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(54) **Device for lifting a bed-spring**

(57) A mechanism for lifting a bedspring (12) with respect to a frame or containment furniture (10) lying on the ground is liked to be simplified. The mechanism comprises a first (20) and a second (30) lifting arm, one of the two arms being extendable telescopically and both mounted substantially parallel to each other and hinged to the frame and to the bedspring to form an articulated parallelogram, in order to lift the bedspring between two positions, keeping it always substantially horizontal.

SOLUTION: the extendable arm consists only of a gas spring.

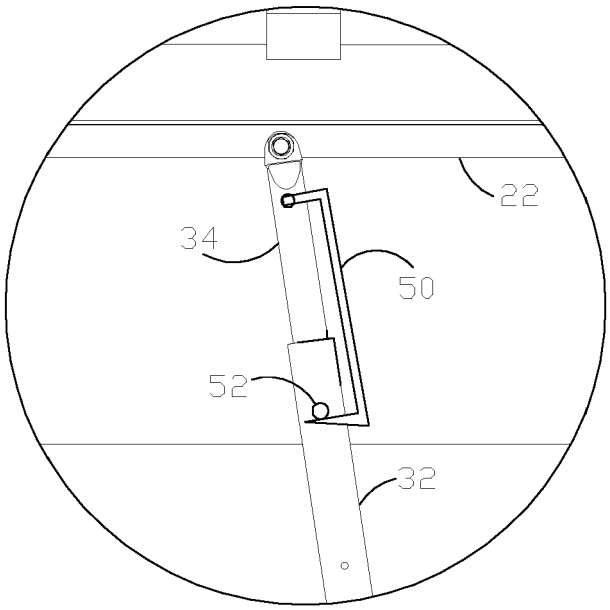

Fig. 5

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Description

[0001] The present invention relates to a lifting mechanism for a platform or bedspring for mattress (e.g. in beds or sofa-beds) or part of furniture, with respect to e. g. a containment structure (e.g. made of wood).

[0002] From EP2322059 or EP2108288 a mechanism is known for lifting a bedspring. The mechanism comprises a frame or containment structure lying on the ground, a first and a second lifting arm mounted substantially parallel to each other and hinged to the frame and to the bedspring to form an articulated parallelogram. One of the two arms is extendable through two segments mounted telescopically into each other, and inside them there is a coaxial gas spring to withstand the weight of the bedspring.

[0003] The arm is extensible because the bedspring is desired to not only remain parallel to the frame (see EP2108288 fig. 2) but also to able to tilt (see EP2108288 fig. 3) to uncover the containment structure, which acts as a storage space. Hence the need to lock the extendable arm when the bedspring is only raised but not tilted. To this aim a hook 82 is used (see EP2322059 fig. 5) which is hinged to a segment and can hook to the other segment.

[0004] A disadvantage of this system is having to ensure the smooth relative sliding of the sleeves, therefore rings made of anti-friction material are interposed therebetween, which are expensive, time-consuming to assemble and can wear out. Furthermore, the sleeves contribute significantly to the weight, cost and size of the mechanism.

[0005] Another disadvantage is having to machine the sleeves to arrange the hook 82 on them. The sleeves surround the internal gas spring, therefore they have a non-negligible diameter. Thus also the hook and/or its coupling means to the sleeve must have a proportionally significant size.

[0006] Finally, there is the problem of accidental closing of the bedspring that can occur if the user, by moving objects inside the containment structure, accidentally moves the hook. Reasons of cost and space prevent to shield the hook; rather, for practical reasons it must be as reachable as possible.

[0007] A mechanism of the above-mentioned type is proposed to solve one or more of the problems cited above.

[0008] The mechanism serves to lift a bedspring with respect to a frame or containment furniture lying on the ground, and comprises:

a first and a second lifting arm,
one of the two arms being telescopically extendable and both mounted substantially parallel to each other and hinged to the frame and to the bedspring to form an articulated parallelogram, in order to lift the bedspring between two positions keeping it always substantially horizontal,
characterized in that
the extendable arm consists only of a gas spring.

[0009] This way, the known sleeves can be got rid of, and a huge simplification of the mechanism is obtained, both in cost and in assembly procedures.

