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(54) **Auxiliary device intended for addition to an article of seating furniture for raising and/or tilting thereof**

Hilfsvorrichtung für Befestigung am Sitzmöbel zum Heben und/oder Neigen

Dispositif auxiliaire attachable à un meuble d'assise pour soulever et/ou incliner

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Description

[0001] Comfortable seating furniture is designed primarily to enable good seating, relaxation and rest. Many people, and particularly older people, are however limited in their mobility and motor functions and find it difficult to sit in such an article of furniture. Sitting down usually requires little effort, but the strength in arms and legs required for standing up again is often lacking. In order to obviate this drawback of normally comfortable seating furniture, adjustable armchairs have been specially developed for senior citizens and people with a physical disability: the so-called stand-up chairs. These adjustable chairs are characterized in that a construction is arranged in the chair under the seat which enables raising and tilting of the seat, and often also the seat back. Such stand-up chairs are described inter alia in EP-A-1 031 337, WO-A-98/29082, DE-A-198 44 240, GB-A-2 344 512.

[0002] In these known constructions the raising movement of the chair is combined with the tilting of the chair seat and seat back. Owing to this combined movement the legs of the person sitting in the chair are stretched, while his or her back is pushed forward. Both movements together help the person to stand up without great effort. Conversely, a person standing in front of the chair can be helped into the sitting position by carrying out the combined movement in opposite direction.

[0003] These known constructions have a number of drawbacks. The construction is formed integrally with the chair, is incorporated into the chair in the space under and/or adjacently of the seat. For the user this means that, when standing-up becomes more difficult, he or she must purchase another chair and cannot make use of his/her own familiar, comfortable chair. The choice from the range of stand-up furniture is limited and the investment in a new article of furniture is usually considerable.

[0004] US-A-4 786 107 discloses an auxiliary device intended for addition to an article of seating furniture with a seat back, for instance a chair or settee, which auxiliary device comprises:

- a first frame for placing on the ground;
- a second frame disposed movably relative to the first frame;
- support means present on the second frame for supporting an article of seating furniture; and
- drive means operative between the first frame and the second frame for displacing the second frame relative to those zones of the first frame with which this latter can support on the floor,
- the effective length of the support means being adjustable.

[0005] A high degree of flexibility in the application and use of the auxiliary device of said type is obtained with an auxiliary device of said type wherein the effective width of the support means is adjustable.

[0006] It is important that this adjustability can be used such that the first frame substantially does not protrude outside the support means or outside the chair supported thereby. This prevents the possibility of a user or other people bumping against the first frame. It is however recommended to make said length and/or width as great as possible. This enhances the stability of the auxiliary device in combination with the seating furniture supported thereby.

[0007] Advantageously, the auxiliary device according to the invention may be characterized in that the support means comprises two front plates and two rear plates, said plates being supported by the second frame in a way such that they are individually laterally adjustable.

[0008] A stable positioning of the seating furniture on the plates is secured with an embodiment, in which each plate has a general rectangular form and is provided with two upright walls extending along its two outer sides.

[0009] The auxiliary device is preferably embodied such that the drive means are adapted to raise and/or tilt the second frame relative to those zones of the first frame with which this latter can support on the floor.

[0010] A very simple and inexpensive, but nevertheless mechanically very stable embodiment of the auxiliary device according to the invention has the special feature that the first frame comprises two frame parts which can swivel in mutually opposing directions, of which one comprises at least one wheel or roller and the other frame part has at least one fixed convex tilting surface such that, when these frame parts are swivelled toward each other, the second frame is displaced relative to those zones of the first frame with which this latter can support on the floor.

[0011] When the position of the first and the second frame is changed, a tilting takes place wherein said frame part rolls over the convex tilting surface, while the other frame part rolls over the ground with the at least one wheel or the at least one roller.

[0012] According to yet another aspect of the invention, the above stated auxiliary device can have the special feature that on its side remote from said wheel or said roller the second frame bears a number of wheels or rollers necessary for mechanical stability which in the lowest position of the second frame, together with said wheel or said wheels or roll or rollers, make the auxiliary device movable over the ground.

[0013] With this embodiment the auxiliary device, optionally with a chair supported thereby, can be moved over the ground easily in said lowest position of the second frame. The wheels or rollers can be fixed or swivelable.

[0014] According to yet another aspect of the invention, the auxiliary device has the special feature that the second frame is provided on its underside with a third frame which is disposed for rotation about a substantially vertical axis relative to the second frame and which supports on the ground in the lowest position of the second frame and in this position rotatably supports the first and

second frame. The swivel angular position of the auxiliary device, and thereby that of a chair supported thereby, can hereby be adjusted as desired.

[0015] Attention is generally drawn to the fact that the length and width of the support means, and optionally of the first frame, at the front and the rear can be adjusted together or, if desired, on an individual basis.

