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(54) **Person-support apparatus with removable siderail**

(57) A person-support apparatus (1) having a rectangular support surface (2) and a siderail support member (3, 5) at at least one end of the support surface (2). The siderail support member (3, 5) extends from the support surface (2) to above a support surface (2) and has a first surface adjacent to and alongside the support surface (2). There is a second surface of the siderail support member (3, 5) substantially transverse to the first surface and facing away from the support surface (2) having receiving means (12) for receiving and supporting an end of a siderail assembly (8).

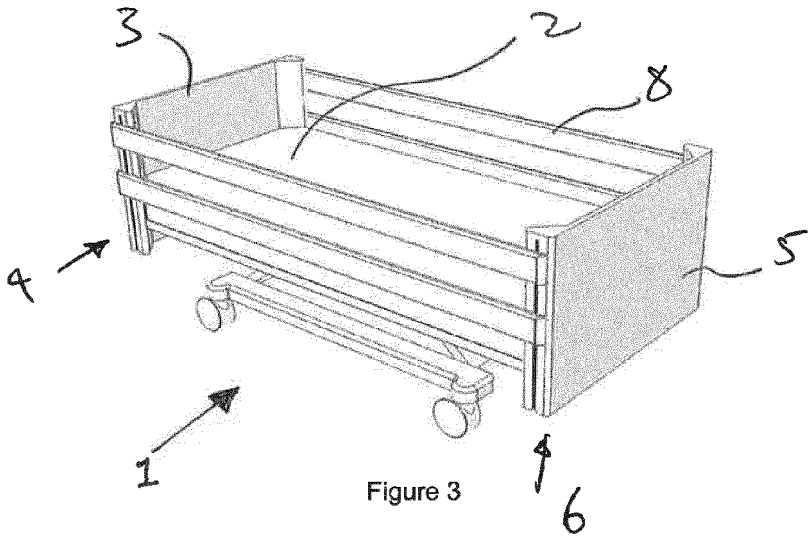


Figure 3

EP 2 644 176 A1

Description

[0001] The present application is concerned with person support apparatus, such as a bed, and with a siderail suitable for use with such person-support apparatus. It is more particularly suitable for removable siderails for a hospital or long-term care (LTC) bed.

[0002] Many person support apparatuses, such as hospital and long-term care beds, include a deck and a support surface, such as a mattress, supported by the deck. Such beds also include siderails. The siderails can be lowered to facilitate patient movement into and out of the bed. The siderails can also be raised to safeguard the patient. When the siderails are raised, they typically extend higher than the support surface of the bed.

[0003] Full length siderails typically extend along the length of each of the two sides of the deck and at the head end of the bed engage with a headboard, and at the foot end of the bed, engage with a footboard. As shown in figures 1 and 2, in the prior art arrangements the siderails engage with slots on the inside surface of the foot and end boards. Such known arrangements suffer from two important problems. Firstly, even if the siderails are removed the overall width of the bed is not reduced (see figure 2) so removal of the siderails does not help in manoeuvring the bed in a tight space such as through a door, or along a corridor. Secondly, known siderail arrangements include siderails held in place in grooves or slots on endboards by a stopper in the bottom of the groove or slot. Such stoppers require a tool to be removed and need to be handled carefully where a siderail is being installed and can be difficult and complicated to remove.

[0004] Thus a need exists for further contributions in this area of technology.

[0005] The present invention in a first aspect provides apparatus as defined in claim 1 to which reference should now be made. The invention in a second aspect provides a siderail assembly as defined in claim 11 to which reference should now be made. Preferred features are defined in the dependent claims to which reference should also be made.

[0006] The arrangement of claim 1 results in a siderail which when removed reduces the width of the person-support apparatus, as the siderail projects beyond the remainder of the apparatus. Furthermore, location of the siderail assembly on the outside of an endboard also means that it is possible to remove the siderail assembly relatively easily and without having to interfere with or move other elements of the person-support apparatus. Preferably the receiving means is a groove or slot. This allows for easy insertion and/or removal of a siderail assembly.

[0007] Preferably the apparatus further includes an elongate siderail assembly comprising at least one substantially elongate siderail, and engagement means for engaging with and being received by the receiving means, wherein said engagement means is located at or towards an end of the elongate siderail assembly and on a longitudinal surface of the elongate siderail assembly. Such an arrangement allows for apparatus with an easily removable and insertable siderail assembly.

[0008] Preferably the siderail support member includes a pivot adjacent to the groove or slot and a blocking element pivotable about the pivot between a first position where it blocks the groove or slot and a second position where it does not block the groove or slot. Such an arrangement results in a simple yet effective and robust locking arrangement which allows for easy insertion and/or removal of a siderail assembly.

