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(54) **Relaxation chair**

Ruhestuhl

Chaise de relaxation

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(56) References cited:  
**EP-A- 0 516 341** **FR-A- 2 618 657**  
**US-A- 3 142 509**

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## Description

[0001] The present invention concerns a so-called relaxation chair, in other words a chair which, as is known, is provided with a seat, a back and a footrest and which can be put from a sitting position into a reclined position.

[0002] In particular, the present invention concerns a mechanism for such a relaxation chair which can be put in the different positions in a continuous manner.

[0003] In known mechanisms for such relaxation chairs, the seat is set in a fixed angle in relation to the supporting structure and the back and footrest are hinge-mounted to this seat, whereby a bar transmission forms an irregular parallel connection between the back and the footrest.

[0004] These known mechanisms are disadvantageous in that in no way is obtained a good reclined position since, when moving from the sitting position into the reclined position, one is easily inclined to shift towards the front of the seat and/or whereby there is a relative displacement between the body and the back of the chair.

[0005] In the known mechanisms of this type, various parts of the mechanism are visible, either in the sitting position, in the reclined position or in both positions.

[0006] This is usually not only unaesthetic, but it is often also dangerous because of the shear effects of the bars of such mechanism.

[0007] Moreover, the known mechanisms are often difficult to operate.

In these known mechanisms, the lever transmissions are selected such that they make it possible for an average person to tilt the chair in the required positions.

[0008] However, this is disadvantageous in that problems arise when such a chair is used by smaller or lighter persons, since the centre of gravity of said person is situated in another point of application of the chair.

[0009] It has also been found that in the known mechanisms, the length of the footrest is relatively short, since this length is limited by the distance between the seat to which it is linked and the floor upon which the chair is placed, one and other such that it is almost impossible for a normal person to let the feet rest on such a footrest.

[0010] From US 3.142.509 there is known a chair, having a mechanism comprising a seat which is provided on a support via which the whole is fixed on a foot; hingemounted to this seat, on the one hand, a back, and on the other hand, a footrest; and bars which form a connection between the back and the footrest. The tilting of the chair is obtained by means of a spindle driven by an electrical motor as a result of which the seat cannot be freely swung. The back and the seat are connected directly to each other by the same hinge point, which hinge point also provides in a connection to the support. Such connection is possible as the mechanism

of US 3.142.509 is provided with drive means, however cannot be used in freely swinging mechanisms as no balance will be obtained.

[0011] EP 516.341 discloses a chair tilting mechanism with a fixed support, a backrest and a seat support, however without a footrest.

[0012] FR 2.618.657 discloses a chair with a backrest, a seat and a footrest, whereby the support is provided with guiding means and a fixed rotation point for the footrest. This construction is rather complex.

[0013] The present inventions aims a relaxation chair which systematically excludes the above-mentioned and other disadvantages of the known chairs.

[0014] To this aim, the invention relates to a relaxation chair, having a mechanism comprising a seat which is provided on a support via which the whole is fixed on a foot; hingemounted to this seat, on the one hand, a back, and on the other hand, a footrest; bars which form a connection between the back and the footrest; characterised in that the seat is provided on the support in a freely swinging manner such that it can be moved by the user of the chair, and in that said mechanism further comprises transmission levers hingedly mounted between the back and the support, compensating springs between the seat and the footrest exerting a force by which the footrest is urged downwards, whereby said transmission levers and compensating springs provide in a balance, and flexible means provided between the seat and the footrest comprising an upholstery.

[0015] According to a special characteristic of the invention, the footrest of the above-mentioned mechanism is extensible, to which end the footrest is formed of two parts which can be telescopically moved in relation to one another and whereby springs are provided between these parts which continuously try to move them apart.

[0016] According to another special characteristic of the invention, the extension of the footrest will be limited first by the upholstery of the chair and/or by a foil of elastic material fixed to the mechanism.

[0017] Another special characteristic of the invention is the fact that the lever transmissions between the back and the support on which the seat is fixed in a swinging manner are determined such in combination with compensating springs provided between the seat and the footrest that the seat mechanism is almost always in balance in any position whatsoever.

[0018] In order to better explain the characteristics of the invention, the following preferred embodiment of a mechanism for a relaxation chair is described as an example only without being limitative in any way with reference to the accompanying drawings, in which:

figure 1 shows a schematic side view of a relaxation chair according to the invention, whereby the chair is in the sitting position;

figures 2 and 3 are views similar to that in figure 1,

but whereby the seat is in an intermediate position, a reclined position respectively;

figure 4 shows a view in perspective of the mechanism in the position as represented in figure 1;

figure 5 shows a view in perspective of the mechanism in the position as represented in figure 3;

figure 6 shows a partial section according to line VI-VI in figure 4;

figure 7 shows a partial section according to line VII-VII in figure 5;

figure 8 shows a view of the part indicated by F8 in figure 4;

figure 9 shows a section according to line IX-IX in figure 8;

figure 10 shows a view of the part indicated by F10 in figure 5.

**[0019]** As shown in figure 1, the mechanism 1 according to the invention mainly consists of a seat 2 which is fixed to a support 4 in a freely hinging manner which is fixed in turn to an actual foot support 5 which is for example designed such that such a chair can turn around pivot 6 of this foot support 5.

**[0020]** To the rear end of the seat 2 is fixed, via a pivot 7, in a freely hinging manner, the back 8, whereas to the front end of the seat 2, via a pivot 9, in a freely hinging manner, is fixed the footrest 10.

