

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 807 390 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
19.11.1997 Bulletin 1997/47

(51) Int. Cl.⁶: **A47C 17/175**

(21) Application number: **97107379.6**

(22) Date of filing: **05.05.1997**

(84) Designated Contracting States:
AT BE DE DK ES FR GB

(30) Priority: **13.05.1996 IT BA960025**

(71) Applicant:
Gruppo Industriale Styling Srl
Altamura (BA) (IT)

(72) Inventor: **Spontella, Nunzio**
Rutigliano (Bari) (IT)

(54) Mechanism for a sofa-bed enabling the adjustment in three positions

(57) Mechanism for a sofa-bed enabling the adjustment in three positions comprising padding elements supported by two frames; said frames can reciprocally move by means of two angle-bars, concurrent in a point; one of said angle-bars 1 supports the frame forming the seat of the sofa-bed and the second one 2 supports the frame forming the back of the sofa-bed; moreover comprising a kinematism which supports said second angle-bar. The mechanism is characterised in that the angle-bars, without interposition of additional elements, con-

stitute a release mechanism enabling the three positions; having the first angle-bar 1 a shaped profile 4, connected to a pawl 7 at two different points 4' and 4'', and having the second angle-bar a toothed profile 3 enabling a cam 9, fixed to said first angle-bar 1, to engage said toothed profile 3; in this way, the relative position among the two angle-bars is well determined both for "divan" and "relax".

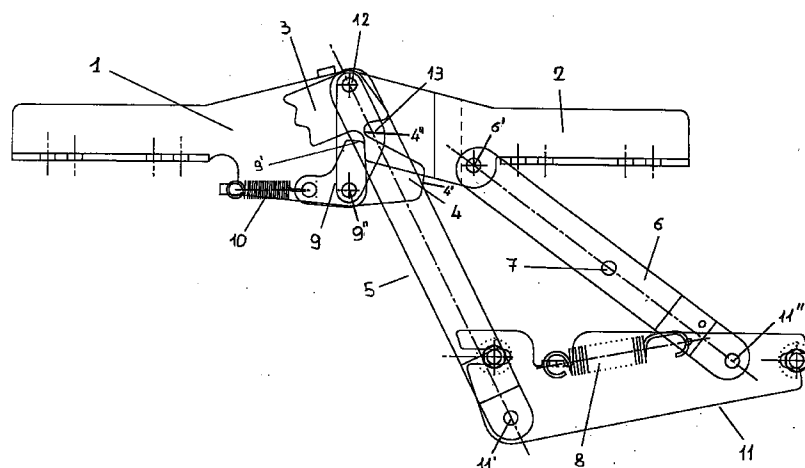


FIG. 1

EP 0 807 390 A2

Description

Technical field

The present invention regards a mechanism for sofa-beds enabling the adjustment in three positions, said "bed", "divan" and "relax", of a sofa-bed.

In the prior art, concerning the above mentioned application, there are already some realisations of mechanisms enabling the adjustment of a sofa-bed in three positions. Such mechanisms, as the one described in the European patent 0 380 156 B1, are generally release mechanisms comprising two reciprocally moving angle-bars, a kinematism, similar to an articulated quadrilater, many intermediate elements forming a seat and a ratchet to lock the sofa-bed in the positions termed "divan" and "relax", and, at least, two toothed profiles that, engaging each other, determine the reciprocal position of the angle-bars and, also, the position of the frames supporting the sofa-bed.

The known applications, anyhow, present many constructive disadvantages. The described kinematism is very complicated, there are a lot of components and, above all, numerous hinges, the toothed profiles do not work in a proper manner because said profiles are not axially stressed but tangentially stressed.

Disclosure of the invention

The invention is different from the standards on the market thanks to the fact that the angle-bars constitute, without interposition of additional elements, a release mechanism enabling the three positions of a sofa-bed ; the first angle-bar has a shaped profile which touches a pawl in two different points ; and the other angle-bar has a toothed profile enabling a cam, fixed to said first angle-bar, to act said toothed profile; in this way, the relative position among the two angle-bars is well determined both for "divan" and "relax".

