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(54) **Hospital bed**

(57) This invention relates to a hospital bed characterised comprising at least one railing that in turn comprises a screen, fixing means to fix said railing to the bed frame and locking means for fixed positions of the railing, so that said screen can swivel, remaining in a perpendicular position to the bed frame and a bed frame having an upper framework or bed, a lower framework or base and operation means for the upper framework of the kind of a retractable compass, thus achieving a stable and safe structure.

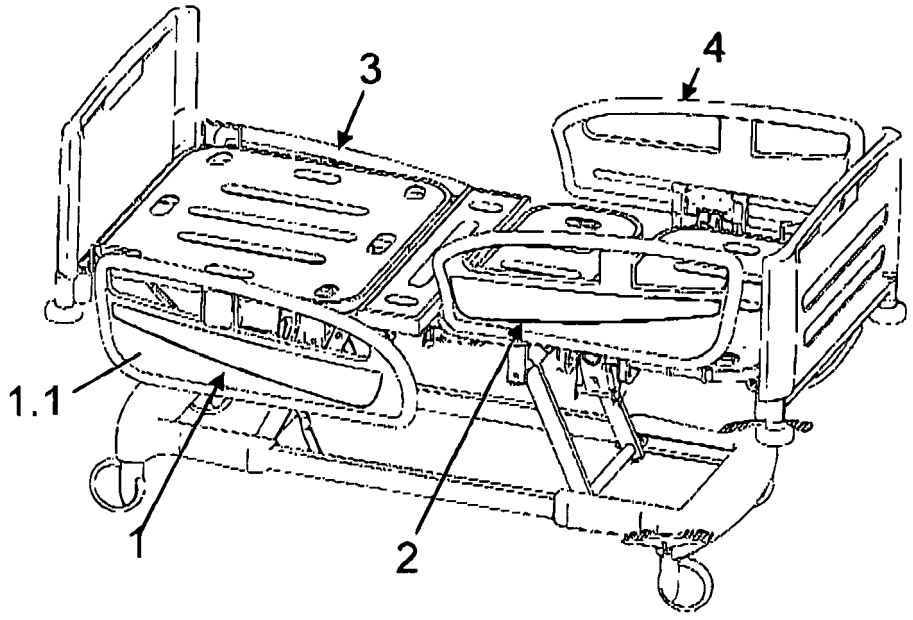

Fig.1

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] This invention relates to the field of hospital beds.

Said invention is a hospital bed comprising at least one railing that in turn comprises a screen, fixing means to fix said railing to the bed frame and locking means for fixed positions of the railing with respect to the frame so that said screen can rotate with respect to the fixing and locking means and that both of these can in turn rotate with respect to the bed frame so that the screen can be withdrawn from the railing so that said withdrawn screen remains in a position that is perpendicular to the bed frame.

[0002] Moreover, the bed includes a bed frame consisting of an upper framework or bed, la lower framework or base and actuation means of the upper framework of the type of a retractable compass, thus providing the bed with a stable mobile structure and strong and easy-to-use retaining means.

BACKGROUND OF THE INVENTION

[0003] Retaining means are known at all levels in clinical settings in order to prevent accidents and facilitate work in hospitals.

[0004] Hospital beds must be provided with railings that provide side retaining means and an upward extension of the mattress in order to prevent the possible falling of the patient, but which can in other circumstances leave the mattress area totally open, to facilitate the operations of getting a patient in and out of bed, changing the bedding, etc., for example.

[0005] A traditional solution consists in providing the bed with a rigid railing that can move vertically, being mounted on end vertical guides, such that when it is in the raised position it provides an adequate degree of protection, whereas when it is in a lowered position its upper edge is located at a level below the upper plane of the mattress, whereas said railing must have locking/unlocking means in said upper limit position.

This railing is difficult to handle due to its basic mechanism, and even though it does meet the required functions its use may even be inadequate for the current requirements of hospital settings.

[0006] Moreover, bed raising and lowering means are known that are either solid and require a very large and heavy structure that is difficult to move, or are weak, with the resulting risk of lack of stability.

[0007] These disadvantages are overcome by this invention, which provides a hospital bed with stable moving and retaining means that are easy to use.

DESCRIPTION OF THE INVENTION

[0008] This invention is described and characterised in the independent claims, whereas the dependent claims describe further features of the invention.

