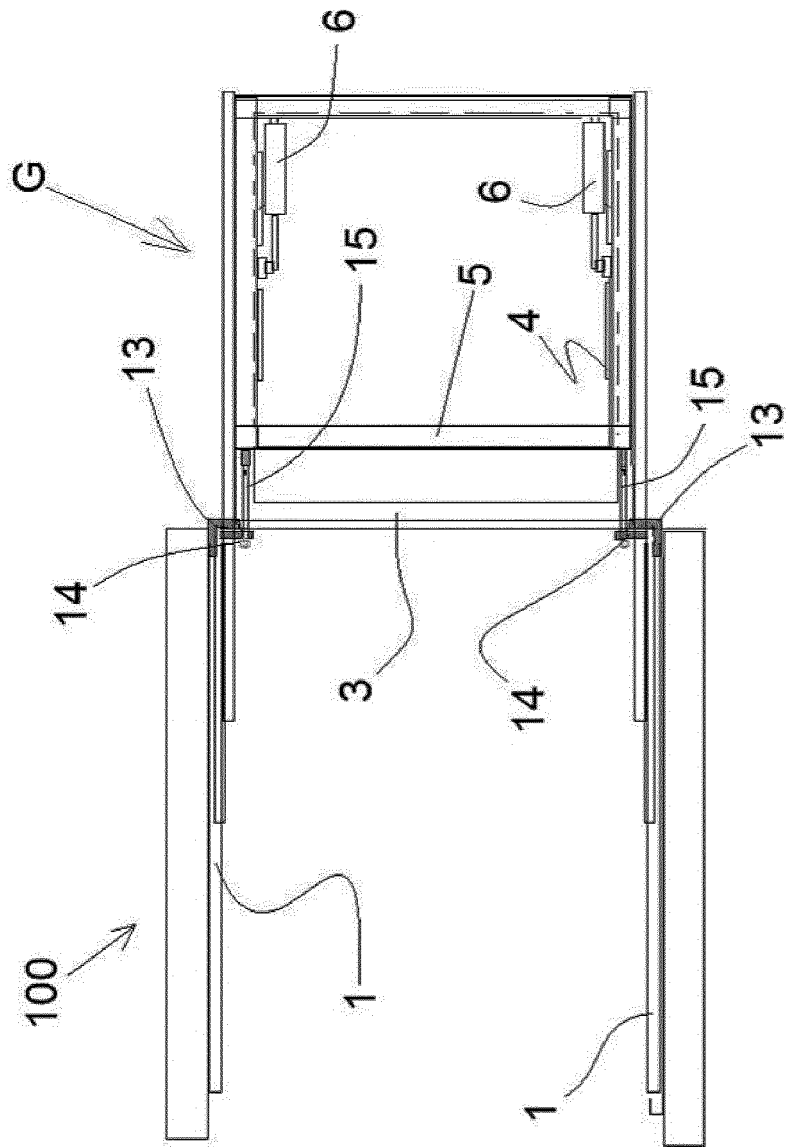