**[0021]** The back support 8 is provided, at the height of its hinge point 7, with a forwardly directed protrusion 11 which so to say forms a lever and which, at its free end, is connected in a freely hinging manner, via a pivot 12, to the lever 13 which is connected in a freely hinging manner at its other end, via a pivot 14, to the support 4.

**[0022]** The back 8 is connected in a freely hinging manner to the footrest 10 by means of bent bars 15 and pivots 16-17.

**[0023]** Finally, the footrest 10 consists of a first part 18 which is connected by means of draw springs 19 to the seat 2 and of a second part 20 which can be moved in a restricted manner in relation to the part 18, whereby this movement is controlled by springs 21 on the one hand, provided between the parts 18 and 20, and for example by the upholstery 22 of the chair on the other hand.

**[0024]** With the exception of the parts 2, 4, 5, 8 and 10, all parts will be symmetrically provided on either side of the mechanism.

**[0025]** When a person is seated in the chair in the position as represented in figure 1, the chair mechanism will be in balance thanks to the cooperation of the levers formed between the hinge points 12-13, 12-14 and 14-3 on the one hand, and the tensile force exerted by the draw springs 19 on the other hand.

**[0026]** The upholstery 22 makes sure, in this position, that the part 20 of the footrest 10, against the action of the springs 21, is maintained in the slid-in position.

**[0027]** When the chair is put into the reclined position, whereby normally the chair will remain in balance in all intermediate positions thanks to the compensatory

action exerted by the springs 19, an excess part 23 of upholstery 22 will be formed as the parts 2 and 10 are put at a smaller angle in relation to one another, which makes it possible for the springs 21 to telescope out the part 20 of the footrest 10 in relation to the part 18, which has a result that not only the upholstery 22 is maintained entirely stretched, but also that an extended footrest 10 is obtained.

**[0028]** By using bent bars 15, the total height of the seat will moreover be restricted, so that there is more space to provide comfort-increasing soft foam.

**[0029]** A preferred embodiment of a chair mechanism according to figures 1 to 3 is described in figures 4 to 10.

**[0030]** One will notice hereby that the seat 2 is formed as it were of two sides 24-25 which show outwardly directed parts 26-27 at the top which form the supports onto which the actual armrests can be fixed.

**[0031]** The sides 24-25 are connected to one another by means of a solid, bent tube 28.

**[0032]** Hingeable in 3 is provided a bent cross-plate 29 with the sides 24-25 which has a central attachment 30 with which this plate is connected to the above-mentioned foot 5, preferably in a rotatable manner.

**[0033]** The seat 8 is in this case formed of a U-shaped, tubular frame 31 in between which can be provided springy means which are not represented, whereby this frame 31 is connected in a removable manner at the bottom to a transversally directed plate 32 which has bent parts at its ends which form the above-mentioned protrusions 11 with which the levers 13 are fixed via pivots 12 itself.

**[0034]** In this embodiment, at least one of the bent bars 15 shows a downwardly directed widening 33 in which is provided a bent groove 34, whereby a bar 35 passes through this groove which is screwed in a plate 36 which is fixed, for example by means of welding, to the side 24 or 25 concerned and whereby the free end of the bar 35 is provided with suitable press-on means which, when turned, draw the bar 15 against the plate 36, loosen it respectively, in order to lock the mechanism in a certain position, free it respectively, by changing the friction between the plate 36 and the bar 15.

**[0035]** The parts 18 and 20 of the footrest 10 are formed in this case of a square tube, save for the side parts 37 of the part 20 which are made as a U-profile, one and other such that guides 38-39 which are provided on the sides of the part 18 can be shifted in these side parts 37.

**[0036]** The springs 21 are provided around bars 40 which are fixed on the part 20, whereby these bars are provided with stops 41 at their free end which have as an aim to determine the maximum movement of the part 20 in relation to the part 18.

**[0037]** Finally, the springs 19 are connected to the tube 28 of the seat 2 in this embodiment.

**[0038]** Preferably, a foil (42) made of elastic synthetic material will also be provided onto such a mechanism,

which can follow all the movements of the mechanism and which determines the final shape of the chair. This foil will be fixed to the back 8 on the one hand and to the telescopic part 20 of the footrest 10 on the other hand.

[0039] It is clear that a mechanism is obtained in this way which remains in balance in almost any position for almost any person, thanks to the appropriate selection of the length of the levers 11-13 in combination with compensating springs 19; which can be appropriately fixed, if required, in any position whatsoever; and whereby is used a footrest which is extended in the reclined position of the chair.

[0040] It is clear that the invention is by no means limited to the embodiment given as an example and represented in the accompanying drawings; on the contrary, such a mechanism according to the invention can be made in all sorts of shapes, dimensions and materials while still remaining within the scope of the invention.

