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(11) **EP 2 462 842 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.06.2012 Bulletin 2012/24

(51) Int Cl.:
A47C 19/04 *(2006.01)*

(21) Application number: **11192365.2**

(22) Date of filing: **07.12.2011**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **10.12.2010 ES 201031823**

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(54) Lifting mechanism for a storage bed base

(57) The invention relates to a lifting mechanism comprising a plurality of arms forming the sides of two rhomboid polygons having a first common side (1), a first rhomboid comprising a lower side (6) parallel to the first side (1) and a second (2) and a third (3) side articulated by one end to the lower side (6) and by the other end to the first side (1), the second rhomboid comprising the first side (1) common with the first rhomboid, a strut (7) of the same length as the first side (1) and a fourth (4) and fifth (5) side parallel to one another, articulated by one end to the first side (1) and by another end to the strut (7), the mechanism comprising an element (8) articulated at one of its ends with a third point of the fourth side (4) and at its other end with a point integral with the lower side (6), this point being not collinear with the articulations (10, 11) of the second (2) and the third (3) sides with the lower side.

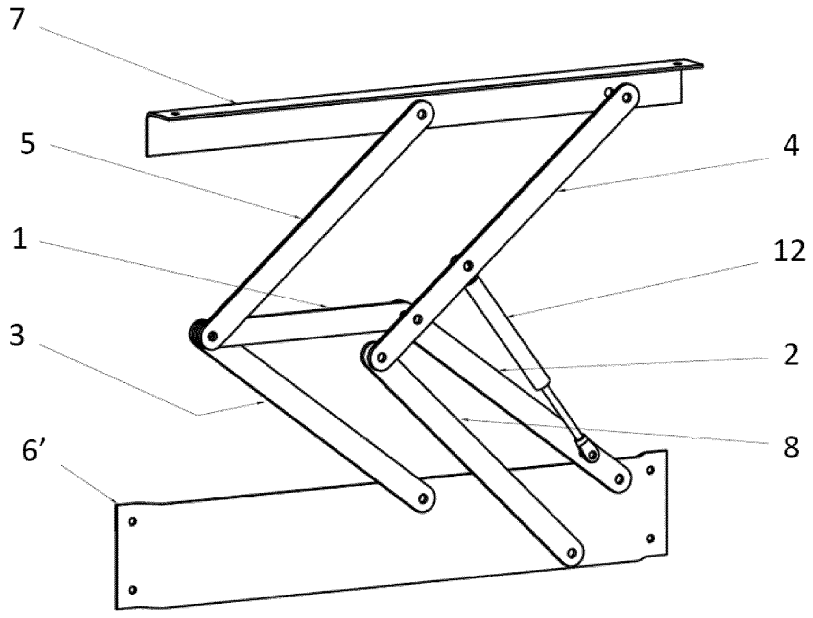

FIGURE. 3

EP 2 462 842 A1

Description

Object of the Invention

[0001] The present invention refers to a lifting mechanism provided to enable separating and bringing two elements or parts of linear structure from or closer to one another, being kept parallel on one and the same plane, and to a storage bed base provided with the same.

Background of the Invention

[0002] Beds that incorporate storage bed bases are much more advantageous and practical than conventional beds because the storage bed base forms a box in which objects, clothes, etc. can be stored, therefore, the storage bed base today provides a solution to various problems, among those are economic and living space problems, since a storage bed base establishes in itself a space complementary to that of wardrobes, but without occupying useful space of the room where it is placed.

[0003] Nevertheless, traditional storage bed bases present a series of limitations and drawbacks because on one hand, making the bed is uncomfortable, and on the other hand, to access the space available in the storage bed base, i.e., the space under the upper cover thereof on which the mattress is supported, said mattress must be removed to subsequently open said cover, which is performed in a pivoting manner, said cover being inclined until handling the inside of the box of the storage bed base is allowed.

