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(54) A bed having a raisable back support element

(57) A bed having a raisable back support element (6) comprises a bed framework (2) to which the back support element is pivotably connected by means of a pivot shaft substantially perpendicular to the length direction of the bed. The back support element (6) is at its

portion (20) adjacent the bed framework (2) connected with the bed framework by means of a guiding device (16, 18) so as to guide said portion of the back support element adjacent the bed framework towards the head end of the bed when the back support element is raised.

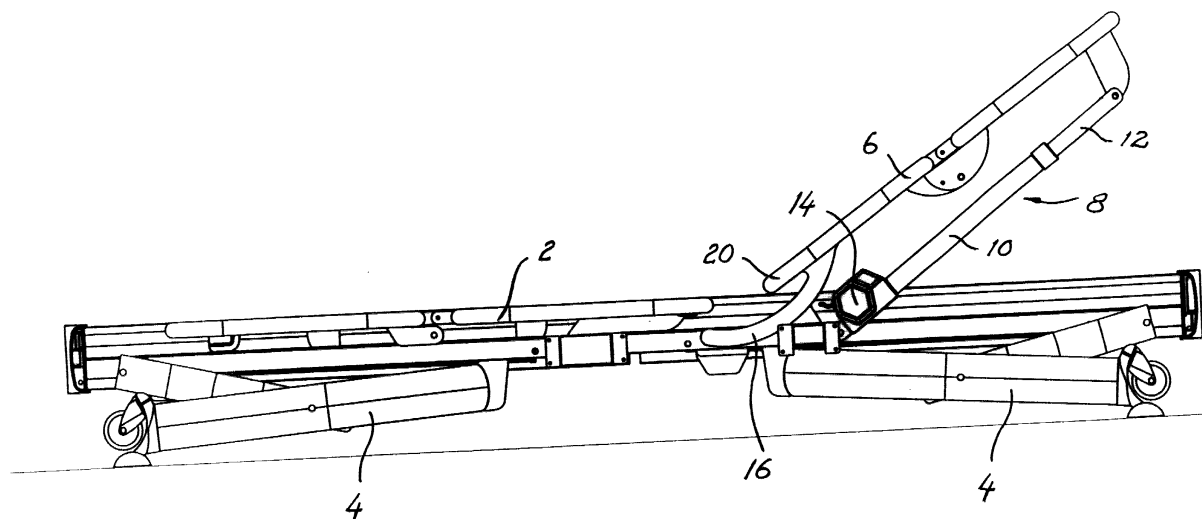


Fig. 1

EP 1 138 227 A2

Description

[0001] The present invention relates to a bed having a raisable back support element.

[0002] Beds of the type home care beds and hospital beds usually have a raisable back support element which makes it possible for the person using the bed to take a more or less raised position in the bed.

[0003] A drawback of previously known beds of this kind is that the back support element while being raised displaces the person using the bed towards the foot end of the bed at the same time as the shoulders of the person are subjected to a downwardly directed force. This is dependent on the fact that the mattress increases the thickness of the raisable back support element and that the surface on which the person rests thereby is at a larger distance from the pivot axle of the back support element.

[0004] The object of the invention is to provide a bed having a raisable back support element wherein the person using the bed is not displaced towards the foot end of the bed when the back support element is raised.

[0005] In order to comply with object the bed according to the invention is characterized in that the back support element is at the portion adjacent the bed framework connected with the bed framework by means of a guiding device for guiding the portion of the back support element adjacent the bed framework towards the head end of the bed when the back support element is raised.

[0006] In order to prevent that the shoulders of the person using the bed are subjected to a downwardly directed force the guiding device of the bed according to the invention is in a preferred embodiment thereof adapted to increase the height of the back support element when this is raised in relation to the bed framework.