[0016] In yet another embodiment, the auxiliary device has the special feature that it comprises fixation means for fixing an article of seating furniture supported by the support means to these support means. Such fixation means can in some circumstances enhance the mechanical stability of the combination of the auxiliary device according to the invention and a chair supported thereby. These fixation means are attached on one side to the article of furniture, for instance to the legs, and on the other side to the support means.

[0017] The invention further relates to an assembly of at least two auxiliary devices as according to the above stated specification for jointly supporting an article of multi-seat furniture. This assembly according to the invention has the special feature that the auxiliary devices are coupled electrically and/or mechanically such that the movements of the second frames relative to the first frames are substantially the same.

[0018] The auxiliary device can be constructed with small overall dimensions. A relatively narrow zone on two sides of the second frame can be used to support a chair. A small remaining zone in the middle of the upper part of the second frame can be higher and provides space for drive means, for instance a hydraulic or electric actuator, which provides for the relative displacement of the second frame and the first frame.

[0019] The invention will now be elucidated with reference to the accompanying drawings of a number of exemplary embodiments, to which the invention is not limited.

[0020] In the drawings:

Fig. 1, 2 and 3 show side views of an auxiliary device according to the invention in respectively the lowest position or rest position, a raised position and a highest position, in which the second frame is not only raised but has also undergone a forward tilting, wherein the seat back part of a chair is raised further than the front part of the chair;

Fig. 4, 5 and 6 show side views of the auxiliary devices of Fig. 1, 2 and 3 on smaller scale, wherein a chair is supported by the auxiliary device;

Fig. 7 shows a more detailed perspective view of a preferred embodiment of the auxiliary device according to the invention;

Fig. 8 and 9 show respectively the raised and the low or rest position of an auxiliary device, on the one side of which the first frame is provided with a set of wheels and on the other side of which the second frame is provided with a set of wheels;

Fig. 10 and 11 show respectively the raised and the

low or rest position of an auxiliary device, the second frame of which is provided on its underside with a turntable base; and

Fig. 12 and 13 are perspective views of tubes with support plates for the legs of a chair in two mutually differing, laterally adjusted positions.

[0021] The operating principle of the mechanism of auxiliary device 1 is described with reference to Fig. 1, 2 and 3. Drive 4 is placed between two torsion tubes 2 and 3 placed parallel to each other. Mounted on torsion tube 2 is one pair of rods 5, the outer ends of which end in tilting supports 6. On torsion tube 3 is mounted one pair of rods 7, the outer ends of which are provided with support wheels 8. From the low or rest position drawn in Fig. 1 the drive rotates the two torsion tubes 2 and 3 simultaneously, whereby support wheels 8 move in the direction of tilting supports 6. The tilting supports tilt about a fixed point. The movement of both pairs of rods 5 and 7 results in raising of the two torsion tubes 2 and 3. The pair of rods 9 provides for the synchronization of the movements of the pair of rods 5 and the pair of rods 7. A raised position of the mechanism is drawn in Fig. 2. Fig. 3 shows the highest position of the mechanism. The characteristic of the auxiliary device can be set subject to the lengths of the two rod pairs 5 and 7, the distance between torsion tubes 2 and 3 and the position of rotation points 10 and 11. The auxiliary device can as required thus raise, tilt or perform a combination of raising and tilting.

[0022] Fig. 4, 5 and 6 show the practical use of auxiliary device 1 as stand-up aid for use under a comfortable article of seating furniture 30. From the low or rest position (Fig. 4) the raising and tilting movement are initiated simultaneously at the chosen characteristic of the auxiliary device (Fig. 5). In the highest position (Fig. 6) the chair is raised about 10 cm and the seat part is tilted through an angle of about 15 degrees. Actuator 4 for moving the auxiliary device can take a mechanical or electrical form, with a preference for electrical. The movement of the stand-up aid is controlled by the user seated in the article of furniture. In order to prevent wear to the floor surface by the tilting or wheel supports under the auxiliary device, a wear-resistant strip or shallow U-shaped channel can be arranged on the path of the wheel supports.

[0023] Fig. 7 shows the preferred embodiment of the auxiliary device for use as stand-up aid under seating furniture. The support surface for the chair is formed by two rear plates 12 and two front plates 13. Adjustment of the auxiliary device to the dimensions of the chair is possible in that rear plates 12 can be displaced relative to front plates 13 by sliding tubes 14a in or out of tubes 14. In width direction of the chair displacement of the left-hand side of the auxiliary device relative to the right-hand side takes place by sliding tubes 2a, 15a and 3a in or out of tubes 2, 15 and 3 respectively. Tubes 2a, 3a, 15a can be fixed in a chosen position relative to tubes 2, 3, 15 by means of locking screws 23, 24, 25. In the same manner

tube 14a can be fixed in a chosen position relative to tube 14 by means of locking screws 26, 36. For use under wide seating furniture with a plurality of mutually adjacent seats, the two sides of the auxiliary device can be placed further apart by applying extra-long connecting tubes.

