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(54) **CHAIR WITH OSCILLATING BACKREST**

STUHL MIT SCHWENKBARER RÜCKENLEHNE

CHAISE AVEC DOSSIER OSCILLANT

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Description

[0001] The present invention relates to a chair, of the type comprising:

a supporting structure;
a seat, having a seat support connected to the supporting structure by means of an articulated-parallelogram connection including at least one first arm and one second arm, each of which is articulated both to the seat support and to the supporting structure so that the seat can be displaced between a lowered position and a raised position;
a backrest, having a backrest support mounted oscillating between a substantially upright position and a position reclined backwards, said backrest support being operatively connected to the seat support in such a way that a displacement of the backrest towards the reclined position causes a displacement of the seat towards the raised position, and vice versa, so that the backrest is recalled towards the upright position by a force depending at least in part upon the weight of the person seated on the seat; and
elastic means set between the supporting structure and one of said first and second arms or said seat support, which tend to recall the seat towards the lowered position and the backrest towards the upright position.

[0002] A chair of the type specified above is described and illustrated in the document No. EP-A-0 249 584. Said known solution presents the advantage of guaranteeing a sort of automatic adjustment of the force that tends to recall the backrest towards the upright position, according to the person occupying the chair. Said characteristic is in general an important requirement in chairs with reclinable backrests. Many chairs for office use are equipped with a manually controlled adjustment device, which enables the user to adjust the force that tends to recall the backrest towards the upright position, said force having to be in general, as has been said, the greater, the greater the weight of the person occupying the chair. In the case of chairs for "communities", such as, for example, chairs designed to be used in conference halls, auditoria, theatres and the like, it is obviously not possible to envisage a manual adjustment device, both because its cost is in contrast with the requirements of simplicity and of low production costs that are characteristic of this type of chairs, and because is not thinkable that each new user of the chair can perform a manoeuvre of adjustment according to his or her own weight. The chair illustrated in *EP-A-0 249 584 solves the aforesaid problem, in so far as each new user of the chair automatically generates a force of return of the backrest towards the upright position that is a function of the weight of the person.

[0003] A chair as set forth in the preamble of claim 1 is known from JP 2007 054152 A

[0004] The object of the present invention is to improve further the aforesaid known chair, adding to the advantageous characteristics described above further characteristics that are advantageous from the standpoint of ergonomics and comfort for the user.

[0005] With a view to achieving said purpose, the subject of the invention is a chair presenting all the characteristics that have been indicated in claim 1.

[0006] Thanks to said characteristic, when the person sitting on the chair rests against the backrest, causing it to recline backwards, there is generated, as in the case of the known solution, a force of return of the backrest towards the upright position depending upon the weight of the person, but in addition to this there also occurs a recession of the seat, which enables the distance between the areas of contact of the body of the occupant with the seat and the backrest to be kept substantially unaltered as the inclination of the backrest varies so as to prevent or reduce a movement of relative sliding of the backrest with respect to the back of the person seated. In the case of known chairs, instead, said distance tends to increase as the inclination of the backrest increases, with the consequence that the chair "undresses" the occupant, in the sense that tends to slide his shirt out of his trousers at the back.

[0007] Further advantageous characteristics of the chair according to the invention are specified in the annexed claims.

[0008] The invention will now be described with reference to the annexed drawings, which are provided purely by way of non-limiting example and in which:

- Figure 1 is a side elevation of an embodiment of the chair according to the invention;
- Figures 2 and 3 are a view at an enlarged scale of a detail of Figure 1, in two different operating conditions of the chairs; and
- Figures 4-9 are schematic views at an enlarged scale of a detail of the chair according to the invention in different operating conditions.

[0009] In Figure 1, the reference number 1 designates as a whole a chair, particularly designed to be used as chair for "communities". The invention is in any case applicable also to chairs designed for different purposes, such as for example chairs for office use or chairs for dwellings.

[0010] The chair 1 comprises a seat 2 and a backrest 3 supported, in the way that will be described in detail in what follows, on a base structure 4.

[0011] In the case of the example illustrated, the base structure 4 is of the type comprising a single central vertical column 5, of the type comprising a gas-operated spring for adjustment of the height of the seat, the bottom end of which is received in a housing provided at the centre of a support 6, comprising a plurality of legs 7 that terminate with swivel wheels 8. Mounted on the top end of the stem 9 of the gas-operated spring associated to

the column 5 is a supporting box 10, for example made of metal material.

[0012] In the present description, the terms "longitudinal" and "longitudinally" are used with reference to a substantially horizontal direction parallel to the vertical plane of symmetry of the chair, indicated by the arrow A in Figure 1. In the same way, the expressions "transverse" and "transversely" are used with reference to a direction horizontal and perpendicular to the vertical plane of symmetry of the chair, i.e., a direction perpendicular to the plane of Figure 1.

[0013] In the case of the present invention, the seat 2 is carried by a sliding structure 2a which is mounted so that it can slide in a direction substantially parallel to the longitudinal direction A on a seat support 2b. The support of the seat 2b is in turn connected to the supporting box 10 by an articulated-parallelogram system that includes, in the case of the embodiment illustrated, two front articulated arms 11 and a single rear articulated arm 12. The two front articulated arms 11 are arranged at the two sides of the box 10 and are articulated around a transverse shaft 13 to the seat support 2b and around a transverse shaft 14 to the supporting box 10. The rear articulated arm 12 is articulated around a transverse shaft 15 to the seat support 2b and around a transverse shaft 16 to the supporting box 10.

[0014] With reference also to Figures 2 and 3, the backrest 3 of the chair according to the invention is carried by a backrest support 17, which, in the example illustrated, is constituted by an arm that at one end carries the panel of the backrest 3 and at the opposite end is forked in two branches 17a (just one of which is visible in the drawings), the ends of which are articulated around the aforesaid transverse shaft 15 on the support of the seat 2b. Each of the two front articulated arms 11 is prolonged at the side of the supporting box 10, behind the articulation shaft 14 up to an articulated shackle 18. The shackle 18 is connected in an articulated way around a shaft 19 (see Figures 2 and 3) to the supporting arm 17 of the backrest 3 and around a shaft 20 at both of the rear ends of the two articulated arms 11. The two side arms 11 are moreover connected to one another by a transverse pin 21 that engages an arched slot 22 made in each side wall of the box 10. Finally, an elbow-shaped arm 23 has one end articulated around the shaft 20 to the shackle 18 and the opposite end articulated around a transverse shaft 24 on the sliding support 2a of the seat.

[0015] In the present description and in the annexed drawings, the specific structure of each of the panels of the seat 2 and of the backrest 3 is not illustrated, since it can be obtained in any known way, and in so far as, taken in itself, it does not fall within the scope of the present invention.

[0016] With reference to Figure 4, the transverse pin 21 connected to the two articulated arms 11 carries a cap 25, resting on the top end of which is a helical spring 26, the axis of which is designated by 27 and which is set within the supporting box 10 and rests with its bottom end against the bottom wall of said box. The spring 26 tends to recall the pin 21 towards a position of maximum raising, in which the pin 21 is in contact with the top end of each of the slots 22 made in the box 10. Since the pin 21 is carried by the two articulated arms 11, the position of maximum raising of the pin 21 corresponds to the position of maximum rotation forwards of the articulated arms 11 and consequently of the rear articulated arm 12, which constitutes, together with the arms 11, the articulated-parallelogram system that connects the seat support 2b to the supporting box 10. Said condition is illustrated in Figure 2, which corresponds to the position assumed by the seat and by the backrest when the chair is not occupied or, even in the case where it is occupied, when the person occupying the chair does not exert a thrust against the backrest. In the condition of rest of the chair, as illustrated in Figure 2, the shaft 20 for connection of the rear ends of the articulated arms 11 to the shackle 18 is consequently in its position of maximum raising, which determines, via the shackle 18, the position of maximum rotation forwards of the supporting arm 17 of the backrest 3. As may be seen, the arrangement is such that, in said condition, the backrest 3 is substantially in an upright condition. It should again be noted that in said condition of rest the sliding support 2a is in a position of maximum advance in the longitudinal direction A with respect to the support of the seat 2b.