The other aim of the invention is a remarkable reduction of the number of the hinges, number that, as it will be seen in the detailed description, is not higher than five.

According to a subsequent aim, the invention is characterised by the fact that the cam and the toothed profile of the second angle-bar are mutually stressed by means of compression, avoiding therefore any tangential stress for the teeth of the profiles.

These and other advantages will be pointed out in the detailed description of the invention that will refer to the figures of the tables I and II in which the preferential schemes of the three positions, have been shown. All of them are exemplifying and not restrictive.

Way of carrying out the invention

With reference to the above mentioned tables:

- fig. 1 shows the kinematism in the "bed" position;

- fig. 2 represents the "relax" position;
- fig. 3 presents the mechanism in the "divan" position.

According to the figures, the present sofa-bed is made of padding elements supported by two frames; said frames are connected so that they can reciprocally move by means of two angle-bars, concurrent in a point; one of said angle-bars 1 supports the frame which makes up the seat of the sofa-bed and the second one 2 supports the frame forming the back of the sofa-bed. The angle-bar 2 is part of an articulated quadrilater comprising a fixed lever 11 (which has two fixed hinges 11' and 11'' at its ends), two movable levers, a front one 5 and a back one 6. An elastic return element connects the fixed rod 8 to the movable rod 6. The two levers 5 and 6 are connected to the second angle-bar by means of the hinges 12 and 6' respectively. In particular, three elements, the angle-bars 1 and 2 and the front rod 5, meet at said hinge 12. The angle-bars, without interposition of additional elements, form a release mechanism enabling the desired positions; in fact, the first angle-bar has a shaped profile 4, such to engage, at two different points 4' and 4'', a pawl 7; said pawl lays on the farthest arm of the articulated quadrilater, and has variable relative motion with the respect to said shaped profile when in the positions "divan" and "relax"; moreover, the other angle-bar has a toothed profile 3 enabling a cam 9 (fixed to said first angle-bar by means of the hinge 9' and submitted to the action of a return spring 10) to engage said toothed profile; in this way, the relative position among the two angle-bars is well determined both for "divan" and "relax".

Of course, since there are not further intermediate elements, it is possible that the cam 9 is on the same plane of the angle-bar 2 and, in particular, of its toothed profile 3. According to a preferential realisation, it is also possible to further ensure the complanarity between the cam and the angle-bar by means of a fixing plate 13.

Example

The principle of functioning of the mechanism is very simple. The shaped profile 4 of the first angle-bar 1 presents a hollow 4'' receiving the pawl 7 in the said position "divan" and a projecting portion 4' able to stop the pawl 7 in the said position "relax". In particular, the projecting portion 4' presents a flat surface, without hollow, and, therefore, the said position "relax" is determined by the contact at just one point between said projecting portion 4' and the pawl 7. The positions "divan" and "relax" are obtained when the surface 9' of the cam 9 engages the toothed profile 3 of the second angle-bar 2; this fact, in a univocal way, determines the reciprocal position of the two angle-bars. The way of working of the surface 9' of the cam and of the teeth of the toothed profile 3 is proper because they are both stressed by compression and not tangentially.

As it is evident, the mechanism in object is

extremely simple, capable of performing, in an effective way, functions which, up to now, were performed only by very complex mechanisms with a large number of components. In particular, the invention is remarkably different from the others, known as prior art, because it needs only five hinges, that is: the two fixed hinges 11' and 11" of the articulated quadrilater, the hinge 6' which connects the back arm of the quadrilater 6 with the second angle-bar 2, the hinge 12 at which the two angle-bars 1 and 2 and the front lever 5 of the articulated quadrilater meet and the hinge 9" which connects the first angle-bar 1 with the cam 9.