[0024] In Fig. 8 the preferred embodiment of auxiliary device 1 for use as stand-up aid under an article of seating furniture is provided with one additional pair of wheels 16. When the auxiliary device is moved from an active position as shown in Fig. 8 to the lowest position, these wheels 16 will make contact at a given moment with the floor surface and the auxiliary device will begin to support on these wheels 16. The arranging of the additional wheels 16 makes the stand-up aid with chair movable in the lowest or rest position as shown in Fig. 9.

[0025] In Fig. 10 the preferred embodiment of auxiliary device 1 for use as stand-up aid under an article of seating furniture is provided with a turntable base 17. As the auxiliary device is moved from a raised position as shown in Fig. 10 to the lowest position, this turntable base 17 will make contact at a given moment with the floor surface and auxiliary device 1 will begin to support on this turntable base 17. The arranging of turntable base 17 under the stand-up aid with chair provides the option, in the lowest or rest position as shown in Fig. 11, of first rotating the article of furniture before setting the stand-up aid into operation to enable standing up from the chair. When the chair is used at a dining table or writing table, the turntable base provides the opportunity to turn to a position in which there is sufficient space to stand up.

[0026] Fig. 12 and 13 show the tube 14a which bears rear plate 12 such that it is laterally adjustable as according to arrow 19. This lateral adjustability is realized by making use of a plate 18 which is rigidly coupled to tube 14a and provided with continuous slotted holes 20 which extend in transverse direction and are used to secure rear plate 12 in a chosen transverse position by means of screw bolts.

[0027] Not drawn are clamps which are clamped fixedly to the legs of the article of furniture and fastened by means of screws to the four plates 18 which support these legs.

[0028] Fig. 7 in particular shows clearly that according to the invention the effective length and the effective width of the support means as well as the effective length and the effective width of the first frame are adjustable in this embodiment.

Claims

1. Auxiliary device (1) intended for addition to an article of seating furniture with a seat back, for instance a chair or settee, which auxiliary device comprises:

a first frame (5, 7) for placing on the ground;
a second frame (14) disposed movably relative to the first frame;

support means (12, 13) present on the second frame for supporting an article of seating furniture; and

drive means (4) operative between the first frame and the second frame for displacing the second frame relative to those zones of the first frame with which this latter can support on the floor,
the effective length of the support means being adjustable,

characterized in that

the effective width of the support means is adjustable.

2. Auxiliary device as claimed in claim 1, wherein the support means comprises two front plates and two rear plates, said plates being supported by the second frame in a way such that they are individually laterally adjustable.
3. Auxiliary device as claimed in claim 2, in which each plate has a general rectangular form and is provided with two upright walls extending along its two outer sides.
4. Auxiliary device as claimed in claim 1, wherein the drive means are adapted to raise and/or tilt the second frame relative to those zones of the first frame with which this latter can support on the floor.
5. Auxiliary device as claimed in claim 1, wherein the first frame comprises two frame parts (2, 3) which can swivel in mutually opposing directions of which one comprises at least one wheel or roller (8) and the other frame part has at least one fixed convex tilting surface such that, when these frame parts are swivelled toward each other, the second frame is displaced relative to those zones of the first frame with which this latter can support on the floor.
6. Auxiliary device as claimed in claim 5, wherein on its side remote from said wheel or said roller the second frame bears a number of wheels or rollers necessary for mechanical stability which in the lowest position of the second frame, together with said wheel or said wheels or roll or rollers, make the auxiliary device movable over the ground.
7. Auxiliary device as claimed in claim 1, wherein the second frame is provided on its underside with a third frame (17) which is disposed for rotation about a substantially vertical axis and which supports on the ground in the lowest position of the second frame and in this position rotatably supports the first and second frame.
8. Auxiliary device as claimed in claim 1, comprising fixation means for fixing an article of seating furniture

supported by the support means to these support means.

9. Assembly of at least two auxiliary devices as claimed in any of the foregoing claims, for jointly supporting an article of multi-seat furniture, wherein the auxiliary devices are coupled electrically and/or mechanically such that the movements of the second frames relative to the first frames are substantially the same.