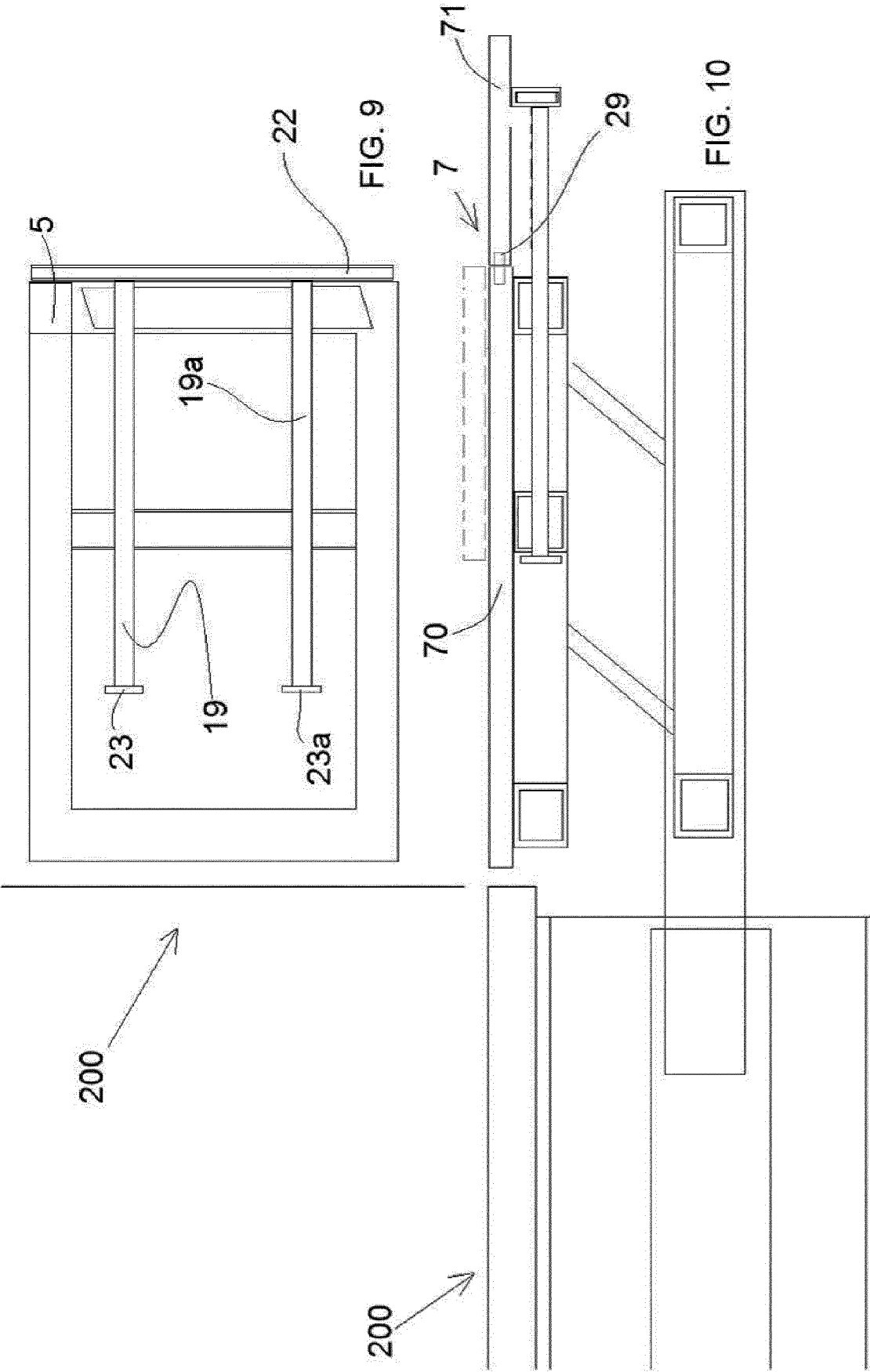