[0004] These drawbacks have led storage bed base manufacturers to search for solutions so that instead of the upper cover supporting the mattress and bed linen opening by pivoting, it is moved vertically, being maintained in a horizontal plane. Two favorable effects are achieved with this, because on one hand it is not necessary to remove the bed linen to open the storage bed base, and on the other hand, the task of bed making is aided, as it will be performed comfortably and without bending over because it allows placing the cover of the storage bed base with the mattress at an appropriate height to carry out this work.

[0005] Although there are mechanisms which allow lifting the cover of the storage bed base in a vertical movement, and therefore in a horizontal position, they are complex and even questionably efficient mechanisms. Furthermore, in the majority of said mechanisms the movement of the cover is not strictly vertical but presents a certain pivoting or even a movement in the plane of the cover, generally forwards or sideways, therefore having additional space in the room is essential.

Description of the Invention

[0006] The present invention solves the existing drawbacks by means of a lifting mechanism for a storage bed base according to claim 1 and a storage bed base according to claim 8, allowing a completely vertical lifting of the cover. Preferred embodiments of the invention are defined in the dependent claims.

[0007] A first aspect defines a lifting mechanism comprising a plurality of arms forming the sides of two rhomboid polygons having a first common side. The first rhomboid comprises a lower side parallel to the first side and a second and third side articulated by one end to the lower side and by the other end to the first side, closing the first rhomboid, the length defined between the articulations of the second and the third side with the lower side being the same as that defined between the articulations of the second and the third side with the first side. The second rhomboid comprises the first side common with the first rhomboid, a strut of the same length as the first side and a fourth and fifth side parallel to one another, articulated by one end to the first side and by another end to the strut, closing the second rhomboid. The mechanism further comprises an element articulated at one of its ends with a third point of the fourth side and at its other end with a point integral with the lower side, this point being not collinear with the articulations of the second and the third side with the lower side.

[0008] In one embodiment the length of the element is equal to the length of the second and the third side.

[0009] In one embodiment the distance between the articulation of the second side with the fourth side and the articulation of the fourth side with the element is substantially half of the distance between the point integral with the lower side and the articulation of the second side with the lower side.

[0010] In one embodiment the distance between the articulation of the second side with the fourth side and the articulation of the fourth side with the element is substantially 1/7 of the total length of the fourth side.

[0011] The lifting mechanism can comprise locking means for maintaining the strut in a lifted position.

[0012] A second inventive aspect defines a storage bed base comprising a box, a cover and at least one lifting mechanism according to the first inventive aspect, the lower side of the mechanism being fixed to the box of the storage bed base and the strut of the mechanism being fixed to the cover of the storage bed base.

Description of the Drawings

[0013] To complement the description that will be made below and for the purpose of aiding to better understand the features of the invention according to a preferred practical embodiment thereof, a set of drawings is attached as an integral part of this description in which the following has been depicted with an illustrative and non-limiting character:

Figure 1 shows a geometric diagram of a lifting mechanism according to the invention in an open position.
Figure 2 shows the geometric diagram of the lifting mechanism in a more closed position than that of

Figure 1.

Figure 3 shows an embodiment of the lifting mechanism according to the invention.

Figure 4 shows the lifting mechanism of Figure 3 in a more closed position.

Figure 5 shows a storage bed base provided with a lifting mechanism according to the invention.

Preferred Embodiment of the Invention

[0014] The lifting mechanism of the invention comprises a plurality of arms arranged forming two rhomboid polygons having a first common side (1), a first rhomboid having a lower side (6) parallel to and of the same length as the first side (1) and a second (2) and third (3) side articulated by one end to the lower side (6) and by the other end to the first side (1), closing the first rhomboid.

[0015] The second rhomboid - placed on top of the aforementioned rhomboid in the drawing - is made up of the first side (1) common with the first rhomboid, a strut (7) of the same length as the first side (1) and a fourth (4) and fifth (5) side parallel to one another, articulated by one end to the first side (1) and by another end to the strut (7), closing the second rhomboid.