[0009] The invention will now be described by way of non-limiting example with reference to the accompanying drawings, in which:

Figure 1 is a perspective side view of a known or prior art person-support apparatus with a siderail assembly;

Figure 2 is a top plan view of the apparatus of figure 1 with the siderails removed;

Figure 3 is a side perspective view of a person-support apparatus embodying invention with a first configuration with the siderail assembly raised;

Figure 4 is a top plan view of the apparatus of figure 3;

Figure 5 is a side perspective view of the person-support apparatus of figure 3 with the siderail assembly lowered;

Figure 6 is a side perspective view of the person-support apparatus of figure 3 with the siderail assemblies removed;

Figure 7 is a perspective side view showing the detail an end of a siderail assembly where it engages with an endboard of the person-support apparatus of figure 3;

Figure 8 is a diagrammatic illustration of the latching mechanism at the bottom of the endboard of figure 7 illustrating how it is actuated to hold a siderail assembly in place and to allow its removal;

Figure 9 is an exploded view (with the endboard side cover removed) of the latching mechanism of figure 8;

Figure 10 is a right side view of the mechanism of figure 9;

Figure 11 is a sectional view along section A-A of figure 10;

Figure 12 is a left side cross-sectional view of the

mechanism of figure 9;

Figure 13 is an exploded illustration showing how the end of a siderail assembly engages a groove in the side of an endboard;

Figures 14a to 14e illustrate the insertion of a siderail assembly in person-support apparatus of figure 3;

Figure 15 is an exploded illustration of the slider shown in figure 13;

Figure 16 is a cross-sectional view through the top of the slider of figure 15 when it is in position in the endboard;

Figures 17a to 17d illustrate the operation of the slider latching mechanism;

Figures 18a to 18i illustrate the operation of the slider latching mechanism as it enters the groove of an endboard; and

Figures 19a and 19b are diagrammatic cross-sectional illustrations of the slider in the lowered position of figure 5 and raised position of figure 3 respectively.

[0010] A person-support apparatus 1 according to one illustrative embodiment is shown in figure 3. The person-support apparatus can be a hospital bed and can include a lower frame or base and an upper frame supported on a plurality of supports above the lower frame (as described in EP 2,314, 267). It should be appreciated that the person-support apparatus can also be a hospital stretcher, an operating table, or other apparatus configured to support a person thereon. It should also be appreciated that the supports can be lift mechanisms configured to move the upper frame with respect to the lower frame. The person-support apparatus can support a substantially rectangular person-support surface 2 (which may be a mattress) on the upper frame.

[0011] The person-support apparatus 1 has a footboard 3 at a first foot end 4 of the bed and a headboard 5 at the second head end 6 of the bed (see figure 3). The footboard and headboard are fixed to the respective foot and head ends of a frame 7. A deck 2 is supported within the frame to form a person-support surface and two siderail assemblies 8 are located along the sides of the frame 7 and deck 2. A siderail assembly 8 is provided for each longitudinal side 9 of the bed. Each siderail assembly 8 is attached at a first end to the footboard 3 and at its other second end to the headboard 5. Each siderail assembly 8 comprises a pair of coupled siderails or siderail bars 10. As shown in figures 13 and 15, the ends of each of the siderail bars 10 are attached to a respective slider 11 which engages a groove 12 in the side of the respective endboard. The slider 11 (see figure 13) includes a tapered upper end 13 to facilitate insertion into the groove or slot 12 and is fixed to each of the siderail bars 10 by a pin or projection 14 which passes through the respective siderail bar. The bottom of the groove or slot 12 has an angled opening to facilitate insertion of the slider 11.

[0012] The endboards 3 and 5 each include an endboard latching assembly 15 (see figures 7 and 8) at their bottom end which allows removal and insertion of the slider assembly 11 (and hence the siderail assembly). The endboard latching mechanism 15 holds the siderail assembly in the endboard groove 12.

[0013] The endboard latching assembly 15 comprises a latching element or bolt 16 mounted on a pivot 17. Referring to figures 9 and 13, the pivot 17 is one end of a shallow U-shaped metal rod 39 whose other end 40 is held in a slot 41 in the side of an endboard groove element 42 which defines the groove 12 and the edge of the respective endboard. The rod 39 is U-shaped so that the end 40 can act as a stop for the latching element of bolt 16 when the latching element or bolt is in its lower or closed position (as shown in figure 12) but allows pivoting movement of a latching element or bolt 16 in the direction shown by arrow X in figures 8 and 12. The angled side inner surface 43 defines an upper stop against movement of the latching element or bolt 16.

[0014] The centre of gravity of the pivotable latching element 16 is located such that gravity biases the latching element 16 to the closed position with its distal end 18 located against the lower stop pin 40. A spring (not shown) may be provided to further bias the latching element 16 in this closed position. The latching mechanism may be opened either by an operator pushing against the proximal end 19 of the latching element 16 (see figure 8) so as to pivot its distal end 18 upwards towards the upper stop surface 43, or by an operator pushing a siderail slider 11 up against the lower side of the latching element (see figures 14a to 14c).

[0015] Figures 14a to 14c illustrate the insertion of a siderail assembly. An operator takes a siderail assembly and positions its siderail sliders under the respective grooves on the person-support apparatus endboard (see figure 14a) (only one endboard is shown in figures 14a to 14e but other end is equivalent). Referring to figures 14b and 14c, the slider assembly is then pushed upwards against the underside of the latching element (not shown) to push it open and permit entry of the slider into the groove. The siderail assembly and slider are then pushed up the groove until the bottom of the slider is clear of the raised latching element. When the slider is clear of the latching element, the bolt latching element 16 falls. To remove the slider 11 from the groove 12, the siderail assembly is lifted by an operator to allow room for the latching element 16 to pivot. The operator then opens the latching element 16 in the way described above with reference to figures14a to 14c.

[0016] Referring to figure 15, the slider 11 includes an upper slider element 20 and a lower slider element 21 supported on an elongate metal loop 22. The lower slider

element 21 is fixed at the loop's lower end and the support slider 20 can move along the loop 22. The loop 22 is clipped to slots at each side of the two slider elements 20, 21. A slot in the bottom of the lower slider element 21 holds the lower slider element so that it does not move relative to the metal loop 22.

