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(54) **Lifting mechanism for articulated bed**

(57) A lifting mechanism for the bedspring or the bed-plane (20) of an articulated bed is presented. The bed-spring or the bed-plane (20) is connected to a chassis (10) laid on the ground, and comprises (i) a first and a second lifting arm (30, 40) mounted substantially parallel to each other and hinged to the chassis and the bed-

plane to form an articulated parallelogram, one of the two arms being extendable through two segments (42, 44) mounted telescopically into one another, and (ii) elastic means thrusting between the two segments to counter the weight of the bed-plane and to servo their lifting. The elastic means (50) are arranged inside one or both of said segments (42, 44).

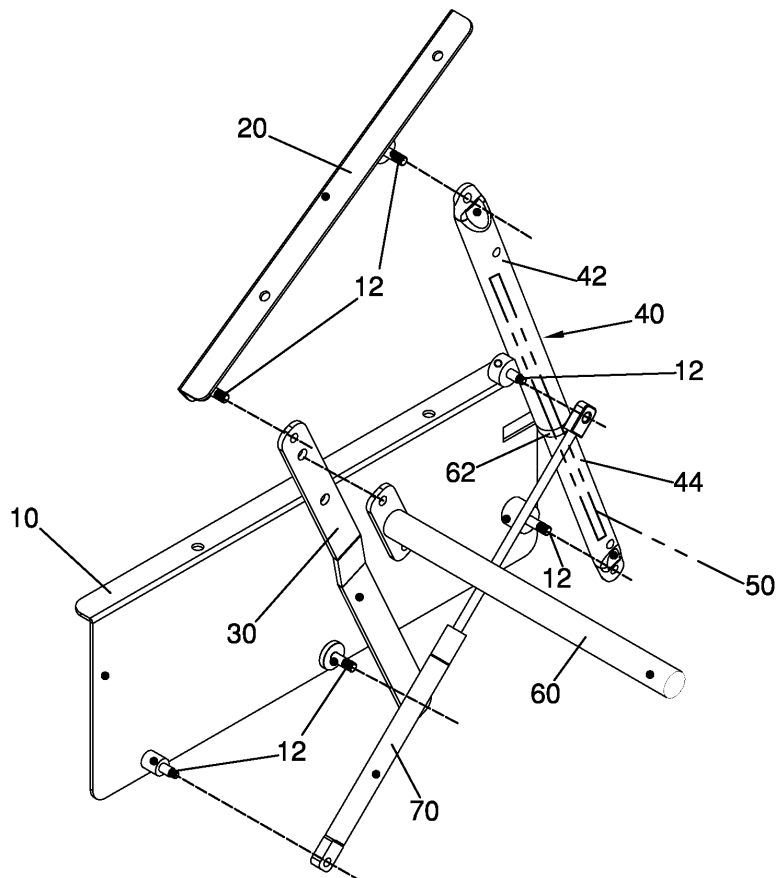


Fig. 4

Description

[0001] The invention relates to a lifting mechanism for an articulated bed.

[0002] Articulated beds are known with lifting mechanisms allowing to raise and maintain the bedspring (or slats) of the bed (i.e. the so-called bed-plane) at a certain height above the ground, allowing for a housewife to redo the bed comfortably without bending and to have access to the space below the bedspring.

[0003] The applicant in the past has patented a mechanism, placed in two identical specimens on two opposite sides of the bed frame/chassis fixed to the ground, constituted by a first and a second lifting arm mounted substantially parallel to each other and hinged to the frame and to the bed-plane to form an articulated parallelogram. One of the two arms is constructed extensible, i.e. through two segments mounted telescopically into one another. This allows, once the bed-plane is raised, to tilt the bed-plane with respect to a horizontal plane, so that the tidy-up of the bed results facilitated. To oppose the weight of the bed-plane-bed and to servo the lifting thereof, elastic means are arranged in thrust (usually springs) on the two segments. A gas-spring is placed between the other arm, the inextensible one, and the chassis, again with the function to servo the lifting of the bed-plane. Generally, the extendable arm consists of rectangular cross-section sleeves, and the elastic means are placed beside them, outside. The thrust of the elastic means tends to distort the extendable arm, increasing the friction of its telescopic segments and requiring greater force for lifting the bed-plane. Also, a torsion bar must be used under the bed-plane to compensate for the thrust of the elastic means, with an increase of weight and costs.

[0004] The invention thus solves the problem of simplifying the structure of the mechanism, at the same time improving it and eliminating some disadvantages.