[0016] In addition to the above elements, the mechanism has an additional element (8), articulated by one end with a third point of the fourth arm (4) and by the other end with a specific point (9) integral with the lower side (6), this point (9) being not collinear with the articulations (10, 11) of the second (2) and the third (3) side with the lower side (6). The element (8) can be linear, i.e., the three points defining it can be aligned, while the articulations (10, 11) of the second (2) and the third (3) side with the lower side (6) and the point (9) of articulation of the element (8) integral with the lower side (6), schematically define a triangle.

[0017] Figures 1 and 2 schematically depict the mechanism according to the invention in two opening states. In reality these schematic elements can be made from metal sheet parts and strips articulated to one another, such as in the mechanism depicted in Figures 3 and 4 in two different positions.

[0018] If the part forming the lower side (6) is fixed and the upper part or strut (7) - which only has one degree of freedom - is attempted to be moved, it can only be moved following a substantially vertical trajectory, which is the purpose for which the mechanism has been conceived for.

[0019] In order to move the strut (7) vertically, it is necessary that the two rhomboids are deformed simultaneously, i.e., if the first rhomboid having sides (1), (3), (6) and (2) is deformed by increasing the angle "a", the second rhomboid having sides (1), (4), (7) and (5) must be deformed correspondingly, such that the angles "a" and "b" are always substantially equal. This is achieved by introducing in the diagram an element (8) articulated by one end to a point (9) which is integral with the lower side (6)- therefore, the articulations (10, 11) with the second (2) and the third (3) side are immovable with respect to the point (9) - and by its other end to the lower end of the fourth side (4) extending below the point in which it is articulated with the first common side (1).

[0020] In a preferred embodiment, the length of the element (8) is substantially equal to the length of the second (2) and the third (3) side of the rhomboid.

[0021] In a preferred embodiment, the distance from the point of articulation between the second (2) and the fourth (4) side to the articulation of the fourth side (4) with the element (8) is substantially half the distance between the point (9) integral with the lower side (6) and the articulation (11) of the second side (2) with the lower side (6), which already determines a process for the marking out and positioning the point (9) integral with the lower side (6).

[0022] In a preferred embodiment, the distance between the articulation of the second side (2) with the fourth side (4) and the articulation of the fourth side (4) with the element (8) is substantially 1/7 of the total length of the fourth side (4). A compromise will have to be found between the length of the extension of the fourth side (4) beyond the articulation with the second side (2) and the vertical deviation in the movement of the strut (7).

[0023] All the linear elements of the diagram are made from mechanical parts forming articulated arms or bars, of which the lower side (6') can be a metal sheet in which the articulations (10, 11) with the second (2) and the third (3) side and the integral point (9) of articulation with the element (8) are made.

[0024] Figure 5 shows a storage bed base provided with a lifting mechanism according to the invention, in which the lower side (6) of the mechanism and its integral point (9) are adjacent and fixed to the inner face of one of the walls of the box (13) of the storage bed base, while the cover of the storage bed base rests on the strut (7) of the mechanism, to which it can also be fixed.

[0025] Similarly, in an alternative embodiment the storage bed base of Figure 5 can be provided with an additional lifting mechanism, installing it in a wall of the box (13) contiguous to the wall having the mechanism, also fixing it to the box (13) and to the cover (14), both mechanisms defining vertical planes perpendicular to one another. The upper parts (7), integral with the cover (14) of the storage bed base therefore define thereon two horizontal lines perpendicular to one another. Since these two mechanisms can only be moved vertically, the two mentioned ideal lines must always be maintained in a horizontal plane, whereby the cover of the storage bed base could occupy different levels but always in a horizontal plane, which is the purpose of the mechanism.