[0007] In a preferred embodiment of the bed according to the invention the guiding device comprises an arcuate element which at one end is connected with the portion of the back support element adjacent the bed framework and from the portion connected with the back support element extends arcuately downwards in relation to the lower surface of the back support element and has its opposite end positioned in the plane of the back support element outside the portion of the back support element which is positioned outside the bed framework. It is suitable that the arcuate element is connected with a portion which is firmly connected with the bed framework and which portion engages the arcuate element so as to guide the portion of the back support element adjacent the bed framework against the head end of the bed and perhaps also increase the height of the back support element in relation to the bed framework when the back support element is raised so as to prevent that the shoulders of the person using the bed are subjected to a downwardly directed force.

[0008] It is suitable that the portion which is firmly connected with the bed framework when the back support

element is in lowered position engages the arcuate element adjacent the end thereof connected with the back support element and that the annular element is at the raising of the back support element guided along the portion firmly connected with the bed framework, so that the portion firmly connected with the bed framework in the completely raised position of the back support element engages the opposite end of the arcuate element in relation to the end connected with the back support element.

[0009] In a preferred embodiment of the bed according to the invention the back support element is connected with the bed framework by means of a raising element for raising the back support element, the raising element being pivotally connected with the bed framework as well as the support element and being positioned below the back support element. It is suitable that the raising element is adapted at the raising of the back support element to be elongated between its pivotable connections with the bed framework and the back support element and the raising element is driven by a motor at the raising and lowering of the back support element.

[0010] An embodiment of the bed according to the invention shall in the following be described with reference to the accompanying drawings.

[0011] Fig. 1 shows from the side a bed according to the invention having a half-raised back support element.

[0012] Fig. 2 shows the bed according to Fig. 1 having a completely raised back support element.

[0013] Fig. 3 shows the bed according to Figs 1 and 2 having a completely lowered back support element.

[0014] Fig. 4 shows on an enlarged scale the connection between the back support element and the bed framework.

[0015] The bed shown in Fig. 1 has a bed framework 2 for supporting a mattress, foldable legs 4 and a back support element 6 which is displaceable between a lowered position in which the mattress of the bed is flat and a raised position wherein the person using the bed takes a more or less raised position in the bed. In Fig. 1 the back support element 6 is shown in a half-raised position.

[0016] In previously known beds having a raisable back support element the raising of the back support element provides because of the thickness of the mattress that the person using the bed is displaced towards the foot end of the bed and is at the same time subjected to a downwardly directed force on the shoulders.

[0017] The raising of the back support element 6 is provided by means of a raising element 8 consisting of a pipe shaped element 10 and a rod 12 displaceable therein. The raising element 8 is driven by means of a motor 14 having a worm gear driving a rotatable screw in the pipe shaped element 10, the rotatable screw being connected with the rod 12 in such a way that the rod 12 is displaced out from the pipe shaped element 10 or is moved into the element 10 when the back support element 6 shall be raised or lowered. Thus, when the rais-

ing element 8 is elongated the back support element is raised while a reduction of the length of the raising element 8 provides for a lowering of the back support element 6.

[0018] In order to prevent that the person using the bed according to the invention at the raising of the back support element 6 is displaced against the foot end of the bed and is subjected to forces exerting a downwardly directed force on the shoulders, the back support element 6 is connected with the bed framework 2 by means of two arcuate element 16 positioned at opposite sides of the back support element 6. The arcuate elements are at one end connected with the back support element 6 at the end 20 thereof adjacent the bed framework 2 and are as is more clearly shown in Fig. 4 connected with the bed framework by means of bearings 18. The bearings 18 cooperate with the inner surfaces of the arcuate elements 16 which in section are U-shaped. The bearings 18 are preferably constituted by sliding bearings but can also be constituted by another type of bearings, for example ball bearings.

[0019] When the back support element 6 is raised by means of the raising element 8 which is elongated at the raising, the end 20 of the back support element 6 adjacent the bed framework 2 is guided towards the head end of the bed by the cooperation between the arcuate elements 16 and the ball bearings rotatably connected with the bed framework 2. This provides that the person using the bed is not displaced against the foot end of the bed. The shoulders of the person are not either supported to any pressing force at the raising of the back support element 6.

[0020] As appears from Fig. 2 the back support element 6 takes in its completely raised position at the end 20 adjacent the bed framework 2 its largest distance from the foot end and its most upward position in relation to the framework 2.