[0017] If, starting from the condition of rest illustrated in Figures 1 and 2, a person sitting on the seat 2 rests his back against the backrest 3, applying a pressure on it, which tends to cause it to oscillate backwards, said oscillation backwards of the supporting arm 17 of the backrest causes an oscillation upwards (in a counterclockwise direction as viewed in Figures 1-3) of the articulated arms 11, 12, since the support 17 moves so as to displace its articulation shaft 15 upwards. The movement of inclination backwards of the backrest consequently causes a raising of the seat 2. Said movement is to a smaller extent countered by the spring 26, which is compressed following upon the displacement downwards of the pin 21 in the slots 22, and to a prevalent extent upon the weight of the person sitting on the chair. The weight of the person tends, in fact, to cause the articulated arms 11, 12 to rotate downwards (in a clockwise direction, as viewed in the drawings), with consequent rotation upwards (in a clockwise direction) of the backrest. Consequently, the occupant, in exerting a thrust backwards on the backrest encounters a resistant force, which tends to recall the backrest towards the upright position, which is a function of the weight of the person seated. The chair according to the invention is consequently characterized, as, from this point of view, has already been envisaged in the document No. EP-A-0 249 584, by a sort of automatic adjustment of the force that recalls the backrest towards the upright position according to the weight of the person seated. Needs of comfort and ergonomics, in fact, require that a heavier person should encounter a greater reaction by the backrest fol-

lowing upon the movement backwards.

[0018] The main characteristic of novelty according to the invention lies in the fact that, during the movement of inclination backwards of the backrest, the arm 23 is displaced, causing a recession of the sliding support 2a of the seat with respect to the seat support 2b. Consequently, in the chair according to the invention, when the occupant rests against the backrest, causing it to recline backwards, there occurs a raising and a recession of the seat such that the distance between the areas of contact of the body of the occupant with the seat and with the backrest remains substantially unaltered. Said aspect constitutes a substantial difference with respect to the known chairs of the type with backrest that can be inclined backwards in so far as the rotation backwards of the backrest occurs with simultaneous movement of sliding upwards of the backrest against the back of the occupant so that, to use the jargon normally adopted in the sector, the chair "undresses" the occupant, in so far as it slides his shirt out of his trousers at the back. Since, in the chair according to the invention, the movement of reclining backwards of the backrest causes both a raising and a recession of the body of the person seated, the aforesaid movement of relative sliding between backrest and back is substantially cancelled out or at least considerably reduced, with consequent greater comfort for the user.

[0019] With reference again to Figures 4-9, mounted on the transverse pin 21 is an auxiliary assembly 28 including a body 29 mounted on the pin 21 and fixed with respect to a stem 30, slidably mounted on which is a cylindrical body 31 provided with an end head 32. A helical spring 33 is axially set between the head 32 of the cylindrical body 31 and a support 34 of the body 29. It should be noted that the auxiliary assembly 28, including the body 29, the spring 33 and the slideable cylinder 31 is set in a plane at a distance, along the shaft of the transverse pin 21, from the plane in which the shaft 27 of the spring 26 is set, to prevent any interference between the spring 26 and the spring 33.

[0020] The auxiliary assembly 28 can rotate around the shaft of the pin 21 so as to assume three different operative positions, respectively illustrated in Figures 4, 6 and 8. The operative position for the auxiliary assembly 28 is selected by means of a selector member 35, which is mounted so that it can rotate around a shaft 36 in the front part of the supporting box 10 and can rotate around said shaft 36 by an actuation lever (not illustrated), provided on a side of the box 10, underneath the seat.

[0021] The shaft 36 coincides with the shaft 14. On one side of the chair, in a position corresponding to the shaft 14/36, is the actuation lever of the selector member 35, whilst located on the other side is the conventional actuation lever of the gas-operated spring 9.

[0022] The selector member 35 has a nose 37, designed to couple elastically in any one of three seats 38a, 38b, 38c defined by an elastic element constituted by a shaped strip made of plastic material, having a cross section shaped like a closed loop. Following upon a rotation impressed via the lever mentioned above on the selector member 35, the nose 37 can engage in one of the three seats 38a, 38b, 38c. The rotation of the selector member 35 is transmitted to the auxiliary assembly 28 by means of a shaped metal wire 39 having one end anchored to a radial appendage 40 of the selector member 35 and the other end anchored to the body 29 of the auxiliary assembly 28. The metal wire 39 is shaped in such a way as to be able to compensate for the variation of distance between the two points to which its ends for selection of the different operating positions of the auxiliary assembly are anchored. The arrangement is moreover such that it is possible to make an adjustment of the selector member 35 even when the chair is occupied and the backrest is reclined backwards so that the pin 21 is in a lowered position within the respective slits 22. In the case where the selection is made with the pin 21 in the lowered position, the connection wire 39 undergoes elastic deformation following upon the manoeuvre of selection and automatically causes new positioning of the auxiliary assembly as soon as the pin 21 returns into the raised position.

[0023] When the nose 37 of the selector member 35 is located within the seat 38a of the spring element 38, the auxiliary assembly 28 is in the position illustrated in Figure 4. In said condition, the spring 33 does not perform any function, and an inclination backwards of the backrest causes lowering of the pin 21 against the action of the spring 26, as well as, as has been seen, against the action due to the weight of the person occupying the seat (see Figure 5).

[0024] When the selector member 35 is in the position illustrated in Figure 6, with the nose 37 engaging within the seat 38b of the spring element 38, the selector member 28 is in a position such that a detent 41 carried by the structure of the supporting box 10 immediately comes into contact with the surface of the body 28, thus preventing a displacement downwards of the pin 21. Consequently, in said condition, the backrest of the chair is blocked in so far as it is not able to incline backwards. It should be noted that in the condition, instead, illustrated in Figure 4, the detent 41 does not interfere with the body 29 of the auxiliary assembly 28 in so far as it inserts in a cavity (not visible in the drawings) made in the body 29. As has already been said, in the condition illustrated in Figure 6 the inclination backwards of the backrest is not consequently possible following upon the contact against the detent 41 (see Figure 7).

[0025] If the selector member 35 is brought into the position illustrated in Figure 8, the head 32 of the cylindrical body 31 comes to rest on a seat 42 made on the bottom of the supporting box 10 so that, when the backrest is inclined backwards, the consequent lowering of the pin 21 causes both compression of the spring 26 and lowering of the body 29, as well as sliding of the stem 30 within the cylindrical body 31, with consequent compression of the helical spring 33. Consequently, in said condition, the spring 33 comes to add to the spring 26 in

creating an action of contrast to the displacement of the backrest backwards. Said option can be chosen by very heavy users, who require a force of opposition of the backrest that the spring 26 alone is unable to guarantee.

[0026] Consequently, as may be seen, the chair according to the invention, in addition to guaranteeing a correct movement of the body of the occupant during a movement of reclining backwards of the backrest, also enables selection of a series of different conditions of operation so as to meet the different requirements of the users.

[0027] As may moreover be seen in the annexed drawings, the movement of reclining backwards of the backrest also causes raising of the seat, which occurs, however, also with a slight inclination backwards of the seat (to a smaller extent with respect to rotation of the backrest) so as to enable maximum comfort for the user.

[0028] A further advantageous characteristic of the chair according to the invention lies in the fact that all the mechanisms forming part of the supporting structure of the seat and of the backrest are contained in a supporting box, including, among other things, the auxiliary assembly 28 with the auxiliary spring 33 that can add to the main spring 26 to generate the force of reaction of the backrest, in the case where it is so desired.