Claims

1. A lifting mechanism comprising a plurality of arms forming the sides of two rhomboid polygons having a first common side (1),

a first rhomboid comprising a lower side (6) parallel to the first side (1) and second (2) and third (3) sides articulated by one end to the lower side (6) and by the other end to the first side (1), closing the first rhomboid, the length defined between the articulations (10, 11) of the second (2) and the third (3) sides with the lower side (6) being the same as that defined between the articulations of the second (2) and the third (3) sides with the first side (1),
the second rhomboid comprising the first side (1) common with the first rhomboid, a strut (7) of the same length as the first side (1) and a fourth (4) and fifth (5) side parallel to one another, articulated by one end to the first side (1) and by another end to the strut (7), closing the second rhomboid,
the mechanism comprising an element (8) articulated at one of its ends with a third point of the fourth side (4) and at its other end with a point (9) integral with the lower side (6), this point (9) being not collinear with the articulations (10, 11) of the second (2) and the third (3) side.

2. The lifting mechanism according to claim 1 wherein the length of the element (8) is equal to the length of the second (2) and the third (3) sides.

3. The lifting mechanism according to any one of the preceding claims, wherein the distance between the articulation of the second side (2) with the fourth side (4) and the articulation of the fourth side (4) with the element (8) is substantially half the distance between the point (9) integral with the lower side (6) and the articulation (11) of the second side (2) with the lower side (6).

4. The lifting mechanism according to any one of the preceding claims, wherein the distance between the articulation of the second side (2) with the fourth side (4) and the articulation of the fourth side (4) with the element (8) is substantially 1/7 of the total length of the fourth side (4).

5. The lifting mechanism according to any one of the preceding claims comprising locking means for maintaining the strut (7) in a lifted position.

6. The lifting mechanism according to claim 5, wherein the locking means comprise a gas spring (12).

7. The lifting mechanism according to any one of the preceding claims, wherein the arms forming the sides of the polygons are made of metal.

8. A storage bed base comprising a box (13), a cover (14) and at least one lifting mechanism according to any one of the preceding claims, the lower side (6) of the mechanism being fixed to the box (13) of the storage bed base and the strut (7) of the mechanism being fixed to the cover (14) of the storage bed base.