### Claims

1. Relaxation chair, having a mechanism comprising a seat (2) which is provided on a support (4) via which the whole is fixed on a foot (5); hingemounted to this seat (2), on the one hand, a back (8), and on the other hand, a footrest (10); bars (15) which form a connection between the back (8) and the footrest (10); characterised in that the seat (2) is provided on the support (4) in a freely swinging manner such that it can be moved by the user of the chair, and in that said mechanism further comprises transmission levers (11,13) hingedly mounted between the back (8) and the support (4), compensating springs (19) between the seat (2) and the footrest (10) exerting a force by which the footrest (10) is urged downwards, whereby said transmission levers (11,13) and compensating springs (19) provide in a balance, and flexible means provided between the seat (2) and the footrest (10) comprising an upholstery.
2. Relaxation chair according to claim 1, characterized in that the footrest (10) is extensible.
3. Relaxation chair according to claim 1, characterized in that the back (8) is formed of a U-shaped bent tube (31) whose bottom ends are connected by means of a cross-plate (32) which has bent protrusions (11) at its end.
4. Relaxation chair according to claim 1 or 3, characterized in that the protrusions (11) are connected in a freely hinging manner to the above-mentioned support (4) via levers (13).
5. Relaxation chair according to claim 3 or 4, characterized in that both the cross-plate (32) and the support (4) are made of steel plate.
6. Relaxation chair according to claim 1 or 2, characterized in that the footrest (10) is formed of two parts (18) and (20) respectively, which can be telescopically moved in relation to one another.
7. Relaxation chair according to claim 6, characterized in that springs (21) are provided between the parts (18) and (20) of the footrest (10) which continuously try to move these parts apart.
8. Relaxation chair according to claim 7, characterized in that the springs (21) are provided on bars (40) which are fixed on the part (20) on the one hand and pass freely through the part (18), whereby the free end of these bars is provided with a stop (41).
9. Relaxation chair according to claim 6, characterized in that the outer sides of the part (18) of the footrest (10) are provided with guides (38-39) over which the part (20) of the footrest (10) can be moved.
10. Relaxation chair according to claim 1, characterized in that the means which are provided between the seat (2) and the footrest (10) and which can form a first restriction to the extension of the footrest (10), consist of the upholstery (22) of the seat.
11. Relaxation chair according to claim 1, characterized in that the means which are provided between the seat (2) and the footrest (10) and which can form a first restriction to the extension of the footrest (10), consist of a foil of elastic synthetic material (42) which is simultaneously fixed to the back (8) and the part (20) of the footrest (10).
12. Relaxation chair according to claim 1, characterized in that at least one of the bent bars (15) is provided with a locking mechanism to fix the chair in a certain position.
13. Relaxation chair according to claim 12, characterized in that the bent bar (15) which is provided with a locking mechanism has a widening (33) in which is provided a bent groove (34), whereby opposite this groove on the side (24) or (25) concerned of the seating (2) is fixed a plate (36) with which a rotatable bar (15) cooperates which has as an aim to increase, respectively reduce the friction between this plate and the bar (15).

### Patentansprüche

1. Ruhesessel, der einen Mechanismus aufweist, der eine Sitzfläche (2) umfaßt, die auf einem Träger (4) angebracht ist, womit das Ganze auf einem Fuß (5) befestigt ist; an dieser Sitzfläche (2), scharnierbe-

