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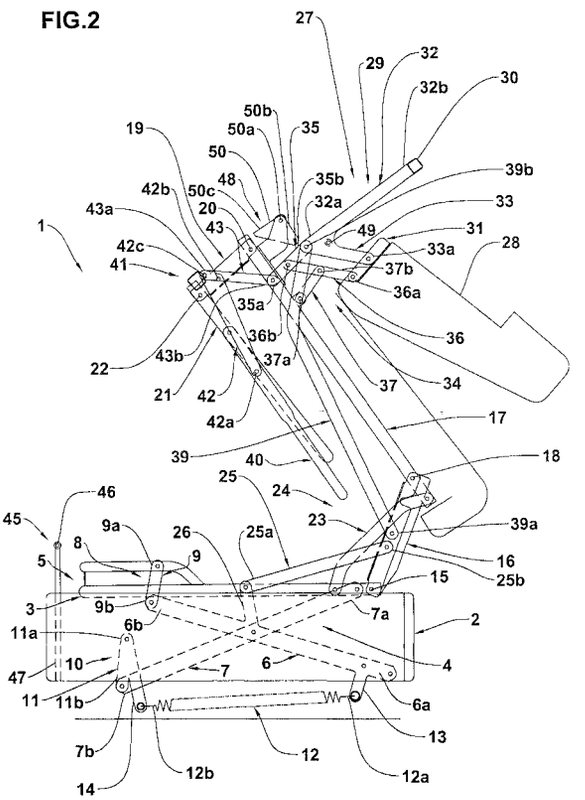
(54) A sofa-bed with an articulated folding structure

(57) A sofa-bed with an articulated folding structure comprises a fixed support framework (2) kinematically connected to a first main movable frame (3), a pantograph leverage (4) operatively active between the first main movable frame (3) and the fixed support framework (2), a first auxiliary movable frame (16) consecutively and rotatably in engagement with the first main movable frame (3) and a second main movable frame (17) consecutively and rotatably in engagement with the first auxiliary movable frame (16). The sofa-bed further comprises a support frame (29) for the second main movable frame (17) hinged on a hooking frame (31) for a back (28) and a connecting leverage (34) joining the hooking frame (31) and support frame (29) to the second main movable frame (17).

FIG.2



EP 1 310 194 A1

Description

[0001] The present invention relates to a sofa-bed with an articulated folding structure of the type defined in the preamble of claim 1.

[0002] It is known that sofa-beds having an articulated folding structure essentially comprise a fixed support framework with which two or more movable frames disposed consecutively and hinged on each other are in engagement. The movable frames are displaceable between a closed position, at which they are folded upon each other and housed within the fixed support framework, and an open position at which they are mutually aligned to take the conformation of a bed.

[0003] Known on the market are sofa-beds of an articulated folding structure in which the sofa back is fastened to one of the movable frames and comprises auxiliary support feet rigidly connected thereto. After overturning of the movable frame, the back takes a place under said frame and rests on the ground by the feet to supply a support to the bed.

[0004] Also known are sofa-beds having a support frame on which both the back and feet are rigidly mounted and which is hinged on one of the movable frames. In the sofa position, the support frame lies parallel to the ground and the back vertically extends therefrom, the feet are at an end of the support frame and project behind the back itself. During opening of the sofa to be converted into a bed, the support frame rotates through 90 degrees and takes a place perpendicular to the movable frame on which it is mounted and, when conversion has been completed, perpendicular to the ground; the feet rest on the ground whereas the back is parallel thereto.

[0005] Such a type of sofa-bed is known from document EP0628269 in the name of the same Applicant. It comprises a fixed support framework with which a main movable frame is in engagement, the movable frame being susceptible of vertical translation by a lifting device of the pantograph type.

[0006] Consecutively and rotatably connected to the main movable frame is a first and a second auxiliary movable frames.

[0007] Then a movable support frame is in engagement with the auxiliary movable frame, and a back of the sofa-bed is associated therewith; rigidly mounted on said back are auxiliary support feet. The movable support frame which is hinged at its end on the second auxiliary movable frame is operatively connected to the first auxiliary movable frame and therefore to the main movable frame, so that rotation of said movable support frame gives rise, as a result, to rotation of the auxiliary movable frames as well as to lifting of the main movable frame.

[0008] When rotation is over, the support frame with the back is under the second auxiliary movable frame and offers a support through the feet mounted thereon.

[0009] The known art briefly described above however has some limits.

[0010] In fact, in the bed conformation of the sofa-bed, the back is very close to the support foot and to the ground and consequently can easily take up dust and dirt from the ground.

[0011] In addition, use of greatly projecting feet to space out the back from the ground is not advisable because, in the sofa conformation, they would be bulky, unaesthetic and dangerous for a user.

[0012] Under this situation the technical task underlying the present invention is to devise a sofa-bed with an articulated folding structure capable of substantially obviating the mentioned limits.

[0013] Mainly, it is an aim of the present invention to devise a sofa-bed with an articulated folding structure that, in its bed conformation, enables the back to be spaced out from the auxiliary support feet.

[0014] Within the scope of said technical task it is then an important aim of the invention to device a sofa-bed with an articulated folding structure in which the back movement and the movement of the auxiliary support feet are synchronized with each other, so that passage from a closed position to an open position is made possible by a single operation.

[0015] It is a further aim of the invention to devise a sofa-bed with an articulated folding structure enabling bulkiness of the support feet in the sofa conformation of the sofa-bed to be minimized.

[0016] The technical task mentioned and the aims specified are substantially achieved by a sofa-bed with an articulated folding structure having the features set out in one or more of the appended claims.