Patentansprüche

1. Hilfsvorrichtung (1) zur Ausrüstung eines Sitzmöbels mit einer Rückenlehne, z.B. eines Sessels oder eines Sofas, wobei die Hilfsvorrichtung umfasst:

einen ersten Rahmen (5,7) zum Stellen auf einen Untergrund;
einen zweiten Rahmen (14), der relativ in Bezug auf den ersten Rahmen beweglich angeordnet ist; Unterstützungsmittel (12,13), die auf dem zweiten Rahmen sich befinden zum Unterstützen eines Sitzmöbels; und Antriebsmittel (4), die zwischen dem ersten Rahmen und dem zweiten Rahmen wirken zum Versetzen des zweiten Rahmens bezogen auf solche Zonen des ersten Rahmens, mit welchen letzterer auf dem Boden abstützen kann,
wobei die wirksame Länge der Unterstützungsmittel einstellbar ist,
dadurch gekennzeichnet, dass
die wirksame Breite der Unterstützungsmittel einstellbar ist.

2. Hilfsvorrichtung gemäß Anspruch 1, worin die Unterstützungsmittel zwei vordere und zwei hintere Platten umfassen, wobei die Platten durch den zweiten Rahmen auf eine solche Weise unterstützt sind, dass sie individuell in Querrichtung einstellbar sind.

3. Hilfsvorrichtung gemäß Anspruch 2, bei welcher jede Platte eine generell rechteckige Form aufweist und versehen ist mit zwei senkrechten Wänden, die sich entlang deren zwei Außenseiten erstrecken.

4. Hilfsvorrichtung gemäß Anspruch 1, worin die Antriebsmittel ausgebildet sind zum Heben und/oder Neigen des zweiten Rahmens in Bezug auf diejenigen Zonen des ersten Rahmens, mit denen letzterer auf dem Boden abstützen kann.

5. Hilfsvorrichtung gemäß Anspruch 1, worin der erste Rahmen zwei Rahmenteile (2,3) umfasst, die in zu einander entgegen gesetzte Richtungen schwenken können, von denen einer mindestens ein Rad oder eine Rolle (8) aufweist, und wobei der andere Rahmenteil mindestens eine feste konvexe Neigoberfläche

che derart aufweist, dass, wenn diese Rahmenteile zueinander geschwenkt werden, der zweite Rahmen versetzt wird in Bezug auf diejenigen Zonen des ersten Rahmens, mit denen letzterer auf dem Boden abstützen kann.

6. Hilfsvorrichtung gemäß Anspruch 5, worin der zweite Rahmen an seiner von dem Rad oder der Rolle entfernten Seite eine Anzahl von Rädern oder Rollen trägt, die erforderlich ist für die mechanische Stabilität, welche in der niedrigsten Position des zweiten Rahmens, zusammen mit besagtem Rad oder besagten Rädern oder Rolle oder Rollen, die Hilfsvorrichtung über dem Untergrund beweglich macht.

7. Hilfsvorrichtung gemäß Anspruch 1, worin der zweite Rahmen an seiner Unterseite mit einem dritten Rahmen (17) versehen ist, der zur Drehung um eine im Wesentlichen senkrechte Achse angeordnet ist und der in der niedrigsten Position des zweiten Rahmens auf dem Untergrund abstützt und in dieser Position den ersten und zweiten Rahmen drehbar unterstützt.

8. Hilfsvorrichtung nach Anspruch 1, umfassend Befestigungsmittel zum Befestigen eines durch die Unterstützungsmittel gestützten Sitzmöbels an diesen Unterstützungsmitteln.

9. Anordnung von mindestens zwei Hilfsvorrichtungen gemäß irgendeinem der vorhergehenden Ansprüche, zur gemeinsamen Unterstützung eines mehrplätzigen Sitzmöbels, worin die Hilfsvorrichtungen elektrisch und/oder mechanisch miteinander derart gekoppelt sind, dass die Bewegungen der zweiten Rahmen im Bezug auf die ersten Rahmen im Wesentlichen dieselben sind.

Revendications

1. Dispositif auxiliaire attachable à un meuble d'assise avec un dossier, par exemple une chaise ou un canapé, lequel dispositif auxiliaire comprend :

un premier cadre pour le placer sur le sol ;
un second cadre placé de manière mobile par rapport au premier cadre ;
des moyens de support présents sur le second cadre pour soutenir un meuble d'assise ; et
des moyens de commande fonctionnant entre le premier cadre et le second cadre pour déplacer le second cadre par rapport aux zones du premier cadre avec lesquelles ce dernier peut reposer sur le sol,
la longueur effective du moyen de support étant réglable,

