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

(11) Publication number: **0 067 069**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **82302964.0**

(22) Date of filing: **09.06.82**

(51) Int. Cl.³: **A 61 G 7/10**, A 61 G 5/00

(30) Priority: **10.06.81 GB 8117788**

(43) Date of publication of application: **15.12.82 Bulletin 82/50**

(84) Designated Contracting States: **AT BE CH DE FR GB IT LI LU NL SE**

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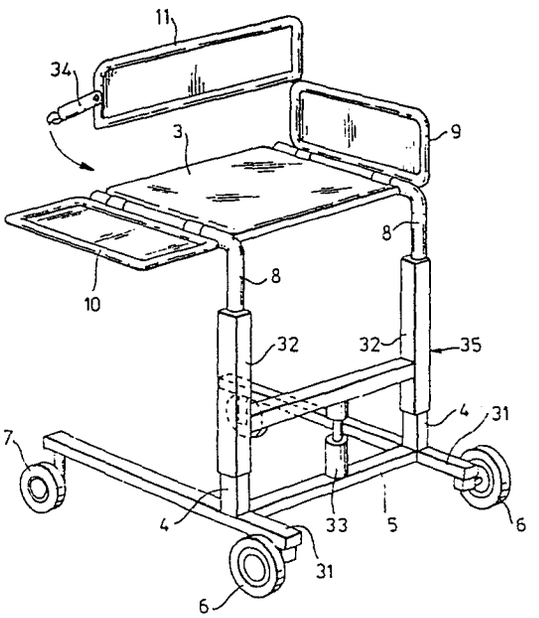
(54) Invalid chairs.

An invalid chair (30) comprises a seat (3) mounted on wo cantilever members (8) which can be placed over a bed. Side supports (9, 10) and a back support (11) are collapsible to facilitate transfer of a patient between a bed and the chair. The height of the seat (3) is adjustable, by means of an hydraulic ram (33).



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INVALID CHAIRS

This invention relates to invalid chairs.

Although numerous invalid chairs have been proposed to date, one is still often faced with the difficult task of transferring an invalid between a bed and a chair. Similar problems exist when transferring an invalid between a car, or other vehicle, and a chair.

Preferred embodiments of the present invention aim to provide invalid chairs which may be improved in the foregoing respects.

More generally, according to a first aspect of the present invention, there is provided an invalid chair comprising a frame, a seat mounted on the frame, and at least one side or back support around the seat, the or each support being collapsible or removable to permit an invalid to lay substantially flat across said seat, whilst at least partially supported thereon.

Thus, the chair can be positioned beside a bed, and the or each support collapsed or removed. Thereafter, a patient may be laid onto the seat and sat upright, whereafter the or each support is erected or replaced. A patient may be removed from the seat in an analagous manner.

Preferably, the frame is a wheeled frame, and in an advantageous arrangement is provided with at least one wheel (or castor, or the like) which is optionally retractable to brake wheeled movement of the frame.

Preferably the chair has a cantilever portion upon which the seat is mounted, whereby the seat may be positioned over a bed or other support. Then, a patient on a bed may simply be rolled onto or off the seat, with the or each support collapsed or removed.

The frame may advantageously be provided with height adjustment means by which the height of the seat may be adjusted. In a preferred arrangement, the height adjustment means comprises a ratchet drive.

In a variant, the seat is formed with a central aperture, as a commode. The seat may then be provided with a lid, e.g. a padded lid. The frame may be adapted to receive a toilet tray underneath the seat, e.g. as a slide-in accessory. The frame may be of such a configuration that it may fit around a fixed toilet, with said seat thereabove.

In an especially advantageous arrangement, there are provided around said seat, first and second side supports which are mounted for pivoting movement about a substantially horizontal axis, and a back support which is mounted on said first support for pivoting movement between a first position in which it is aligned therewith, and a second position in which it is substantially perpendicular thereto. There is preferably provided a catch for securing together the back support and said second support. With advantage, each of said side supports is pivotally connected to said back support by a respective releasable catch, such that each said support may serve selectively as said first or second side support.