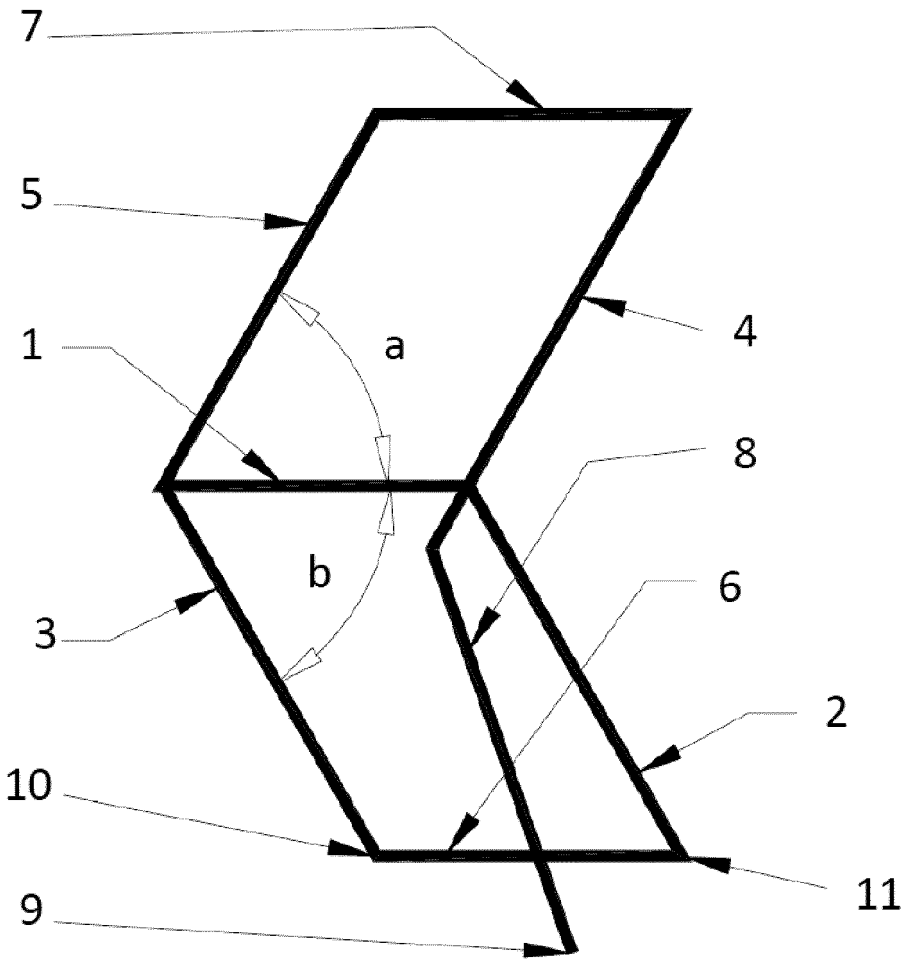

FIGURE. 1

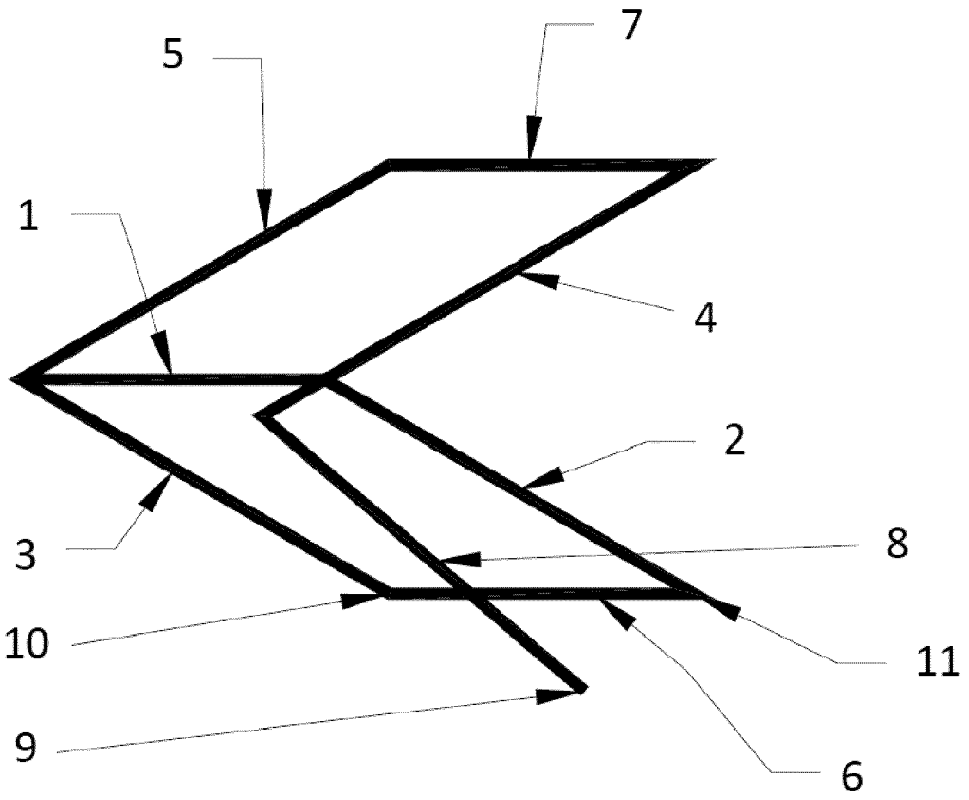

FIGURE. 2

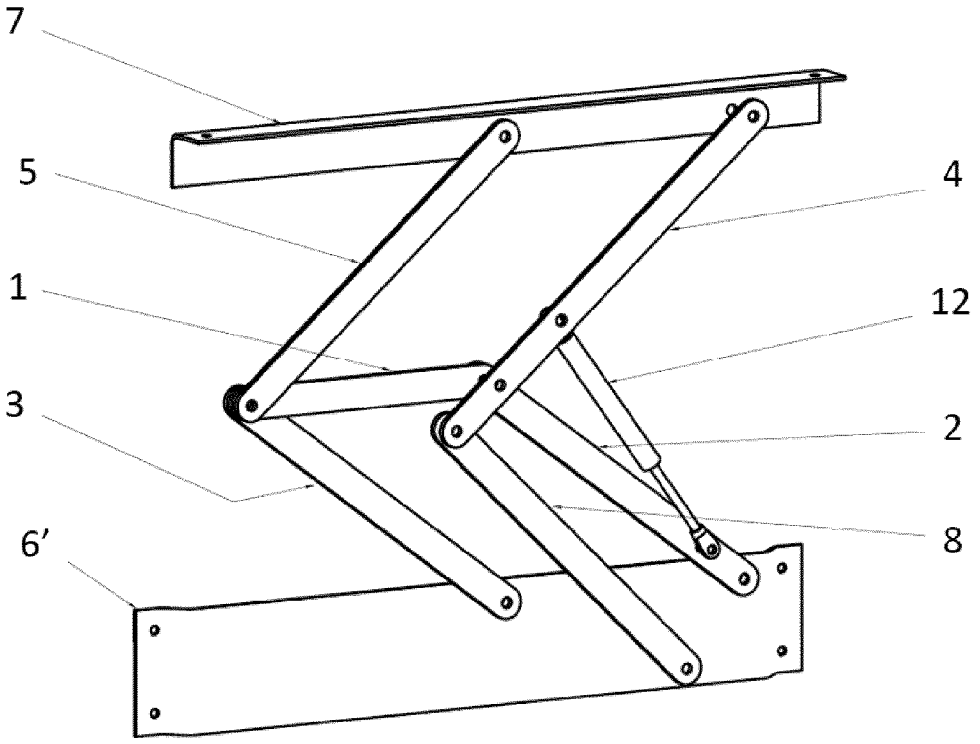

