(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 525 867 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
27.04.2005 Bulletin 2005/17

(51) Int Cl.[7]: **A61G 5/14**

(21) Application number: **04077850.8**

(22) Date of filing: **18.10.2004**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL HR LT LV MK

(30) Priority: **21.10.2003 NL 1024576**

(71) Applicant: **First Care B.V.**
NL-7514 DP Enschede (NL)

(72) Inventor: **Nijsen, Ir. Andreas Jacobus Louis**
7521 AT Enschede (NL)

(74) Representative:
Schumann, Bernard Herman Johan
Schumann Patent Consultancy B.V.,
Kerkedennen 43
7621 EB Borne (NL)

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

(57) The invention relates to 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.

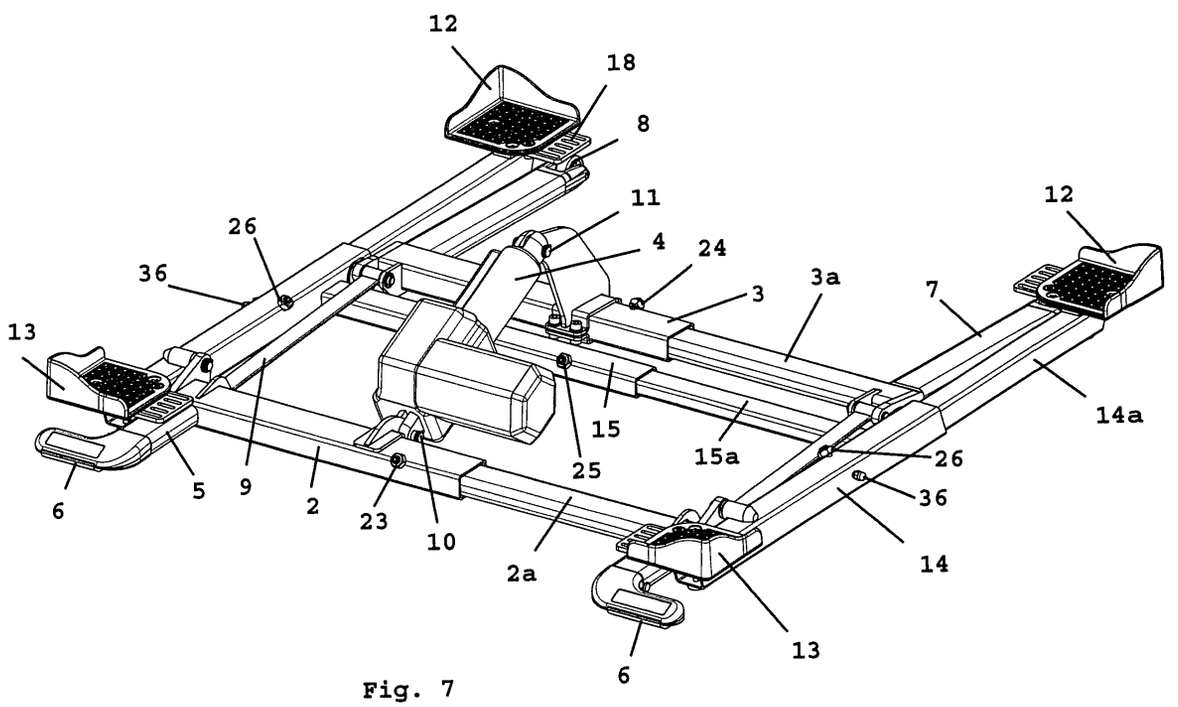

Fig. 7

EP 1 525 867 A1

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.

[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 length and/or the effective width of the support means is adjustable.

[0006] 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.

[0007] 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.

[0008] 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.

[0009] 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.

[0010] 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 swivellable.

[0011] 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.

[0012] According to another aspect of the invention, the auxiliary device has the special feature that the effective length and/or the effective width of the first frame is adjustable. 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.