In another aspect of the present invention, there is provided an invalid chair comprising a frame and a seat which may be detachably mounted on the frame at different heights and/or attitudes with respect of the frame.

Preferably, the frame comprises two cantilever members which are individually adjustable in height, and the seat is provided with holes for receiving free ends of said cantilever. There may be constructed such an invalid chair in which the seat is adapted to fit onto a support in a car or other vehicle, and the frame is adapted to be positioned with a base portion underneath a car and the cantilever members engaging said apertures.

The cantilever members are preferably removable from the remainder of the frame, and replaceable by a frame portion upon which there is mounted a seat having at least one collapsible or removable side or back support, to afford a seat is accordance with the first aspect of the invention.

For a better understanding of the invention and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings in which:

Figure 1 is a perspective sketch of an invalid chair;

Figure 2 is a detail view, showing a variant of part of the chair;

Figure 3 is another detail view showing a variant of another part of the chair;

Figure 4 is a detail view showing an alternative seat for the chair;

Figure 5 is a perspective sketch of a modified invalid chair; and

Figure 6 is a detail view showing a variant of the chair of Figure 5.

In all the Figures, like reference numerals denote like or corresponding parts.

The invalid chair 1 that is shown in Figure 1 comprises a frame 2 upon which there is mounted a seat 3. The frame 2 comprises two uprights 4 of hollow section, which are interconnected by three cross-members 5. The frame 2 is mounted on front wheels 6, and rear wheels 7. Preferably, the front wheels 6 are fixed, whilst the rear wheels 7 pivot, to permit steering.

A respective cantilever member 8 is mounted for telescopic sliding movement in each of the uprights 4, and the seat 3 is secured to the two cantilever members 8. A first side support 9 is pivotally mounted on one of the cantilever members 8, and a second side support 10 is pivotally mounted on the other cantilever member 8. A back support 11 is pivotally secured to the first side support 9 for movement between a first position in which it is aligned therewith, and a second position in which it is perpendicular thereto. The height of the cantilever members 8 can be individually adjusted, with respect to the lower portion of the frame, and locking means 12 are provided for adjusting the positions of the cantilever members 8 within the uprights 4.

The arrangement of the side supports 9 and 10 and the back support 11 is such that the supports may selectively be positioned either operatively around the seat 3, or laid flat more or less in alignment with the seat 3. Thus, for example, with the chair 1 in the condition illustrated in Figure 1, the second side support 10 may be pivoted upwardly into a vertical position, where it is secured to the back support 11 by means of a suitable catch. The supports 9, 10 and 11 are then erected in operative positions around the seat 3. When it is desired to collapse the supports 9, 10 and 11, the aforementioned catch is released, and the second side support 10 is pivoted downwardly until it assumes the position shown in Figure 1. The back support 11 is then pivoted about a substantially vertical axis until it is in alignment with the first side support 9, and the two supports 9 and 10 are then pivoted together about the respective cantilever member 8, until they too are in a position corresponding to that illustrated for the second side support 10.

In use, the chair 1 is wheeled to a bedside, where it is positioned with the rear wheels 7 underneath the bed, and the seat 3 upon the cantilever member 8 over the mattress. The supports 9, 10 and 11 are then collapsed, as outlined above, whereupon a patient lying on the bed may, in a simple movement, be either rolled or lifted onto the seat 3, and subsequently moved into a sitting position. This manoeuvre completed, the supports 9, 10 and 11 are then erected as outlined above, to give support to the patient in the chair 1. The chair 1 can then be simply wheeled away from the bed. The height of the cantilever members 8 is adjusted in accordance with the height of the particular bed. In particular, it is to be noted that, due to the cantilever construction of the members 8, the seat 3 may be urged downwardly somewhat into firm engagement with a bed, under the influence of the weight of a patient sitting or lying thereon. This can have a useful safety aspect, insofaras there is a tendency then to resist movement of the seat 3 with respect to the bed below. It will readily be appreciated that the patient may easily be transferred from the chair 1 to a bed, in the reverse of the above described manner.