Claims

1. Mechanism for a sofa-bed enabling the adjustment in three positions comprising padding elements supported by two frames; said frames can reciprocally move by means of two angle-bars, concurrent in a point; one of said angle-bars 1 supports the frame forming the seat of the sofa-bed and the second one 2 supports the frame forming the back of the sofa-bed; moreover comprising a kinematism which supports said second angle-bar. The mechanism is characterised in that the angle-bars, without interposition of additional elements, constitute a release mechanism enabling the three positions; having the first angle-bar 1 a shaped profile 4, connected to a pawl 7 at two different points 4' and 4", and having the second angle-bar a toothed profile 3 enabling a cam 9, fixed to said first angle-bar 1, to engage said toothed profile 3; in this way, the relative position among the two angle-bars is well determined both for "divan" and "relax".
2. Mechanism according to the claim 1 characterised by the fact that shaped profile 4 of the first angle-bar 1 presents a hollow 4" receiving the pawl 7 in the said position "divan" and a projecting portion 4' able to stop the pawl 7 in the said position "relax".
3. Mechanism according to the claim 2 characterised by the fact that the projecting portion 4' presents a flat surface, without hollow, and, therefore, the said position "relax" is determined by the contact at just one point between said projecting portion 4' and the pawl 7.
4. Mechanism according to the claim 1 characterised by the fact that the surface 9' of the cam 9 engages the toothed profile 3 of the second angle-bar 2; this fact, in a univocal way, determines the reciprocal position of the two angle-bars.
5. Mechanism according to the claims 1 and 4 characterised by the fact that the portions 9' of the cam 9 and of the toothed profile 3 of the second angle-bar 2 are both stressed by compression.
6. Mechanism according to the claim 1 characterised by the fact that said cam 9 is on the same plane of said second angle-bar 2 with toothed profile 3.
7. Mechanism according to the claim 6 characterised by the fact that the complanarity between the cam 9 and the angle-bar 2 is further ensured by means of a fixing plate 13.
8. Mechanism according to the claims 1, 4, 5, 6 and 7 characterised by the fact that said cam 9 is submitted to the action of an elastic return element 10.
9. Mechanism according to the claim 1 characterised by the fact that in the junction 12 among the two angle-bars 1 and 2 also the front lever 5 converges.
10. Mechanism according to the claim 1 characterised by the fact that it needs only five hinges, that is: the two fixed hinges 11' and 11" of the articulated quadrilater, the hinge 6' which connects the back arm of the quadrilater 6 with the second angle-bar 2, the hinge 12 at which the two angle-bars 1 and 2 and the front lever 5 of the articulated quadrilater meet and the hinge 9" which connects the first angle-bar 1 with the cam 9.