[0010] Note that the lifting and articulation mechanism between the bedspring and the containment furniture consists only in the two arms (and not e.g. three as in certain known models): two such arms alone are enough to lift and stabilize the bedspring. The mechanism is open to variants, to be used alone or in combination: For instance:

(i) it can comprise a locking element or locking means adapted to block the relative position of a cylinder and a stem present in the gas spring. The effect is to allow the lifting of the bedspring with the arms having fixed and stable length, and/or to allow a third position to the bedspring (see fig. 4). The locking element or means can be integrated in the structure of the cylinder or the stem (i.e. they can be part of the structure of the gas spring, e.g. for grater compactness) or mounted on the (body of the) cylinder or on the stem afterwards, e.g. superimposed or connected to their external surface (e.g. to convert every gas spring in one able to be used in the lifting mechanism). In particular the locking element or means can be articulated (e.g. hinged) to a clamp or collar tightened on the cylinder or on the stem, advantageous and simple solution to allow any gas spring to be lockable in its own length. For instance the locking element or means can comprise a rigid element or hook adapted to block the relative position of the cylinder and the stem;

(ii) one can use gas springs with locking command via a cable or with oil pump, or the simplest ones with just one cylinder and one piston rod, optionally lockable against each other as mentioned above.

[0011] A bed is also proposed comprising the mechanism according to the invention. The bed acquires the advantages of piece simplification and bulk reduction owned by the mechanism.

[0012] As another aspect of the invention the use of a gas spring is proposed as the only component for one of two lifting arms present in a mechanism for lifting a bedspring with respect to a frame or containment furniture lying on the ground, the mechanism consisting of:

a first and a second lifting arm;
one of the two arms being telescopically extendable and both mounted substantially parallel to each other and hinged to the frame and to the bedspring to form an articulated parallelogram, in order to move the bedspring between two positions keeping it always substantially horizontal.

[0013] The use can be characterized in that the gas spring comprises in its structure locking means adapted to block the relative position of a cylinder and a rod present in the gas spring, and/or can be characterized for all of the variants of the mechanism described here.

[0014] Said clamp or collar can be a screw-device, applied to the cylinder or the piston rod (stem). It can have two jaws (e.g. with ends hinged on each other) which can be set closer to each other or clamped by means of screws or other; or can have a C-shaped jaw with a screw which acts to tighten it; or can have two C-shaped flanges tightened at their extremities.

[0015] The advantages of the invention will be better clarified by the following description of exemplary embodiments, illustrated in the accompanying drawing wherein:

Fig. 1 shows an isometric view of a mechanism according to the invention (bedspring in the lowered position) when mounted in a bed;
Figures 2-4 show a side sectional view of the mechanism of Fig. 1 respectively with bedspring in lowered, raised and tilted position;
Fig. 5 shows a zoom of the detail contained in the circle C of Fig. 3.

[0016] In the drawings, same reference numerals indicate same or similar parts, and positional terms as "horizontal" or "vertical" in the description refer to the object when in normal use, i.e. for example resting on a plane or floor. The mentioned technical variants can be used individually and/or combining them together, whether or not expressly described.

[0017] A bed LT (fig. 1) has a peripheral frame or containment structure 10, e.g. rectangular or square and/or metallic. In fig. 1 the bed LT can be seen with the frame 10 having an approximately rectangular or square plant (having sides, indicated counterclockwise, by 10a, 10b, 10c and 10d) inside which there is mounted a lifting mechanism.

[0018] The frame 10 is a kind of parallelepiped drawer, empty inside, which can serve for containing objects in a compartment VN under a bedspring or platform 12, once the bedspring 12 is in the lowered rest position (fig. 2).

[0019] The bedspring 12 has e.g. a metal perimetral frame that serves to support in the center some slats 14 (only some indicated) through (optional) socles 22.

[0020] The mechanism in the bed LT (Figures 2-4) is preferably symmetric (i.e. applicable on two opposite sides of the drawer 10 and the bedspring 12) and is composed of two pairs of arms or segments 20, 30, placed approximately parallel to each other (e.g. with an angular deviation caused by mechanical tolerances or at most of 3-5 degrees) and hinged at one end to the bedspring 12, via an angle bracket 22, and at the other end to a plate 14 fixed inside and approximately in the center of the sides 10a, 10c. References are indicated only for a pair in Figures 2-4.

[0021] The segment or arm 30 is constituted by a gas spring, in turn, for example, constituted by a piston 34 linearly movable inside a cylinder 32. The segment 20 is instead preferably constituted by a rigid metal bar.