[0009] In view of the above, this invention relates to a hospital bed comprising at least one railing that in turn comprises a screen, fixing means to fix said railing to the bed frame and locking means for fixed positions of the railing with respect to the frame so that said screen can rotate with respect to the fixing and locking means and that both of these can in turn rotate with respect to the bed frame so that the screen can be withdrawn from the railing so that said withdrawn screen remains in a position that is perpendicular to the bed frame.

[0010] It optionally comprises a bed frame consisting of an upper framework or bed, a lower framework or base and means of operating the upper framework.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] This specification is supplemented with a set of drawings illustrating the preferred embodiment, which are never intended to limit the invention.

Figure 1 shows a perspective view of a hospital bed.

Figure 2 shows a perspective view of the bed frame with the upper framework in the raised position.

Figure 3 shows a perspective view of the bed frame with the upper framework in the lowered position.

Figure 4 shows a perspective view of a detail of the railing.

Figure 5 shows a perspective view of another detail of railing.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

[0012] This invention relates to a hospital bed comprising at least one railing (1) that in turn comprises a screen (1.1), fixing means (1.2) to fix said railing to the bed frame (5) and locking means (1.3) for fixed positions of the railing (1) with respect to the frame (5) so that said screen (1.1) can rotate with respect to the fixing (1.2) and locking means (1.3) and that both of these can in turn rotate with respect to the bed frame (5) so that the screen (1.1) can be withdrawn from the railing so that said withdrawn screen (1.1) remains in a position that is perpendicular to the bed frame (5).

[0013] The railing (1) in this embodiment has a size equivalent to approximately half the length of the bed, and therefore it is relatively large and its parts must be strong and reliable, since they will retain the patient.

[0014] Moreover, said retention must be released in order to remove the patient over one side or to prepare the bedding or for other tasks.

[0015] In the embodiment explained herein the bed has four railings (1, 2, 3, 4), two on each of the larger

sides of the bed.

[0016] The screen (1.1) of the railing is joined to the bed frame (5) using fixing means (1.2) that have two angled arms (1.2.1) and is also joined to the bed frame (5) by means of the body (1.3.1) of the locking means (1.3) and via said body (1.3.1) via the shock absorbing means (1.4).

[0017] All the joints between the components joining the screen (1.1) of the railing to the bed frame (5) are rotating joints. That is, the screen (1.1) rotates with respect to the fixing means (1.2) and the locking means (1.4) and vice versa; the fixing means (1.2), the locking means and the shock absorbing means (1.4) rotate about the bed frame (5) and vice versa.

[0018] According to the configuration described, the railing (1) can perform two rotations or swivelling movements: one of rotation of the screen (1.1) with the arms (1.2.1) about the bed frame (5), another of rotation of the screen (1.1) about the arms (1.2.1) .

[0019] These two rotation movements allow the screen (1.1) of the railing (1) to remain totally or partially below the edge of the bed frame (5) when withdrawn, so that there is a space on the side of the bed that is left completely free in order to allow moving the patient on that side or for tasks such as making the bed or others, as usual during hospitalisation.

[0020] This is achieved because the screen (1.1) in its withdrawn position remains perpendicular to the bed frame (5), since the relative position between the screen (1.1) and the bed frame (5) is perpendicular to the bed frame during the entire operation of withdrawal and it therefore remains perpendicular in the withdrawn position.

[0021] The perpendicular position described herein relates to that between the largest plane of the screen (1.1), which is approximately perpendicularly to the floor, and the largest plane of the bed frame (5), which is approximately horizontal to the floor.

[0022] The screen (1.1) of the railing in this embodiment is a solid part made of two joined plastic parts, of those known in the state of the art.

[0023] The screen (1.1) has a fixed position in which its screen is in a vertical position and serves as a retention element for the patient.

[0024] This fixed position of the screen (1.1) must guarantee strong retention, since it must be able to hold any weight of any person that may want to or be liable to fall over the side of the bed.

[0025] In this embodiment, the bed has two railings (1,2 and 3,4) on each side, which highlights the fact that the retention to be performed by the railing is very demanding.

[0026] The railing thus includes locking means (1.4) that consist, in this embodiment, of a ratchet (1.3.2), means of recovery (1.3.3) of a ratchet such as a spring, fastening means for the ratchet (1.3.4) such as a nut, a button (1.3.5) to move the ratchet (1.3.2) and a flat bar (1.3.6) to fix the button (1.3.5) and house the ratchet (1.3.2) and a body (1.3.1) housing all of these components.