In an avantageous variant of the illustrated chair 1, the seat 3 is provided with an aperture, whereupon the chair 1 may function as a comode. Preferably, the seat 3 is provided with a padded lid, for normal use. The frame 2 may be adapted to receive a toilet tray underneath the seat 3. It is also to be noted that, with the construction of the frame 2 as illustrated in Figure 1, the chair 1 may be positioned around a conventional toilet, with the seat 3 thereabove.

Figure 2 shows a preferred modification of the adjustment controls 12. The cantilever members 8 are here provided with vertical series of teeth 13, by means of which the members 8 may be driven longitudinally by rotational movement of a handle 14. Ratchet means is preferably provided to control the drive

of the cantilever members 8 by means of the handle 14.

The arrangement shown in Figure 3 affords braking of the chair 1. The front wheel at the left-hand side (as seen) of the chair 1 is mounted at the base of the upright 4, in the same manner as shown in Figure 1. However, the corresponding rear wheel 7 is mounted at the end of a lever arm 15, which is pivotally mounted upon a leg 16 which is secured to the respective cross-member 5. The lever 15 is arranged to be controlled by a control lever 17, which is pivotally mounted to the respective upright 4, and is connected to the lever 15 by means of a connecting rod 18. It may be appreciated that, upon moving the control lever 17, the respect rear wheel 7 may selectively be brought into and out of engagem with the ground, selectively to provide either wheeled movement or braking thereof. It may also be appreciated that, where an arrangement has shown in Figure 3 is provided at each of two opposite sides of the chair 1, (optionally controlled by a common lever 17), the rear of the chair 1 drops somewhat in height when the respective wheels 7 disengage from the ground. Again, this can be a useful safety feature, in that the seat 3 is brought more firmly into contact with a bed over which it is positioned.

Figure 4 shows a variant which may be used in place of the illustrated cantilever members 8 and seat 3. As shown in Figure 4, a seat 19 of simple squab configuration has a pair of apertures which are adapted to receive free ends of cantilever members 20, as a sliding fit. The cantilever members 20 are adapted to engage within the uprights 4, as replacements for the cantilever members 8, and are individually adjustable in height. The seat 19 is adapted to fit onto a car seat, and when in use with the parts shown in Figure 4, the chair 1 is suitable for use in lifting a disabled person into and out of a car.

Thus, an invalid may firstly be sat upon the seat 19, and then wheeled to a car or other vehicle. The chair 1 is brought up to the side of the car, and the wheels 7 placed underneath the car, with the seat 19 projecting into the body of the car. The cantilever members 20 are then lowered in height, until the seat 19 is resting safely upon the conventional car seat (or any other suitable support in the car or other vehicle). Thereafter, the chair 1 is moved away from the car, such that the cantilever supports 20 are withdrawn from their respective apertures in the seat 19, and the invalid is then safely positioned in the car. The removal of the invalid from the car is carried out in a reverse manner. It will be appreciated that, as the cantilever members 20 are individually adjustable in height, both the height and attitude of the seat 19, with respect to the frame 2, can be adjusted, to suit different car seats.

Figure 5 of the accompanying drawings shows an invalid chair 30 which is generally similar to the chair 1 shown in Figure 1, except for the details now described. In Figure 5, the front wheels 6 are each mounted on forwardly extending members 31, whereby the stability of the chair 30 is improved. The cantilever members 8 are fixedly mounted in respective uprights 32 of an H-member 35, which is mounted for vertical telescopic sliding movement with respect to the uprights 4. A pneumatic (or hydraulic) ram 33 is positioned between the front cross-member 5 and the H-member 35. A foot pump (not shown) is provided for pressurizing the ram 33 and thereby lifting the H-member 35 and seat 3. A pressure release valve (not shown) is provided for releasing pressure in the ram 33, thus allowing the H-member 35 and therefore the seat 3 to fall slowly in a controlled manner.