[0029] Also the relative positioning of the various shafts of articulation of the articulated arms constituting the supporting structure of the seat and of the backrest is chosen so as to provide maximum comfort for the user. Furthermore, the use of connecting-rod elements like the shackle 18 or the rear articulated arm 12, instead of more traditional pin-and-slot connections, enables an improvement from the standpoint of reduction of friction.

[0030] Of course, without prejudice to the principle of the invention, the details of construction and the embodiments may vary widely with respect to what is described and illustrated herein purely by way of example, without thereby departing from the scope of the present invention.

Claims

1. A chair (1) comprising:

- a supporting structure (4);
- a seat (2), having a seat support (2b), connected to the supporting structure (4, 10) by means of an articulated-parallelogram connection (11, 12), including at least one first arm (11) and at least one second arm (12), each of which is articulated both to the seat support (2b) and to the supporting structure (10) so that the seat can be displaced between a lowered position and a raised position;
- a backrest (3) with a backrest support (17), mounted so that it can slide between a substantially upright position and a position reclined backwards, said backrest support (17) being operatively connected to the seat support (2b) in such a way that a displacement of the backrest (3) towards a position reclined backwards causes a displacement of the seat (2) towards a raised position, and vice versa, so that the backrest is recalled towards its upright position by a force depending at least in part upon the weight of the person sitting on the seat (2); and
- elastic means (26), operatively set between the supporting structure (10) and said first articulated arm (11) or said second articulated arm (12), or said backrest support (17), which tend to recall the seat (2) towards the lowered position and the backrest (3) towards the upright position,

wherein said seat (2) is carried by a sliding support (2a) mounted so that it can slide on the support of the seat (2b) in a longitudinal direction and in that said sliding support (2a) is operatively connected to said backrest support (17) so that an inclination backwards of the backrest support (17) causes a recession of the sliding support (2a), on which the seat is mounted (2) with respect to the seat support (2b), connected by means of the articulated-parallelogram system to the fixed supporting structure (10),

characterized in that said first articulated arm (11) is prolonged behind its articulation shaft (14) above the fixed supporting structure (10) and terminates with a rear end, connected in an articulated way around a transverse shaft (19, 20) to the backrest support (17), the latter being moreover connected in an articulated way around a transverse shaft (15) to the aforesaid seat support (2b).

2. The chair according to Claim 1, **characterized in that** the part of the aforesaid first articulated arm (11) that is prolonged further, beyond its articulation shaft (14) above the fixed supporting structure (10), carries a transverse pin (21), which is guided in a slot (22) in the fixed supporting structure (10), and presses on a return spring (26) set between said transverse pin (21) and the aforesaid fixed supporting structure (10).

3. The chair according to Claim 1, **characterized in that** the backrest support (17) is moreover connected to the aforesaid sliding support (2a) by means of an articulated arm (23).

4. The chair according to Claim 1, **characterized in that** the rear end of the aforesaid first articulated arm (11) is articulated around a transverse shaft (20) to a shackle element (18), the opposite end of which is articulated around a transverse shaft (19) above the backrest support (17).

5. The chair according to Claim 2, **characterized in that** the rear end of the aforesaid first articulated arm (11) is articulated around a transverse shaft (20) to a shackle element (18), the opposite end of which is articulated around a transverse shaft (19) above the backrest support (17) and **in that** the aforesaid articulated arm (23) that connects the backrest support (17) to the sliding support (2a) is connected in an articulated way around the aforesaid transverse shaft (20) on the aforesaid shackle element (18).

6. The chair according to any one of the preceding claims, **characterized in that** the aforesaid first and second articulated arms (11, 12) are shaped and arranged so that a rotation thereof upwards causes a slight inclination backwards of the seat (2).

7. The chair according to any one of the preceding claims, **characterized in that** the part of the fixed supporting structure, to which the first and second articulated arms (11,12) are articulated, is in the form of a box, made in which is at least one guide slot (22) for the aforesaid transverse pin (21), carried by the aforesaid first articulated arm (11), said box containing the aforesaid spring (26) set between the fixed structure and the aforesaid transverse pin (21).

8. The chair according to Claim 7, **characterized in that** there are provided two first articulated arms (11, 12), mounted articulated to the two sides of the aforesaid supporting box (10) and connected by the aforesaid transverse pin (21), which engages two guide slots (22) made in the two sides of said box (10).

9. The chair according to any one of the preceding claims, **characterized in that** the backrest support (17) is constituted by an arm having one end connected to the backrest (3) and the opposite end that branches into two arms (17a), the ends of which are articulated, around a common transverse shaft (15), to the aforesaid seat support (2b).

10. The chair according to any one of the preceding claims, **characterized in that** associated to the fixed supporting structure (10) is an auxiliary assembly (28) that can be located selectively in a first position, for the normal positioning of the chair, or in a second position, in which it prevents the inclination backwards of the backrest, or in a third position, in which auxiliary elastic means (33) forming part of said auxiliary assembly (28) determine an additional force of reaction that opposes the movement of reclining backwards of the backrest.

11. The chair according to Claim 10, **characterized in that** said auxiliary assembly is mounted so that it can rotate around the axis of a transverse pin (21), rigidly connected to said first articulated arm, that causes deformation of first elastic means (26) associated to the fixed supporting structure of the chair following upon a reclining backwards of the backrest.

12. The chair according to Claim 11, **characterized in that** said auxiliary assembly (28) has different operative positions around the axis of said transverse pin (21) and **in that** the operative position of the auxiliary assembly (28) is selectable by means of a selector member (35) mounted so that it can rotate around a transverse shaft (36) on the fixed supporting structure of the chair.

13. The chair according to any one of the preceding claims, **characterized in that** the aforesaid auxiliary elastic means are constituted by a helical spring (33), which is orientable together with said auxiliary assembly (28) around the axis of said transverse pin (21) and **in that** in one of said operative positions said spring (33) is set between the fixed supporting structure of the chair and the aforesaid transverse pin (21) so as to react to a movement of inclination backwards of the backrest.

Patentansprüche

1. Stuhl (1), der umfasst:

   - eine Tragestruktur (4);
   - eine Sitzfläche (2) mit einem Sitzflächen-Träger (2b), der mit der Tragestruktur (4, 10) mittels einer Gelenkparallelogramm-Verbindung (11, 12) verbunden ist, die wenigstens einen ersten Arm (11) und wenigstens einen zweiten Arm (12) enthält, die jeweils sowohl an dem Sitzflächen-Träger (2b) als auch der Tragestruktur (10) angelenkt sind, so dass der Sitz zwischen einer abgesenkten und einer angehobenen Position verschoben werden kann,
   - eine Rückenlehne (3) mit einem Rücklehnen-Träger (17), die so angebracht ist, dass sie zwischen einer im Wesentlichen aufrechtstehenden Position und einer nach hinten zurückgeklappten Position gleiten kann, wobei der Rücklehnen-Träger (17) funktional so mit dem Sitzflächen-Träger (2b) verbunden ist, dass eine Verschiebung der Rückenlehne (3) auf eine nach hinten zurückgeklappte Position eine Verschiebung der Sitzfläche (2) auf eine angehobene Position zu und umgekehrt bewirkt, so dass die Sitzlehne durch eine Kraft, die wenigstens teilweise vom Gewicht der auf der Sitzfläche (2) sitzenden Person abhängt, in ihre aufrechtstehende Position zurückgestellt wird; und
   - eine elastische Einrichtung (26), die funktional zwischen der Tragestruktur (10) und dem ersten Gelenkarm (11) oder dem zweiten Gelenkarm

(12) oder dem Rükkenlehnen-Träger (17) angeordnet ist und die dazu neigt, die Sitzfläche (2) auf die abgesenkte Position zu und die Rückenlehne (3) auf die aufrechtstehende Position zu zurückzustellen,
wobei die Sitzfläche (2) von einem gleitenden Träger getragen wird, der so angebracht ist, dass er an dem Träger der Sitzfläche (2b) in einer Längsrichtung gleiten kann und dass der gleitende Träger (2a) funktional mit dem Rükkenlehnen-Träger (17) so verbunden ist, dass eine Neigung des Rückenlehnen-Trägers (17) nach hinten ein Zurückziehen des gleitenden Trägers (2a), an dem die Sitzfläche (2) angebracht ist, in Bezug auf den Sitzflächen-Träger (2b) bewirkt, der mittels des Gelenkparallelogramm-Systems mit der festen Tragestruktur (10) verbunden ist,
dadurch gekennzeichnet, dass der erste Gelenkarm (11) hinter seiner Gelenkwelle (14) oberhalb der festen Tragestruktur (10) verlängert ist und mit einem hinteren Ende abschließt, das um eine Querwelle (19, 20) herum gelenkig mit dem Rückenlehnen-Träger (17) verbunden ist, wobei letzterer darüber hinaus um eine Querwelle (15) herum gelenkig mit dem Sitzflächen-Träger (2b) verbunden ist.