FIGURE. 3

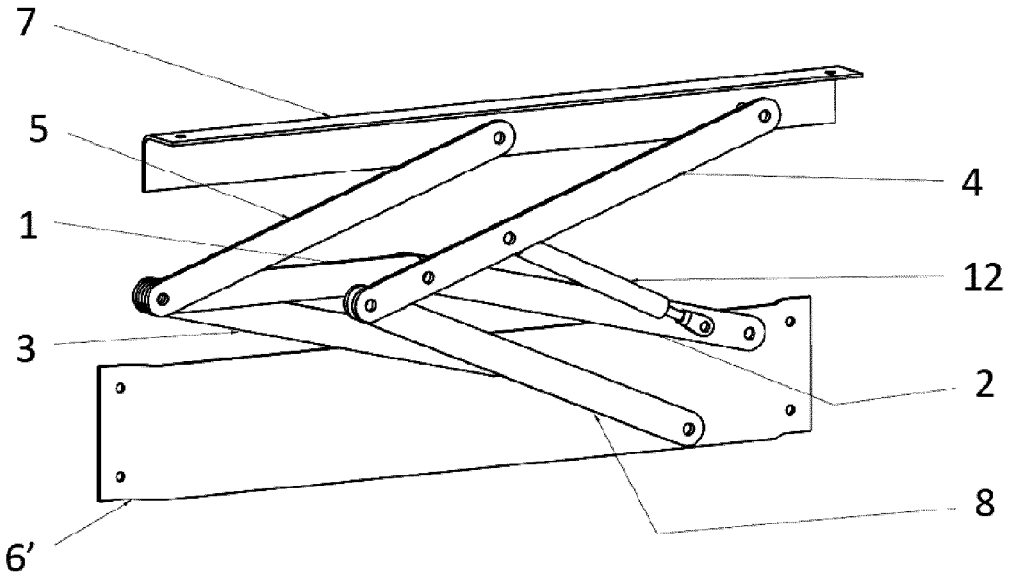

FIGURE. 4

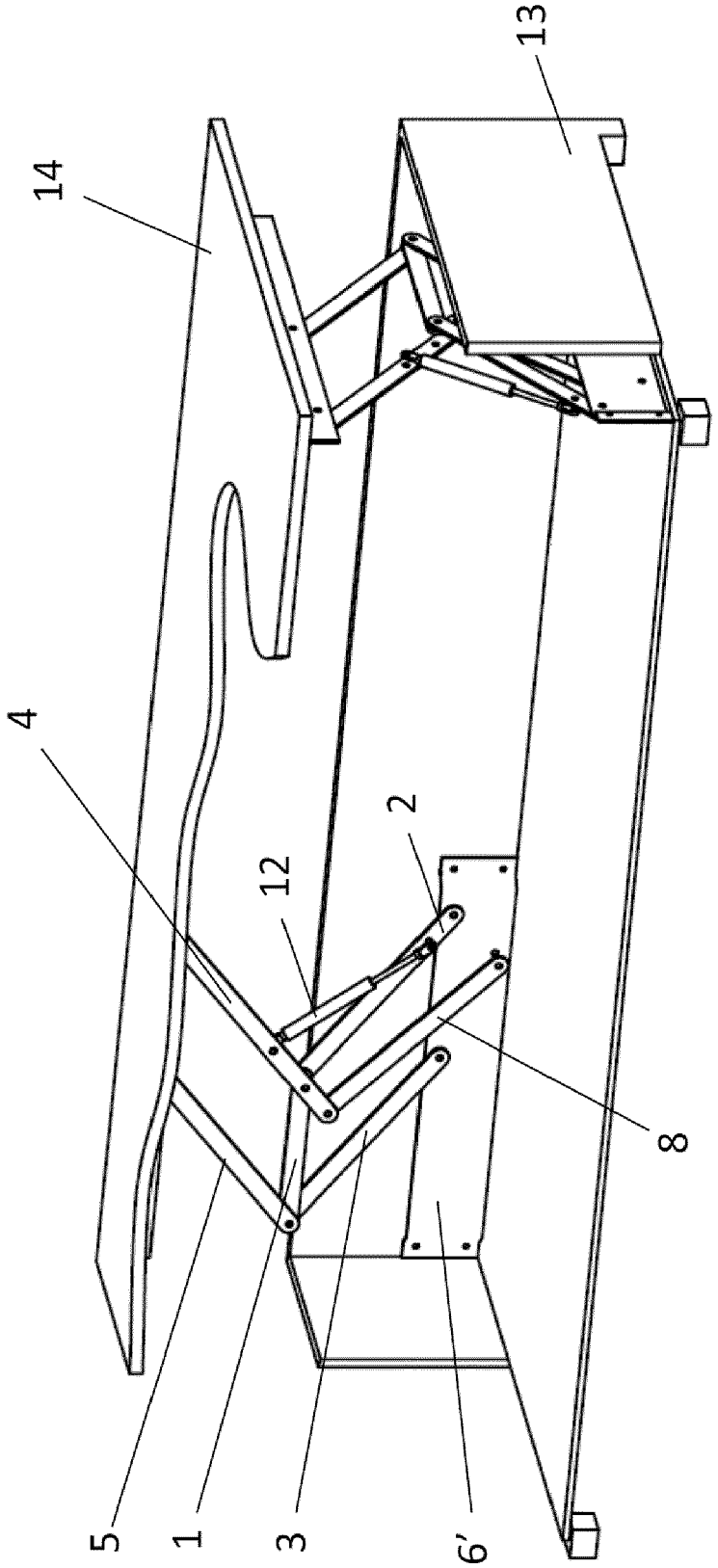

FIGURE. 5

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EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 February 2012	MacCormick, Duncan

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