[0017] Description of a preferred but not exclusive embodiment of a sofa-bed in accordance with the invention is now given hereinafter, by way of non-limiting example, with the aid of the accompanying drawings, in which:

- Fig. 1 is a side view of a sofa-bed with an articulated folding structure in a closed position, in accordance with the present invention;
- Fig. 2 is a side view of the sofa-bed in Fig. 1, in a first intermediate position;
- Fig. 3 is a side view of the sofa-bed in Fig. 1, in a second intermediate position;
- Fig. 4 is a side view of the sofa-bed in Fig. 1 in an open position; and
- Fig. 5 is a side view of a second embodiment of a sofa-bed in accordance with the invention, in an opening intermediate position.

[0018] With reference to the drawings, a sofa-bed with an articulated folding structure has been generally denoted at 1.

[0019] Sofa 1 comprises a fixed support framework 2 resting on the ground by means of support feet, not shown in the drawings. In engagement with the fixed framework 2 is a first main movable frame 3 through a

pantograph leverage 4. The pantograph leverage 4 kinematically connects the fixed support framework 2 to the first main movable frame 3 and enables the first main frame 3 to be moved substantially in a vertical direction between a position at which it is housed at the bottom of the fixed support framework 2 and an operating lifting position relative to the framework 2 itself.

[0020] Practically, leverage 4 and the fixed support framework 2 constitute a lifting device 5 for conversion of the sofa to a bed.

[0021] The pantograph leverage 4 comprises a first lifting rod 6 and a second lifting rod 7 centrally hinged on the first rod 6 and intersecting it crosswise. The two rods 6, 7 are therefore mutually hinged at respective median points.

[0022] The pantograph leverage 4 is connected to the first main movable frame 3 by first connecting means 8 and to the fixed support framework 2 through second connecting means 10. In particular, the first lifting rod 6 has a first end 6a hinged on the fixed framework 2 and a second end 6b kinematically fastened to the main movable frame 3 by a first oscillating link 9. More specifically, the first oscillating link 9 is hinged at a first end thereof 9a on the first main movable frame 3 and, at a second end 9b, on the second end 6b of the first rod 6.

[0023] According to one embodiment, the first end 9a of the first oscillating link 9 lies above the second end 9b and, in the closed position of the sofa, the first oscillating link 9 is substantially vertical. The second lifting rod 7 is hinged at a first end 7a thereof, on the main movable frame 3 and, like the first rod 6, has a second end 7b kinematically fastened to the fixed support framework 2 by a second oscillating link 11. Likewise, the second oscillating link 11 has a first end 11a hinged on the fixed support frame 2 and a second end 11b hinged on the second end 7b of the second lifting rod 7.

[0024] The first end 11a of the second oscillating link 11 lies above the second end 11b and, in the closed position of the sofa, the second oscillating link 11 is substantially vertical.

[0025] As shown in the figures, the two lifting rods 6, 7, during the vertical moving up of the first movable frame 3, move from a starting condition in which they lie substantially parallel, to a final condition in which they are mutually crossed.

[0026] Advantageously, the lifting device 5 further comprises elastic means 12 operatively active between the first end 6a of the first rod 6 and the second end 7b of the second rod 7, to facilitate lifting of the main movable frame 3.

[0027] Preferably, as shown in the accompanying drawings, the elastic means 12 consists of a draw-spring linked at a first end thereof 12a to a first tailpiece 13 rigidly extending from the first lifting rod 6 and, at a second end 12b opposite to the first one 12a, to a second tailpiece 14 rigidly connected to the second oscillating link 11.

[0028] The draw-spring 12 pulls the two respective ends 6a, 7b of the two rods 6, 7 towards each other, thereby facilitating opening of the pantograph leverage 4 and moving up of the first main movable frame 3.

[0029] Rotatably and consecutively in engagement with the first main movable frame 3, at a first hinging axis 15, is a first auxiliary movable frame 16.

[0030] In turn, a second main movable frame 17 rotating about a second hinging axis 18 is consecutively in engagement with the first auxiliary movable frame 16.

[0031] In addition, sofa 1 comprises a second auxiliary movable frame 19 rotatably and consecutively in engagement with the second main movable frame 17 around a third hinging axis 20 and finally a third main movable frame 21 rotatably and consecutively engaged with the second auxiliary movable frame 19 about a fourth hinging axis 22.

[0032] The five frames 3, 16, 17, 19, 21 can be rotated relative to each other about the four mentioned axes 15, 18, 20, 22 to move from a closed position at which the three main frames 3, 17, 21 are superposed on each other to an open position at which the five frames 3, 16, 17, 19, 21 are in mutual alignment and define the structure of a bed.

[0033] In more detail, in the closed position the third main frame 21 is placed over the first main frame 3 and under the second main frame 17 whereas the two auxiliary frames 16, 19 substantially lie in a vertical arrangement.

[0034] To enable simultaneous rotation of the first auxiliary movable frame 16 and the second main movable frame 17 relative to the first main movable frame 3, sofa 1 is provided with an interconnecting lever 23 operating between the first main movable frame 3 and the second main movable frame 17.

[0035] The first auxiliary movable frame 16, second main movable frame 17 and interconnecting lever 23 constitute an overturning assembly 24 arranged to enable rotation of the first auxiliary movable frame 16 and the second main movable frame 17 from a position at which they are folded back on the first main movable frame 3 to a position at which they are aligned with each other and with the first main movable frame 3.

[0036] In accordance with the present invention, also provided is a synchronizing lever 25 to synchronize the vertical raising or lowering movement of the first movable frame 3 with rotation of the second main movable frame 17 to ensure simple opening and closing of the sofa-bed.

[0037] According to the embodiments shown, the synchronizing lever 25 has a first end 25a in engagement with the pantograph leverage 4, at an hooking tab 26 for example, extending from the first lifting rod 6 at a median point thereof, and a second end 25b hinged on the first auxiliary movable frame 16.

[0038] Advantageously, the synchronizing lever 25 transmits the horizontal displacements of the hooking lever 26 to the first auxiliary movable frame 16 thereby causing, by raising of the first main movable frame 3, a

clockwise rotation (looking at Figs. 1 to 4) of said first auxiliary movable frame 16 around the first hinging axis 15. Simultaneously, the interconnecting lever 23 acts in such a manner that, following rotation of the first auxiliary movable frame 16, a simultaneous rotation in the same way of the second main movable frame 17 occurs.