2. Stuhl nach Anspruch 1, **dadurch gekennzeichnet, dass** der Teil des ersten Gelenkarms (11), der über seine Gelenkwelle (14) hinaus oberhalb der festen Tragestruktur (10) weiter verlängert ist, einen Querzapfen (21) trägt, der in einem Schlitz (22) in der festen Tragestruktur (10) geführt wird und auf eine Rückstellfeder (26) drückt, die zwischen den Querzapfen (21) und der festen Tragestruktur (10) angeordnet ist.

3. Stuhl nach Anspruch 1, **dadurch gekennzeichnet, dass** der Rückenlehnen-Träger (17) des Weiteren mittels eines Gelenkarms (23) mit dem gleitenden Träger (2a) verbunden ist.

4. Stuhl nach Anspruch 1, **dadurch gekennzeichnet, dass** das hintere Ende des ersten Gelenkarms (11) um eine Querwelle (20) herum gelenkig an einem Verbindungselement (18) angebracht ist, dessen gegenüberliegendes Ende um eine Querwelle (19) herum gelenkig oberhalb des Rückenlehnen-Trägers (17) gelagert ist.

5. Stuhl nach Anspruch 2, **dadurch gekennzeichnet, dass** das hintere Ende des ersten Gelenkarms (11) um eine Querwelle (20) herum gelenkig an einem Verbindungselement (18) gelagert ist, dessen gegenüberliegendes Ende um eine Querwelle (19) herum gelenkig oberhalb des Rückenlehnen-Trägers (17) angebracht ist, und dass der Gelenkarm (23), der den Rückenlehnen-Träger (17) mit dem gleitenden Träger (2a) verbindet, um die Querwelle (20) herum gelenkig mit dem Verbindungselement (18) verbunden ist.

6. Stuhl nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der erste und der zweite Gelenkarm (11, 12) so geformt und angeordnet sind, dass eine Drehung derselben nach oben eine leichte Rückwärtsneigung der Sitzfläche (2) bewirkt.

7. Stuhl nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der Teil der festen Tragestruktur, an dem der erste und der zweite Gelenkarm (11, 12) gelenkig angebracht sind, die Form eines Kastens hat, in dem sich wenigstens ein Führungsschlitz (22) für den Querzapfen (21) befindet, der von dem ersten Gelenkarm (11) getragen wird, wobei der Kasten die Feder (26) enthält, die zwischen der festen Struktur und dem Querzapfen (21) angeordnet ist.

8. Stuhl nach Anspruch 7, **dadurch gekennzeichnet, dass** zwei erste Gelenkarme (11, 12) vorhanden sind, die gelenkig an den zwei Seiten des Tragekastens (10) angebracht und durch den Querzapfen (21) verbunden sind, der in zwei Führungsschlitze (22) eingreift, die in den zwei Seiten des Kastens (10) ausgebildet sind.

9. Stuhl nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der Rückenlehnen-Träger (17) durch einen Arm gebildet wird, dessen eines Ende mit der Rückenlehne (3) verbunden ist und dessen gegenüberliegendes Ende sich zu zwei Armen (17a) verzweigt, deren Enden um eine gemeinsame Querwelle (15) herum gelenkig an dem Sitzflächen-Träger (2b) angebracht sind.

10. Stuhl nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** zu der festen Tragestruktur (10) eine Hilfsbaugruppe (28) gehört, die sich selektiv in einer ersten Position für die normale Positionierung des Stuhls oder in einer zweiten Position, in der sie die Rückwärtsneigung der Rückenlehne verhindert, oder in einer dritten Position befinden kann, in der eine zusätzliche elastische Einrichtung (33), die Teil der Hilfsbaugruppe (28) ist, eine zusätzliche Gegenwirkungskraft bestimmt, die der Rückwärtsneigungsbewegung der Rückenlehne entgegenwirkt.

11. Stuhl nach Anspruch 10, **dadurch gekennzeichnet, dass** die Hilfsbaugruppe so angebracht ist, dass sie sich um die Achse eines Querzapfens (21) herum drehen kann, der starr mit dem ersten Gelenkarm verbunden ist, wodurch Verformung der er-

sten elastischen Einrichtung (26), die zu der ersten Tragestruktur des Stuhls gehört, als Folge einer Rückwärtsneigung der Rückenlehne verursacht wird.

12. Stuhl nach Anspruch 11, **dadurch gekennzeichnet, dass** die Hilfsbaugruppe (28) unterschiedliche Funktionspositionen um die Achse des Querzapfens (21) herum hat und dass die Funktionspositionen der Hilfsbaugruppe (28) mittels eines Wählelementes (35) ausgewählt werden kann, das so angebracht ist, dass es sich um eine Querwelle (36) an der festen Tragestruktur des Stuhls herum drehen kann.

13. Stuhl nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** die zusätzliche elastische Einrichtung durch eine Schraubenfeder (33) gebildet wird, die zusammen mit der Hilfsbaugruppe (28) um die Achse des Querzapfens (21) herum ausgerichtet werden kann, und dass in einer der Funktionspositionen die Feder (33) zwischen der festen Tragestruktur des Stuhls und dem Querzapfen (21) angeordnet ist und auf eine Rückwärtsneigungsbewegung der Rückenlehne reagiert.

Revendications

1. Chaise (1) comprenant :

une structure de support (4) ;
une assise (2), ayant un support d'assise (2b), raccordé à la structure de support (4, 10) au moyen d'un raccordement articulé en forme de parallélogramme (11, 12), comprenant au moins un premier bras (11) et au moins un deuxième bras (12), dont chacun est articulé à la fois par rapport au support d'assise (2b) et à la structure de support (10), de sorte que l'assise peut être déplacée entre une position abaissée et une position levée ;
un dossier (3) avec un support de dossier (17), monté de sorte qu'il peut coulisser entre une position sensiblement verticale et une position inclinée vers l'arrière, ledit support de dossier (17) étant raccordé de manière opérationnelle au support d'assise (2b) de sorte qu'un déplacement du dossier (3) vers une position inclinée vers l'arrière provoque un déplacement de l'assise (2) vers une position levée, et vice-versa, de sorte que le dossier est rappelé vers sa position verticale par une force dépendant au moins en partie du poids de la personne assise sur l'assise (2) ; et
des moyens élastiques (26), placés de manière opérationnelle entre la structure de support (10) et ledit premier bras articulé (11) ou ledit deuxième bras articulé (12), ou ledit support de dossier (17), qui ont tendance à rappeler l'assise (2) vers la position abaissée et le dossier (3) vers la position verticale,
dans laquelle ladite assise (2) est supportée par un support coulissant (2a) monté de sorte qu'il peut coulisser sur le support de l'assise (2b) dans une direction longitudinale et en ce que ledit support coulissant (2a) est raccordé de manière opérationnelle audit support de dossier (17), de sorte qu'une inclinaison vers l'arrière du support de dossier (17) provoque un recul du support coulissant (2a), sur lequel l'assise est monté (2) par rapport au support d'assise (2b), raccordé au moyen du système articulé en forme de parallélogramme à la structure de support (10) fixe,
caractérisée en ce que le premier bras articulé (11) est prolongé derrière son arbre d'articulation (14) au-dessus de la structure de support (10) fixe et se termine par une extrémité arrière, raccordée d'une manière articulée autour d'un arbre transversal (19, 20) au support de dossier (17), ce dernier étant de plus raccordé d'une manière articulée autour d'un arbre transversal (15), au support d'assise (2b) mentionné précédemment.