[0022] Overall, the two segments 20, 30 form with the frame 10 and the bedspring 12 (or with the bracket 22 and the plate 14) an articulated parallelogram, which can lift the bedspring 12 from a lowered position (fig. 2) to a raised position (fig. 3), keeping it always substantially horizontal, and this holds also for the opposite movement when the bedspring 12 is lowered again.

[0023] The gas spring makes its relative lifting arm extendable. Thus, from the position of Fig. 3 the gas spring can extend and the bedspring 12 can tilt while remaining raised (fig. 4, movement indicated by arrow F). The advantage is to facilitate access to the compartment VN and/or to servo-operate the action of tilting the bedspring 12.

[0024] To keep the bedspring 12 raised and horizontal (fig. 3) it is preferable to install on the gas spring blocking means adapted to block the relative position between the piston 34 and the cylinder 32 (overcoming e.g. the thrust of the piston 34). Sometimes the weight of the bedspring 12 can be sufficient to maintain the gas spring compressed and stable in the position of Fig. 2, and the blocking means are not necessary.

[0025] The blocking means can comprise e.g. a hook 50, directly hinged in an oscillating manner on the piston 34, cooperating with a protrusion or pin 52 integrated in or integral with the cylinder 32. The hook 50 can be moved until it engages the protrusion or pin 52, thereby blocking the extension in length of the spring 50 (Fig. 2) and ensuring the stable horizontality of the bedspring 12. The position of the pin 52 and of the hinging or articulation point of the hook 50 can also be reversed on the gas spring.

[0026] The blocking means can be stably integrated into the body of the gas spring or mounted as accessories. E.g. the hook 50 can be articulated to an element attachable to the piston 34 or the cylinder 32, e.g. a ring or a clamp or a collar (not shown).

[0027] Optionally, one can mount a second gas spring or an actuator for servoing the lifting of the bedspring. This element is indicated with 80 (Fig. 3) and schematically with a dashed line, and should be placed between two hinging points: one on the plate 14 and one on the arm 20.

Claims

1. Mechanism for lifting a bedspring (12) with respect to a frame or containment furniture (10) lying on the ground, comprising:

   a first (20) and a second (30) lifting arm,
   one of the two arms being extendable telescop-

ically and both mounted substantially parallel with each other and hinged to the frame and to the bedspring to form an articulated parallelogram, in order to lift the bedspring between two positions, keeping it always substantially horizontal,
characterized in that
the extendable arm consists only of a gas spring.

2. Mechanism according to claim 1, comprising a locking element (50) or means adapted to block the relative position of a cylinder (32) and a stem (34) present in the gas spring.

3. Mechanism according to claim 2, wherein the locking element or means is/are integrated in the structure of the cylinder or the stem.

4. Mechanism according to claim 2, wherein the locking element or means is/are mounted on the cylinder or on the stem.

5. Mechanism according to claim 4, wherein the locking element or means is/are articulated to a clamp or collar tightened on the cylinder or on the stem.

6. Mechanism according to any one of the preceding claims, wherein the locking element or means comprise a rigid element or hook (50) adapted to block the relative position of the cylinder and the stem.

7. Mechanism according to claim 6, wherein the rigid element or hook is hinged on the clamp or collar.

8. Bed comprising the mechanism according to one of the preceding claims.

9. Use of a gas spring as the only component for one of two lifting arms (20, 30) present in a mechanism for lifting a bedspring with respect to a frame or containment furniture (10) lying on the ground, the mechanism consisting of:

the two lifting arms (20, 30), 5
one of the two arms being extendable telescopically and both mounted substantially parallel with each other and hinged to the frame and to the bedspring to form an articulated parallelogram, in order to move the bedspring between two positions, keeping it always substantially horizontal.

10. Use according to claim 9, wherein the gas spring includes in its structure blocking means (50) adapted to block the relative position of a cylinder and a stem present in the gas spring.