[0005] These problems are solved by a lifting mechanism for the bedspring or the bed-plane of an articulated bed, the bedspring or the bed-plane being connected to a chassis laid on the ground, comprising

- a first and a second lifting arm mounted substantially parallel to each other and hinged to the chassis and the bed-plane to form an articulated parallelogram, one of the two arms being extendable through two segments mounted telescopically into one another,
- elastic means thrusting between the two segments to oppose the weight of the bed-plane and to servo their lifting,

characterized in that said elastic means are arranged inside one or both of said segments.

[0006] In this way the thrust of the elastic means is directed and discharges along the direction of movement of the telescopic segments, and does not induce any lateral effort tending to bend them one on the other. This results in an improved mutual sliding of the telescopic

segments because the friction is lower, and in the possibility of eliminating the torsion bar. A preferred construction provides that said segments have circular cross-section, circumstance which allows to improve the sliding thereof and avoids oscillations thereof since the mechanical plays are reduced. Very easily for said segments metal sleeves may be used. Preferably, said elastic means comprise a gas-spring, very easily available and reliable object. Preferably the gas spring has its body mounted inside a segment and its stem connected in thrusting action to the other segment, i.e. the stem is mounted in thrust internally one of the segments. Further advantages can be obtained when one uses an element mounted between the two segments adapted to decrease the mutual coefficient of friction, e.g. a ring, a seal or a collar, preferably formed by a material with low friction coefficient, e.g. Teflon®, applied coaxially above and/or inside the edge of the segment which contains the other.

[0007] The advantages of the invention will be better clarified by the following description of a preferred embodiment, illustrated in the attached drawing showing a liftable bed-plane with a mechanism according to the invention, in which

Fig 1 shows a side view of the mechanism according to the invention in a closed position;

Fig 2 shows a side view of the mechanism in fig. 1 in a lifted position;

Fig. 3 shows a side view of the mechanism in fig. 1 in the lifted position and with the bed-plane inclined ; Fig 4 shows an exploded assonometric view of the mechanism in fig. 1.

[0008] The mechanism (or articulation) of the invention is mounted on a frame/chassis 10 fixed to the ground, which under resting conditions (bed-plane not raised) serves as a support to a bed-plane or support for a bedspring 20. The chassis 10 acts as a base for the bed (Fig. 1). With a known maneuver, the bed-plane 20 can be lifted with respect to the chassis 10 (fig. 2) and, when lifted, it can be tilted with respect to a horizontal plane (Fig. 3). The movements permitted to the bed-plane 20 are essentially known (see also arrows in Fig. 1-3).

[0009] The mechanism allowing the movement of the bed-plane 20 is mounted in two identical specimens on two sides of the bed, and comprises two rigid arms 30, 40, each pivoted rotatably both to the frame 10 and to the bed-plane 20 by pins, indicated generically with 12. The arm 30 is one-piece, while the arm 40 has a telescopic extendable structure and consists of two cylindrical, tubular segments or hollow sleeves 42, 44. The segment 44 therefore can slide inside the segment 42. The arms 30, 40 are mounted substantially parallel to each other to form an articulated parallelogram with which to raise and support the bed-plane 10.

[0010] As it is evident from the figure, to cushion the two segments 42, 44 a gas spring 50 (see fig. 4 where it

is shown schematically dashed) is housed inside the segment 44, with its stem 46 (see Figure 3) internally connected with, and in thrust on, the segment 42. Since, then, the thrust of the spring 50 occurs axially with respect to the segments 42, 44 and not sideways, they do not undergo any deformation or lateral bending (the twisting torque is eliminated), and the stability and ease of relative sliding results improved. The gas spring 50, or any equivalent means, may be placed inside one of the segments 42, 44 and/or in both, depending on its size and/or characteristics desired for the mechanism.

[0011] Although in the figures there is shown a known torsion bar 60, adapted to connect and stabilize the two mechanisms of the bed, in practice it has proved unnecessary. Thanks to the circular section of the segments 42, 44, their sliding shows improved since there are not sliding edges mechanical efforts can concentrate on. To further improve the such sliding, it is preferred to mount at the mouth of the segment 42 a collar 62 (see fig. 4), e.g. made of Teflon®, in order to maintain coaxial and with a certain mutual play (inside the segment 42) - as well as to better drive - the two segments 42, 44, avoiding unwanted rubbing.

[0012] A gas spring 70, hinged through pins 12 to the frame 10 and to the arm 30, completes the mechanism. Its function is to servo the lifting of the bed-plane 10 and to balance the weight thereof.