2. Chaise selon la revendication 1, **caractérisée en ce que** la partie du premier bras articulé (11) mentionné précédemment qui est davantage prolongée, au-delà de son arbre d'articulation (14) au-dessus de la structure de support (10) fixe, supporte une broche transversale (21) qui est guidée dans une fente (22) dans la structure de support (10) fixe, et appuie sur un ressort de rappel (26) placé entre ladite broche transversale (21) et ladite structure de support (10) fixe mentionnées précédemment.

3. Chaise selon la revendication 1, **caractérisée en ce que** le support de dossier (17) est de plus raccordé au support coulissant (2a) mentionné précédemment au moyen d'un bras articulé (23).

4. Chaise selon la revendication 1, **caractérisée en ce que** l'extrémité arrière du premier bras articulé (11) mentionné précédemment est articulée autour d'un arbre transversal (20) à un élément de biellette (18), dont l'extrémité opposée est articulée autour d'un arbre transversal (19) au-dessus du support de dossier (17).

5. Chaise selon la revendication 2, **caractérisée en ce que** l'extrémité arrière du premier bras articulé (11) mentionné précédemment est articulée autour d'un arbre transversal (20) à un élément de biellette (18), dont l'extrémité opposée est articulée autour d'un arbre transversal (19) au-dessus du support de dossier (17) et **en ce que** le bras articulé (23) mentionné

précédemment qui raccorde le support de dossier (17) au support coulissant (2a) est raccordé d'une manière articulée autour de l'arbre transversal (20) mentionné précédemment sur l'élément de biellette (18) mentionné précédemment.

6. Chaise selon l'une quelconque des revendications précédentes, **caractérisée en ce que** les premier et deuxième bras articulés (11, 12) mentionnés précédemment sont formés et agencés de sorte que leur rotation vers le haut provoque une légère inclinaison vers l'arrière de l'assise (2).

7. Chaise selon l'une quelconque des revendications précédentes, **caractérisée en ce que** la partie de la structure de support fixe, sur laquelle les premier et deuxième bras articulés (11, 12) sont articulés, se présente sous la forme d'un boîtier, dans laquelle est réalisée au moins une fente de guidage (22) pour la broche transversale (21) mentionnée précédemment, supportée par le premier bras articulé (11) mentionné précédemment, ledit boîtier contenant le ressort (26) mentionné précédemment placé entre la structure fixe et la broche transversale (21) mentionnées précédemment.

8. Chaise selon la revendication 7, **caractérisée en ce que** l'on prévoit deux premiers bras articulés (11, 12), montés de manière articulée sur les deux côtés du boîtier de support (10) mentionné précédemment et raccordés par la broche transversale (21) mentionnée précédemment, qui met en prise deux fentes de guidage (22) réalisées dans les deux côtés dudit boîtier (10).

9. Chaise selon l'une quelconque des revendications précédentes, **caractérisée en ce que** le support de dossier (17) est constitué par un bras ayant une extrémité raccordée au dossier (3) et l'extrémité opposée qui se sépare en deux bras (17a), dont les extrémités sont articulées, autour d'un arbre transversal commun (15), au support d'assise (2b) mentionné précédemment.

10. Chaise selon l'une quelconque des revendications précédentes, **caractérisée en ce que**, associé à la structure de support (10) fixe, on trouve un ensemble auxiliaire (28) qui peut être placé sélectivement dans une première position, pour le positionnement normal de la chaise, ou dans une deuxième position, dans laquelle il empêche l'inclinaison vers l'arrière du dossier, ou dans une troisième position, dans laquelle des moyens élastiques auxiliaires (33) faisant partie dudit ensemble auxiliaire (28) déterminent une force de réaction supplémentaire qui s'oppose au mouvement d'inclinaison vers l'arrière du dossier.

11. Chaise selon la revendication 10, **caractérisée en ce que** ledit ensemble auxiliaire est monté de sorte qu'il peut tourner autour de l'axe d'une broche transversale (21), raccordé de manière rigide audit premier bras articulé, qui provoque la déformation des premiers moyens élastiques (26) associés à la structure de support fixe de la chaise suite à une inclinaison vers l'arrière du dossier.

12. Chaise selon la revendication 11, **caractérisée en ce que** ledit ensemble auxiliaire (28) a différentes positions opérationnelles autour de l'axe de ladite broche transversale (21), et **en ce que** la position opérationnelle de l'ensemble auxiliaire (28) peut être sélectionnée au moyen d'un élément de sélection (35) monté de sorte qu'il peut tourner autour d'un arbre transversal (36) sur la structure de support fixe de la chaise.

13. Chaise selon l'une quelconque des revendications précédentes, **caractérisée en ce que** les moyens élastiques auxiliaires mentionnés précédemment sont constitués par un ressort hélicoïdal (33) qui est orientable conjointement audit ensemble auxiliaire (28) autour de l'axe de ladite broche transversale (21) et **en ce que** dans l'une desdites positions opérationnelles, ledit ressort (33) est placé entre la structure de support fixe de la chaise et la broche transversale (21) mentionnées précédemment afin de réagir à un mouvement d'inclinaison vers l'arrière du dossier.