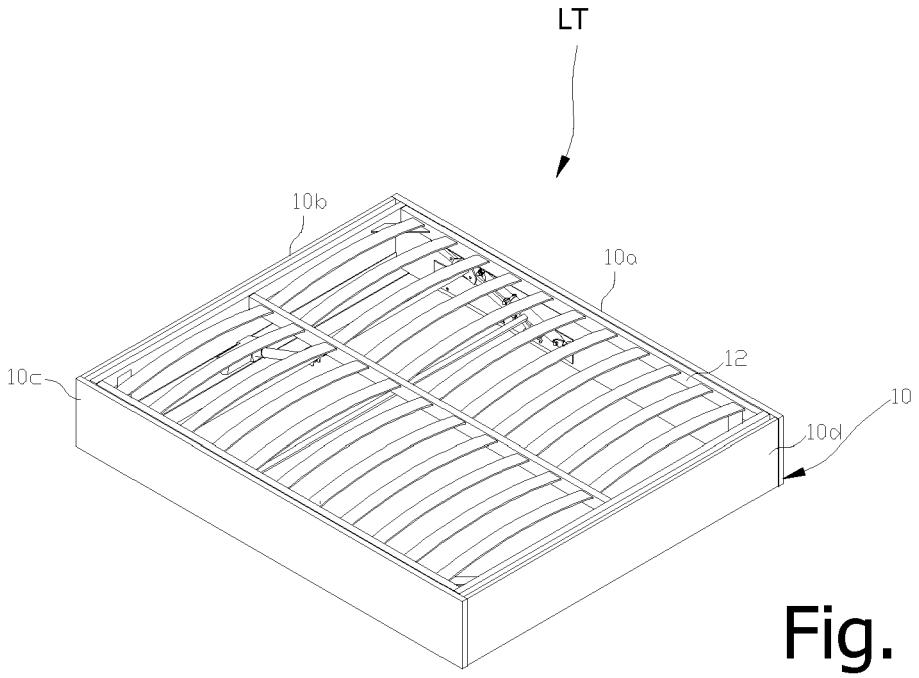


Fig. 1

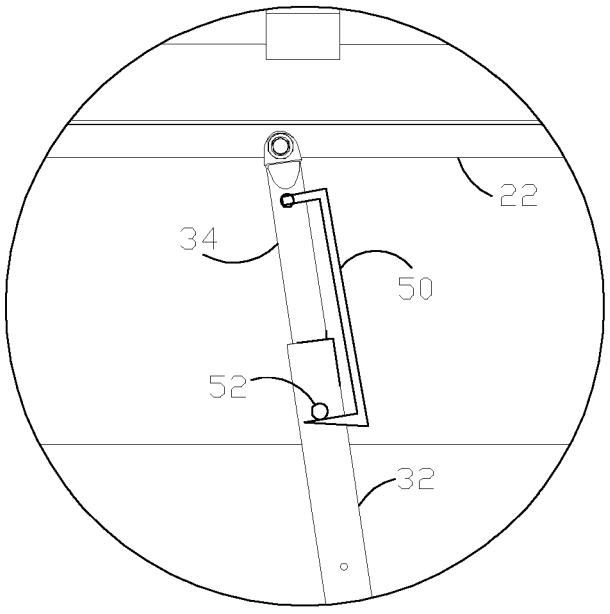


Fig. 5

Fig. 2

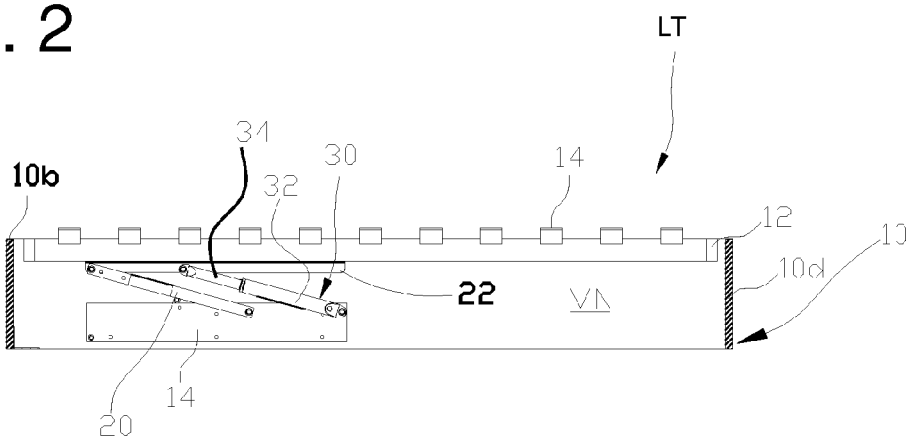
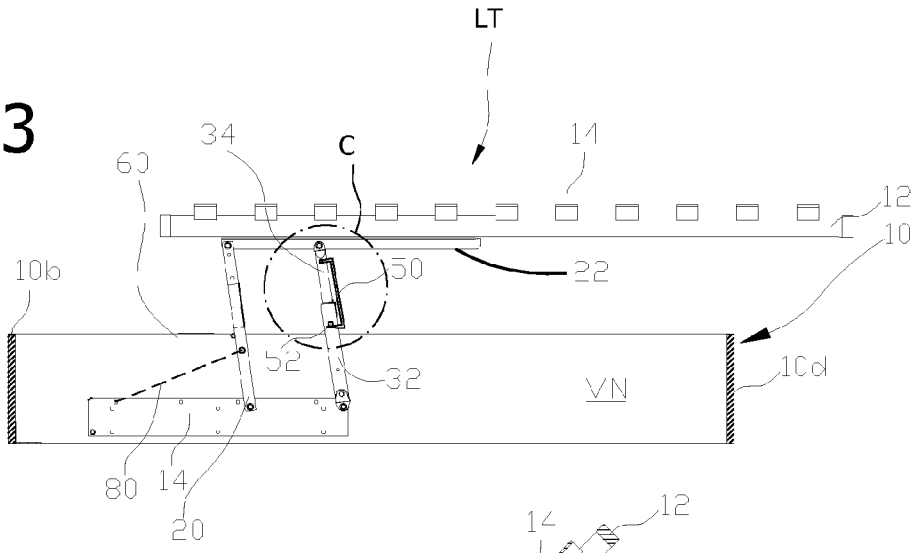