caractérisé en ce que

- la largeur effective du moyen de support est réglable.
2. Dispositif auxiliaire selon la revendication 1, dans lequel le moyen de support comprend deux plaques avant et deux plaques arrière, lesdites plaques étant soutenues par le second cadre de manière à ce qu'elles soient réglables latéralement de manière individuelle. 5
 3. Dispositif auxiliaire selon la revendication 2, dans lequel chaque plaque présente une forme généralement rectangulaire et est munie de deux parois verticales s'étendant le long de ses deux côtés extérieurs. 10 15
 4. Dispositif auxiliaire selon la revendication 1, dans lequel les moyens de commande sont adaptés pour soulever et/ou incliner le second cadre par rapport aux zones du premier cadre avec lesquelles ce dernier peut reposer sur le sol. 20
 5. Dispositif auxiliaire selon la revendication 1, dans lequel le premier cadre comprend deux parties de cadre qui peuvent pivoter dans des directions mutuellement opposées dont l'une comprend au moins une roue ou un galet et l'autre partie de cadre présente au moins une face de bascule convexe fixe de manière à ce que lorsque ces parties de cadre sont pivotées en direction l'une de l'autre, le second cadre est déplacé par rapport aux zones du premier cadre avec lesquelles ce dernier peut reposer sur le sol. 25 30
 6. Dispositif auxiliaire selon la revendication 5, dans lequel sur son côté éloigné de ladite roue ou dudit galet, le second cadre supporte un nombre de roues ou de galets nécessaires à la stabilité mécanique, qui dans la position la plus basse du second cadre, avec ladite ou lesdites roue(s) ou ledit ou lesdits galet(s), rendent le dispositif auxiliaire mobile sur le sol. 35 40
 7. Dispositif auxiliaire selon la revendication 1, dans lequel le second cadre est muni sur son côté inférieur d'un troisième cadre qui est placé pour tourner sur un axe essentiellement vertical et qui repose sur le sol dans la position la plus basse du second cadre et dans cette position soutient de manière rotative les premier et second cadres. 45
 8. Dispositif auxiliaire selon la revendication 1 comprenant des moyens de fixation pour fixer un meuble d'assise soutenu par les moyens de support sur ces moyens de support. 50
 9. Assemblage d'au moins deux dispositifs auxiliaires selon l'une quelconque des revendications précédentes, pour conjointement soutenir un meuble multi-assises, dans lequel les dispositifs auxiliaires sont 55

couplés électriquement et/ou mécaniquement de manière à ce que les mouvements des seconds cadres par rapport aux premiers cadres soient essentiellement les mêmes.