[0017] The slider elements 20, 21 are supported in corresponding slots 23 in the end of the respective siderail bars 10 and held in place by bar end covers 24. As shown in figure 16, the slider elements 20, 21 can each slide along the endboard groove 12 unless the slider latching mechanism is engaged to hold the slider in place.

[0018] The slider latch 25 (see figures 17a to 17d) is arranged on the support slider 20. A rod 26 includes a latch bolt element 27 at a first distal end 28 and an actuating button latch 30 at its second proximal end 29. A torsion spring (not shown) biases the latch bolt element 27 towards a lowered closed position. In the lowered closed position the bolt 27 has an upper surface 38 which is at an angle to the vertical and a lower locking surface 37 which is substantially horizontal. The rod includes a cam follower 32 which engages a helical cam surface 33 on the button or actuator element 30.

[0019] A compression spring 34 biases the button or actuator element 30 towards a first position in which the cam follower 32 is at the distal end of the cam surface 33 (see, for example, figure 17a). At that distal end the latch bolt element 26 is free to rotate subject to the torsion spring (see figures 17a to 17c) which biases it towards the closed position of figures 17a and 17c.

[0020] Referring to figure 17d, when the button or activator 30 is pushed inwards against the compression spring 34 the cam follower 32 moves along the helical cam surface 33 and rotates the latch bolt element 27 to an open position.

[0021] To insert a siderail assembly 8 into an endboard 3,5 the slider assembly 11 is aligned with the groove 12 (see figures 18a and 18b) and pushed upwards into the groove. Movement of the slider assembly into the groove rotates the latch bolt element 27 (see figures 18c and 18d) so that the slider assembly 11 is free to move along the groove 12. The walls of the groove push against the latch bolt element angled surface 35 to rotate it against the torsion spring 31.

[0022] The groove 12 includes one or more latch element engagement holes or catches 36 (see figure 18a). When the latch bolt element 27 is alongside such a hole 36, the latch bolt 27 rotates into the hole (see figure 18e) to hold the slider assembly in place. The lower bolt surface 37 engages the bottom of the hole 36 to bolt the slider assembly 11 in place. To unlatch the slider 11, the siderail assembly 1 (and hence the slider) is displaced sideways slightly and then the button or actuator 30 is pressed to rotate the latch bolt 27 to its open position (see figures 18h and 18g).

[0023] Referring to figure19a the siderail assembly 8 can be located in a lowered position (see figure 5) with the upper and lower slider elements 20, 21 being pressed together, and being pressed down on to the latching element or bolt 16 by gravity. In the lowered position of figures 19a and 5, the slower slider element 20 is supported by the closed bolt 16.

[0024] Referring to figure 19b, the siderail assembly 8 is held in a raised position with the upper 21 and lower 20 slider elements being separated. The lower slider 20 is supported on the bolt 16 and the upper slider 21 is held by the slider latching mechanism 25 described above with reference to figures 18a to 18c.

[0025] The described embodiment of the invention includes only a single hole 36 defining a simple locking position. However, there could be a number of holes 36 to allow locking of the siderails in different positions.

[0026] While embodiments of the disclosure have been illustrated and described in detail in the drawings and foregoing main description, the same are to be considered as illustrative and not intended to be exhaustive or to limit the disclosure to the precise forms disclosed. Additional alternatives, modifications and variations can be applied to those skilled in the art. Also, while multiple inventive aspects and principles have been presented, they need not be utilised in combination, and various combinations of the inventive aspects and principles are possible in light of the various embodiments provided.

Claims

1. A person-support apparatus including a substantially rectangular support surface and a siderail support member at at least one end of the support surface, the siderail support member (3,5) extending from the support surface to above the support surface, the support member (3,5) having a first surface adjacent to and alongside the support surface, and wherein a second surface of the board member substantially transverse to the first surface and facing away from the support surface has receiving means (12) for receiving and supporting an end of a siderail assembly.

2. Person-support apparatus according to claim 12 wherein the support surface is substantially rectangular.

3. Person-support apparatus according to any preceding claim wherein the siderail support member is a footboard (3) or headboard (5).

4. Person-support apparatus according to any preceding claim including a siderail support member at each of two opposite ends of the support surface.

5. Person-support apparatus according to any preceding claim wherein the receiving means comprises a groove or slot (12).

6. Person-support apparatus according to any preced-

ing claim further including an elongate siderail assembly (8) comprising at least one substantially elongate siderail (10), and engagement means (11) for engaging with and being received by the receiving means (12), wherein said engagement means is located at or towards an end of the elongate siderail assembly and on a longitudinal surface of the elongate siderail assembly.

7. Person-support apparatus according to claim 5 and claim 6 wherein said engagement means comprises at least one projecting element (20, 21) engageable with and slideable along the groove or slot.

8. Person-support apparatus according to claim 5, or any of claims 6 or 7 when dependent on claim 5, wherein the siderail support member includes a pivot (17) adjacent to the groove or slot (12) and a blocking element (16) pivotable about the pivot (17) between a first position where it blocks the groove or slot and a second position where it does not block the groove or slot.

9. Person-support apparatus according to claim 8 wherein the pivot (17) is biased towards the first blocking position.

10. Person-support apparatus according to claim 8 where in the pivot (17) is biased towards the first blocking position by gravity.