FIG. 1

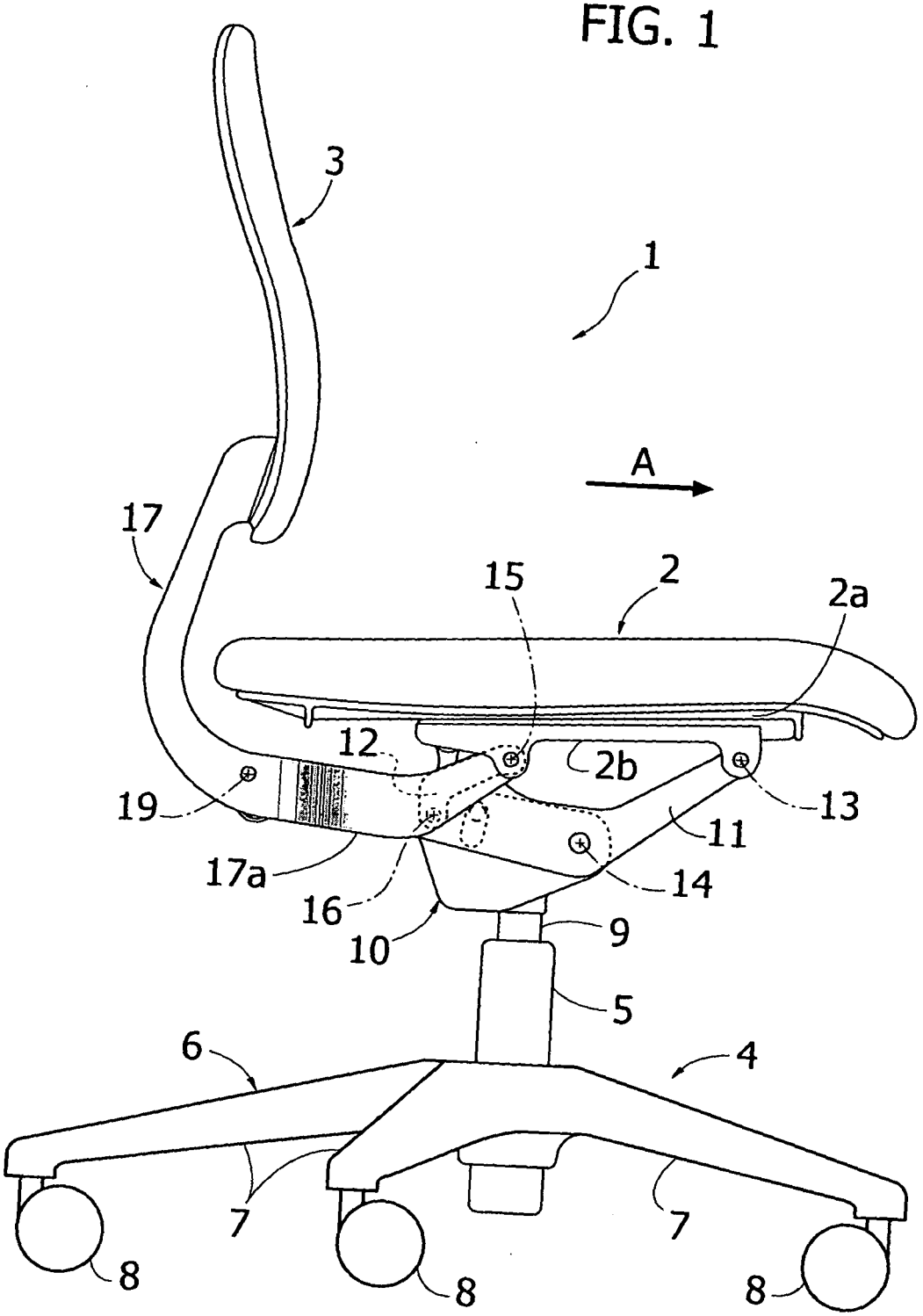


FIG. 2

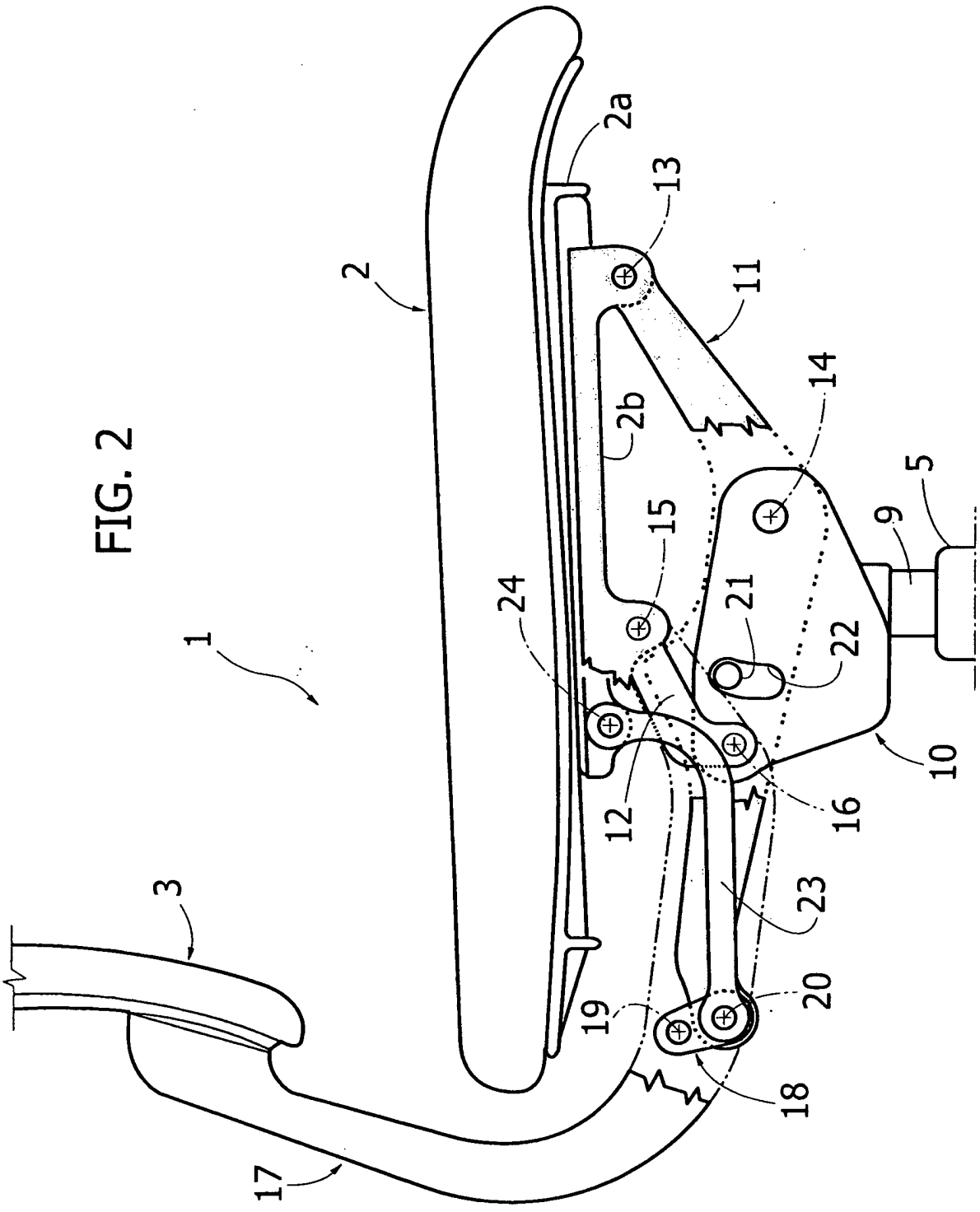


FIG. 3

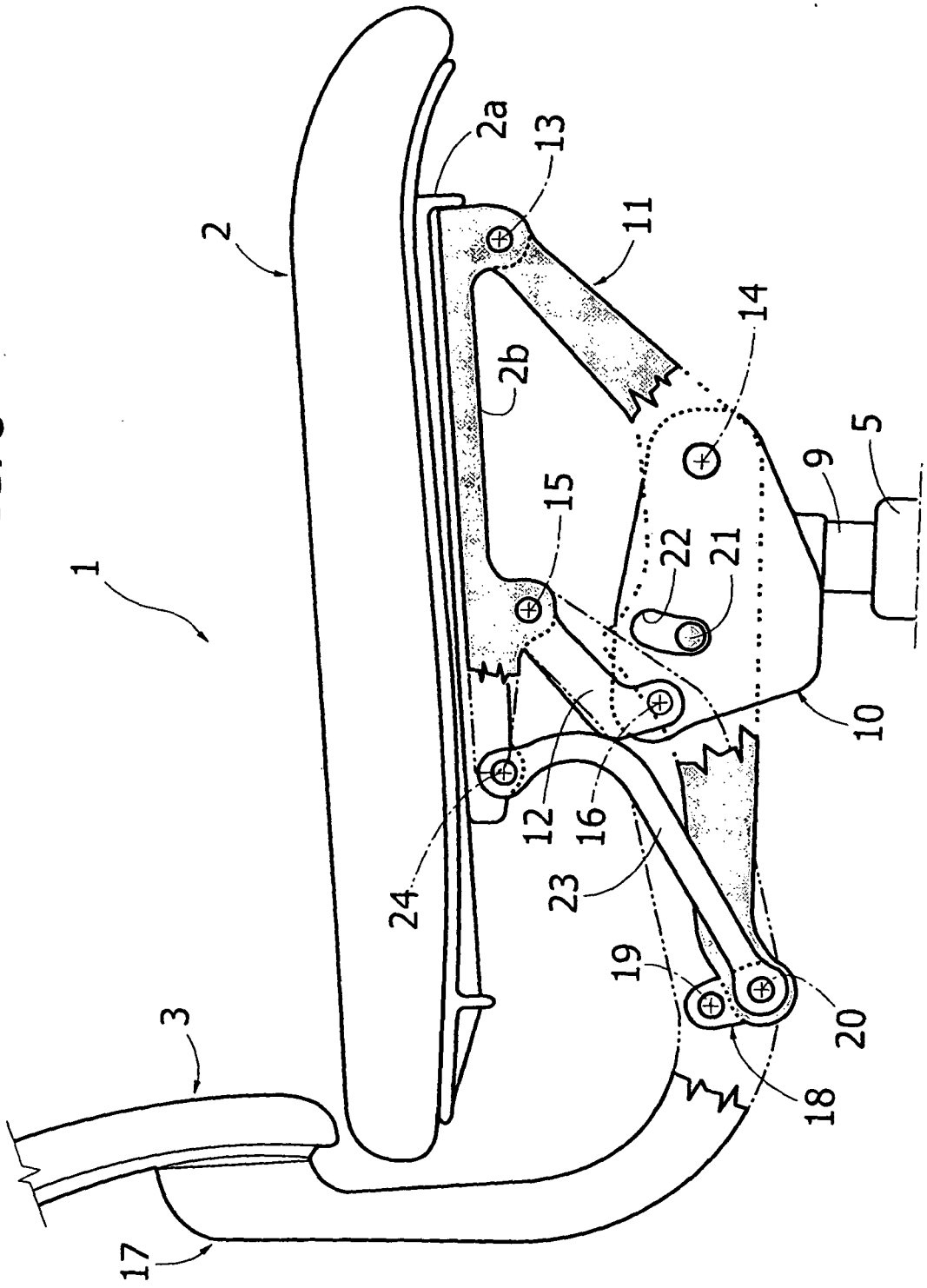


FIG. 4

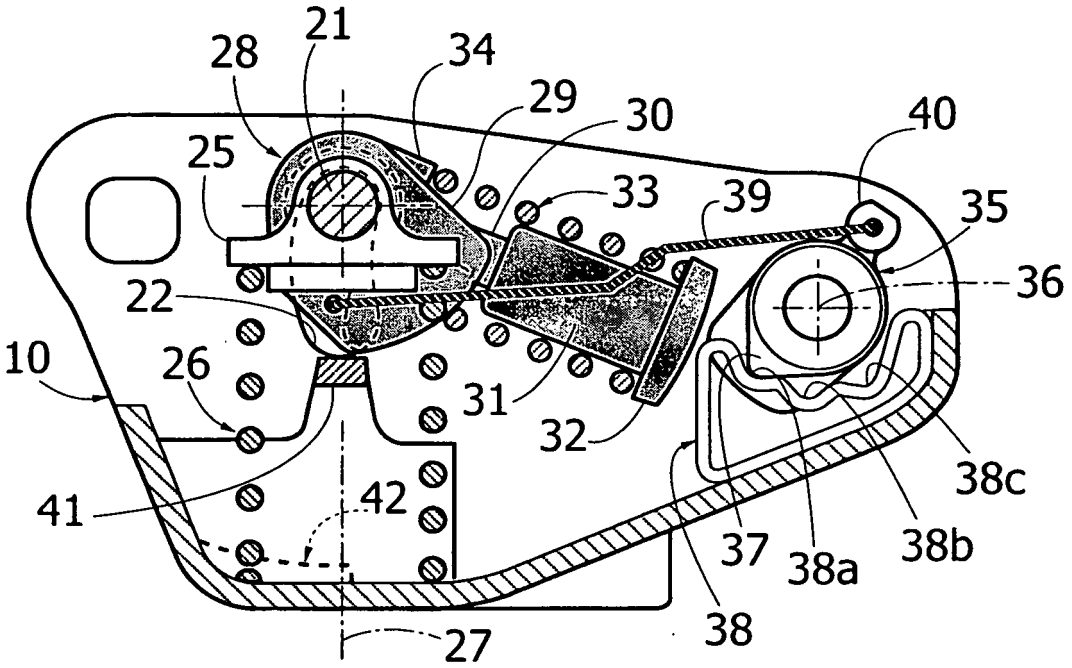

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FIG. 5

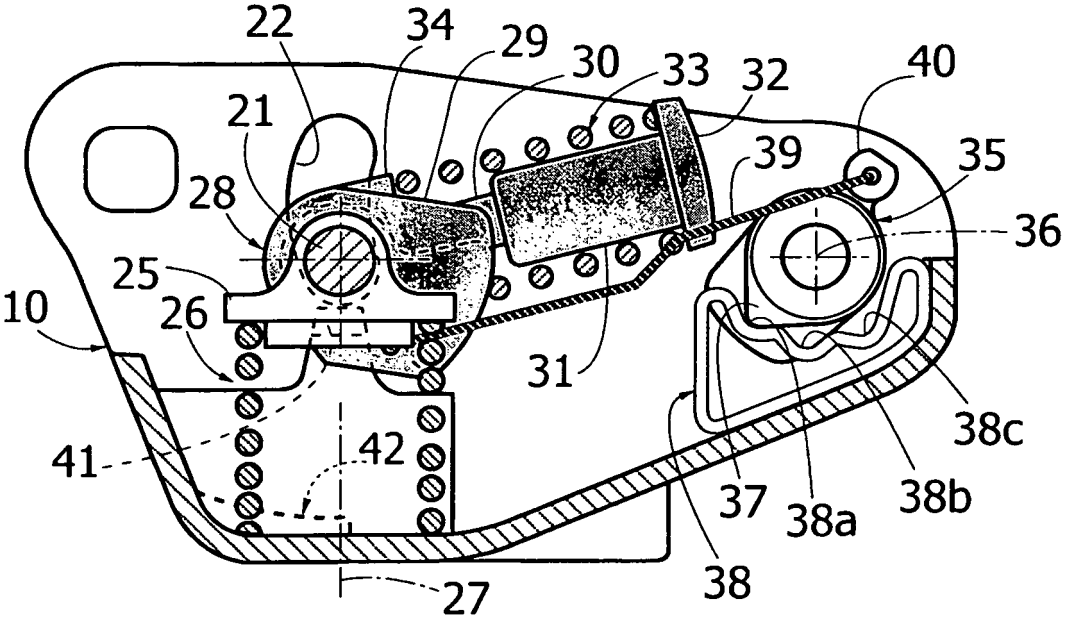