[0039] The sofa-bed further comprises an overturning device 27 in engagement with the second main movable frame 17 to cause movement of a back 28 connected therewith.

[0040] In particular, the overturning device 27 comprises a first support frame 29 for the second main movable frame 17 when it is in a bed condition, with which auxiliary support feet 30 are associated, and a hooking frame 31 for the back 28 connected to the support frame 29 and kinematically linked to the second main movable frame 17.

[0041] According to the embodiments show, the support frame 29 comprises a support rod 32 having a first end 32a and a second end 32b opposite to the first one, to which feet 30 are fastened, and a connecting portion 33 rigidly fastened to rod 32 and disposed transversely thereof. Practically, in a side view the support frame 29 has the shape of a reversed "1" the longer leg of which is the support rod 32.

[0042] The support frame 29 and hooking frame 31 are connected to the second main movable frame 17 through a connecting leverage 34. In particular, the connecting leverage 34 comprises a first connecting lever 35 a first end 35a of which is hinged on the second main movable frame 17 and the second end 37b of which is hinged on the first end 32a of the support rod 32, as clearly shown in Fig. 2.

[0043] The hooking frame 31 for the back 28 is hinged on the free end 33a of the connecting portion 33 and is further operatively connected to the second main movable frame 17 so that displacement of the support frame 29 relative to the second main movable frame 17 gives rise to a rotation of the hooking frame 31 relative to said support frame 29.

[0044] According to a first embodiment shown in Figs. 1 to 4, the hooking frame 31 is operatively connected to the second main movable frame 17 by a second connecting lever 36 and a third connecting lever 37.

[0045] The second connecting lever 36 has a first end 36a pivotally mounted on the hooking frame 31 at a different point from that on which the support frame 29 is hinged, and a second end 36b pivotally mounted on the first connecting lever 35 at a median point thereof.

[0046] The third connecting lever 37 has a first end 37a directly hinged on the second main movable frame 17 and a second end 37b centrally hinged on the second connecting lever 36.

[0047] In an alternative embodiment, shown in Fig. 5, the hooking frame 31 is operatively connected to the second main movable frame 17 by a plate 38 integral with the second main movable frame 17 on which the hooking frame 31 is hinged.

[0048] In both embodiments the support frame 29 is movable between a first position, at which the support rod 32 has its first end 32a close to the second main movable frame 17 and is substantially perpendicular to the second main movable frame 17, and a second position at which the support rod 32 is spaced apart from the second main movable frame 17 while still being substantially perpendicular thereto.

[0049] It is to be noted that in the second position the first connecting lever 35 is aligned with the support rod 32 and performs the function of spacing it apart from the second main movable frame 17.

[0050] Advantageously, the hooking frame 31 is movable between a first position corresponding to the first position of the support frame 29, at which it is perpendicular to the support rod 32 and substantially parallel to the second main movable frame 17, and a second position corresponding to the second position of the support frame 29, at which said frame is substantially parallel to the support rod 32. In the last-mentioned position, the back 28 extending from the hooking frame 31 lies therefore parallel to the second main movable frame 17.

[0051] It should be also appreciated that the overturning device 27 is operatively connected to the first auxiliary movable frame 16 and therefore the first main movable frame 3, so that rotation of said overturning device 27 gives rise, as a result, to rotation of the first auxiliary movable frame 16 and the second main movable frame 17, as well as raising of the first main movable frame 3.

[0052] In fact, the sofa-bed 1 comprises an intermediate lever 39 having a first end 39a pivotally mounted to the first auxiliary movable frame 16 and a second end 39b hinged on the first connecting lever 35.

[0053] In the first embodiment shown in Figs. 1 to 4, the intermediate lever 39 is hinged on the first connecting lever 35 at the hinging point of the first lever 35 on the support frame 29.

[0054] Alternatively, according to the second embodiment shown in Fig. 5, the intermediate lever 39 is hinged on the first connecting lever 35 at a median point of said connecting lever.

[0055] In addition, pivotally mounted on the third main movable frame 21 is a support structure 40 movable between a first position at which it is substantially parallel to the third main movable frame 21 and a second position at which it is disposed transversely of the third frame 21 itself.

[0056] In order to synchronize displacement of the support structure 40 with rotation of the third main movable frame 21 relative to the second auxiliary movable frame 19 and rotation of the second auxiliary movable frame 19 relative to the main movable frame 17, the sofa-bed 1 comprises a synchronization leverage 41 consisting of a synchronization plate 42 and an intermediate rod 43. The synchronization plate 42 is hinged at a first end 42a thereof on the support structure 40 and at a second end 42b on the second auxiliary movable frame

19; it further has a hinge 42c placed close to the second end 42b on which a first end 43a of the intermediate rod 43 is pivotally mounted, whereas a second end 43b of the intermediate rod 43 itself is hinged on the second main movable frame 17.

[0057] Finally, the sofa-bed 1 comprises a locking mechanism to lock the same to the closed position.

[0058] The locking mechanism 44 has an engagement portion 45 integral with the fixed framework 2 and placed at the rear of back 28.

[0059] In more detail, the engagement portion 45 is formed of a horizontal portion 46 disposed in cantilevered fashion on a support rod 47 extending from the fixed framework 2 in a vertical direction.

[0060] In the accompanying figures there is a clear view of the support rod 47 which, at its upper end, carries the cantilevered portion 46 of circular cross section.

[0061] Advantageously, the sofa-bed 1 comprises two horizontal portions 46 facing each other and placed on respective support rods 47, only one of which is shown in the drawings, vertically extending from opposite sides of the sofa-bed 1.

[0062] Alternatively, the engagement portion 45 is made up of a single horizontal rod 46 connecting the two support rods 47.

[0063] The locking mechanism 44 further comprises rocker means 48 in engagement with the second main movable frame 17 and a pusher pin 49 integral with the support frame 29.