FIG. 8



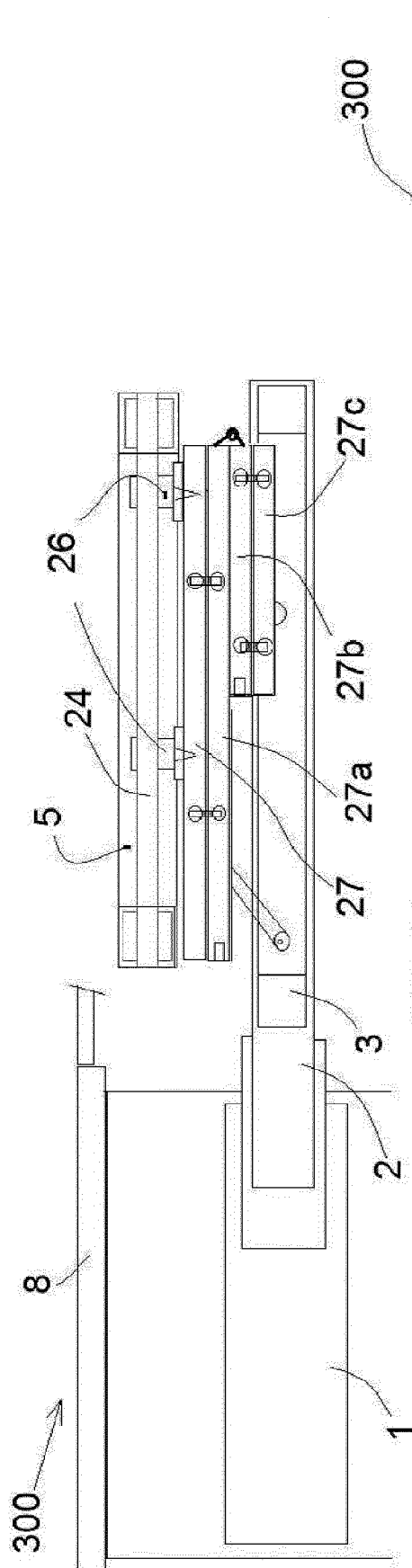


FIG. 11

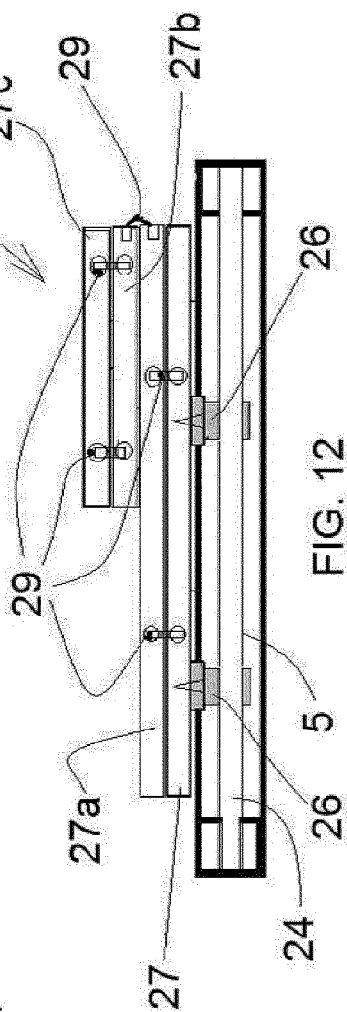


FIG. 12

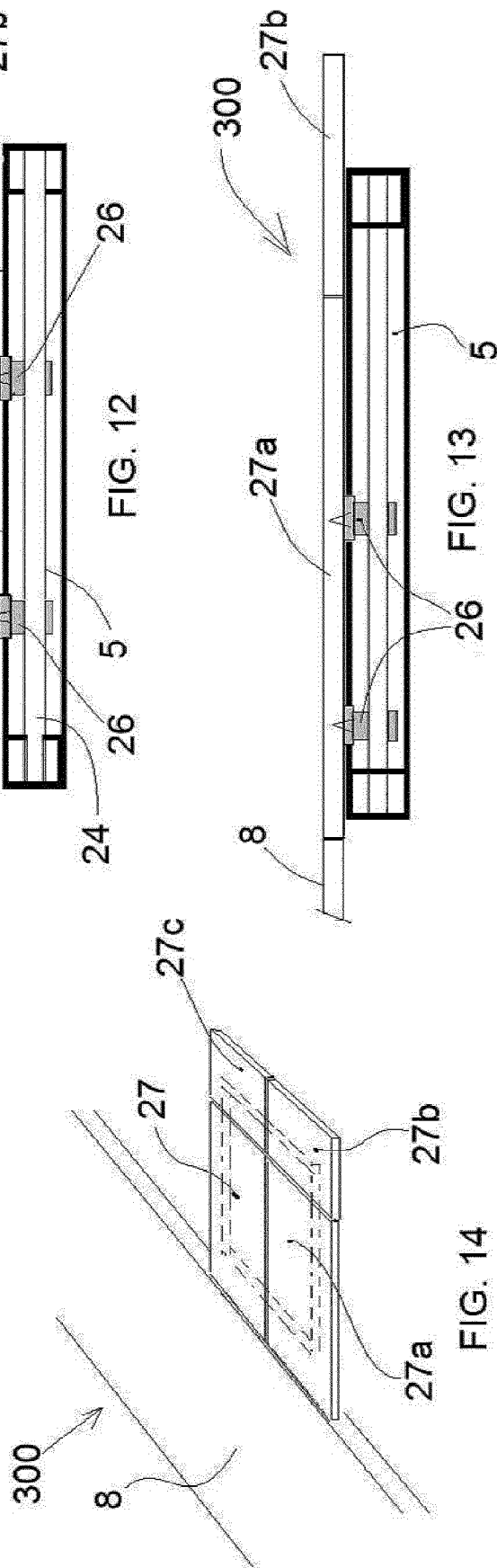


FIG. 13

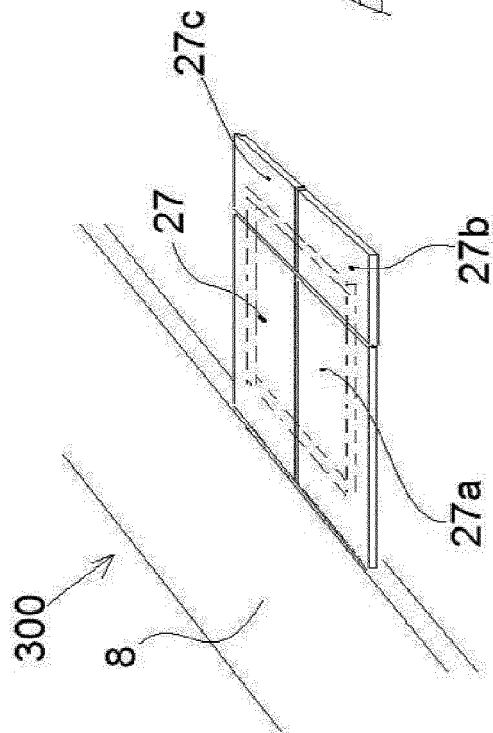


FIG. 14



EUROPEAN SEARCH REPORT

 Application Number
 EP 17 17 3944

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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 A	DE 20 2013 004210 U1 (LOH KG HAILO WERK [DE]) 11 August 2014 (2014-08-11) * figures 3-7 * * page 5, paragraph 41 * -----	1,3-7, 10,11 8,9	INV. A47B51/00 A47B77/10 A47B88/00
X	US 2 486 564 A (KAMIN GEORGE W) 1 November 1949 (1949-11-01) * figures 1-3 * -----	1,2,6,11	ADD. A47B88/90
X	DE 10 2007 045215 A1 (MAHLER ANDREA [DE]) 2 April 2009 (2009-04-02) * paragraph [0042] * * figures 1-5 * -----	1,3,6,11	
A	WO 91/05497 A1 (PELLEY IND AB [SE]) 2 May 1991 (1991-05-02) * figure 1 * -----	7-9	
A	US 5 974 980 A (KENT ROGER T [US]) 2 November 1999 (1999-11-02) * figure 2 * -----	7-9	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47B B66F A47L A61G A47C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 18 August 2017	Examiner Ibarrondo, Borja
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			

EPO FORM 1503 03.82 (P04C01)

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

EP 17 17 3944

5 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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18-08-2017

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202013004210 U1	11-08-2014	NONE	
US 2486564 A	01-11-1949	NONE	
DE 102007045215 A1	02-04-2009	NONE	
WO 9105497 A1	02-05-1991	AU 6549390 A SE 463443 B WO 9105497 A1	16-05-1991 26-11-1990 02-05-1991
US 5974980 A	02-11-1999	NONE	