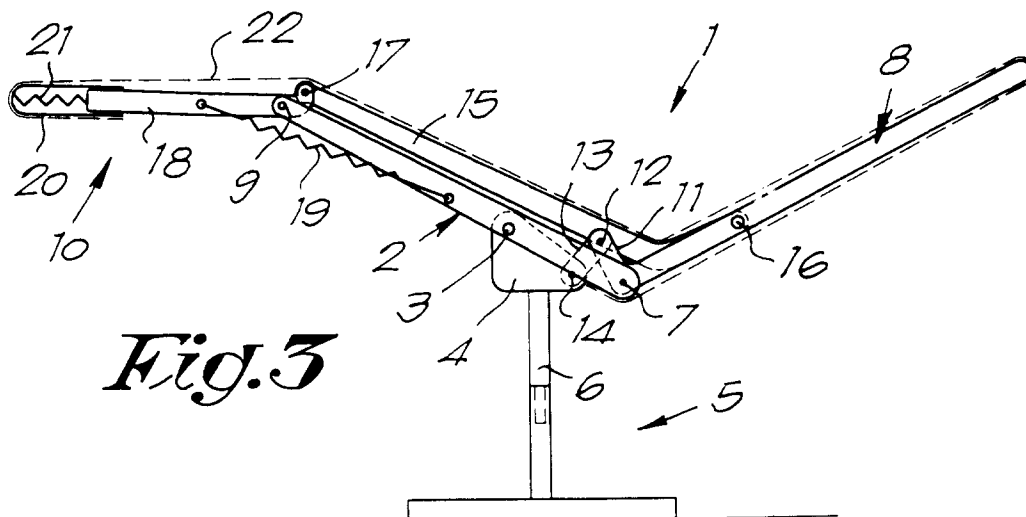
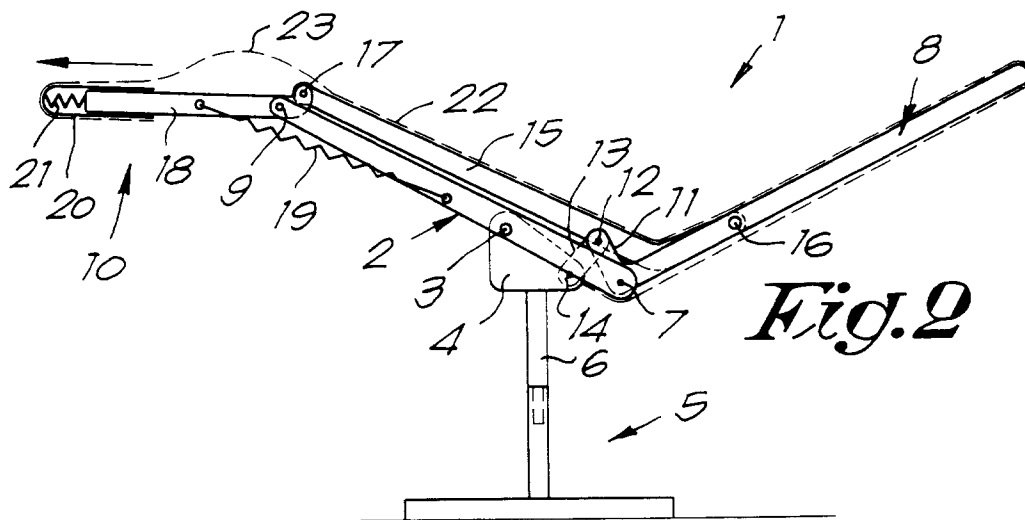
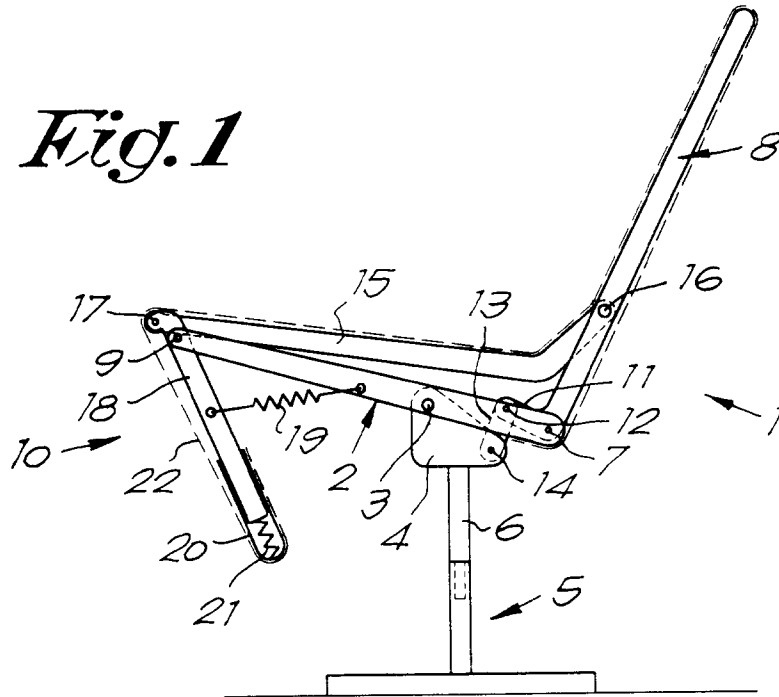
- weglich montiert, einerseits eine Rückenlehne (8) und andererseits eine Fußstütze (10); Stangen (15), die eine Verbindung zwischen der Rückenlehne (8) und der Fußstütze (10) bilden; dadurch gekennzeichnet, daß die Sitzfläche (2) frei schwingend auf dem Träger (4) vorgesehen ist, so daß sie vom Benutzer des Sessels bewegt werden kann, und daß besagter Mechanismus weiter Übersetzungshebel (11,13) umfaßt, die zwischen der Rückenlehne (8) und dem Träger (4) Scharnierbeweglich montiert sind, Ausgleichsfedern (19) zwischen der Sitzfläche (2) und der Fußstütze (10), welche eine Kraft ausüben, mittels derer die Fußstütze (10) nach unten gezwungen wird, wobei besagte Übersetzungshebel (11,13) und Ausgleichsfedern (19) für ein Gleichgewicht sorgen, und zwischen der Sitzfläche (2) und der Fußstütze (10) vorgesehene flexible Mittel, die eine Polsterung umfassen.
2. Ruhesessel gemäß Anspruch 1, dadurch gekennzeichnet, daß die Fußstütze (10) verlängerbar ist.
  3. Ruhesessel gemäß Anspruch 1, dadurch gekennzeichnet, daß die Rückenlehne (8) aus einem U-förmigen gebogenen Rohr (31) geformt ist, dessen untere Enden mittels einer Querplatte (32), die an ihrem Ende gebogene Vorsprünge (11) aufweist, verbunden sind.
  4. Ruhesessel gemäß Anspruch 1 oder 3, dadurch gekennzeichnet, daß die Vorsprünge (11) über die Hebel (13) frei schwingend mit dem oben erwähnten Träger (4) verbunden sind.
  5. Ruhesessel gemäß Anspruch 3 oder 4, dadurch gekennzeichnet, daß sowohl die Querplatte (32) als auch der Träger (4) aus Stahlblech gefertigt sind.
  6. Ruhesessel gemäß Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Fußstütze (10) aus zwei Teilen (18) beziehungsweise (20) geformt ist, die in Bezug zueinander teleskopartig bewegt werden können.
  7. Ruhesessel gemäß Anspruch 6, dadurch gekennzeichnet, daß zwischen den Teilen (18) und (20) der Fußstütze (10) Federn (21) vorgesehen sind, die kontinuierlich versuchen, diese Teile auseinanderzubewegen.
  8. Ruhesessel gemäß Anspruch 7, dadurch gekennzeichnet, daß die Federn (21) an Stangen (40) angebracht sind, die einerseits an dem Teil (20) befestigt sind und frei durch das Teil (18) passieren, wobei das freie Ende dieser Stangen mit einem Anschlag (41) versehen ist.
  9. Ruhesessel gemäß Anspruch 6, dadurch gekennzeichnet, daß die äußeren Seiten des Teils (18) der Fußstütze (10) mit Führungen (38-39) versehen sind, über die das Teil (20) der Fußstütze (10) bewegt werden kann.
  10. Ruhesessel gemäß Anspruch 1, dadurch gekennzeichnet, daß die Mittel, die zwischen der Sitzfläche (2) und der Fußstütze (10) vorgesehen sind und die eine erste Begrenzung für das Verlängern der Fußstütze (10) bilden können, aus der Polsterung (22) des Sitzes bestehen.
  11. Ruhesessel gemäß Anspruch 1, dadurch gekennzeichnet, daß die Mittel, die zwischen der Sitzfläche (2) und der Fußstütze (10) vorgesehen sind und die eine erste Begrenzung für das Verlängern der Fußstütze (10) bilden können, aus einer Folie aus elastischem Kunststoffmaterial bestehen, die gleichzeitig an der Rückenlehne (8) und dem Teil (20) der Fußstütze (10) befestigt ist.
  12. Ruhesessel gemäß Anspruch 1, dadurch gekennzeichnet, daß zumindest eine der gebogenen Stangen (15) mit einem Verriegelungsmechanismus zum Feststellen des Sessels in einer bestimmten Position versehen ist.
  13. Ruhesessel gemäß Anspruch 12, dadurch gekennzeichnet, daß die gebogene Stange (15), die mit einem Verriegelungsmechanismus versehen ist, eine Verbreiterung (33) aufweist, worin eine gebogene Nut (34) vorgesehen ist, wobei gegenüber dieser Nut an der betreffenden Seite (24) oder (25) der Sitzfläche (2) eine Platte (36) befestigt ist, womit eine drehbare Stange zusammenwirkt, die zum Ziel hat, die Reibung zwischen dieser Platte und der Stange (15) zu erhöhen, beziehungsweise zu verringern.

