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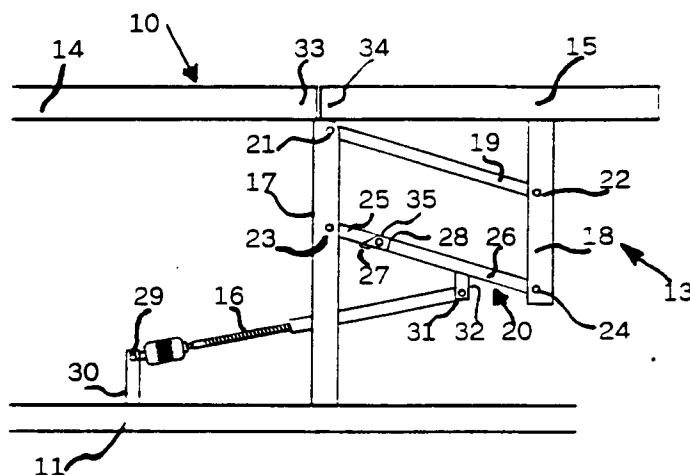
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DE FR GB(71) Applicant: **DI BLASI INDUSTRIALE S.r.l.**
Contrada Risicone
I-95049 Vizzini (Catania) (IT)(72) Inventor: **Di Blasi, Carmelo**
Via Vittorio Emanuele, 32
I-96015 Francofonte (Siracusa) (IT)
Inventor: **Di Blasi, Carlo Maria**
Via Messina, 6
I-96015 Francofonte (Siracusa) (IT)(74) Representative: **Gervasi, Gemma, Dr. et al**
NOTARBARTOLO & GERVASI Srl
Viale Bianca Maria 33
I-20122 Milano (IT)(54) **Articulated bed and articulation for moving at least a portion of said bed.**

(57) An articulated bed (10) which has the lying surface (12) consisting of a first fixed portion (14) and a second mobile portion (15) detached from said first fixed portion (14), characterized in that, starting from a position wherein said second mobile portion (15) lies on the same plane of said first fixed portion (14), said second mobile portion (15) may assume, with

respect to said first fixed portion (14), all positions comprised between a first parallel raised position and a second downwards inclined position, an articulation (13) being also provided in order to move said second mobile portion (15) between said positions.

**Fig. 2****EP 0 655 233 A1**

FIELD OF THE INVENTION

The present invention refers to an articulated bed and to the correspondent articulation for moving at least a portion of said bed, said portion being detached from the rest of the bed. The articulation allows the motion of a second mobile portion of the lying surface referring to a first fixed one.

In particular, the second mobile portion can assume, referring to said first fixed portion, all positions comprised between a first raised position and a second downwards inclined position.

PRIOR ART

Articulated beds having the aim to satisfy all therapeutic requirements are well known in the Art. In particular, in some kinds of therapeutic treatments the patient legs have to assume positions different from the usual one, i.e. the lying position on the same surface on which the rest of the patient body lies. For this purpose articulated beds showing fixed and mobile portions connected to each other by means of hinges have been proposed. This constraint restricts the possibility to have a wide range of positions; in fact, in order to get remarkable results several mobile portions hinged to each other are necessary, said portions being moved by means of devices. The more the articulated portions, the more complex the device.

SUMMARY OF THE INVENTION

In order to obviate the aforesaid disadvantages, an articulated bed has been conceived which has the lying surface consisting of a first fixed portion and of a second mobile portion not linked with the first one by means of a hinge, but detached from the last one in order to assume all positions according to all possible therapeutic requirements, which have otherwise been satisfied by means of several different articulated beds.

In other words, by means of a simple device it is possible to move the mobile portion with respect to the fixed one either by a vertical shifting wherein during the translation the portion remains always parallel to the fixed portion, or by a rotation on a fixed point.

Starting from a position wherein the second mobile portion is detached from the first fixed one and lies on the same plane, said second mobile portion may assume, with respect to the first fixed portion, all positions comprised between a first parallel raised position and a second downwards inclined position, an articulation being provided in order to move said mobile second portion through the aforesaid positions.

The articulation also object of the present invention consists of a frame part and of an element integral with the second mobile portion, linked to each other by means of a first and a second rod. The second rod is in its turn articulated in correspondence to a hinge and consists of a first portion and a second portion presenting respectively a tooth and a lug resting on each other, thus allowing only a rotation towards the moving away direction of the lug from the tooth, whereas a rotation towards the opposite direction is prevented.

Through the articulation just described the second mobile portion may assume the most suitable position for supporting a part of the patient body, in particular the legs.

LIST OF THE FIGURES

Figure 1 represents a comprehensive view of the articulated bed first object of the present invention, which consists of a fixed portion and a mobile portion; the second object of the present invention, i.e. the articulation, is also shown in this figure;

Figure 2 represents a view of the articulation second object of the present invention, wherein the mobile portion lies on the same plane of the fixed one;

Figure 3 represents a view of the articulation second object of the present invention, wherein the mobile portion assumes a raised position parallel to the fixed one;

Figure 4 shows a view of the articulation second object of the present invention, wherein the mobile portion assumes a downwards inclined position with respect to the fixed one.