Claims

1. Lifting mechanism for the bedspring or the bed-plane (20) of an articulated bed, the bedspring or the bed-plane (20) being connected to a chassis (10) laid on the ground, comprising (i) a first and a second lifting arm (30, 40) mounted substantially parallel to each other and hinged to the chassis and the bed-plane to form an articulated parallelogram, one of the two arms being extendable through two segments (42, 44) mounted telescopically into one another, and (ii) elastic means thrusting between the two segments to oppose the weight of the bed-plane and to servo their lifting, **characterized in that** said elastic means (50) are arranged inside one or both of said segments (42, 44).
2. Mechanism according to claim 1, wherein said segments (42, 44) have circular cross-section.
3. Mechanism according to claim 2, wherein said segments (42, 44) consist of metal sleeves.
4. Mechanism according to any of the preceding claims, wherein said elastic means comprise a gas spring (50).
5. Mechanism according to claim 4, wherein the gas spring (50) has its body mounted inside a segment (44) and its stem (46) connected in thrusting action to the other segment (42).
6. Mechanism according to any of the preceding claims, comprising an element (62) mounted between the two segments (42, 44) adapted to decrease the mutual coefficient of friction.
7. Mechanism according to claim 6, wherein the element mounted between the two segments is a ring, a seal or a collar (62) applied coaxially above and/or inside the edge of the segment (44) which contains the other (42).
8. Mechanism according to claim 7, wherein said ring, gasket or collar is formed by a material with low friction coefficient, e.g. Teflon®.