[0021] In the lowered position of the back support element 6 according to Fig. 3 the back support element 6 is in plane with the rest of the lying surface of the bed at the same time as the end 20 of the back support element 6 is closest to the foot end of the bed.

[0022] The invention can be modified within the scope of the following claims.

Claims

1. A bed having a raisable back support element (6), comprising a bed framework (2) to which the back support element is pivotably connected with a pivot axle which is substantially perpendicular to the length direction of the bed, **characterized in that** the back support element (6) is at its portion (20) adjacent the bed framework (2) connected with the bed framework by means of a guiding device (16, 18) for guiding said portion (20) of the back support element towards the head end of the bed when the

back support element is raised.

2. A bed as claimed in claim 1, **characterized in that** the guiding device (16, 18) is adapted at the raising of the back support element (6) to move this upwards in relation to the bed framework (2).
3. A bed as claimed in claim 1 or 2, **characterized in that** the guiding device comprises an arcuate element (16) which at one end is connected with the portion (20) of the back support element (6) adjacent the bed framework (2) and from the end connected with the back support element extends arcuately downwards in relation to the lower surface of the back support element and has its opposite end positioned in the plane of the back support element outside the portion of the back support element connected with the bed framework and that the arcuate element (16) is connected with a part (18) attached to the bed framework and engaging the arcuate element so as to guide the part of the back support element adjacent the bed framework towards the head end of the bed and possibly upwards in relation to the bed framework (2).
4. A bed as claimed in claim 3, **characterized in that** the part (18) attached to the bed framework (2) when the back support element is in its lowered position engages the arcuate element at the end thereof attached to the back support element (6) and that the arcuate element is at the raising of the back support element guided along the part (18) attached to the bed framework so that said part in the completely raised position of the back support element engages the end of the arcuate element opposite to the end thereof connected with the back support element.
5. A bed as claimed in claim 3 or 4, **characterized in that** the guiding device comprises two arcuate elements (16) positioned at opposite sides of the back support element (6).
6. A bed as claimed in any of claims 3-5, **characterized in that** the part attached to the bed framework (2) comprises bearings (18) engaging the arcuate element (16) or the arcuate elements (16).
7. A bed as claimed in any of the preceding claims, **characterized in that** the back support element (6) is connected with the bed framework (2) by means of a raising element (8) for raising the back support element, the raising element (8) being positioned below the back support element and being pivotally connected with the bed framework (2) as well as with the back support element (6).
8. A bed as claimed in claim 7, **characterized in that**

the raising element (8) is adapted at the raising of the back support element to be elongated between its pivotably connections with the bed framework (2) and the back support element (6).

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9. A bed as claimed in claim 7 or 8, **characterized by** a motor (14) for driving the raising element for raising and lowering the back support element (6).

10. A bed as claim in claims 7-9, **characterized in that** the raising element (8) comprises a pipe shaped element (10) and a bar shaped element (12) received therein and that the bar shaped element (12) is connected with the motor (14) by means of a rotatable screw for by means of the motor being displaced out from and into the pipe shaped element (10) at the raising and the lowering of the back support element (6).