[0013] 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 adjust-

ed together or, if desired, on an individual basis.

[0014] 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.

[0015] 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.

[0016] 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.

[0017] 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.

[0018] 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.

[0019] 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.

[0020] 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.

[0021] 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. The right-hand front plate has been removed in Fig. 7. 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.

[0022] 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.

[0023] 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.

[0024] Fig. 12 shows 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.

[0025] 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.

[0026] 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 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,

characterized in that
the effective length and/or the effective width of the support means is adjustable.

2. 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.

3. Auxiliary device as claimed in claim 1, wherein 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.

4. Auxiliary device as claimed in claim 3, 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.

5. Auxiliary device as claimed in claim 1, wherein the second frame is provided on its underside with a third frame 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.

6. Auxiliary device as claimed in claim 1, wherein the effective length and/or the effective width of the first frame is adjustable.

7. 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.

8. 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.

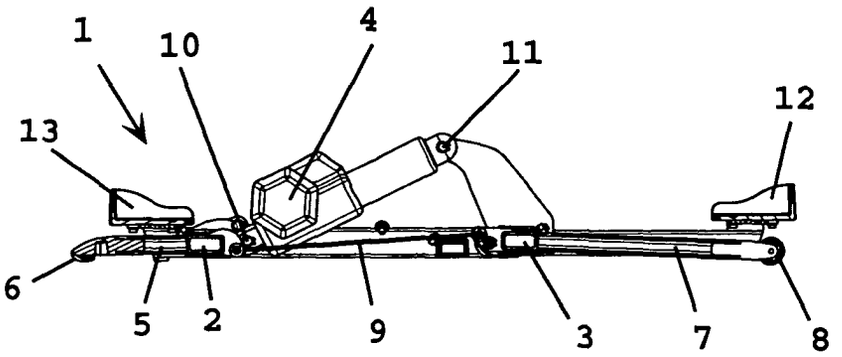

Fig. 1

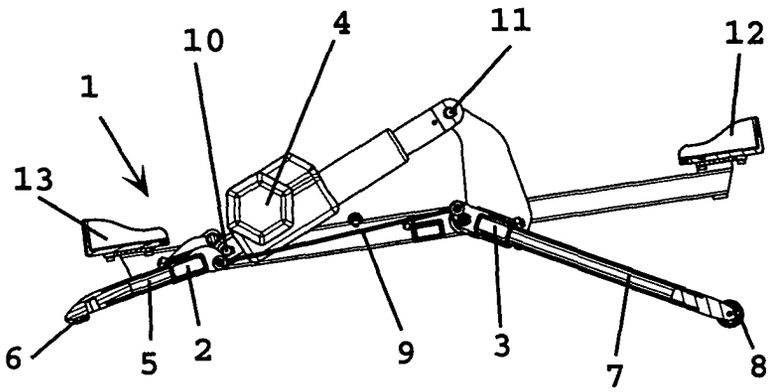

Fig. 2

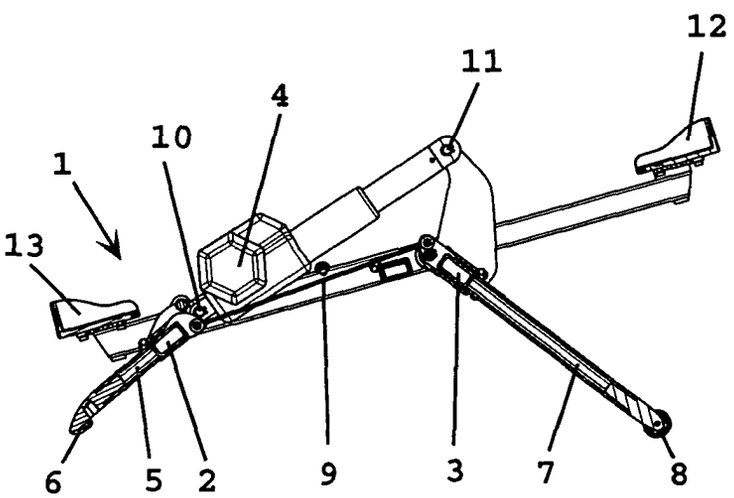

Fig. 3

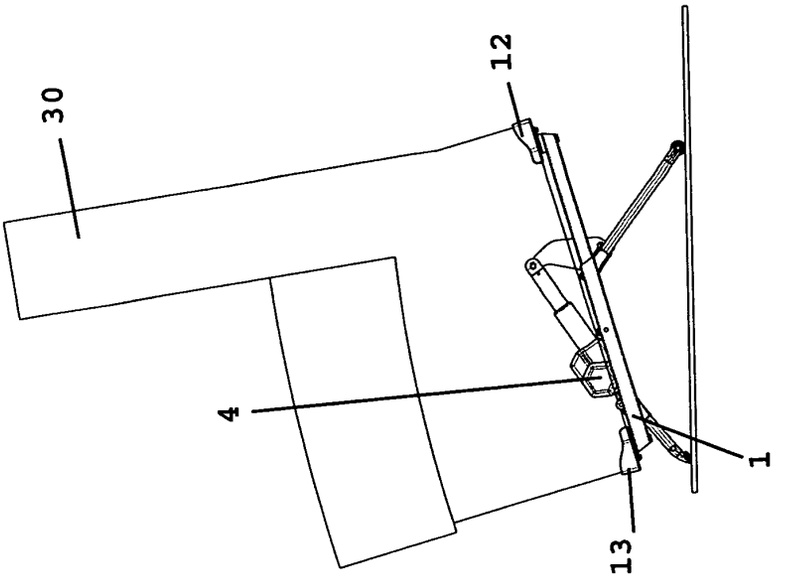

Fig. 6

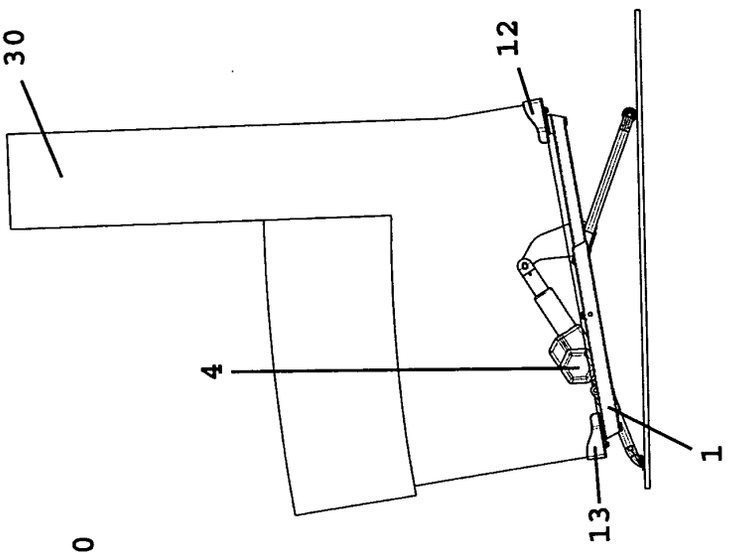

Fig. 5

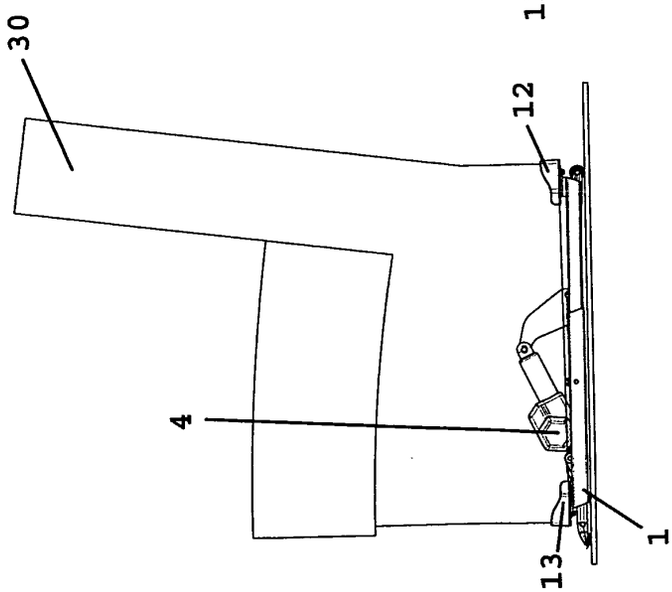

Fig.4

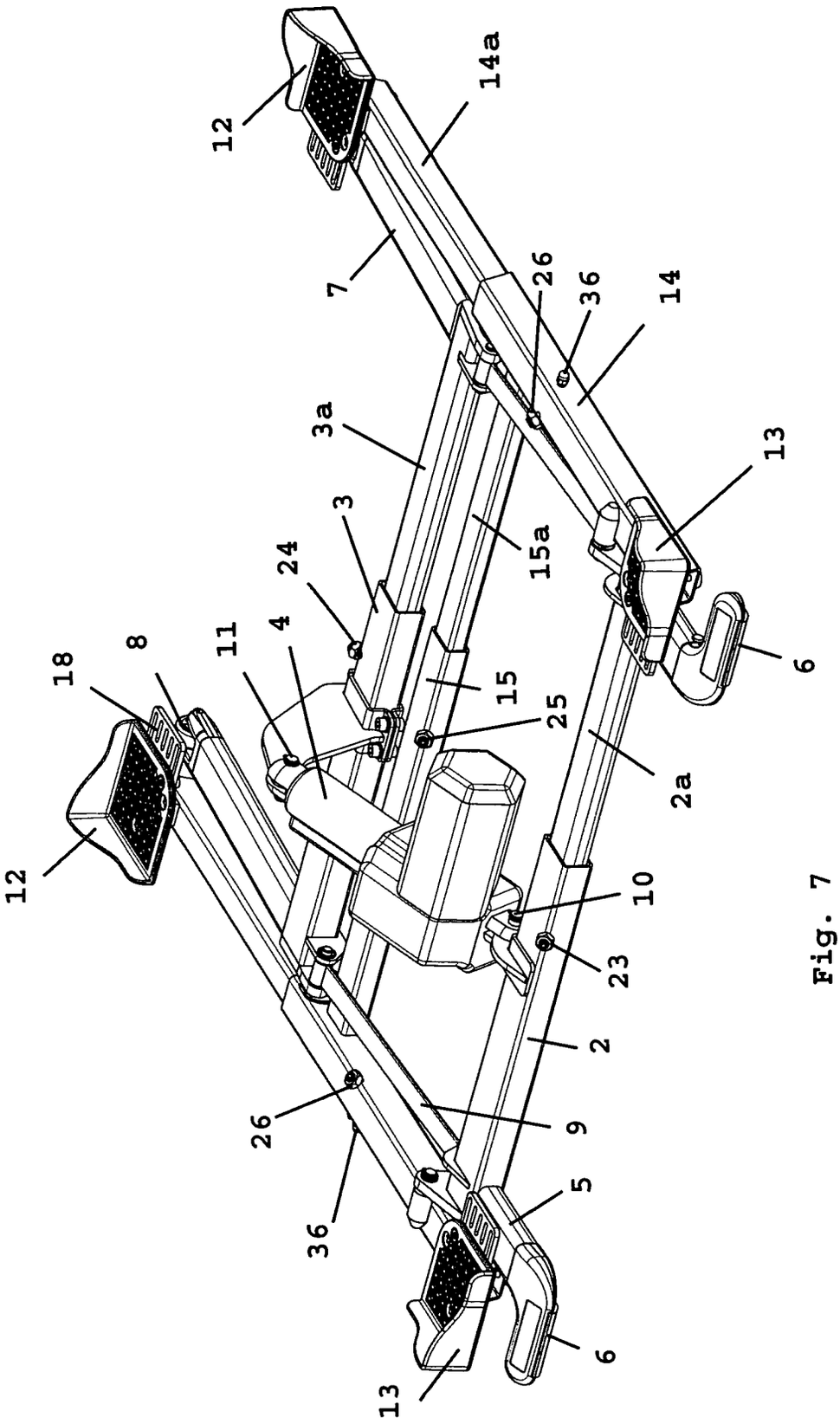
12
14a
7
26
36
14
3a
13
3
15a
24
4
11
8
18
15
25
6
2a
12
10
23
2
26
9
36
5
6
13