It may be appreciated that the arrangement shown in Figure 5 is such as to permit height adjustment in a simple, safe and effective manner. Another feature that is shown in Figure 5 is a catch

34 for securing together the side support 10 and the back support 11.

In Figure 5, when the seat 3 is removed from the cantilever member 8, and replaced with a car seat 19 as shown in Figure 4, for example, additional means are desirable to vary the attitude of the car seat 19 to conform with differing car seats (which usually slope). Thus, means may be provided for securing the cantilever members 8 in various different vertical positions, with respect to the uprights 32 of the H-member 35. Alternatively, means may be provided on the car seat 19 itself, for affording side supports of differing or variable heights.

If desired, means may be provided for the self-propulsion of the invalid chairs 1 and 30. One such arrangement is illustrated, by way of example, in Figure 6 of the accompanying drawings, as a modification of the chair 30 shown in Figure 5.

In Figure 6, there is provided a driven pulley 40, which is arranged to rotate with a respective one of the front wheels 6, and is mounted therewith at the front end of the respective member 31. A drive pulley 41 is mounted on a support member 46, which is positioned adjacent a respective one of the uprights 4. The drive pulley 41 is provided with a handle 42 by which it may be turned, and is connected to the driven pulley 40 by means of a belt 43, which passes over idler pulleys 44 and 45. Upon rotating the handle 42, drive is transmitted from the pulley 41 to the pulley 40, to cause rotation of the respective front wheel 6. The belt 43 is advantageously of V-section. As an alternative to the belt 43, there may be provided a chain which engages respective sprocket wheels instead of the illustrated pulleys, or any other suitable flexible drive medium. If desired, suitable

gearing may be provided between the handle 42 and the respective driven wheel 6. However, where the self-propulsion arrangement is primarily for fine manoeuvring, a simple linkage may be quite sufficient.

The illustrated arrangement may be varied in a number of ways. For example, all of the front and rear wheels 6 and 7 may be pivotally mounted on the frame 4 and/or may be provided with respective brakes. The back support 11 may be pivotally secured to the seat 3, and asjustable as a reclining seat, with the side supports 9 and 10 detachable from the cantilever members 8. Tilting footrests may be fitted. Then, the seat 3 may be mounted at right angles to the illustrated position, with the back support 11 parallel to the cantilever members 8, to facilitate transferring of an invalid, especially into a car. Collapsible struts may then be provided for supporting the free ends of the cantiliver members 8 by way of the frame 2.

The seat 3 may optionally be mounted on the cantilever members 8 by way of a turntable, to enable orientation of the seat 3 in any desired direction. This may facilitate transferring of an invalid to and from a car. The car seat 19 may also be mounted on a turntable, in which case it, too, may have side and back supports.

The seat squab of a car normally stops rather short of the car doors, and therefore it may be necessary to provide means to extend the squab to accomodate the car seat 19. For example, an intermediate base may be provided, for securement to the seat squab of a car, to receive the car seat 19. Such a base preferably compensates the slope of the seat squab.

The illustrated chairs may be modified to have a pair of large wheels to assist self-propulsion, in the manner of a conventional wheelchair. To enable the chair still to fit under a bed, however, it may be found convenient to mount the seat 3 on a turntable, as mentioned above, so that the large wheels may effectively be at the front or rear of the chair, as necessary. The large wheels may, moreover, be mounted on a support which is moveable with respect to the frame 2, such that the large wheels may be moved out of the way of a bed. In this connection, I have found that it is not always essential that the entire seat 3 is placed fully over a bed. Movement of an invalid may be facilitated even if the seat 3 is only partly over a bed.

To facilitate storage and transport, the uprights 4 (and associated parts) may be pivotally and/or detachably mounted on the cross members 5, such that the frame 2 may be collapsed.

In a variation, the seat 3 may be mounted on the frame 2 by means of a parallel linkage, such that the seat 3 may be swung from its normal position, over a "centre" position (of maximum height), and down into a "loading" position, over a bed, where an invalid may be transferred, the seat 3 remaining in a substantially horizontal position during its movement.