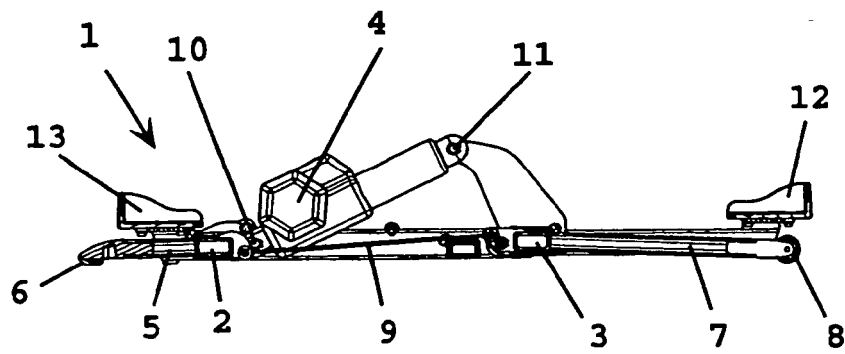


Fig. 1

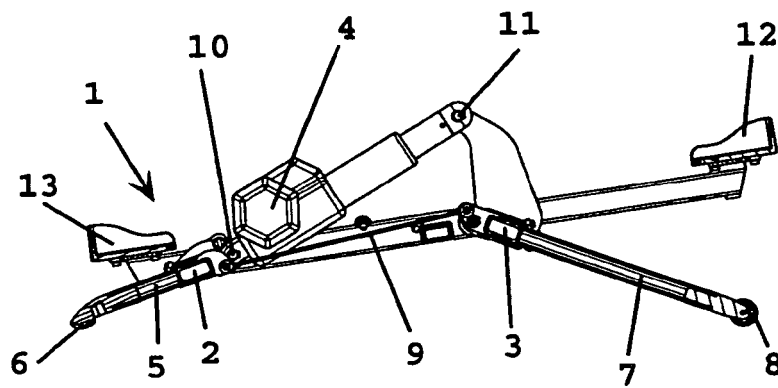


Fig. 2

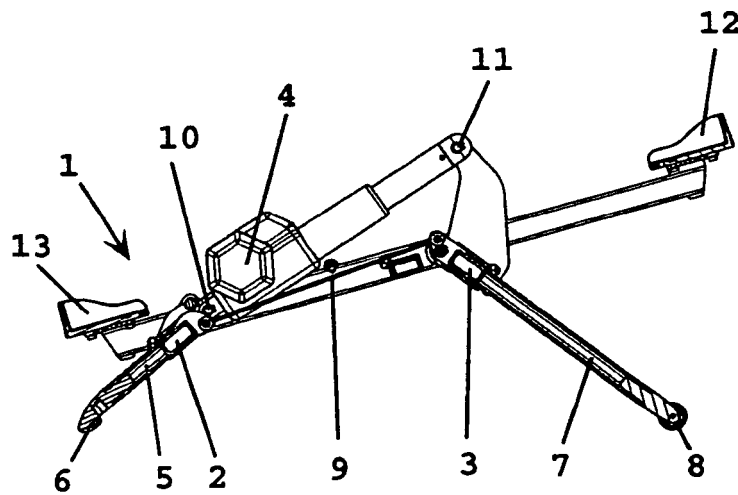


Fig. 3

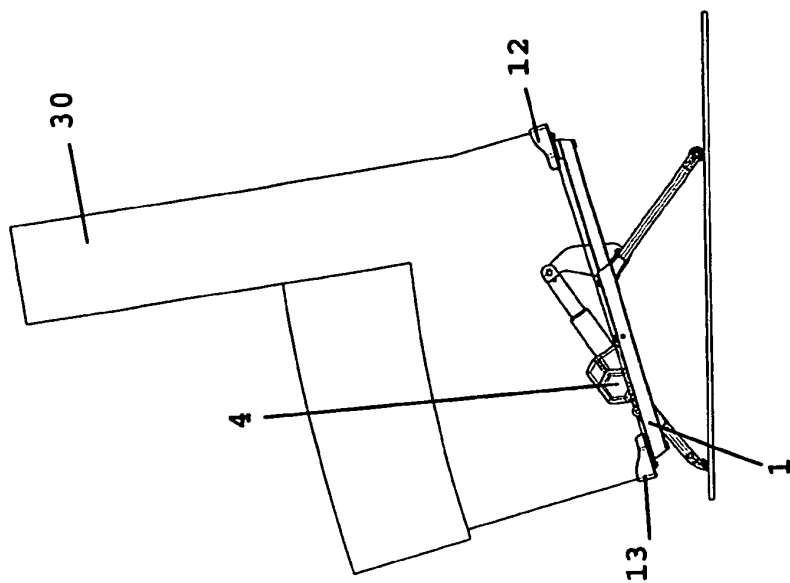


Fig. 6