[0027] The operation of the locking means (1.3) is as follows: in the vertical position of the railing screen (1.1) it is in a retaining position, that is, a greatly resistant position, which is achieved because the spring (1.3.3) of the ratchet pushes It so that one end is housed within an opening (5.1) in the bed frame; in order to release the railing (1) and be able to swivel it the button (1.3.5) is moved by shifting it upwards along the body (1.3.1) it is on, so that said button (1.3.5) moves the flat bar (1.3.6) that in turn moves the ratchet (1.3.4) in order to release it from the opening (5.1) it is fixed into.

[0028] When the screen is withdrawn (1.1), that is, when it is returned to its vertical position, the end of the ratchet (1.3.4) slides along the flat bar of the bed frame (5.2) with the spring (1.3.3) compressed until the ratchet (1.3.4) finds the opening (5.1), which is when said spring (1.3.3) extends, causing the part to be fixed.

[0029] As mentioned above, the screen (1.1) is relatively large, and therefore relatively heavy. In order to aid in its movement, and especially to slow down a possible sudden downward swivelling, the railing (1) incorporates shock-absorbing means (1.4) such as a known pneumatic cylinder.

[0030] Said pneumatic cylinder (1.4) is anchored on one end to the body (1.3.1) of the locking means and on the other end to the bed frame (5).

[0031] Also in order to provide the bed with the means necessary to ensure optimal safety and stability features, it includes a bed frame (5) that is especially adapted to ensure great stability.

[0032] Said bed frame (5), as usual in most hospital beds, provides upward and downward vertical movement of the bed surface on which the patient lies, in order to adapt the height of the bed to the patient's height, for greater comfort when getting into and out of bed and for usual tasks during hospitalisation.

[0033] The bed frame (5) has an upper framework or bed (5.3), a lower framework or base (5.4) and means of operation (5.5) for the upper framework.

[0034] Said means of operation (5.5) include, in the embodiment described herein, two frames (5.5.1), two cylinders (5.5.2) and two motors (5.5.3).

[0035] The upper framework (5.3) is essentially an assembly of metal profiles that form a rectangle, within which and in the middle area of which there are anchoring elements (5.3.1) that are a couple of half-U shaped metal profiles the curved portion of which is joined to the centre of the framework (5.3) and the straight area of which is joined to the larger side of the framework.

[0036] This straight section of the two half-U shaped anchoring elements (5.3.1) is anchored in a rotating manner to the ends of the cylinders (5.5.2).

[0037] The lower framework (5.4) is also essentially an assembly of metal profiles that form a rectangle, including guides (5.4.1), which in this embodiment are U-shaped metal profiles, there being four of these guides

(5.4.1), each assembled on the inner side of each side, towards the end of each of these sides and with the open part of the U shape directed inwards towards the rectangle.

[0038] The upper framework (5.3) and the lower framework (5.4) are connected by means of the frames (5.5.1) and the cylinders (5.5.2). One end of each cylinder (5.5.2) rotates with respect to the straight end of a half-U shaped anchoring element (5.3.1), the other end of the cylinder (5.5.2) rotates with respect to a pin (5.5.3) of the frames.

[0039] Each frame (5.5.1) has lugs (5.5.4) with a sliding movement within and along the guides (5.4.1) of the lower framework.

[0040] The vertical movement of the upper framework (5.3) is performed via two motors (5.5.3), one for each frame (5.5.1) acting upon cylinders (5.5.2) so that they make each frame (5.5.1) rotate with respect to the upper framework (5.3) and move with respect to the lower framework (5.4), thus achieving the movement of a retractable compass that changes the distance between the upper and lower frameworks and therefore allows raising or lowering the surface on which the patient is to be lied down.

Claims

1. A hospital bed **characterised in that** it comprises at least one railing (1) that in turn comprises a screen (1.1), fixing means (1.2) to fix said railing to the bed frame (5) and locking means (1.3) for fixed positions of the railing (1) with respect to the bed frame (5) so that said screen (1.1) can rotate with respect to the fixing (1.2) and locking means (1.3) and that both of these can in turn rotate with respect to the bed frame (5) so that the screen (1.1) can be withdrawn from the railing so that said withdrawn screen (1.1) remains in a position that is perpendicular to the bed frame (5) .

2. A hospital bed according to claim 1, **characterised in that** it includes two railings (1,2 and 3,4) on each of the longer sides of the bed.

3. A hospital bed according to claim 1, **characterised in that** it comprises shock absorbing means (1.4) for the rotation movement of the screen (1.1) with respect to the bed frame (5).