With reference to Figure 5, the single ram 33 may be replaced by a pair of rams, each built into a respective one of the uprights 4. Control means may be provided for operating such a pair of rams either in common or individually, as required.

If the seat 3 is to be rotatable, it may be carried on a single upright tubular support of the frame 2, in such manner as to be rotatable about the axis of the support. The support may contain a ram, for height adjustment of the seat 3. As mentioned above, it need not be essential for all of the seat 3 to be supported on a bed, to enable an invalid to be transferred. The single support may therefore be positioned substantially centrally of the seat 3. The seat 3 may be mounted on an extending carriage, or the like, such that it may extend transversely of the invalid chair, for positioning over a bed. The wheels of the chair may also be mounted for extension transversely of the chair, to provide a stable support under the seat 3 when so extended. An hydraulic ram or a gear arrangement may be provided for controlling such extension of the seat 3 and/or wheels.

CLAIMS:

1. An invalid chair (1) comprising a frame (2), a seat (3) mounted on the frame (2), and at least one side or back support (9, 10, 11) around the seat (3), characterised in that the or each said support (9, 10, 11) is collapsible or removable to permit an invalid to lay substantially flat across said seat (3), whilst at least partially supported thereon.

2. An invalid chair according to Claim 1, wherein the frame is adapted to fit at or around the side of a bed, with the seat positioned at least partially above the bed.

3. An invalid chair according to Claim 2, wherein the frame comprises at least one cantilever member adapted to fit over a bed.

4. An invalid chair according to Claim 1 or 3, provided with means for adjusting the height of the seat.

5. An invalid chair according to Claim 4, wherein said means comprises at least one pneumatic or hydraulic ram, which may be operated by a foot pump, or wherein said means comprises a ratchet mechanism.

6. An invalid chair according to any preceding claim, including means for pivoting the seat about a vertical axis, with respect to the frame.

7. An invalid chair according to any preceding claim, wherein the frame is wheeled, and provided with braking means.

8. An invalid chair according to Claim 7, being adapted for self-propulsion by an occupant.

9. An invalid chair according to any preceding claim, wherein there are provided around said seat, first and second side supports mounted for pivoting movement about a substantially horizontal axis, and a back support which is mounted on said first support for pivoting movement between a first position in which it is aligned therewith, and a second position in which it is substantially perpendicular thereto.

10. An invalid chair according to Claim 9, wherein each of said side supports is pivotally connected to said back support by a respective releasable catch, such that each said side support may serve selectively as said first or second side support.

11. An invalid chair (1) comprising a frame (2) and a seat (19) mounted thereon, characterised in that the seat (19) may be detachably mounted on the frame (2) at different heights and/or attitudes with respect to the frame (2).