## Revendications

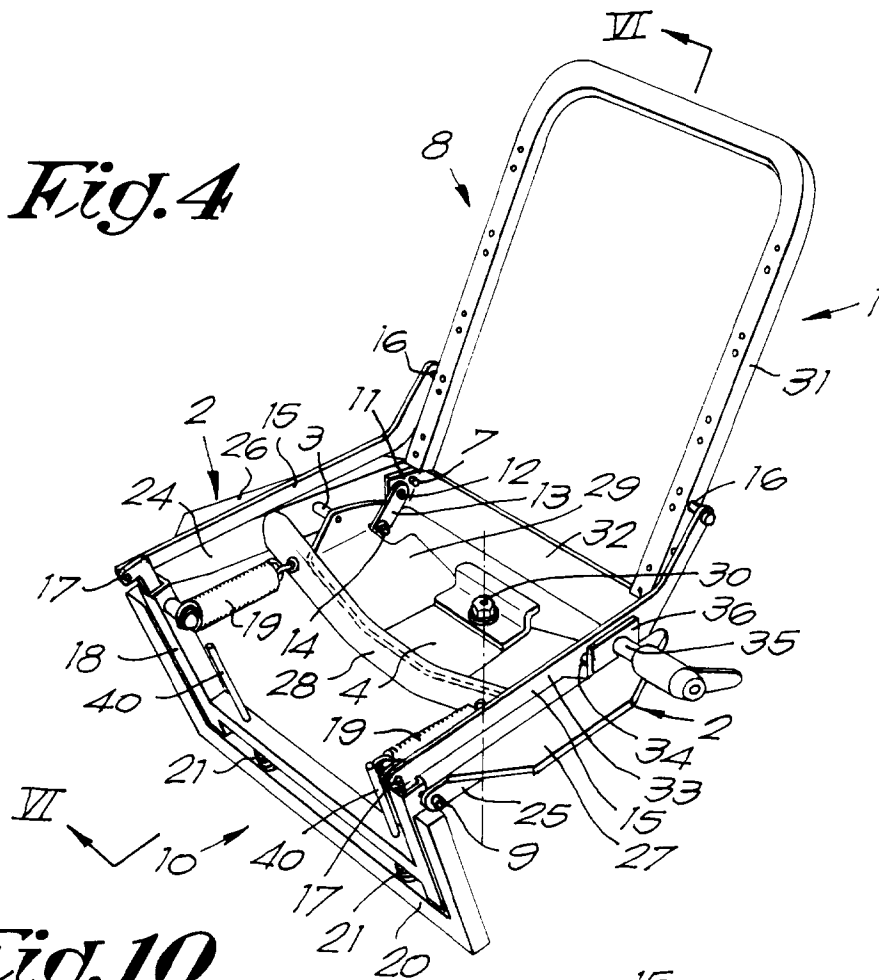
1. Chaise de relaxation possédant un mécanisme comprenant: un siège (2) qui est prévu sur un support (4) par lequel l'ensemble est fixé sur un pied (5); montés en articulation sur ce siège (2), d'une part un dossier (8) et d'autre part un appui (10) pour les pieds; des barres (15) qui forment une connexion entre le dossier (8) et l'appui (10) pour les pieds; caractérisée en ce que le siège (2) est prévu sur le support (4) en oscillation libre de telle sorte qu'il peut être déplacé par l'utilisateur de la chaise, et en ce que ledit mécanisme comprend en outre des leviers de transmission (11, 13) montés en articulation entre le dossier (8) et le support (4), des ressorts de compensation (19) entre le siège (2) et l'appui (10) pour les pieds exerçant une force telle que l'appui (10) pour les pieds est pressé vers le