4. A hospital bed according to claim 3, **characterised in that** the shock absorbing means (1.4) are a pneumatic cylinder.

5. A hospital bed according to claim 1, **characterised in that** the fixing means (1.2) have two angled arms (1.2.1) so that screen (1.1) rotates with respect to the fixing means (1.2) and vice versa.

6. A hospital bed according to claim 1, **characterised in that** the locking means (1.3) include a body (1.3.1) such that the screen (1.1) rotates with respect to such locking means and vice versa, and the bed frame rotates about said locking means (1.3) and vice versa.

7. A hospital bed according to claim 1, **characterised in that** the locking means (1.3) include a ratchet (1.3.2), means of recovery (1.3.3) of the ratchet, fastening means for the ratchet (1.3.4), a button (1.3.5) to move the ratchet (1.3.2), a flat bar (1.3.6) to fix the button (1.3.5) and house the ratchet (1.3.2).

8. A hospital bed according to claim 7, **characterised in that** the means of recovery (1.3.3) for the ratchet are a spring and the fastening means for the ratchet (1.3.4) are a nut.

9. A hospital bed according to claim 1, **characterised in that** it comprises a bed frame (5) consisting of an upper framework or bed (5.3), a lower framework or base (5.4) and means of operation (5.5) for the upper framework.

10. A hospital bed according to claim 9, **characterised in that** the means of operation (5.5) include two frames (5.5.1), two cylinders (5.5.2) and two motors (5.5.3).

11. A hospital bed according to claim 9, **characterised in that** the upper framework (5.3) is an assembly of metal profiles that form a rectangle, within which and in the middle area of which there are two half-U shaped anchoring elements (5.3.1) the curved portion of which is joined to the centre of the framework (5.3) and the straight area of which is joined to the larger side of the framework.

12. A hospital bed according to claims 10 and 11, **characterised in that** the straight area of the two half-U shaped anchoring elements (5.3.1) are anchored rotatingly to the ends of the cylinders (5.5.2).

13. A hospital bed according to claim 9, **characterised in that** the lower framework (5.4) is an assembly of mental profiles that form a rectangle, including four U-shaped guides (5.4.1), each assembled on the inner side of each side, towards the end of each of these sides and with the open part of the U shape directed inwards towards the rectangle.

14. A hospital bed according to claims 9 to 13, **characterised in that** the frames (5.5.1) include pins (5.5.3) on their upper portion and lugs (5.5.4) such that the upper framework (5.3) and the lower framework (5.4) are connected by means of the frames (5.5.1) and via the cylinders (5.5.2), since one end of each cyl-

inder (5.5.2) rotates about the straight end of a half U-shaped anchoring element (5.3.1), the other end of the cylinder (5.5.2) rotating about a pin (5.5.3) of the frame, and each frame (5.5.1) having lugs (5.5.4) with a sliding movement inside and along the guides (5.4.1) of the lower framework.