11. Person-support apparatus according to any of claims 8 to 10 wherein the blocking element (16) is arranged such that it blocks the groove (12) until or unless an unblocking force is applied thereto.

12. Person-support apparatus according to claim 11 wherein the siderail support member (3,5) includes a stop to hold the blocking element in place in the first position, and wherein the blocking element is biased towards the first position.

13. Person-support apparatus according to claim 12 wherein the blocking element is biased towards the first position by its own weight and/or a biasing spring.

14. A siderail assembly for person-support apparatus comprising at least one substantially elongate siderail (10), and engagement means (11) for engaging with the person-support apparatus, wherein said engagement means is located at or towards an end of the elongate siderail assembly and on a longitudinal surface of the elongate siderail assembly.

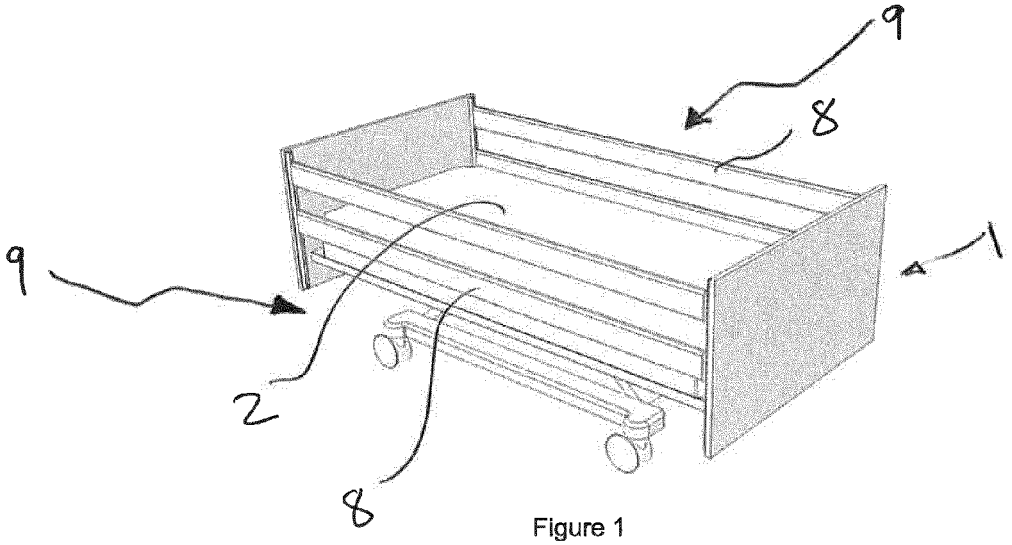


Figure 1

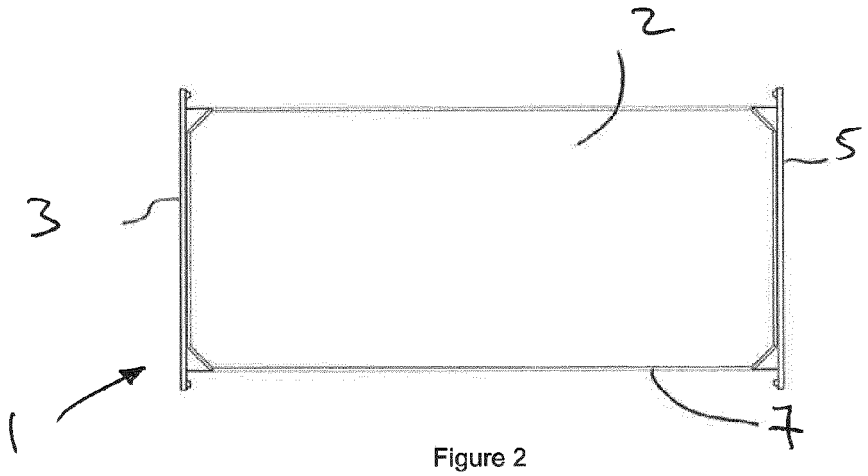


Figure 2

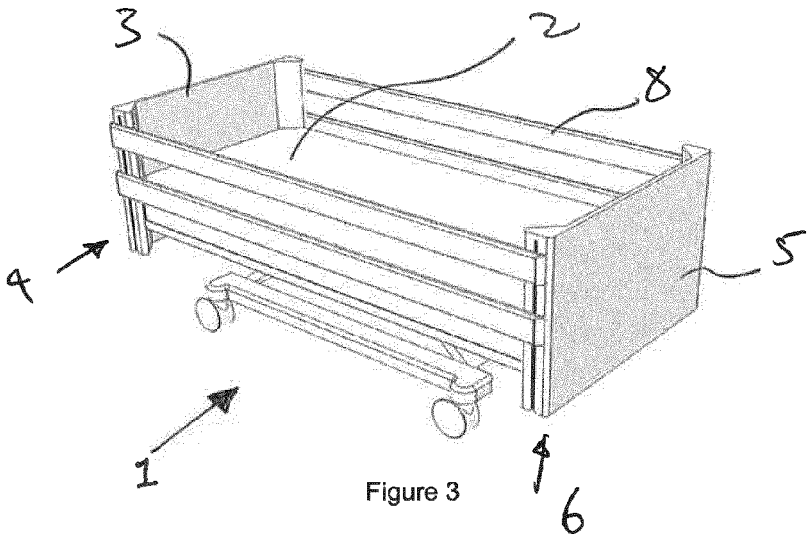


Figure 3

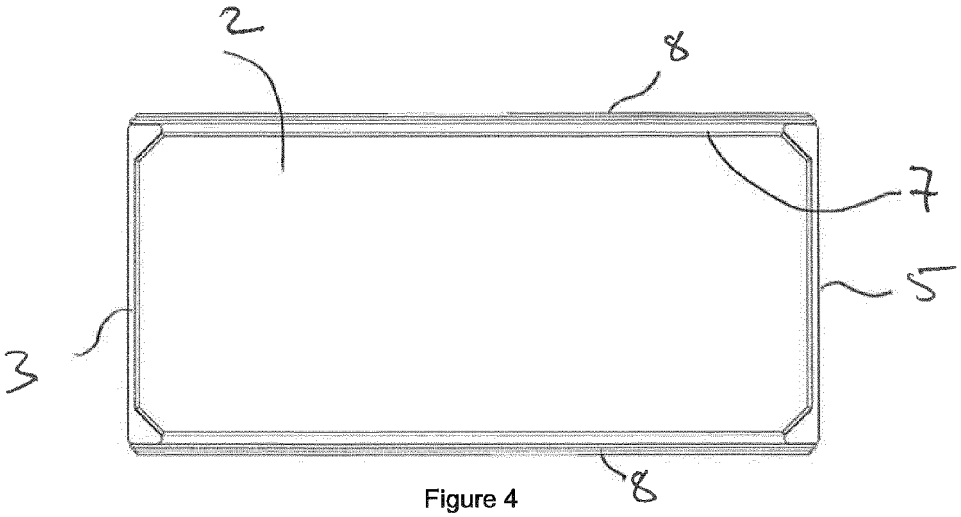
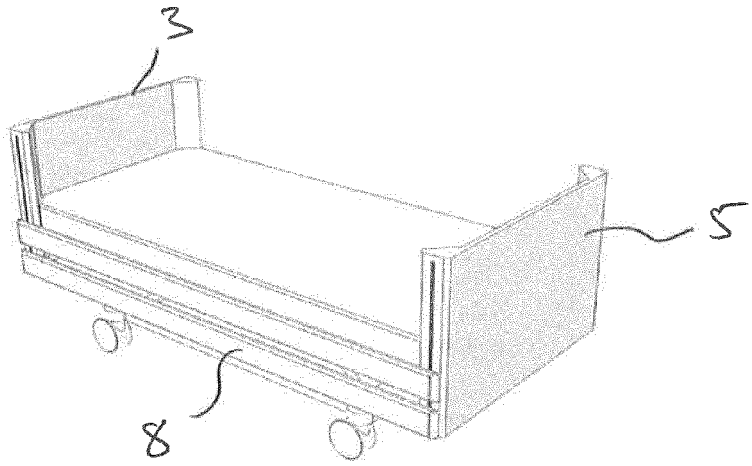


Figure 4



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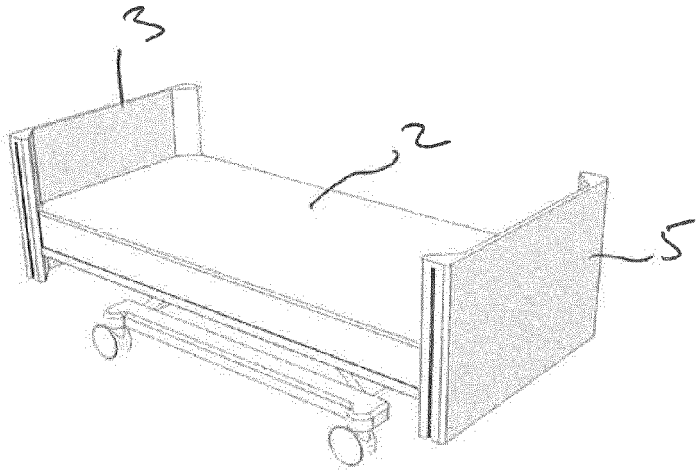

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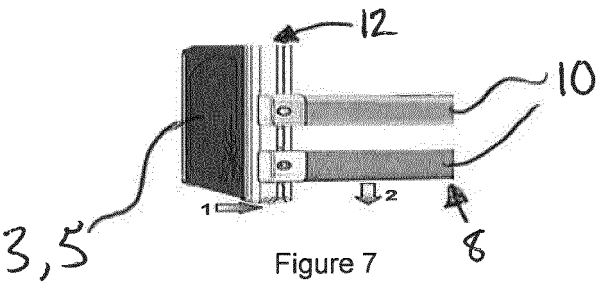