Fig. 3



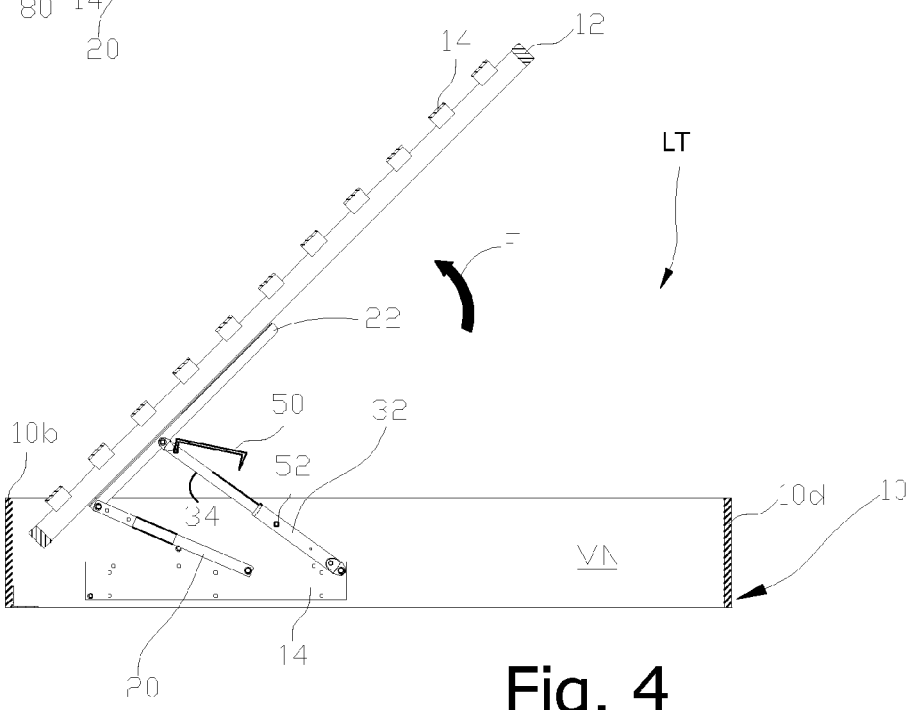


Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 15 15 2596

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	WO 2013/098787 A2 (PESSOTTORETI S A S [IT]) 4 July 2013 (2013-07-04) * claims 1-3,6,7; figures 3,4,7 * -----	1-10	INV. A47C17/86
X	CN 202 014 884 U (XIAOJUN WANG) 26 October 2011 (2011-10-26) * Translation by SIPO, claims 1-3; figures * -----	1,2,6,8,9	

TECHNICAL FIELDS SEARCHED (IPC)

A47C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	30 March 2015	Amghar, Norddin

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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EPO FORM 1503 03.82 (P04C01)

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30-03-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2013098787 A2	04-07-2013	EP 2797462 A2	05-11-2014
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CN 202014884 U	26-10-2011	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- EP 2108288 A **[0002] [0003]**