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FIG. 6

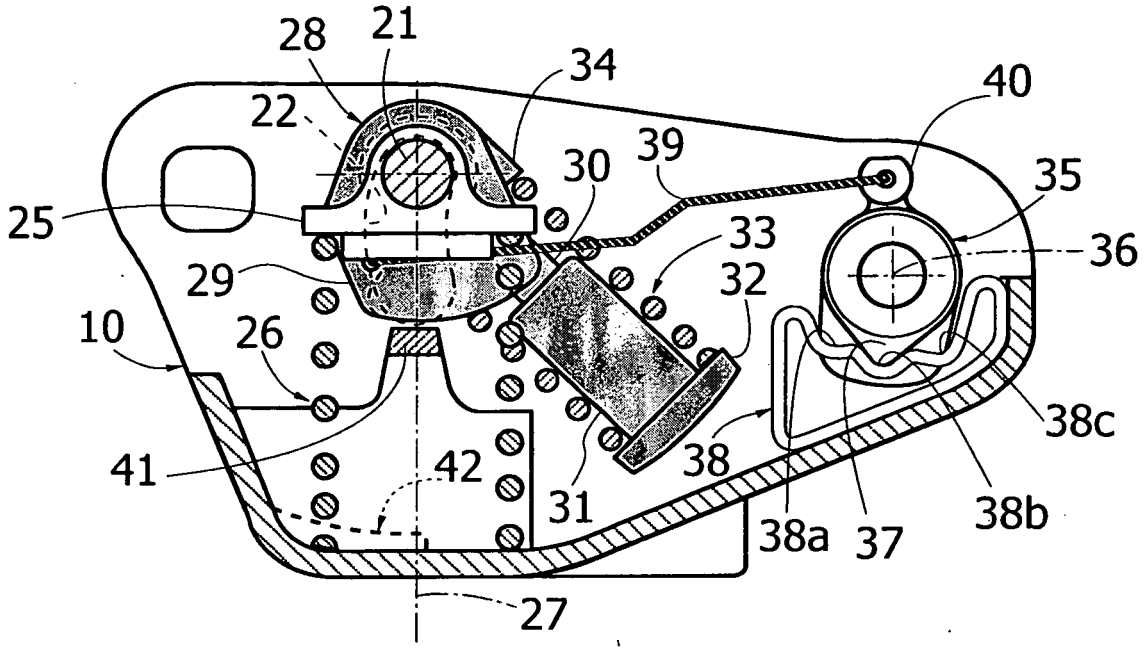

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FIG. 7

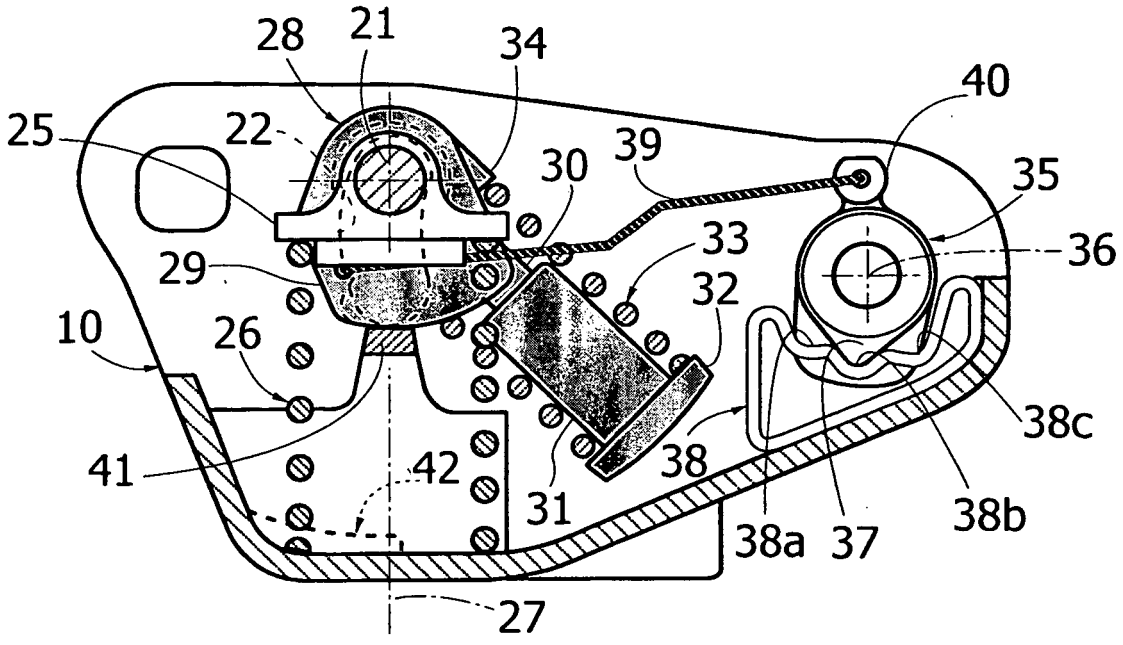

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FIG. 8