Figure 7

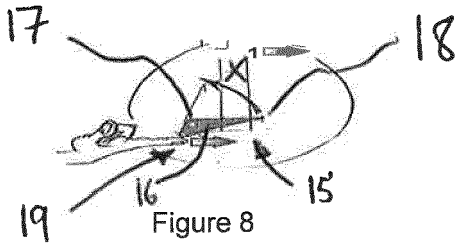

Figure 8

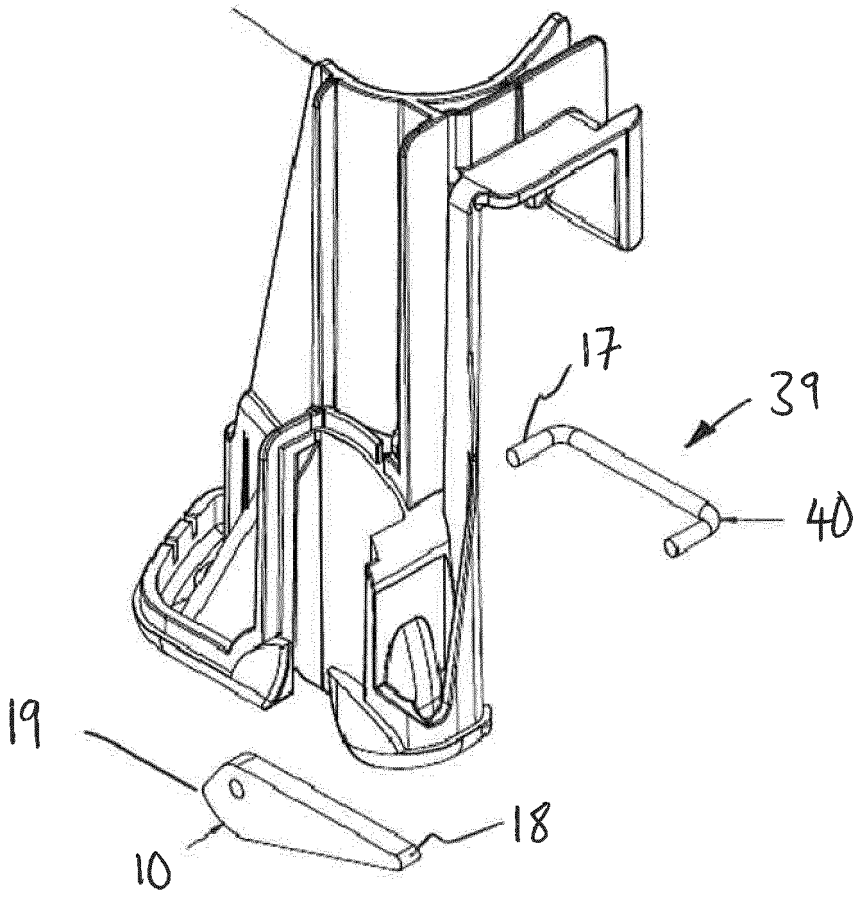

Figure 9

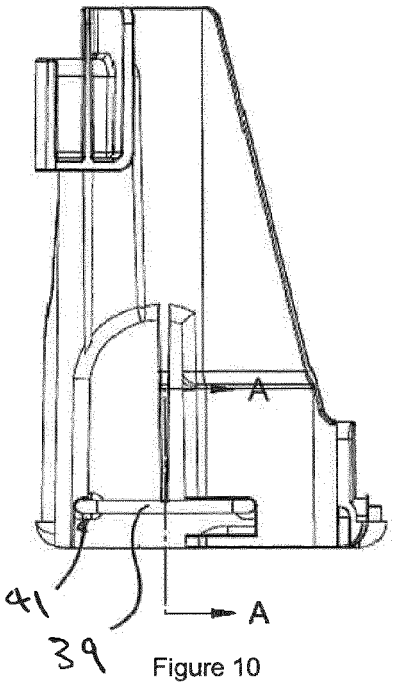

Figure 10

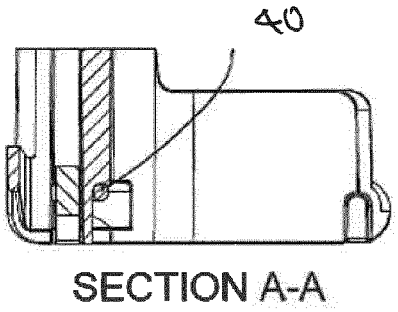

Figure 11

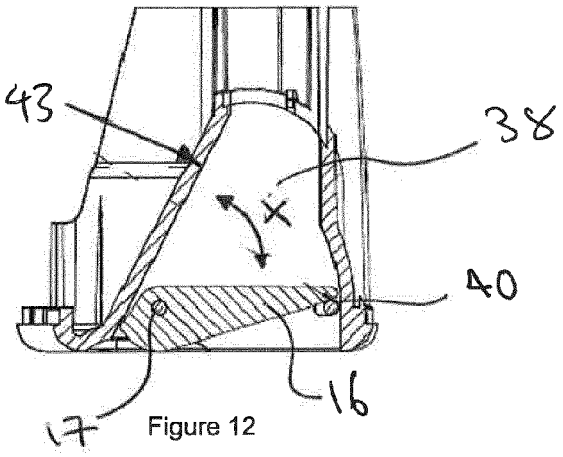

Figure 12

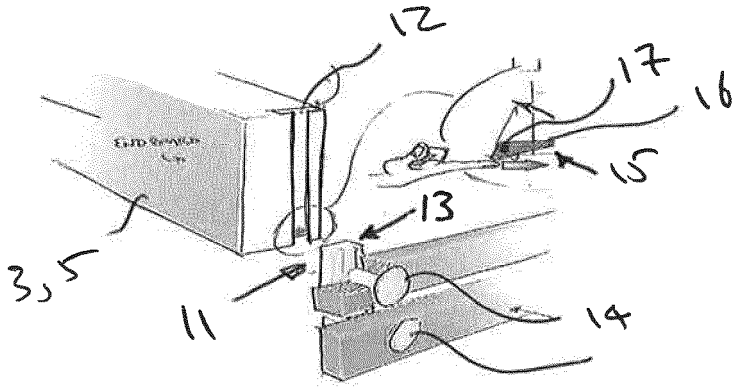

Figure 13

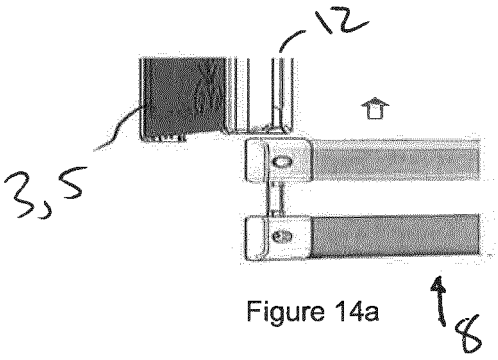

Figure 14a

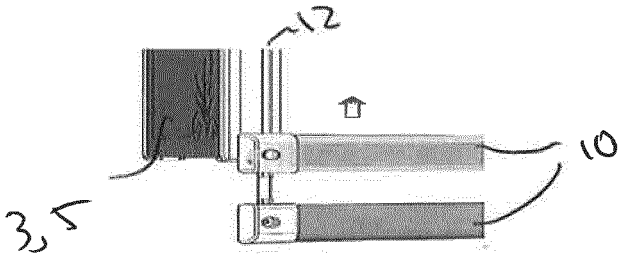

Figure 14b

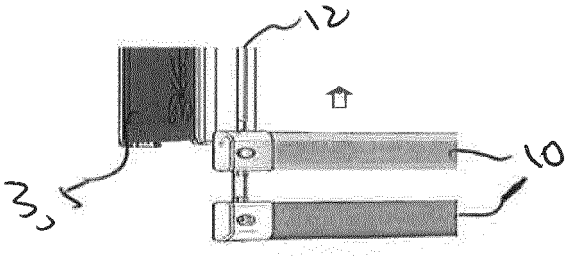

Figure 14c

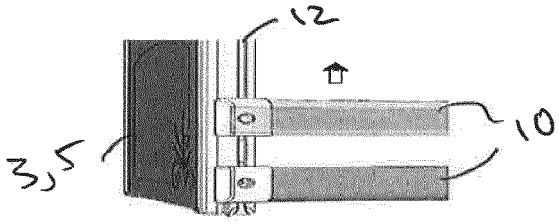

Figure14d

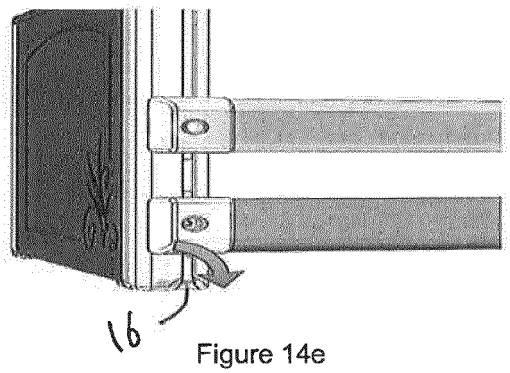

Figure 14e

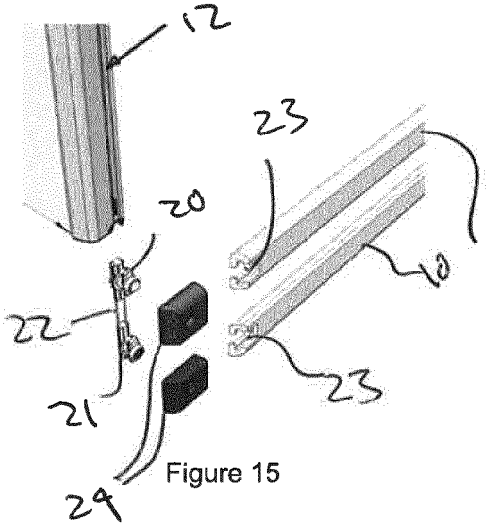

Figure 15

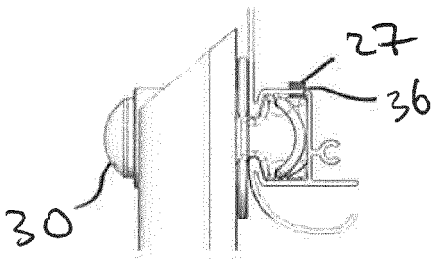

Figure 16

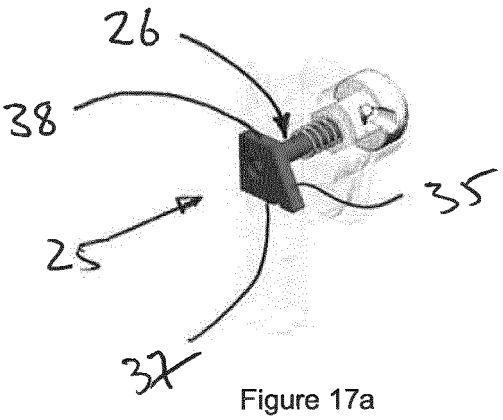

Figure 17a

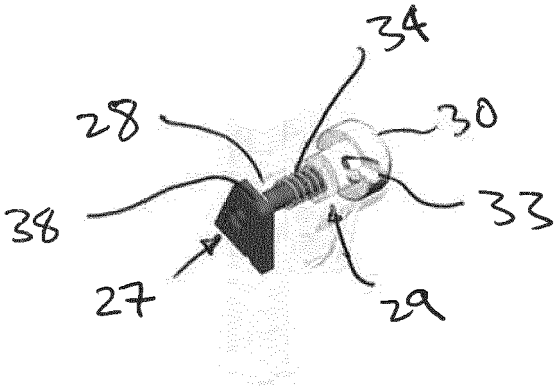