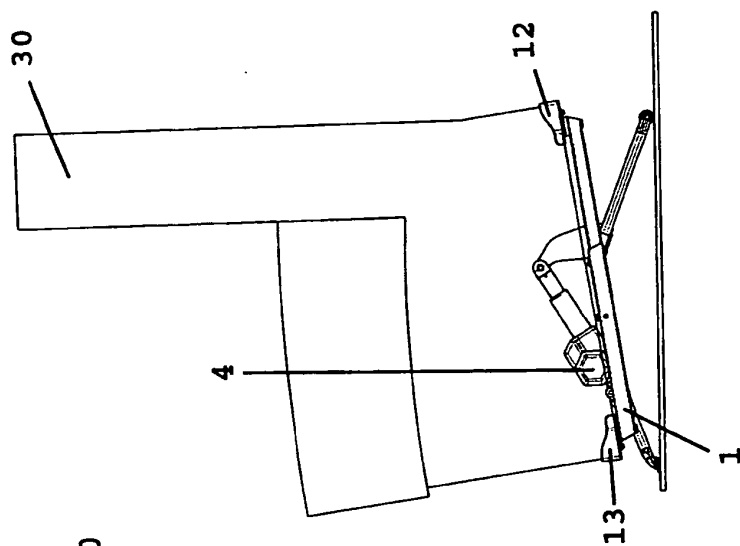


Fig. 5

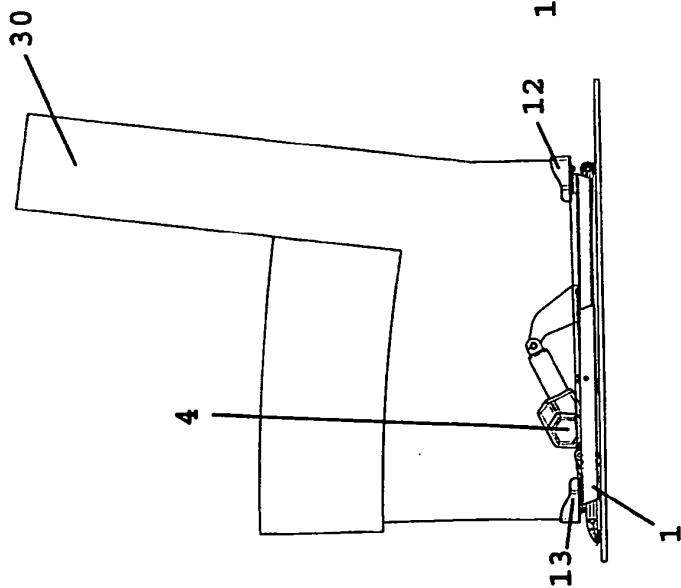


Fig. 4

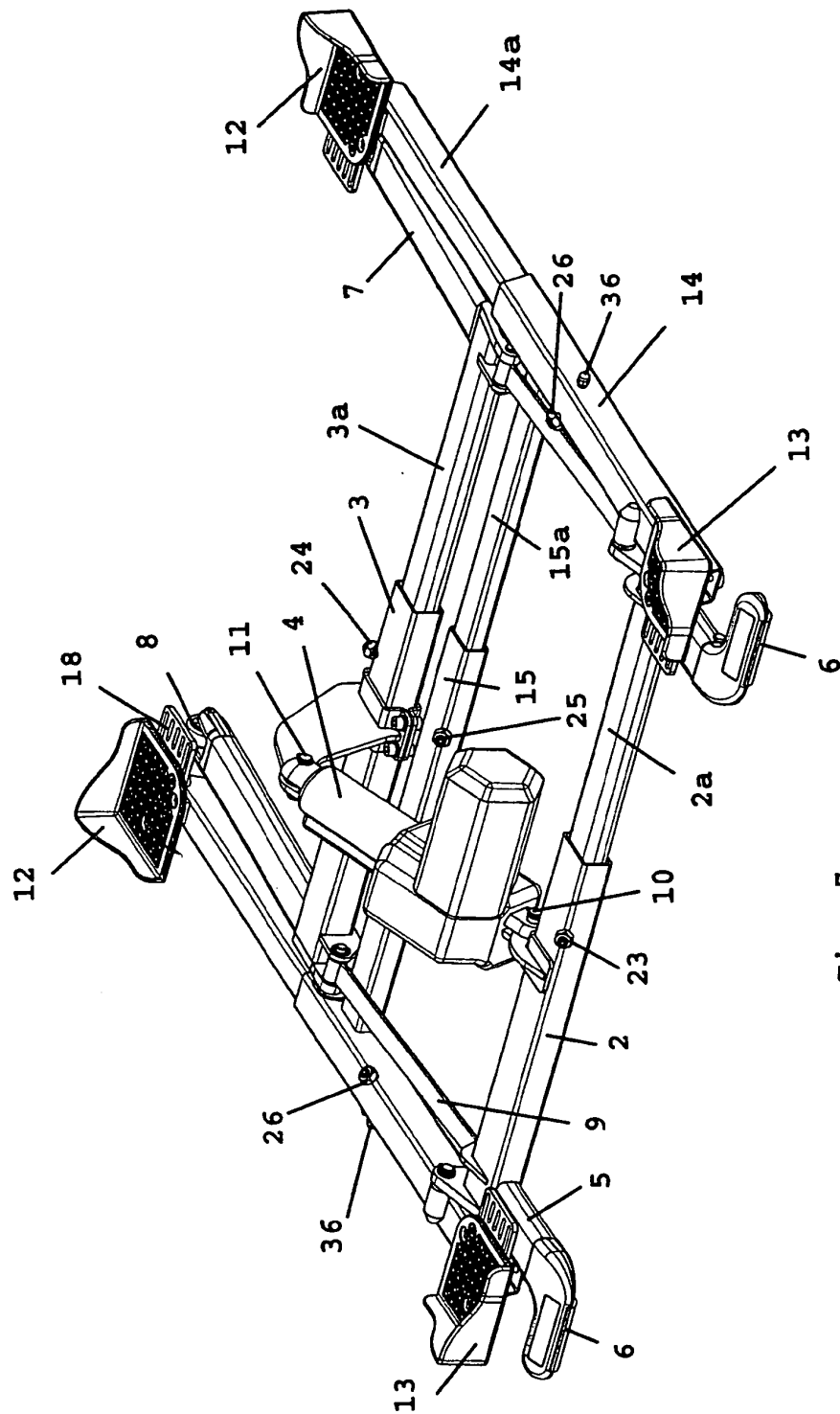
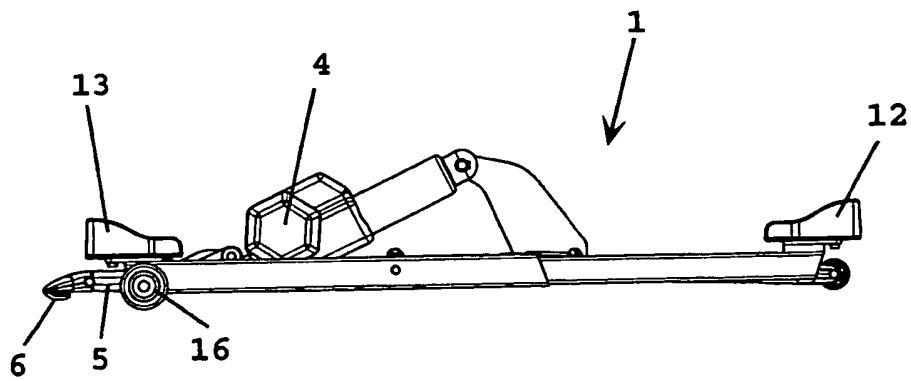
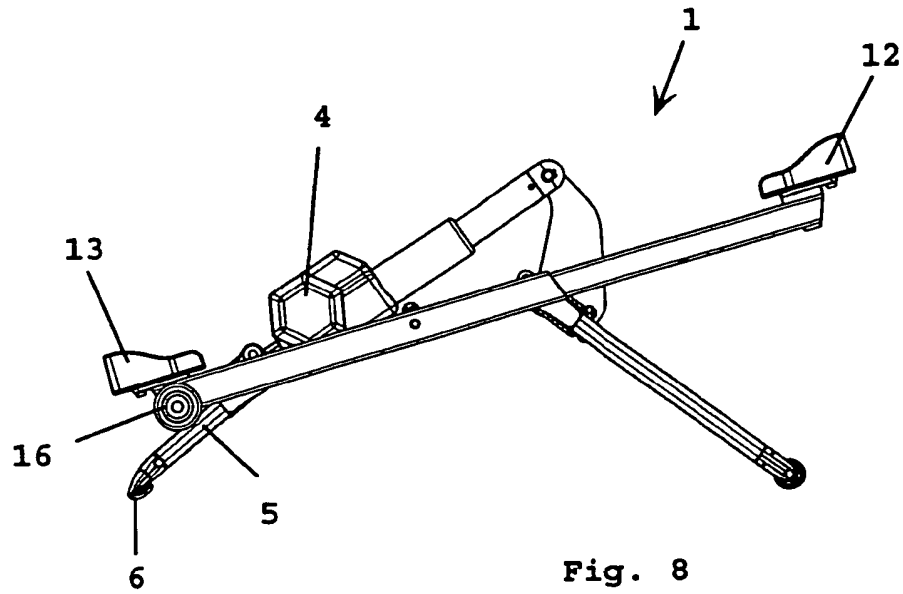