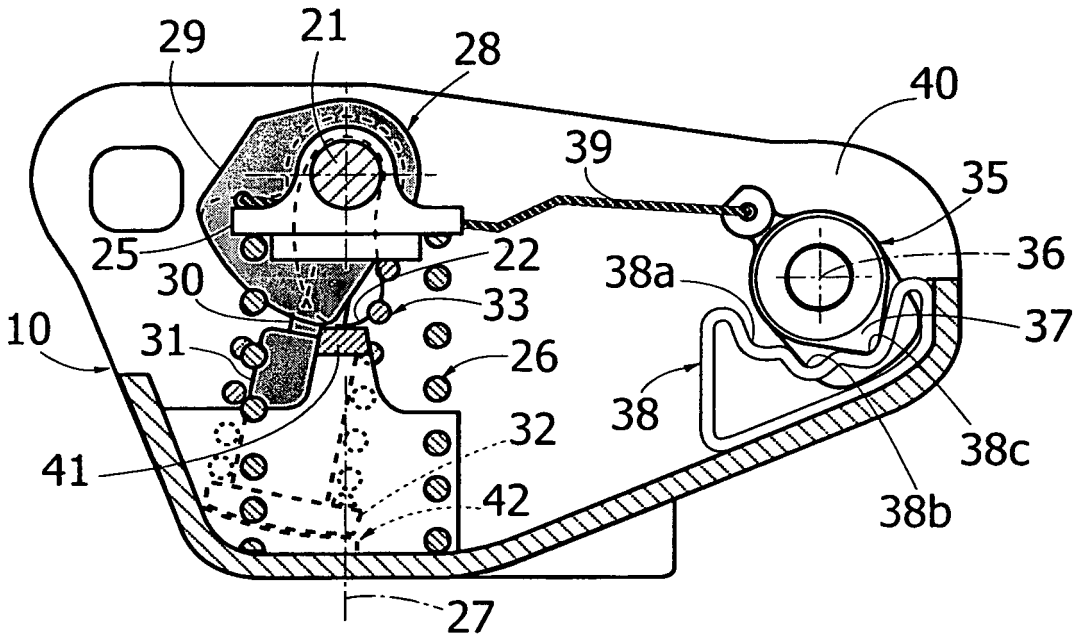
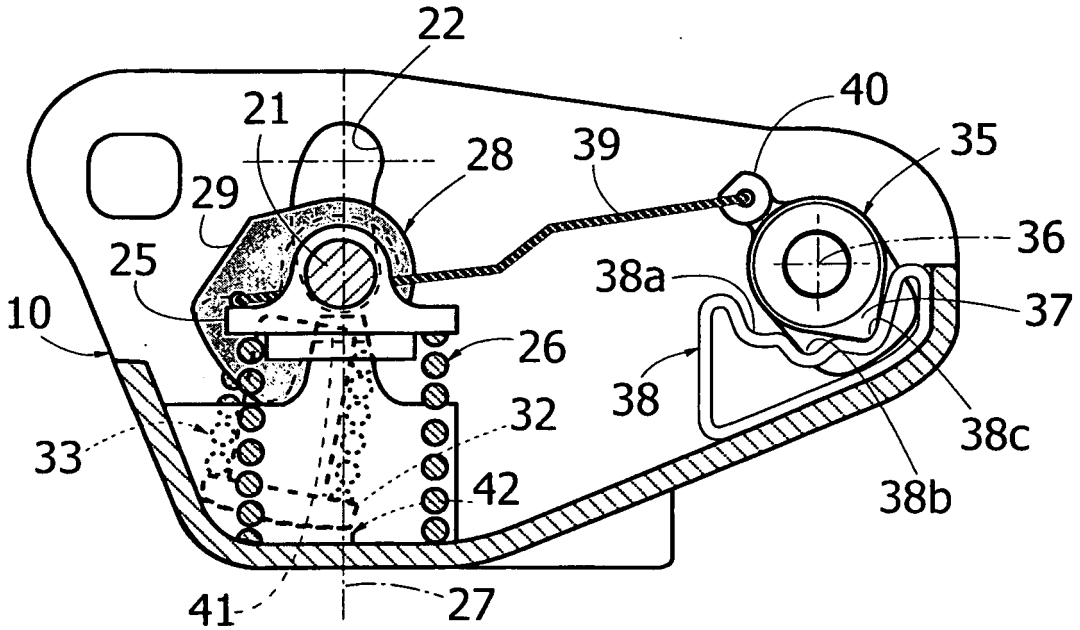

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FIG. 9


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REFERENCES CITED IN THE DESCRIPTION

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