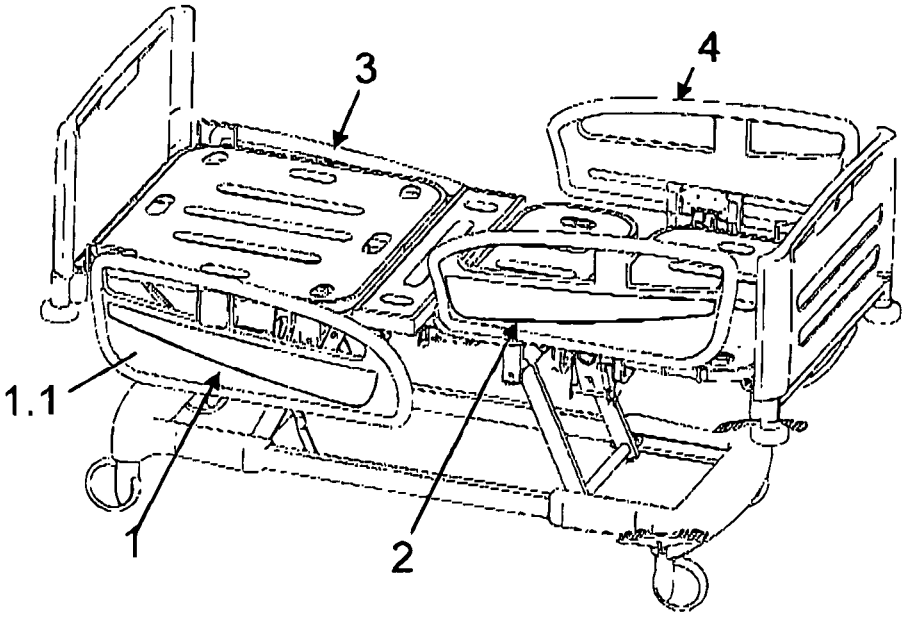

Fig.1

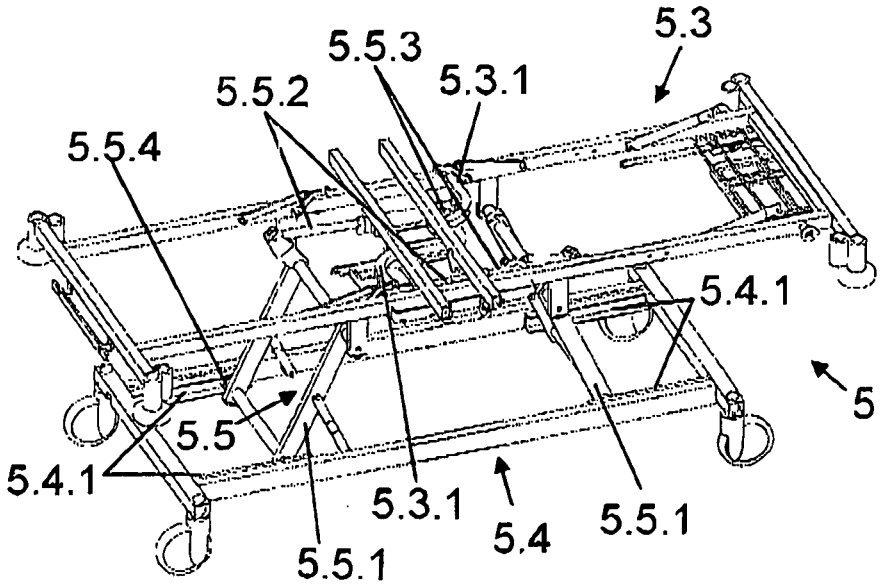

Fig.2

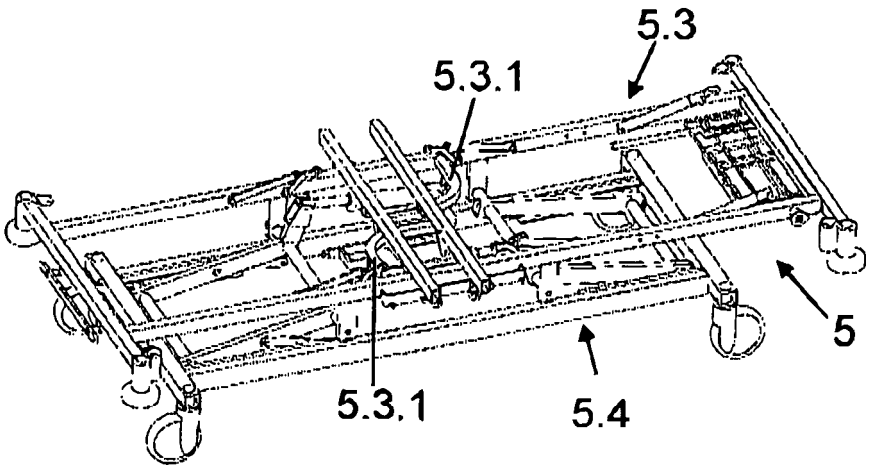

Fig.3

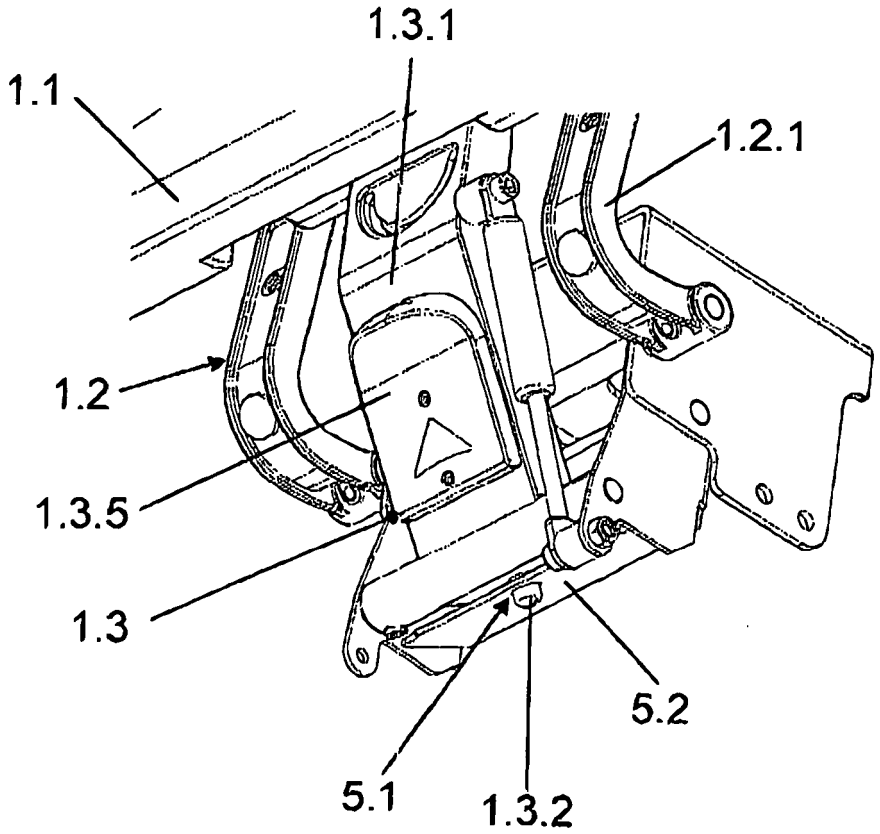

Fig.4

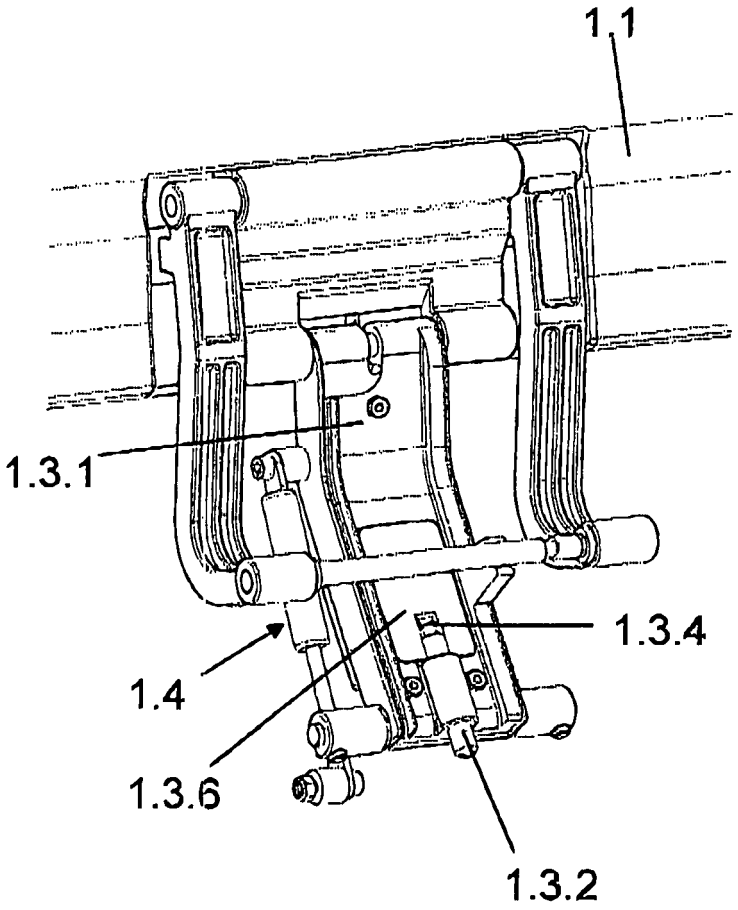

Fig.5

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EUROPEAN SEARCH REPORT

Application Number
EP 10 38 2177

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 4 612 679 A (MITCHELL LARRY D [US]) 23 September 1986 (1986-09-23) * column 6, line 62 - column 7, line 2; figure 1 *	1	INV. A61G7/05 A61G7/012
A	FR 2 815 527 A1 (HILL ROM SAS [FR]) 26 April 2002 (2002-04-26) * figures 4-7 *	1	

TECHNICAL FIELDS SEARCHED (IPC)

A61G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	22 November 2010	Girard, Olivier

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
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1

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 38 2177

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
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22-11-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4612679 A	23-09-1986	NONE	
FR 2815527 A1	26-04-2002	NONE	

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