[0064] In more detail, the rocker means 48 is made up of a tilting element 50 (Figs. 3 and 4) hinged at a fulcrum 50a on a plate 51 integral with the second main movable frame 17. Advantageously, the tilting element 50 is of triangular shape having its fulcrum 50a at one of the vertices thereof.

[0065] Alternatively, according to an embodiment not shown, the tilting element 50 has the shape of a "7", its fulcrum 50a being at the vertex.

[0066] The pusher pin 49 is operatively active on a first side 50b (Figs. 2 and 3) of the tilting element 50 to rotate it between a first disengagement position corresponding to the second position of the support frame 29 and a second engagement position corresponding to the first position of the support frame 29.

[0067] In the disengagement position, the pusher pin 49 is spaced apart from the tilting element 50, whereas in the engagement position corresponding to the closed position of the sofa-bed 1 as shown in Fig. 1, the pusher pin 49 acts against the first side 50b of the tilting element 50 to push a second side 50c of the tilting element 50 itself from bottom to top against the horizontal portion 46.

[0068] Operation of the sofa-bed with an articulated folding structure described above mainly as regards structure is as follows.

[0069] If it is wished to pass from the closed position at which use of the sofa-bed as a sofa is intended, to the open position at which the sofa-bed is provided to be used as a bed, the sofa back 28 and the hooking frame 31 fastened thereto are required to be rotated in order to obtain lifting of the support rod 32, alignment of the first connecting lever 35 with the support rod 32 itself and rotation of the intermediate lever 39.

[0070] During raising of the support rod 32 the pusher pin 49 moves far from the tilting element 50 thereby disengaging the engagement portion 45 to enable opening of the sofa-bed 1.

[0071] Since said intermediate lever 39 and interconnecting lever 23 kinematically engage the first and second main movable frames 3, 17 and the first auxiliary movable frame 16 with each other, following rotation of the intermediate lever 39 a simultaneous rotation of the second main movable frame 17 and the first auxiliary movable frame 16 is obtained and they thus tend to arrange themselves in alignment with the first main movable frame 3. During this rotatory alignment movement, due to the synchronizing lever 25 kinematically connecting the first auxiliary movable frame 16 with the pantograph leverage 4, simultaneous lifting of the first main movable frame 3 over the fixed support framework 2 is obtained.

[0072] Importantly, it is to be pointed out that even in the absence of the locking mechanism 44, opening of the sofa-bed 1 by directly lifting the second main movable frame 17 cannot be obtained. In this case, in fact, by effect of the particular starting arrangement of the levers, the hooking frame 31 would tend to rotate in the opposite way relative to the second main movable frame 17.

[0073] However, as shown in Fig. 1, frame 31 cannot carry out such a kind of rotation. In other words, it is necessary for the hooking frame 31 to be first rotated relative to the second main movable frame 17 beyond a given critical angle. Only at this point the second main movable frame 17 can be directly acted upon and the sofa-bed 1 can be opened.

[0074] At all events, the locking mechanism 44 is a further element increasing the structure steadiness.

[0075] As soon as rotation has been completed, when the first main movable frame 3, the second main movable frame 17 and the first auxiliary movable frame 16 are aligned, the auxiliary feet 30 of the support frame 29 rest on the floor.

[0076] Finally, in order to also align the third main movable frame 21 and second auxiliary movable frame 19 with the three first frames 3, 16, 17, the support structure 40 is to be rotated clockwise until it reaches a position transverse to the third main movable frame 21. In fact, the synchronization leverage 41 as a result of rotation of the support structure 40, causes rotation and alignment of the third main movable frame 21 and the second auxiliary movable frame 19.

[0077] When the last-mentioned rotation is over too, the support structure 40 rests on the floor to offer a support to the end portion of the bed as well.

[0078] If, on the contrary, it is wished to pass from the

open position to the closed position, first the end of the third main movable frame 21 is acted upon so as to rotate said frame 21 counter-clockwise until bringing it parallel to the second main movable frame 17. During this rotation, by virtue of the synchronization leverage 41, the simultaneous rotation of the second auxiliary movable frame 19 is obtained as well as re-alignment of the support structure 40 with the third main movable frame 21.

[0079] Subsequently, by acting on the end of the second main movable frame 17, so as to rotate it counter-clockwise, by virtue of the intermediate lever 39, the interconnecting lever 23 and the synchronizing lever 25, simultaneous rotation of the first auxiliary movable frame 16 and descent of the first main movable frame 3 are obtained.

[0080] Simultaneously with the above operation, the hooking frame 31 comes into alignment with the second main movable frame 17 bringing the sofa back 28 again to the correct position as a sofa.

[0081] During the final descent stretch of the second main movable frame 17 into the fixed support framework 2 and of the support frame 29 onto the second main movable frame 17, the pusher pin 49 comes into contact with the tilting element 50 causing rotation of same and locking it under the horizontal portion 46.

[0082] The invention achieves important advantages.

[0083] In fact, first of all, it is to be noted that the sofa-bed in accordance with the present invention in its bed conformation enables the back to be spaced out from the ground and, simultaneously, the auxiliary support feet to be concealed when the sofa-bed is closed in its sofa conformation.

[0084] Therefore, during use of the sofa as such, the support frame keeps concealed in the back, making the sofa safe because devoid of dangerous projecting parts and also aesthetically agreeable.

[0085] In addition, when the structure is open, the back is sufficiently spaced apart from the ground to prevent dust and dirt from storing thereon.

[0086] Furthermore, due to the simplicity of the overturning device for the back, reliability of the sofa-bed is ensured even after a great number of utilisation cycles.

[0087] Finally, the locking mechanism when closed avoids tendency of the sofa to open or at all events to lift up at the back region, as a result of the presence of a very bulky mattress for example, even when backlashes have been formed at the junction points due to the great number of utilisation cycles.