Fig. 7

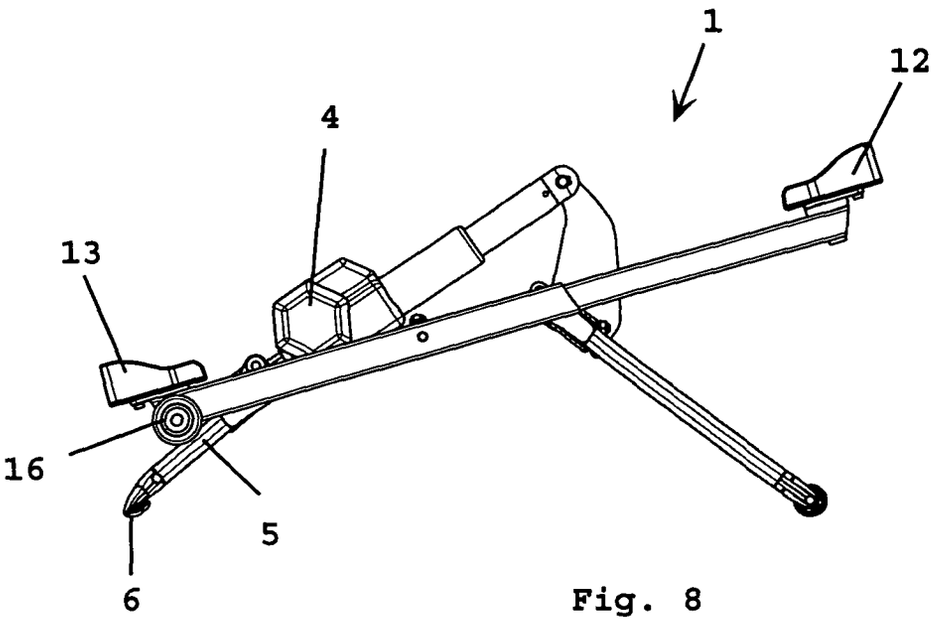

Fig. 8

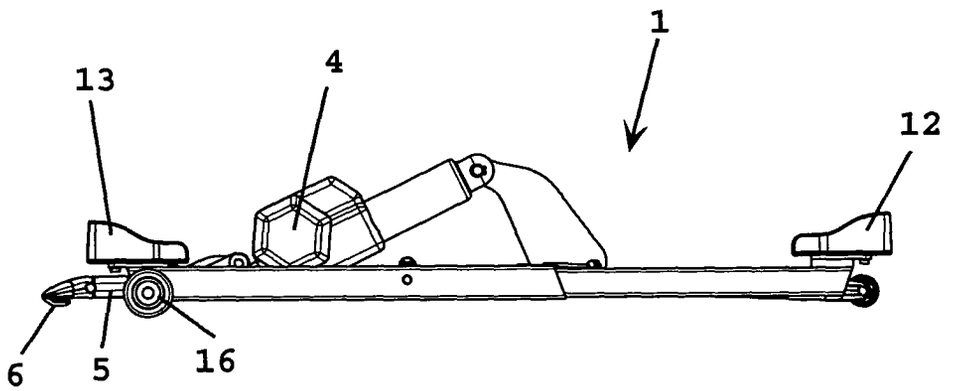

Fig. 9

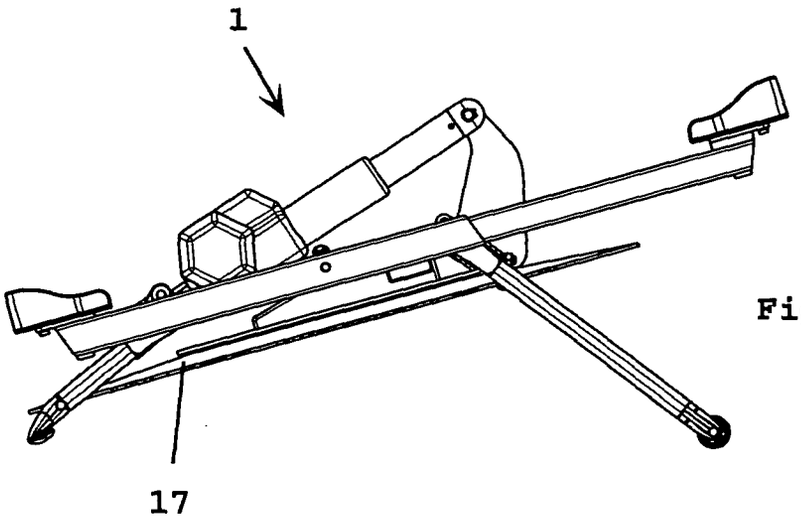

Fig. 10

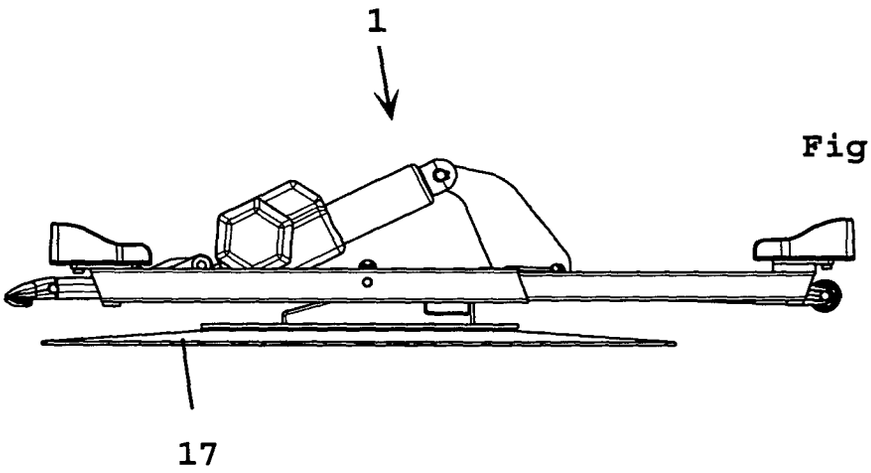

Fig. 11

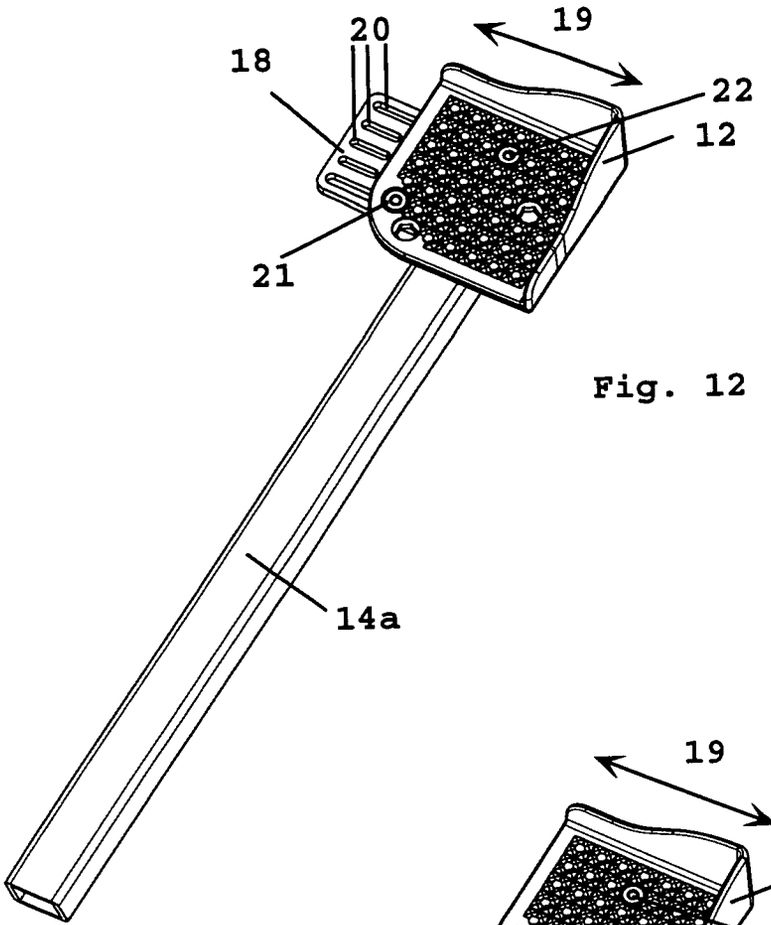

Fig. 12

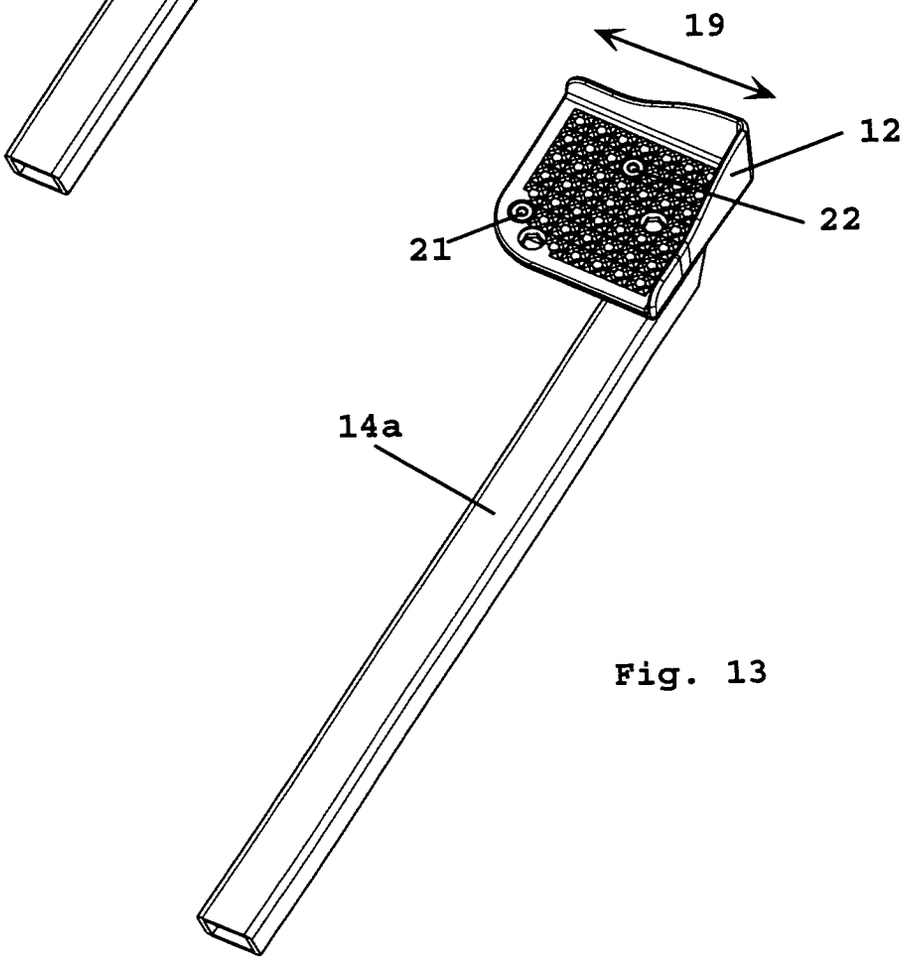

Fig. 13

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 07 7850

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X,D	US 4 786 107 A (CROCKETT FOY) 22 November 1988 (1988-11-22) * the whole document *	1,2,6	A61G5/14
A	US 5 641 201 A (CASEY KENNETH ET AL) 24 June 1997 (1997-06-24) * the whole document *	1,2	
A	US 5 294 179 A (RUDES ARNOLD H ET AL) 15 March 1994 (1994-03-15) * column 1, line 51 - line 56 * * column 3, line 41 - column 4, line 60; figures *	1	