In order to make easier the following description only the details shown in figures 1 and 2 have been numbered.

DETAILED DESCRIPTION OF THE INVENTION

The articulated bed 10 first object of the present invention consists of a frame 11, a lying surface 12 and of an articulation generally indicated as 13. The lying surface 12 is composed in its turn by at least a first fixed portion 14 (see figure 2) and at least a second mobile portion 15 separated from the first one; the lower part of the patient body usually lies on said mobile portion 15.

As represented in figures 2, 3, 4, by means of the second object of the present invention, i.e. the articulation 13, it is possible to move without interruption the second mobile portion 15 from a starting position (shown in figure 3), wherein the second mobile portion 15 is raised and parallel to the first fixed portion 14, to a final position (shown

in figure 4 wherein the second mobile portion 15 is downwards inclined with respect to said first fixed portion 14.

The use of a linear actuator 16 is suitable in order to put in movement the second mobile portion 15.

Number 17 indicates a part of frame 11, whereas the element 18 is integral with the second mobile portion 15. The frame part 17 and the element 18 are linked to each other by means of a first rod 19 and of a second rod 20 (figures 2, 3).

The rigid rod 19 is hinged at 21 to the frame part 17 and at 22 to the element 18, whereas the second rod 20 is hinged respectively at 23 and at 24. The second rod 20 is composed by two portions 25 and 26 linked by a knee-shaped hinge 35, namely tooth 27 integral with portion 25 and lug 28 of the portion 26 allow the rotation of the portions 25, 26 only towards the direction shown in figure 4. In other words, the frame part 17, the element 18, the first rod 19 and both portions 25, 26 of the second rod 20 constitute the sides of a polygon capable of being deformed.

The linear actuator 16 shows a first extremity linked to a lug 30 of the frame 11 by means of a hinge 29, and the other extremity linked to the lug 32 of portion 26 of second rod 20 by means of the hinge 32. Furthermore, the extremity of the first fixed portion 14 has been called 33, said extremity being adjacent to the extremity 34 of the second mobile portion 15.

The working of the present invention is evident by examining the alleged figures.

The shaping of the polygon and, consequently, the position of the second mobile portion 15 with respect to the first fixed one 14 is determined by the extension of the linear actuator 16.

Figures 1, 2, represent the normal situation of the articulated bed 10, wherein the second mobile portion 15 lies on the same plane of the first fixed portion 14. In this situation the portions 25, 26, work as single rod 20; in fact, in this last case the lug 28 of the second portion 26, resting on the tooth 27 integral with the portion 25, prevents the rotation between said two portions 25, 26, towards the direction which would be determined by the pushing of the linear actuator 16. Therefore, in this situation the polygon works as an articulated parallelogram.

Starting from the normal position shown in figures 1, 2, a stretching of the linear actuator 16 implies a deformation of the polygon which, as already mentioned, works in this case as an articulated parallelogram (see figure 3); this fact implies an upwards shifting of the second mobile portion 15 with respect to the first fixed one 14. It can be also noticed that during this upwards movement the mobile portion remains always parallel to the

fixed portion.

Also starting from the normal situation shown in figures 1, 2 a shorting of the linear actuator 16 has as a consequence the pushing of the extremity 34 of the second mobile portion 15 against the extremity 33 of the first fixed portion 14; this causes the rod 20 to bend as a "knee", whereas the second mobile portion 15 moves downwards by means of a rotation on the extremity 33 which works as a fixed point (see figure 4).

It is easily remarkable that through a simple device the position of the second mobile portion 15 can be varied with respect to the first fixed portion 14, thus allowing the most convenient positioning with respect to the starting lying surface of the body part, in particular of the legs.

Claims

1. An articulated bed (10) which has the lying surface (12) consisting of a first fixed portion (14) and a second mobile portion (15) detached from said first fixed portion (14), characterized in that, starting from a position wherein said second mobile portion (15) lies on the same plane of said first fixed portion (14), said second mobile portion (15) may assume, with respect to said first fixed portion (14), all positions comprised between a first parallel raised position and a second downwards inclined position, being also provided an articulation (13) in order to move said second mobile portion (15) between said positions.
2. An articulated bed (10) according to claim 1, characterized in that the lower part of the patient body lies on said second mobile portion (15).
3. An articulated bed (10) according to claim 1, characterized in that said articulation (13) consists of a frame part (17), of an element (18) integral with said second mobile portion (15), of a first rod (19) hinged at (21, 22), respectively, to said frame part (17) and to said element (18) and of a second rod (20) hinged at (23, 24), respectively, to said frame part (17) and to said element (18), said second rod (20) being articulated in its turn in correspondence to a hinge (35) and consisting of a portion (25) and a portion (26) having respectively a tooth (27) and a lug (28) which rest on each other, thus allowing only a rotation towards a moving away direction of said lug (28) from said tooth (27), whereas a rotation towards an opposite direction is prevented.