12. An invalid chair in accordance both with Claim 11 and any one of Claims 1 to 10.

13. An invalid chair according to any preceding claim, having interchangeable seats.

14. An invalid chair according to Claim 13, wherein at least one of said seats is adapted to fit onto the seat of a car.

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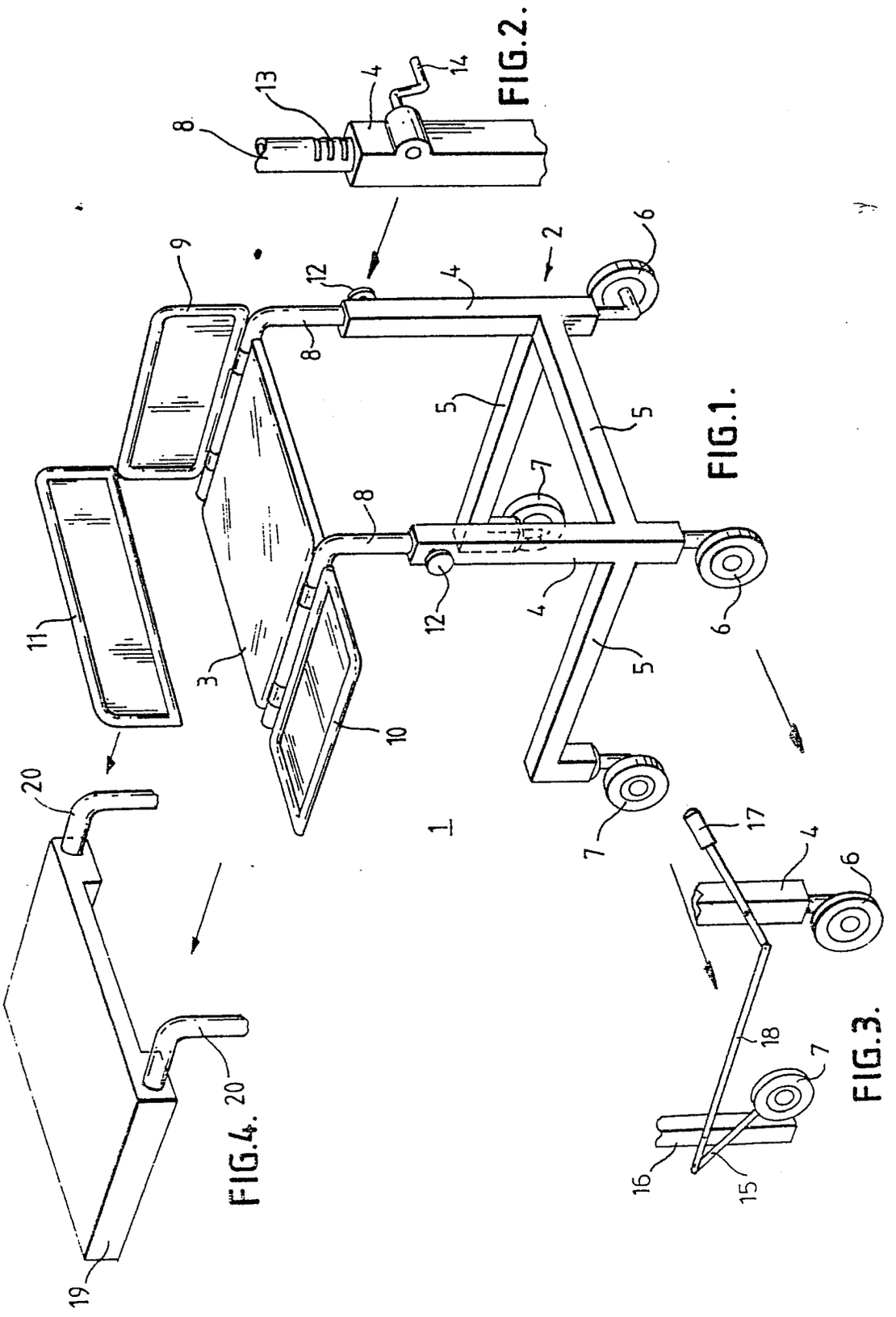

FIG.1.

FIG.2.

FIG.3.

FIG.4.