Claims

1. A sofa-bed with an articulated folding structure, comprising:

   - a fixed support framework (2);
   - a first main movable frame (3) kinematically connected to the fixed support framework (2);
   - a pantograph leverage (4) operatively active between the first main movable frame (3) and the fixed support framework (2) to move the first main movable frame (3) in a substantially vertical direction between a first position at which it is housed in the fixed support framework (2) and a second position at which it is raised relative to the fixed support framework (2);
   - a second main movable frame (17) rotatably in engagement with the first main movable frame (3);
   - a support frame (29) for the second main movable frame (17), said support frame (29) being connected to a back (28) of the sofa-bed (1);
   - a hooking frame (31) for the back (28);
   - a connecting leverage (34) joining the hooking frame (31) and support frame (29) with the second main movable frame (17);

   characterized in that the hooking frame (31) is hinged on the support frame (29) and movable between a first position at which the back (28) is substantially parallel to the support frame (29) and a second position at which the back (28) is substantially transverse to said support frame (29).

2. A sofa-bed as claimed in claim 1, **characterized in that** the connecting leverage (34) joining the hooking frame (31) and support frame (29) with the second main movable frame (17) comprises:

   - a first connecting lever (35) hinged on the movable frame (17), preferably at a first end (35a) of said first lever (35), and on the support frame (29), preferably at a second end (35b) of said first lever (35);
   - a second connecting lever (36) pivotally mounted on the hooking frame (31), preferably at a first end (36a) of said second lever (36), and on the first connecting lever (35), preferably at a second end (36b) of said second lever (36);
   - a third connecting lever (37) hinged on the movable frame (17), preferably at a first end (37a) of said third lever (37), and on the second connecting lever (36), preferably at a second end (37b) of said third lever (37).

3. A sofa-bed as claimed in claim 2, **characterized in that** the second connecting lever (36) is pivotally mounted on an intermediate point of the first connecting lever (35).

4. A sofa-bed as claimed in claim 2, **characterized in that** the third connecting lever (37) is hinged on an intermediate point of the second connecting lever (36).

5. A sofa-bed as claimed in claim 1, **characterized in that** the connecting leverage (34) joining the hooking frame (31) and support frame (29) with the second main movable frame (17) comprises:

a first connecting lever (35) hinged on the movable frame (17), preferably at a first end (35a) of said first lever (35), and on the support frame (29), preferably at a second end (35b) of said first lever (35);
- a plate (38) integral with the movable frame (17), said plate (38) being hinged on the hooking frame (31).

6. A sofa-bed as claimed in anyone of claims 2 to 5, **characterized in that** it comprises an intermediate lever (39) having a first end (39a) pivotally mounted on the first auxiliary movable frame (16) and a second end (39b) hinged on the first connecting lever (35), to synchronize rotation of the back (28) with rotation of the first auxiliary movable frame (16).

7. A sofa-bed as claimed in claim 1, **characterized in that** it further comprises a first auxiliary movable frame (16) consecutively and rotatably in engagement with the first main movable frame (3) at a first hinging axis (15); the second main movable frame (17) being consecutively and rotatably hinged on the first auxiliary movable frame (16) at a second hinging axis (18).

8. A sofa-bed as claimed in claim 1, **characterized in that** it further comprises a locking mechanism (44) to lock said sofa-bed (1) to the first closed position.

9. A sofa-bed as claimed in claim 1, **characterized in that** said locking mechanism (44) comprises:

- an engagement portion (45) integral with the fixed framework (2) and placed at the rear of the back (28);
- rocker means (48) in engagement with the second main movable frame (17) and rotating between a disengagement position corresponding to the second position of the support frame (29), and a position of engagement with the engagement portion (45) corresponding to the first position of the support frame (29);
- a pusher pin (49) integral with the support frame (29) and operatively active on the rocker means (48) to rotate said rocker means (48) between the disengagement position and the engagement position.

10. A sofa-bed as claimed in anyone of the preceding claims **characterized in that** it further comprises:

- a second auxiliary movable frame (19) consecutively and rotatably in engagement with the second main movable frame (17) at a third hinging axis (20);
- a third main movable frame (21) consecutively and rotatably in engagement with the second auxiliary movable frame (19) at a four hinging axis (22).