Figure 17b

Figure 17c

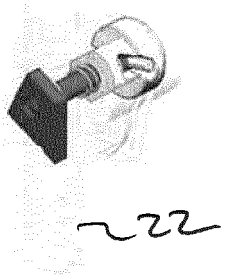

Figure 17d

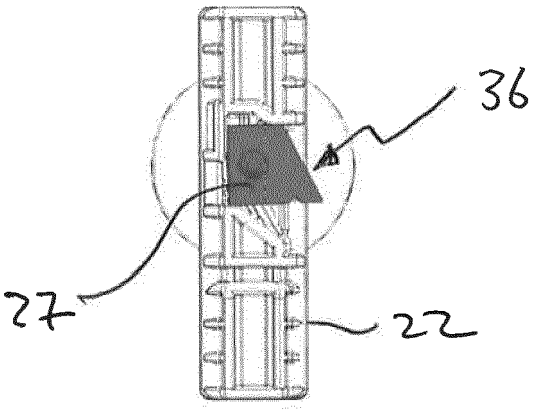

Figure 18a

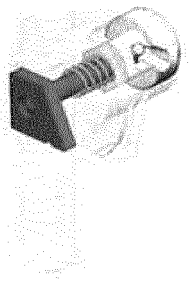

Figure 18b

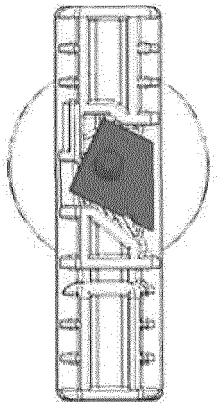

Figure 18c

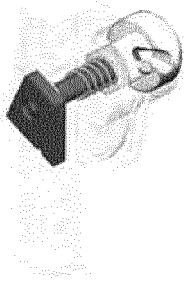

Figure 18d

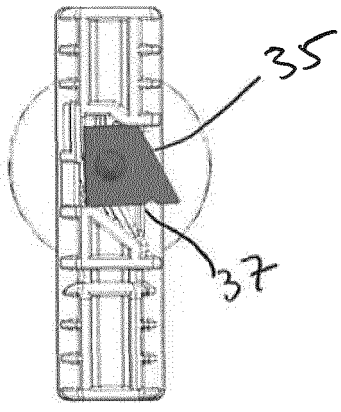

Figure 18e

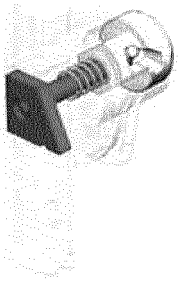

Figure 18f

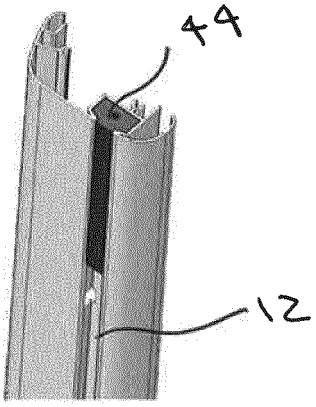

Figure 18g

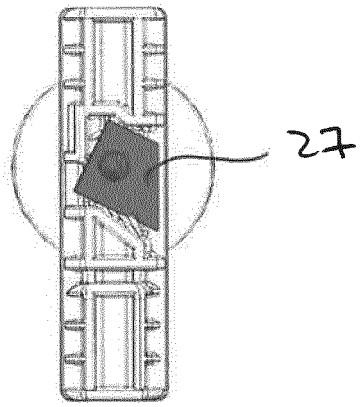

Figure 18h

Figure 18i

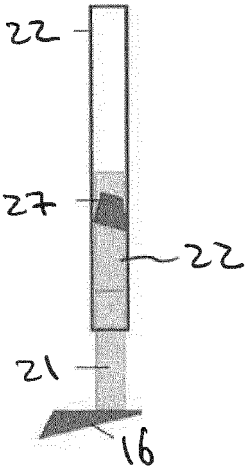

Figure 19a

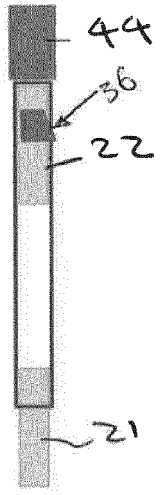

Figure 19b

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EUROPEAN SEARCH REPORT

Application Number
EP 12 16 2698

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 1 714 586 A1 (FLEX EQUIPOS DE DESCANSO SA [ES]) 25 October 2006 (2006-10-25) * paragraph [0017] - paragraph [0019]; figures 1,2 *	1-7,14	INV. A61G7/05
A	BE 873 880 A2 (JOSEPH MERTENS INTERNAT NV) 2 August 1979 (1979-08-02) * page 6, line 3 - line 14; figures 5,6 *	9-13	
A	DE 39 38 377 A1 (WISSNER GMBH [DE]) 13 September 1990 (1990-09-13) * column 4, line 20 - line 37; figures 12,13 *	8,9, 11-13	
			TECHNICAL FIELDS SEARCHED (IPC) A61G A47C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	16 August 2012	Sommer, Jean

CATEGORY OF CITED DOCUMENTS

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16-08-2012

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

REFERENCES CITED IN THE DESCRIPTION

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