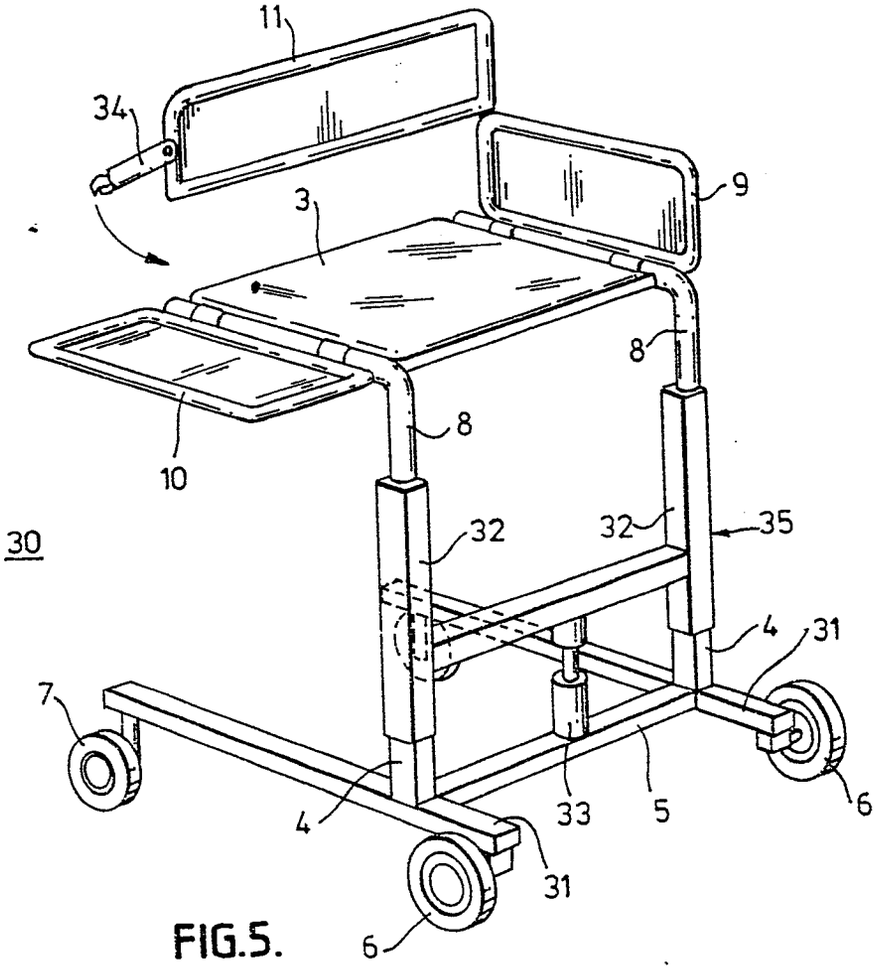

FIG.5.

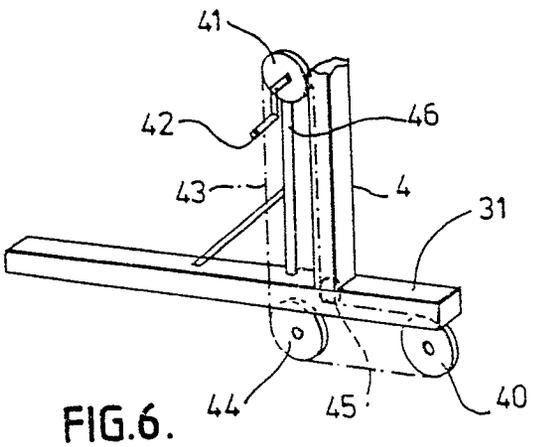

FIG.6.

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 82 30 2964.0

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
X,Y	US - A - 2 609 862 (M.L. PRATT) * claim 2; column 5, lines 17 to 20; column 6, lines 44 to 75; fig. 1 to 3 *	1-8, 11-14
Y	GB - A - 1 414 644 (F.A.O. WAREN) * claims 1, 7; fig. 1 *	5
Y	GB - A - 1 421 368 (A.N. CLIFTON) * claims 1, 2; page 1, lines 85 to 87; page 2, lines 9 to 50; fig. 1, 2 *	6,11, 12,14
Y	GB - A - 1 130 530 (HALE & ASSOCIATES LTD.) * page 4, lines 99 to 105; fig. 3 *	8
Y	DE - A1 - 2 815 763 (SCHUBERT-TECHNIK KG) * page 10, last paragraph; fig. *	13
A	US - A - 3 289 219 (R.H. FERNEAU et al.) * column 4, lines 43 to 53; fig. 4 *	9
A	US - A - 3 999 227 (C.A. INGEMANSSON)	

CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)

A 61 G 7/10
A 61 G 5/00

TECHNICAL FIELDS SEARCHED (Int.Cl. 3)

A 61 G 5/00
A 61 G 7/10

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

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Berlin	19-08-1982	CLOT

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