FIG.1

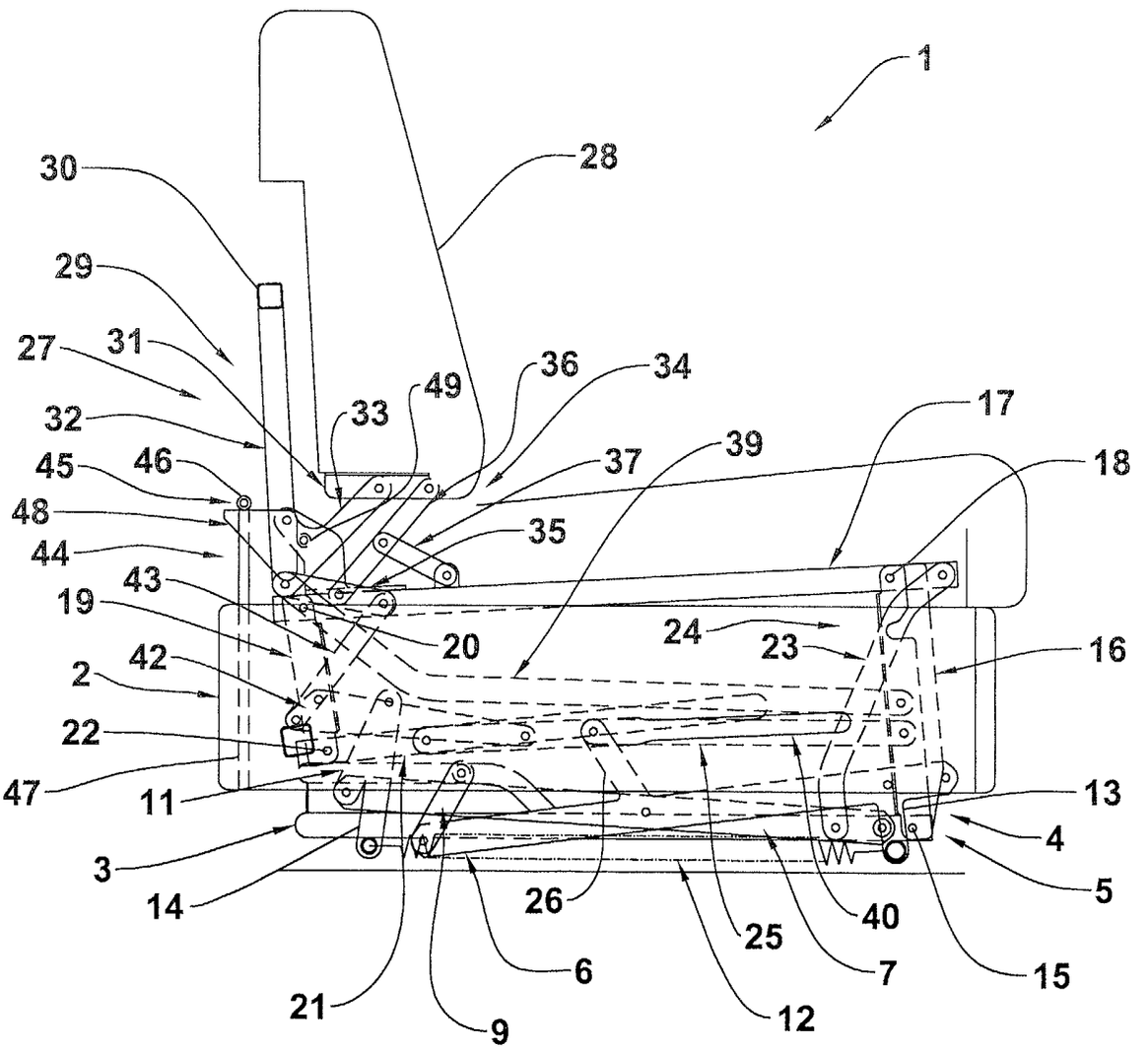

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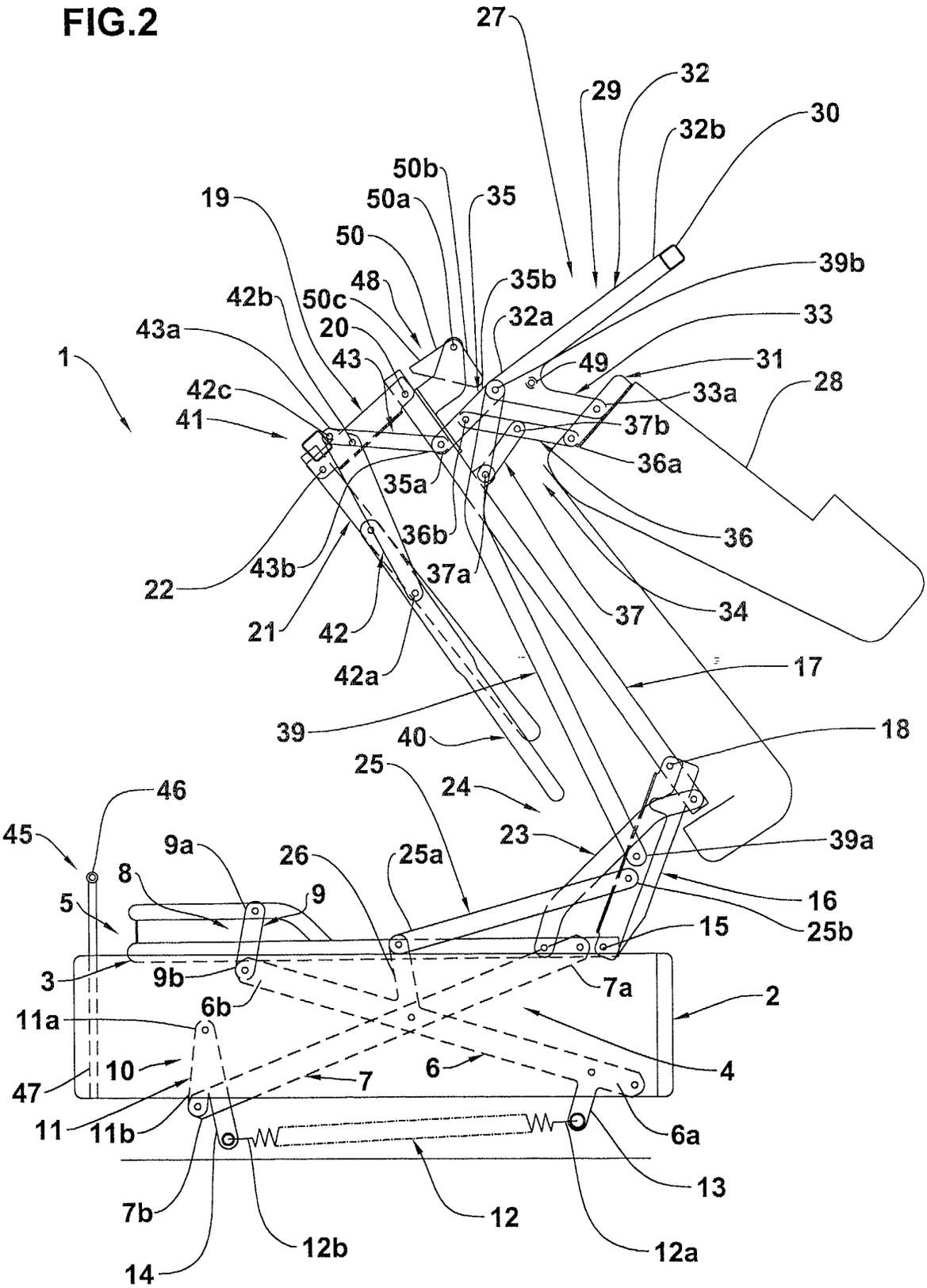
FIG.2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15
3
9b
7a
2
6b
11a
10
6
4
47
7
11
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6a