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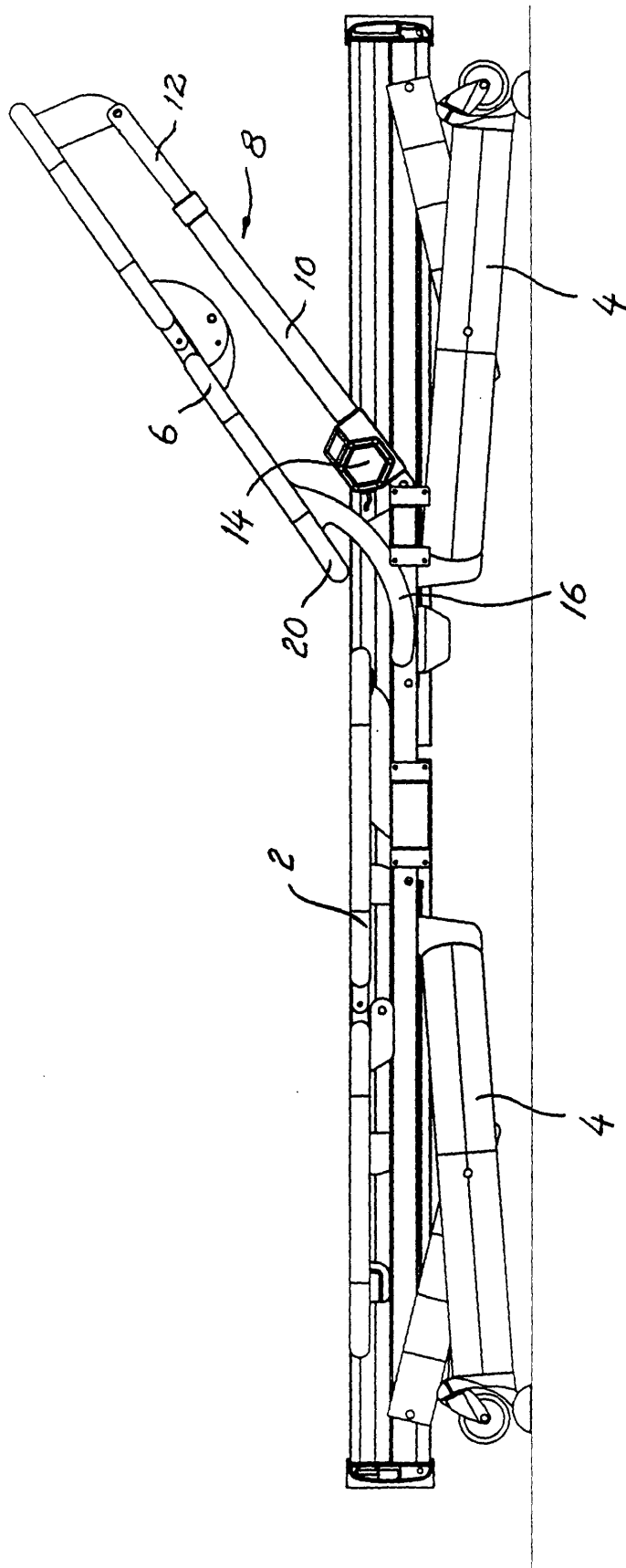