4. An articulated bed (10) according to claim 3, characterized in that the shaping of said articulation (13), and consequently of said second mobile portion (15), is settled by the extention of a linear actuator (16), the extremity of which is hinged at (29) to a lug (30) of said frame (11), whereas the other extremity is hinged at (31) to a lug (32) of said portion (26) of said second rod (20).

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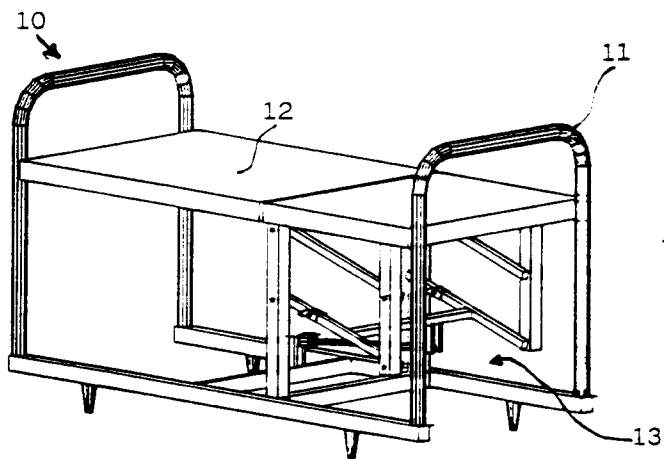


Fig. 1

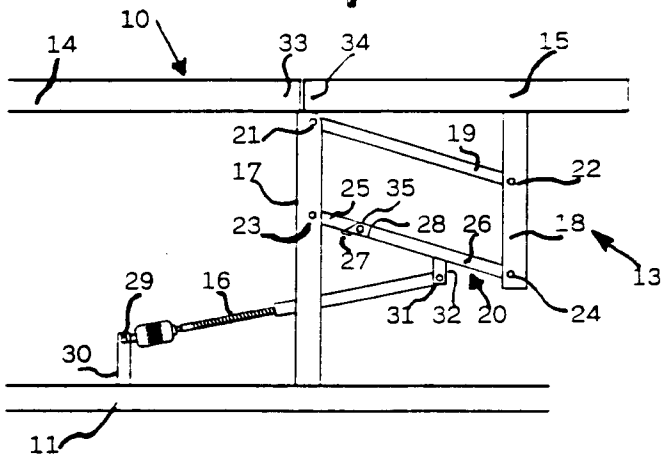


Fig. 2

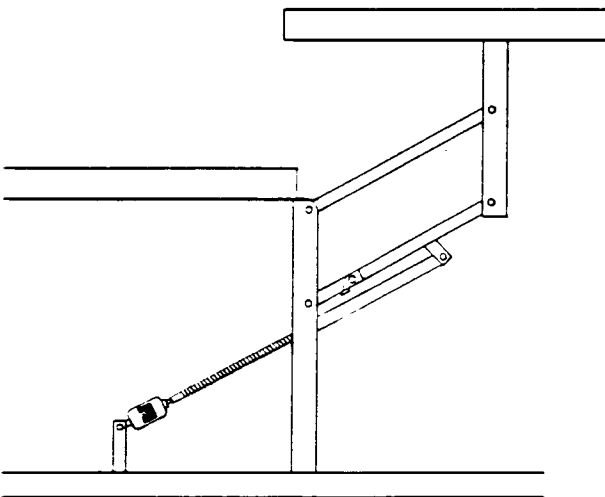


Fig. 3

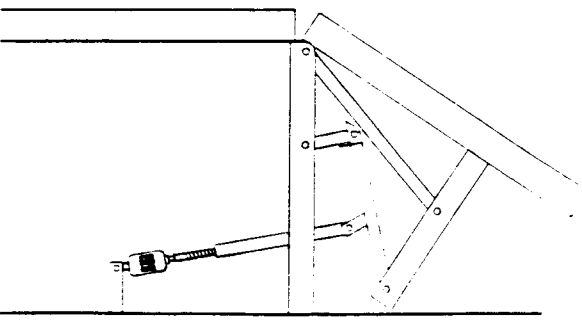


Fig. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 94 11 8665

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.6)
Y	WO-A-82 03171 (ZUR) * abstract; figures 1-5 * ---	1,2	A61G13/00 A47C20/04 A61G7/015
Y	EP-A-0 539 089 (HILL-ROM COMPANY INC.) * column 2, line 56 - column 3, line 3; figure 2 * ---	1,2	
A	US-A-2 177 341 (DEMCAK) * page 2, column 2, line 14 - line 21; figure 2 * -----	1,2	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A61G A47C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27 February 1995	Examiner Godot, T
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	