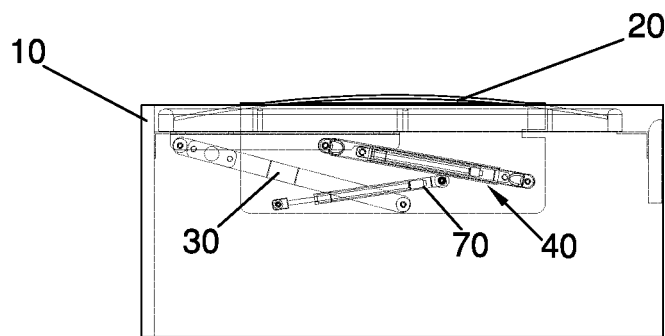


Fig. 1

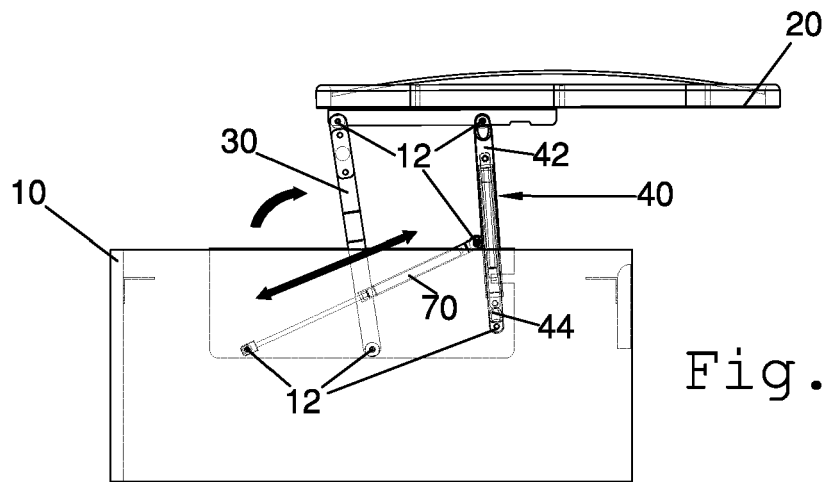


Fig. 2

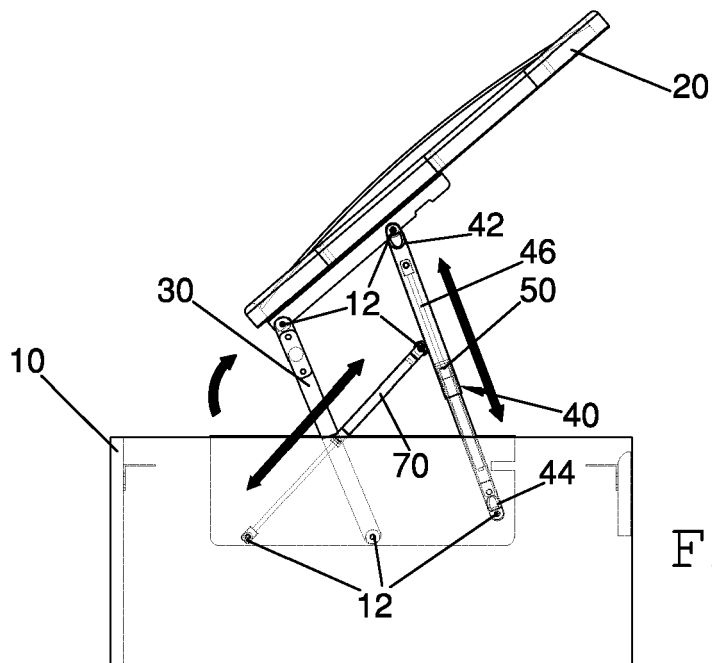


Fig. 3

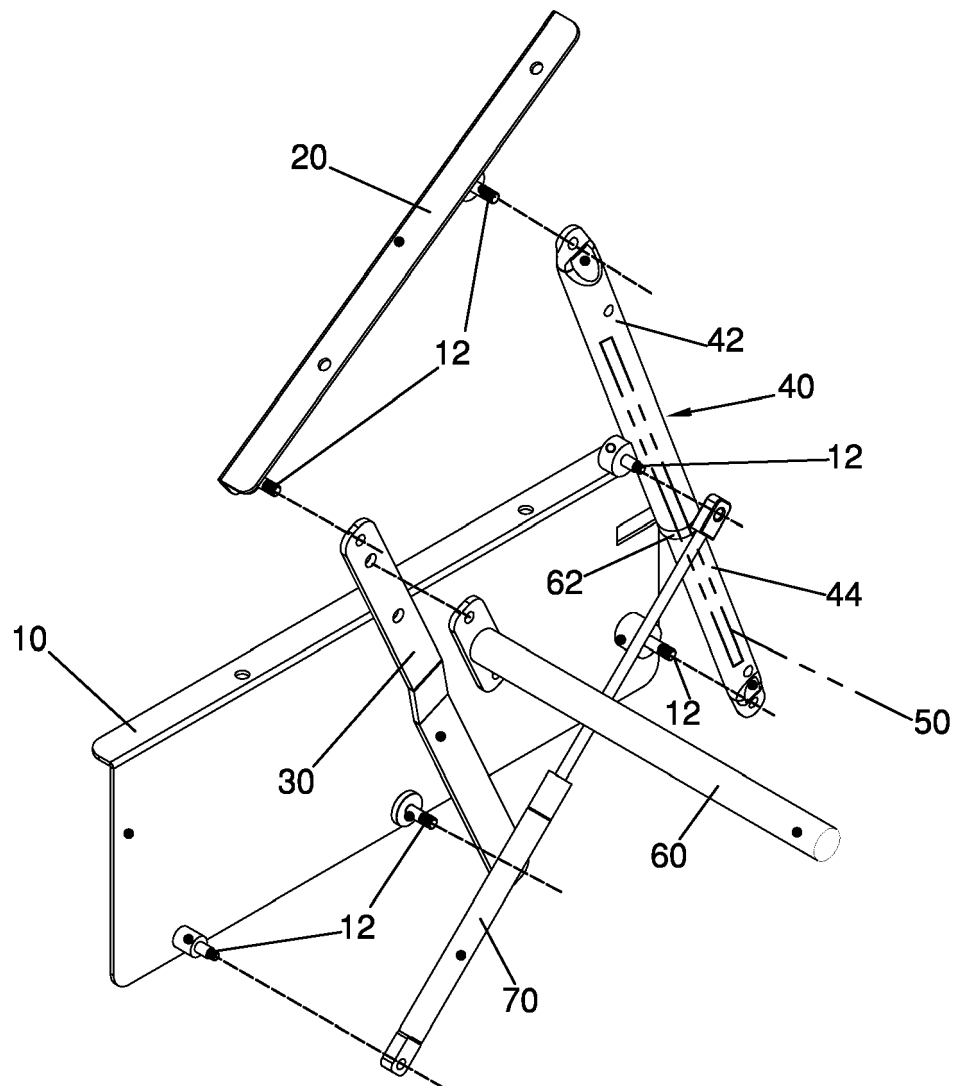


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 09 15 7352

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	EP 1 374 741 A (OGGIONI & C S R L) 2 January 2004 (2004-01-02) * figures *	1-8	INV. A47C19/00
A	US 2008/041680 A1 (MINTGEN ET AL) 21 February 2008 (2008-02-21) * paragraphs [0005], [0020], [0023] - [0025]; claim 1; figures * -----	3-5	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47C F16F
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 20 August 2009	Examiner Kis, Pál
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

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

EP 09 15 7352

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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20-08-2009

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