Fig. 7



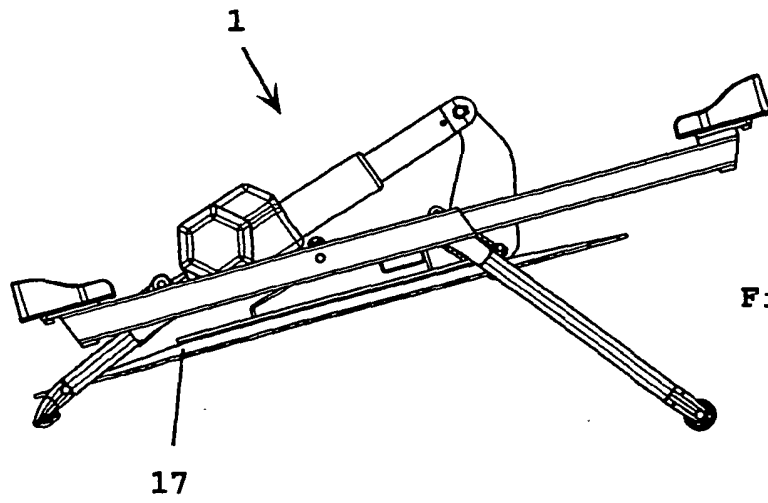


Fig. 10

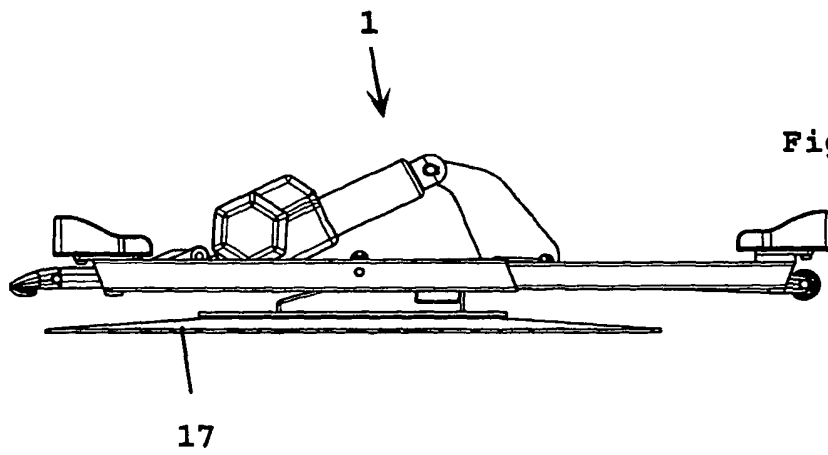


Fig. 11