Fig. 1

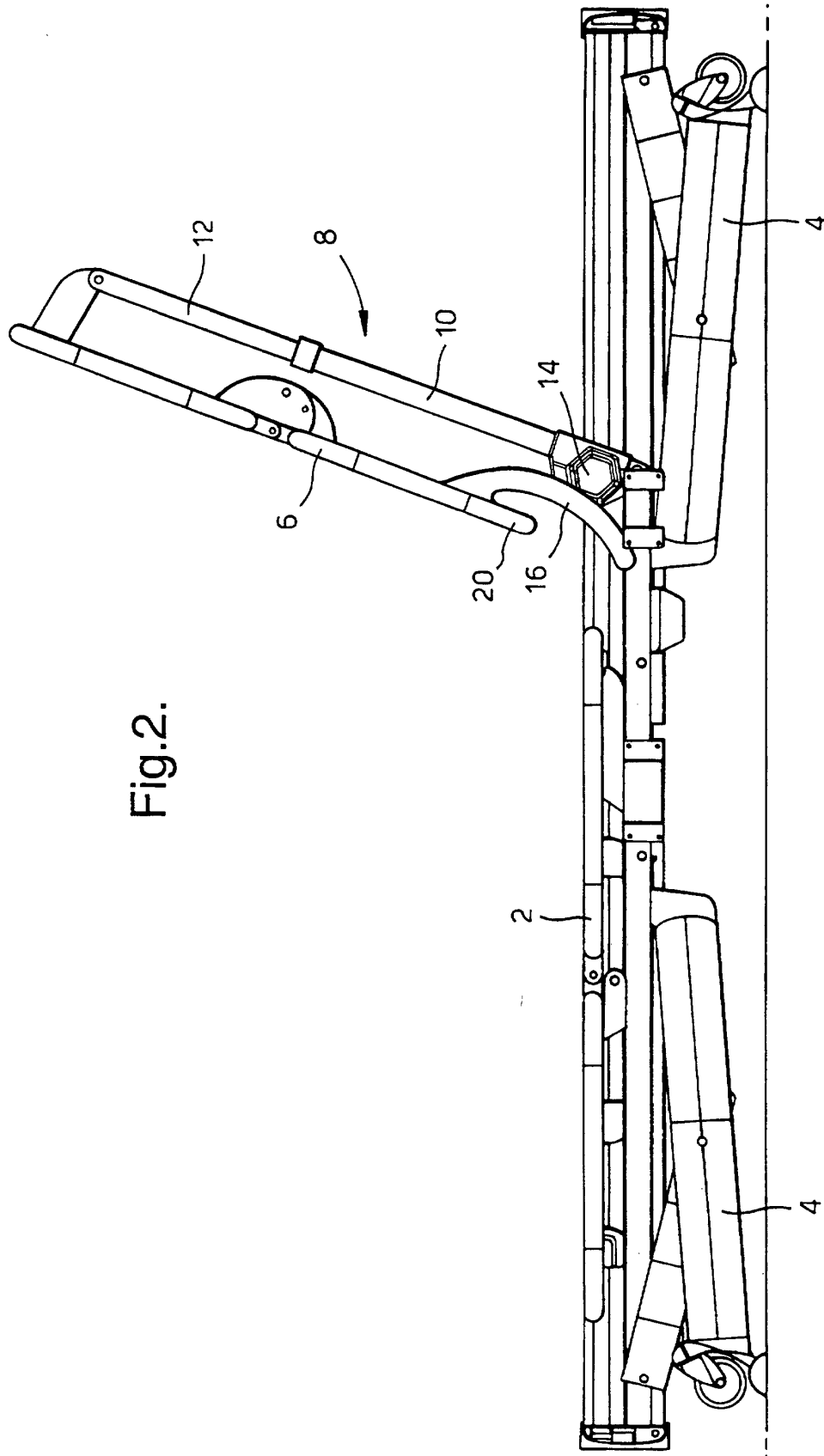


Fig.2.

Fig.3.

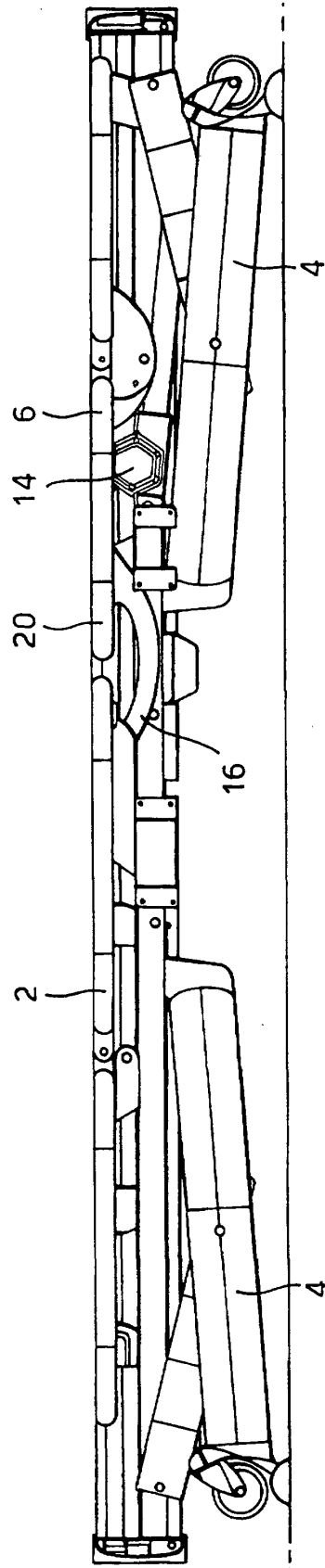


Fig.4.