13
7b
12
12b
12a
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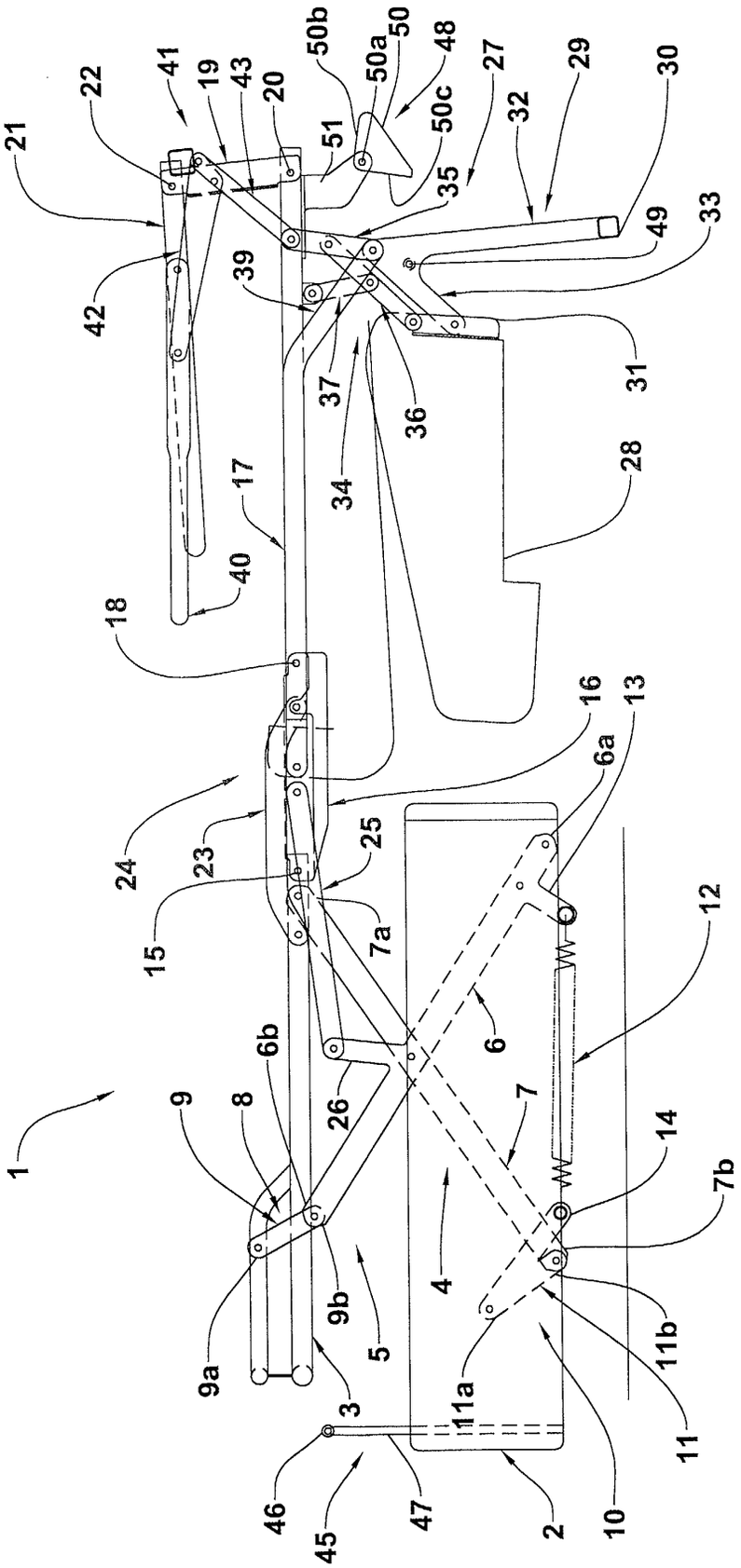
FIG.3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7a
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50c
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FIG.4