- bas, par laquelle lesdits leviers de transmission (11, 13) et lesdits ressorts de compensation (19) procurent un équilibre, des moyens flexibles étant prévus entre le siège (2) et l'appui (10) pour les pieds comprenant un rembourrage. 5
2. Chaise de relaxation selon la revendication 1, caractérisée en ce que l'appui (10) pour les pieds est extensible.
3. Chaise de relaxation selon la revendication 1, caractérisée en ce que le dossier (8) est formé à l'aide d'un tube (31) coudé en U, dont les extrémités inférieures sont reliées à l'aide d'une plaque transversale (32) qui comporte des saillies coudées (11) à son extrémité. 10 15
4. Chaise de relaxation selon la revendication 1 ou 3, caractérisée en ce que les saillies (11) sont reliées en articulation libre au support (4) susmentionné via des leviers (13). 20
5. Chaise de relaxation selon la revendication 3 ou 4, caractérisée en ce qu'à la fois la plaque transversale (32) et le support (4) sont réalisés à l'aide d'une tôle en acier. 25
6. Chaise de relaxation selon la revendication 1 ou 2, caractérisée en ce que l'appui (10) pour les pieds est constitué de deux parties (18) et (20), respectivement, qui peuvent être déplacées à la manière d'un télescope l'une par rapport à l'autre. 30
7. Chaise de relaxation selon la revendication 6, caractérisée en ce que des ressorts (21) sont prévus entre les parties (18) et (20) de l'appui (10) pour les pieds, qui tentent en continu d'écarter ces parties l'une de l'autre. 35
8. Chaise de relaxation selon la revendication 7, caractérisée en ce que les ressorts (21) sont prévus sur des barres (40) qui sont fixées sur la partie (20) d'une part et qui traversent librement la partie (18) d'autre part, l'extrémité libre de ces barres étant munie d'un arrêt (41). 40 45
9. Chaise de relaxation selon la revendication 6, caractérisée en ce que les côtés externes de la partie (18) de l'appui (10) pour les pieds sont munis de guides (38-39) par-dessus lesquels la partie (20) de l'appui (10) pour les pieds peut être déplacée. 50
10. Chaise de relaxation selon la revendication 1, caractérisée en ce que les moyens qui sont prévus entre le siège (2) et l'appui (10) pour les pieds et qui peuvent former une première restriction à l'extension de l'appui (10) pour les pieds sont constitués par le rembourrage (22) du siège. 55
11. Chaise de relaxation selon la revendication 1, caractérisée en ce que les moyens qui sont prévus entre le siège (2) et l'appui (10) pour les pieds et qui peuvent former une première restriction pour l'extension de l'appui (10) pour les pieds sont constitués d'une feuille d'une matière synthétique élastique (42) qui est fixée simultanément au dossier (8) et à la partie (20) de l'appui (10) pour les pieds.
12. Chaise de relaxation selon la revendication 1, caractérisée en ce qu'au moins une des barres coudées (15) est munie d'un mécanisme de verrouillage pour fixer la chaise dans une certaine position.
13. Chaise de relaxation selon la revendication 12, caractérisée en ce que la barre coudée (15) qui est munie d'un mécanisme de verrouillage possède un élargissement (33) dans lequel est prévue une rainure coudée (34), dans laquelle, à l'opposé de cette rainure, sur le côté (24) ou (25) concerné du siège (2), est fixée une plaque (36) avec laquelle coopère une barre rotative (15) qui a pour effet d'augmenter, respectivement de réduire la friction entre cette plaque et la barre (15).

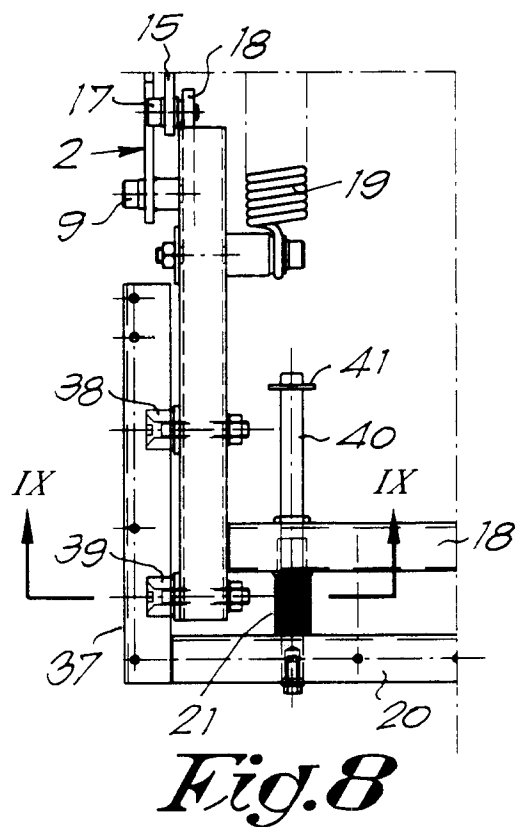
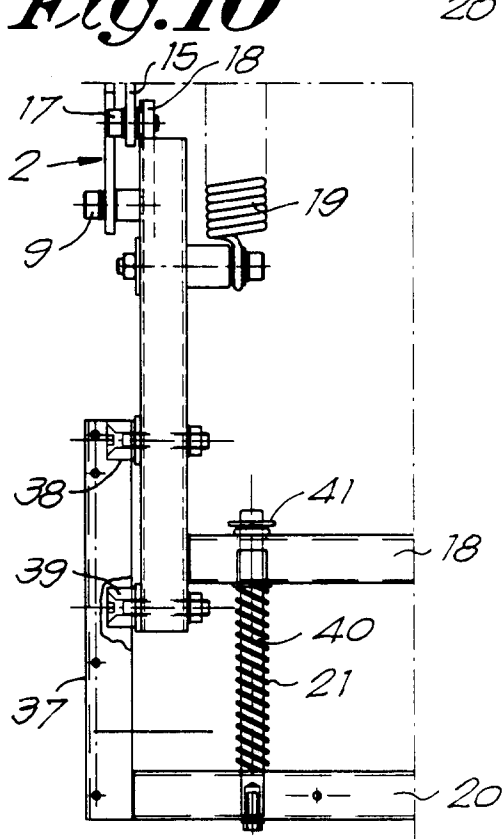
*Fig.1*