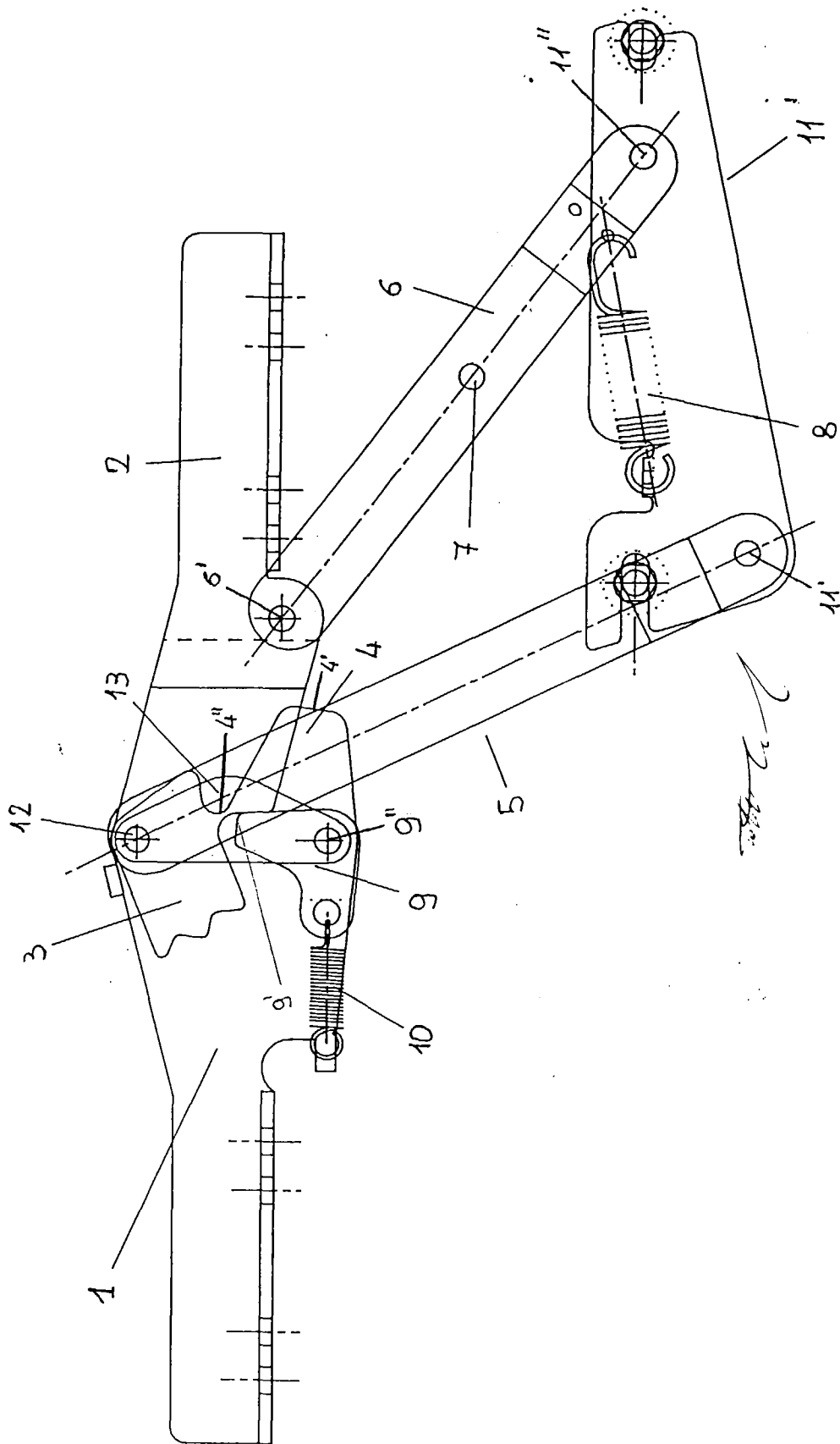
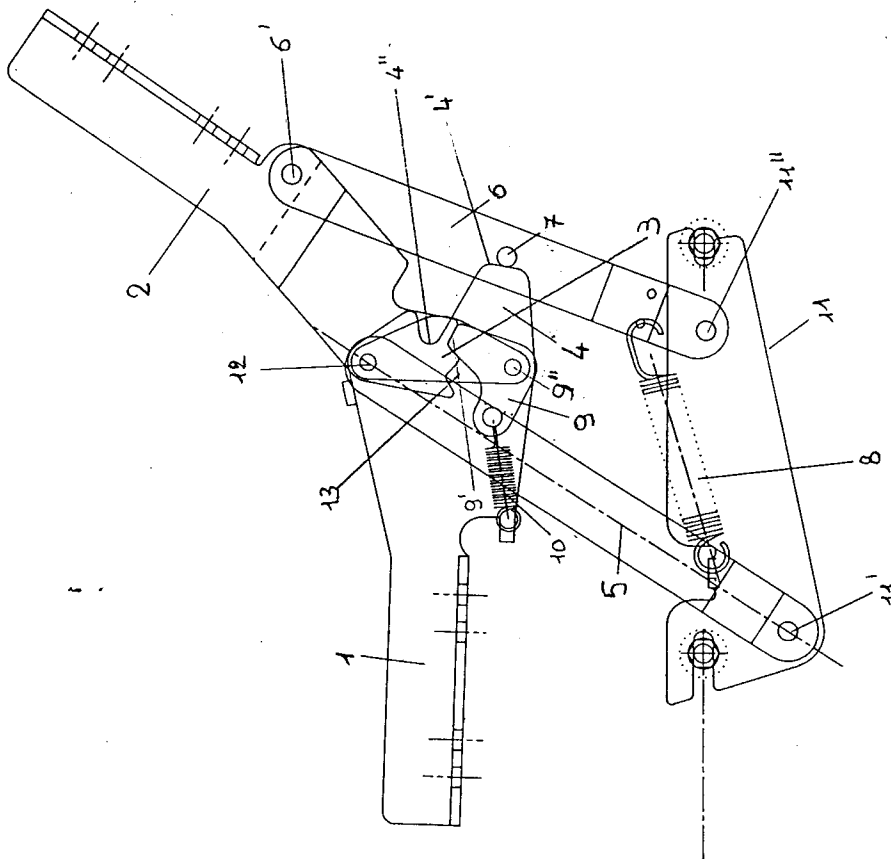