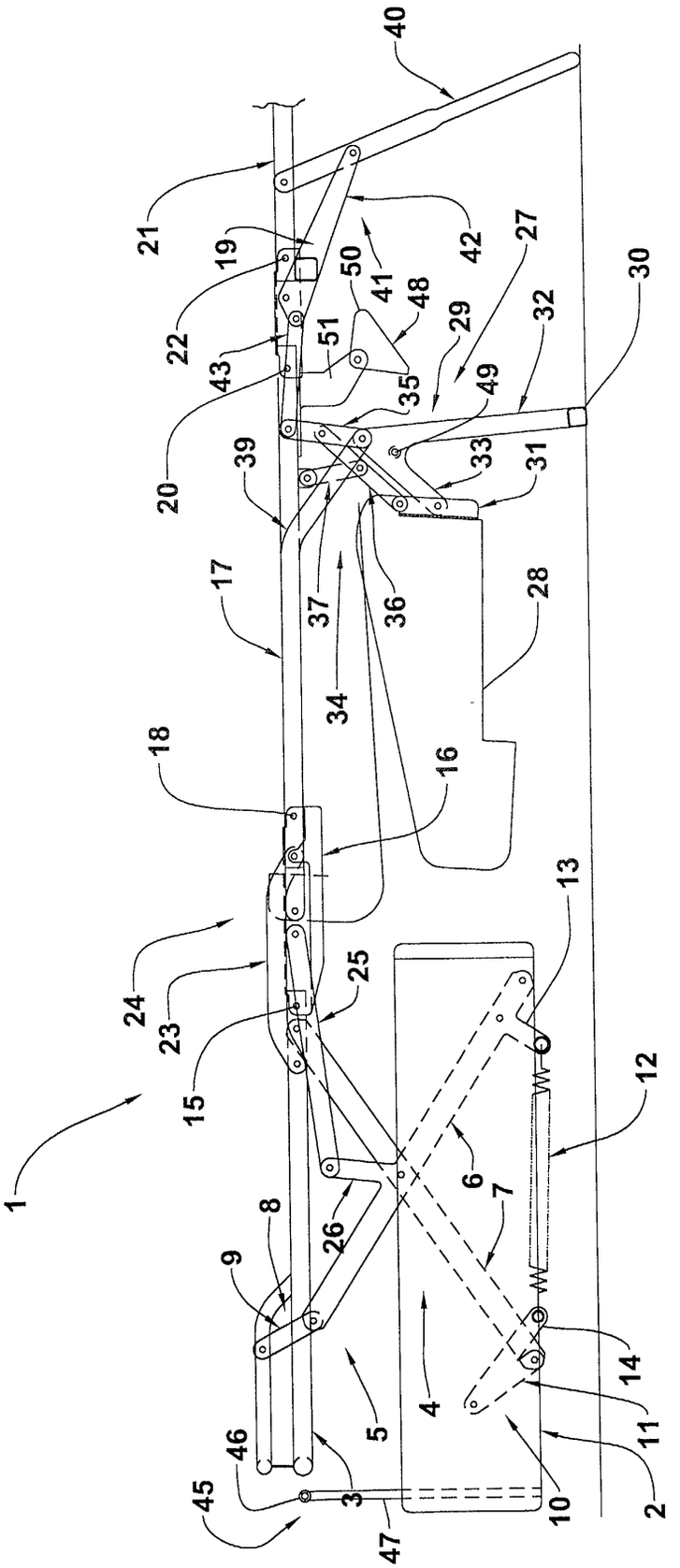
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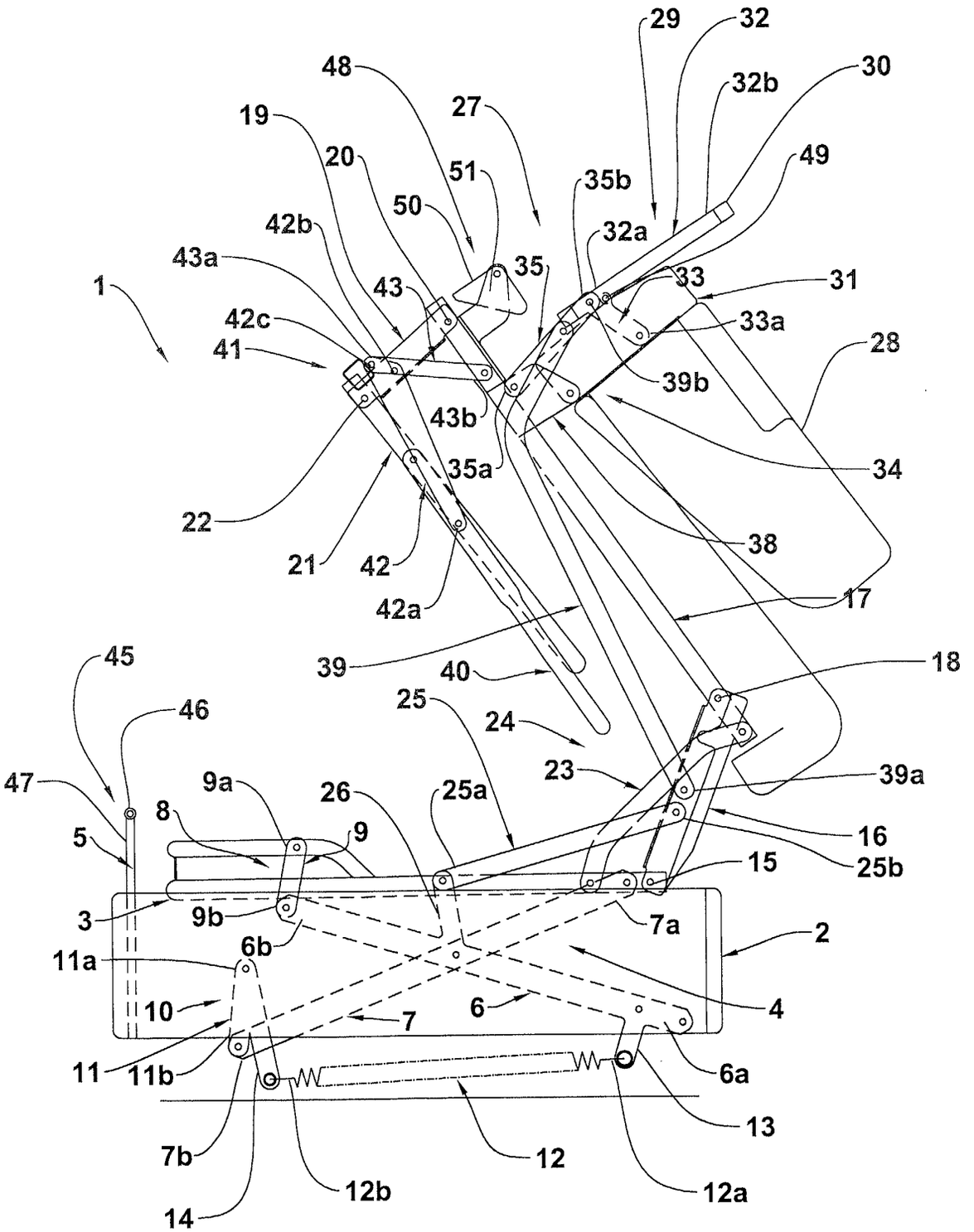
FIG.5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42c
33a
41
28
39b
43b
34
35a
22
38
21
42
17
42a
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45
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46
24
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39a
47
9a
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25a
8
16
9
5
15
25b
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9b
7a
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6b
11a
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11
11b
6a
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7b
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12b
12a
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EUROPEAN SEARCH REPORT

Application Number
EP 01 83 0769

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Place of search	Date of completion of the search	Examiner
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