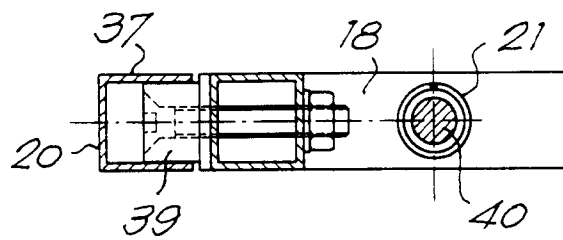
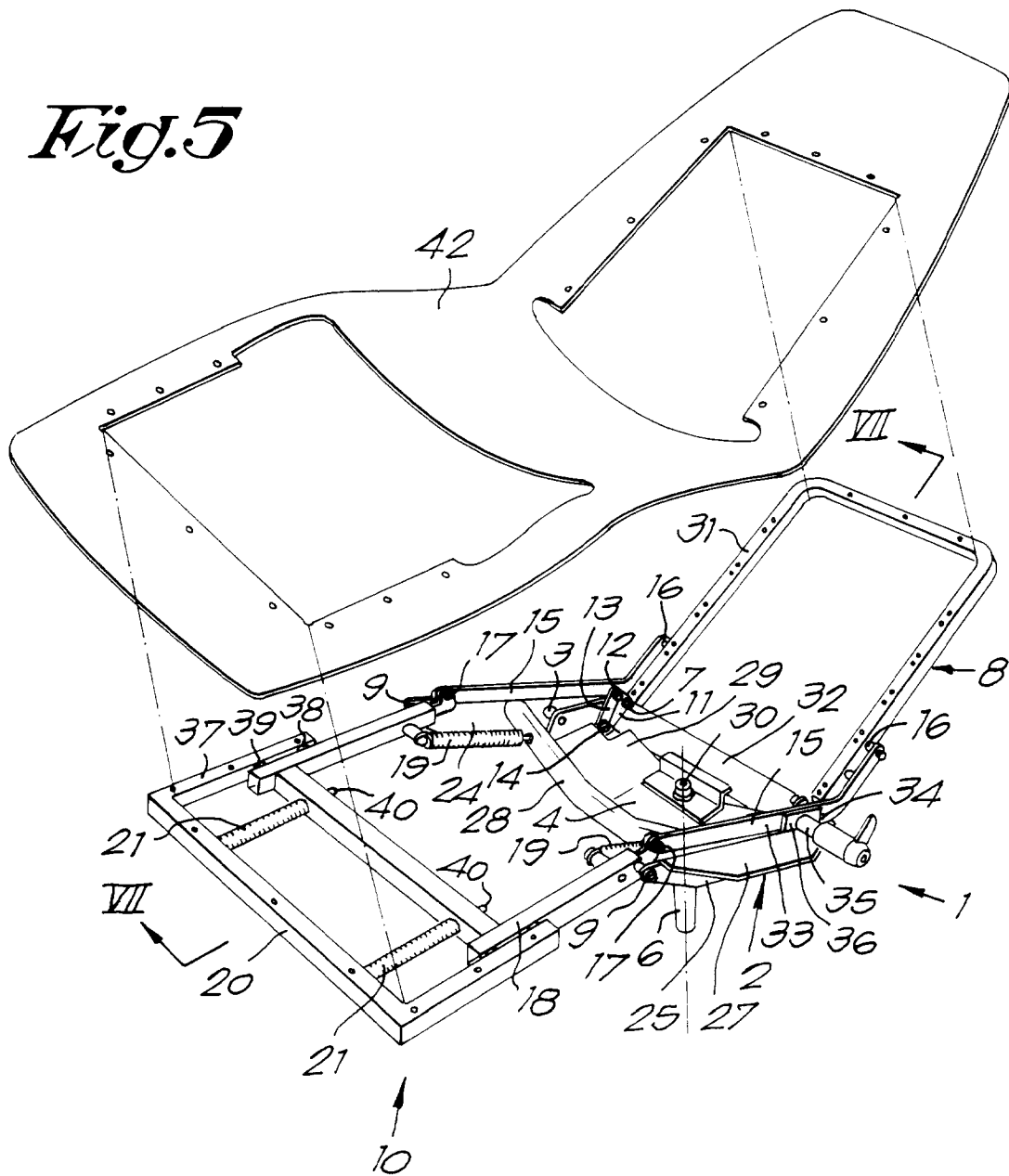
*Fig.4*