A	US 4 790 716 A (MCCONNELL SYLVIA J) 13 December 1988 (1988-12-13) * column 5, line 18 - line 43; figures 6,7 *	3	
A	FR 2 695 813 A (JOUK LEO) 25 March 1994 (1994-03-25) * page 3, line 16 - page 4, line 2; claim 7; figures *	3	TECHNICAL FIELDS SEARCHED (Int.Cl.7) A61G
A	US 6 478 529 B1 (WILLEY DONALD L ET AL) 12 November 2002 (2002-11-12) * column 2, line 13 - line 22; figures 1,2 *	4	
A	US 5 895 093 A (CASEY KENNETH ET AL) 20 April 1999 (1999-04-20) * abstract; figures *	5	
A,D	EP 1 031 337 A (SOWECO N V) 30 August 2000 (2000-08-30) * abstract; claims; figures *	1	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 January 2005	Baert, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 07 7850

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A,D	WO 98/29082 A (JOHANSSON AAKE) 9 July 1998 (1998-07-09) * abstract; claims; figures * -----	1	
A,D	GB 2 344 512 A (SICHELSCHMIDT STANZWERK) 14 June 2000 (2000-06-14) * abstract; claims; figures * -----	1	
A,D	DE 198 44 240 A (SICHELSCHMIDT STANZWERK) 6 April 2000 (2000-04-06) * abstract; claims; figures * -----	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 January 2005	Baert, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 04 07 7850

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

21-01-2005

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4786107 A	22-11-1988	US 4850645 A	25-07-1989
US 5641201 A	24-06-1997	AU 6354194 A	26-09-1994
		CA 2157466 A1	15-09-1994
		WO 9419994 A1	15-09-1994
US 5294179 A	15-03-1994	NONE	
US 4790716 A	13-12-1988	US 4726730 A	23-02-1988
FR 2695813 A	25-03-1994	FR 2695813 A1	25-03-1994
		WO 9406389 A1	31-03-1994
US 6478529 B1	12-11-2002	NONE	
US 5895093 A	20-04-1999	NONE	
EP 1031337 A	30-08-2000	NL 1011365 C2	24-08-2000
		EP 1031337 A1	30-08-2000
WO 9829082 A	09-07-1998	SE 518430 C2	08-10-2002
		SE 9604672 A	20-06-1998
		WO 9829082 A1	09-07-1998
GB 2344512 A	14-06-2000	DE 29821875 U1	04-02-1999
		DE 19902467 A1	15-06-2000
		DE 19945118 A1	24-08-2000
		DE 29916600 U1	09-12-1999
		ES 2200600 A1	01-03-2004
		FR 2786996 A1	16-06-2000
		IT MI992370 A1	14-05-2001
		US 6338531 B1	15-01-2002
DE 19844240 A	06-04-2000	DE 19844240 A1	06-04-2000

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82