FIG. 1



RELAX

FIG. 2

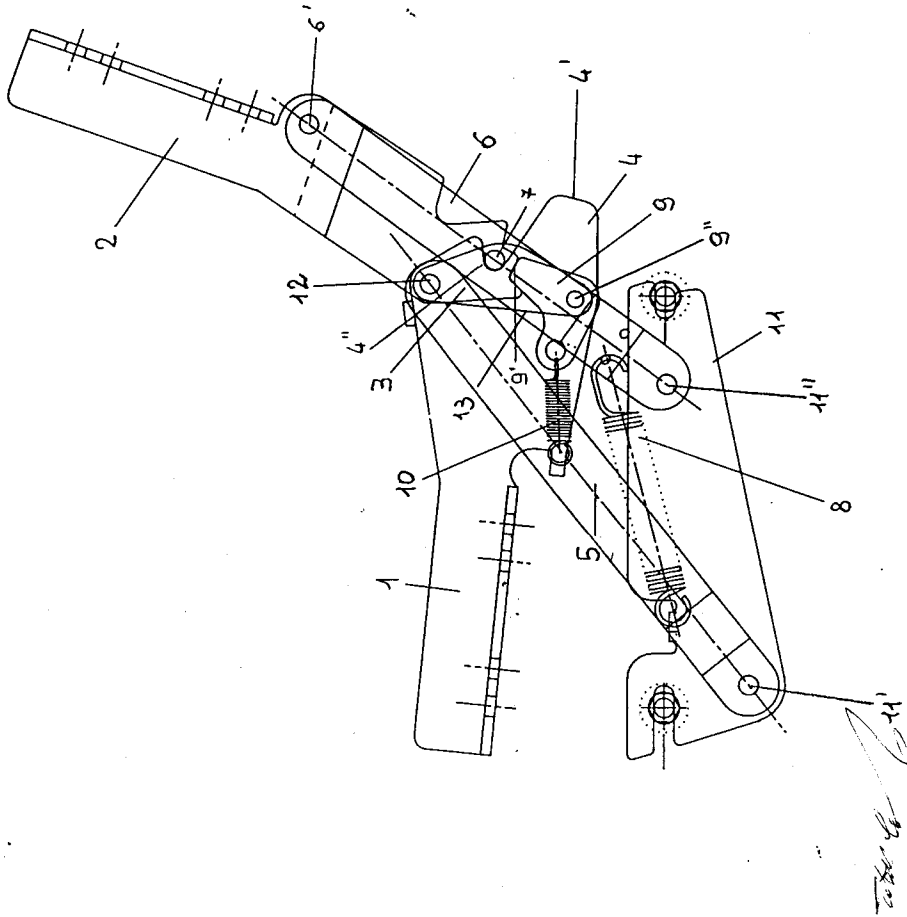


FIG. 3

DIVAN