*Fig.10*

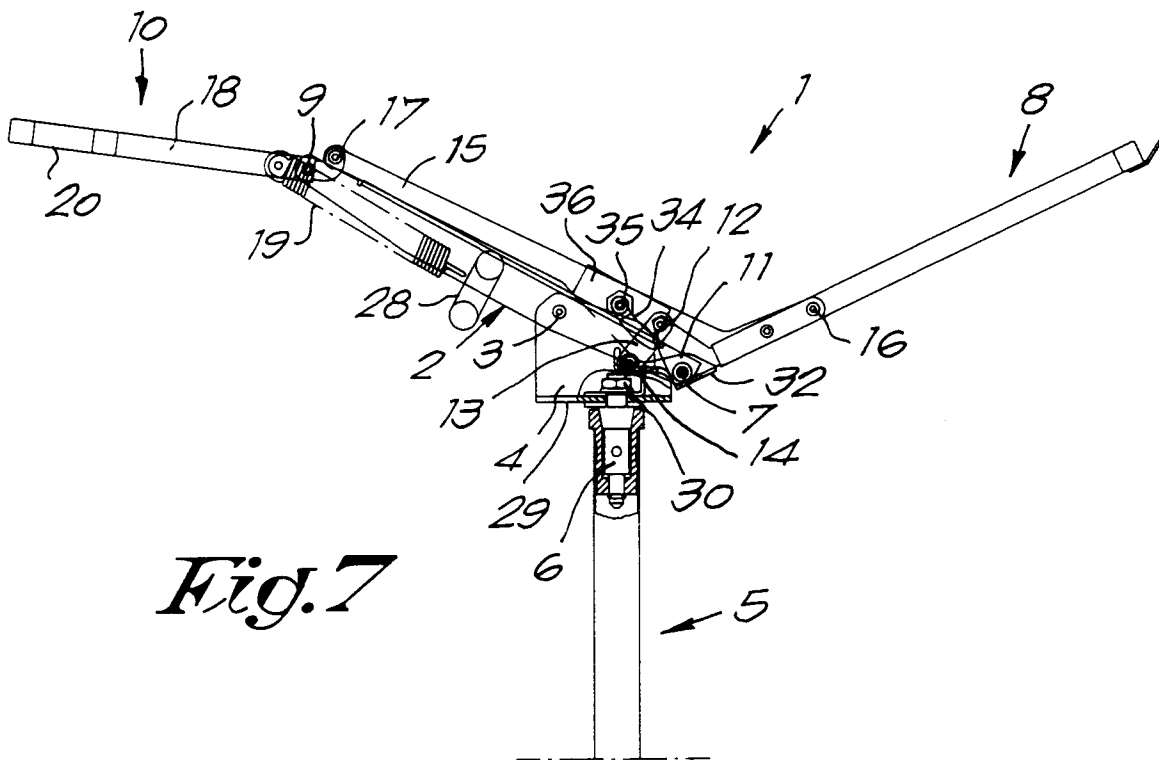
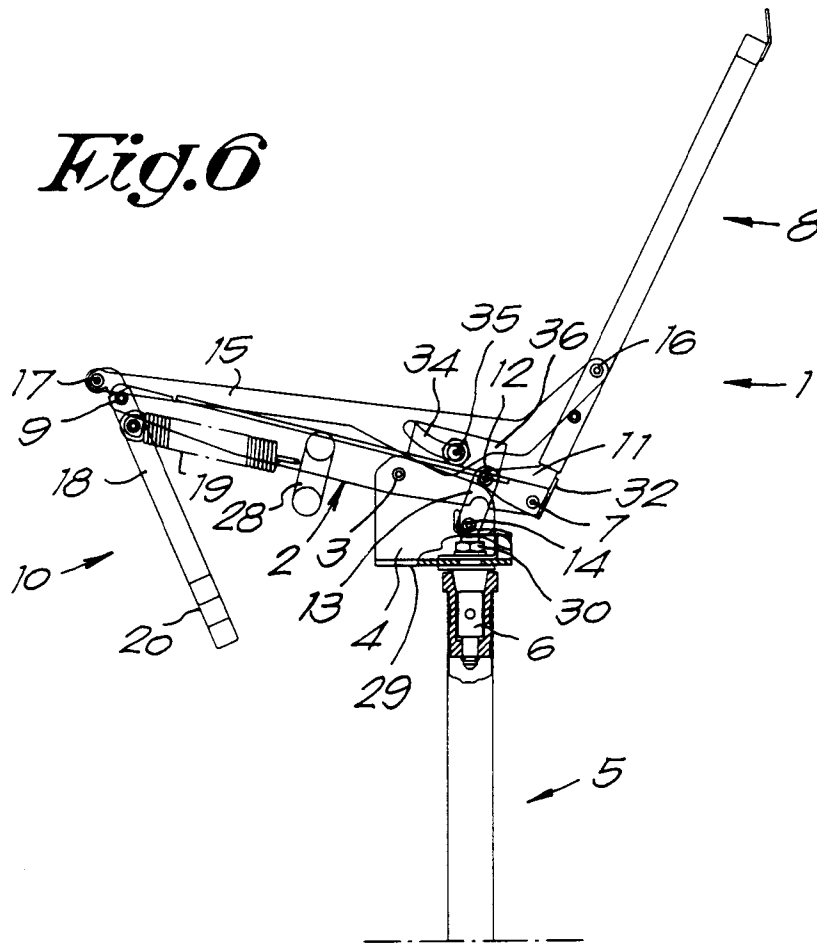


*Fig.5*



*Fig.9*

*Fig.6*



*Fig.7*