

[54] **TURNOVER BED ASSEMBLY**

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[21] Appl. No.: 181,092

[57] **ABSTRACT**

- [52] U.S. Cl. .... 5/61, 5/63
- [51] Int. Cl. .... A47c 3/32, A61g 7/10
- [58] Field of Search ..... 5/60-63, 81 R

A turnover bed assembly, having two parallel but relatively movable mattresses movably supported on a rotationally movable carrier frame. An invalid who is lying on the lower mattress, and who wishes to change position from face-down to face-up to the other position, is strapped to that mattress; then the assembly is rotated a quarter-revolution, and his mattress is supported for movement towards the other mattress. Then a succeeding quarter-turn positions him in his desired position-changed position on the other mattress.

[56] **References Cited**

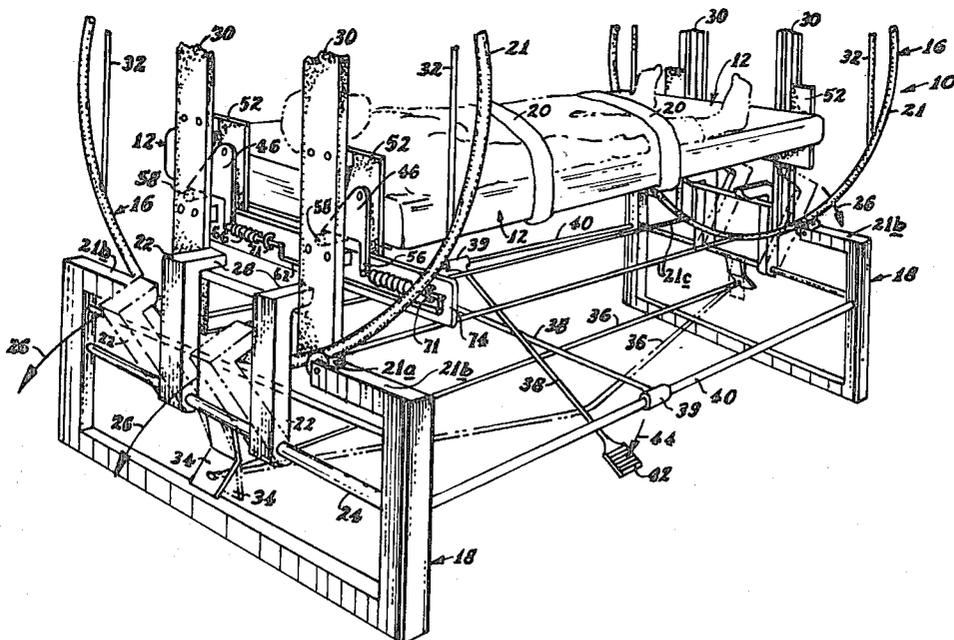
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9 Claims, 9 Drawing Figures





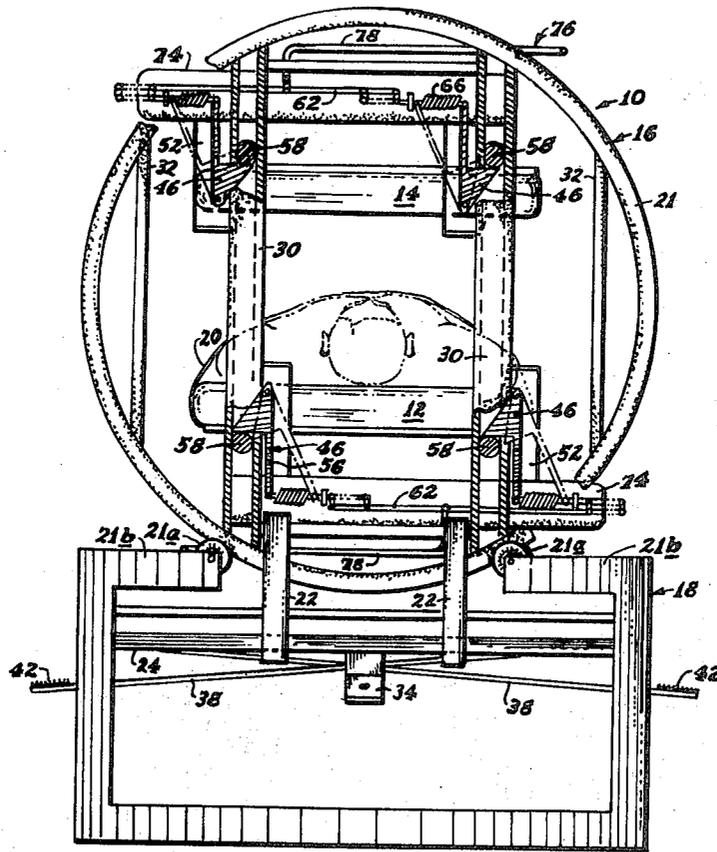


Fig. 2

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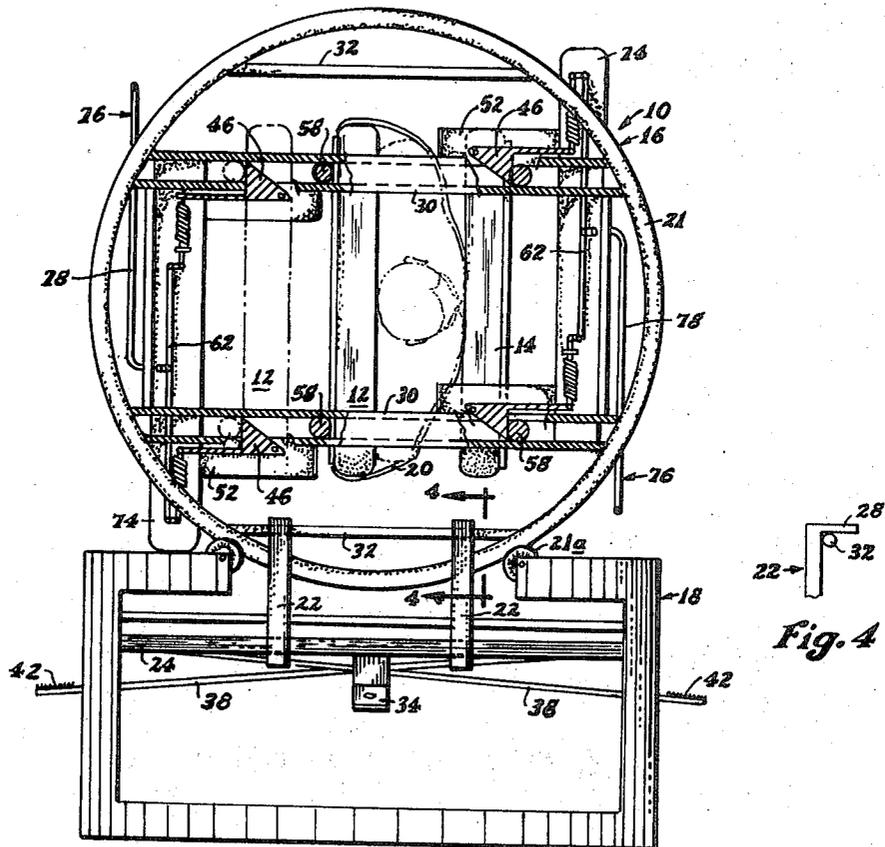


Fig. 3

Fig. 4

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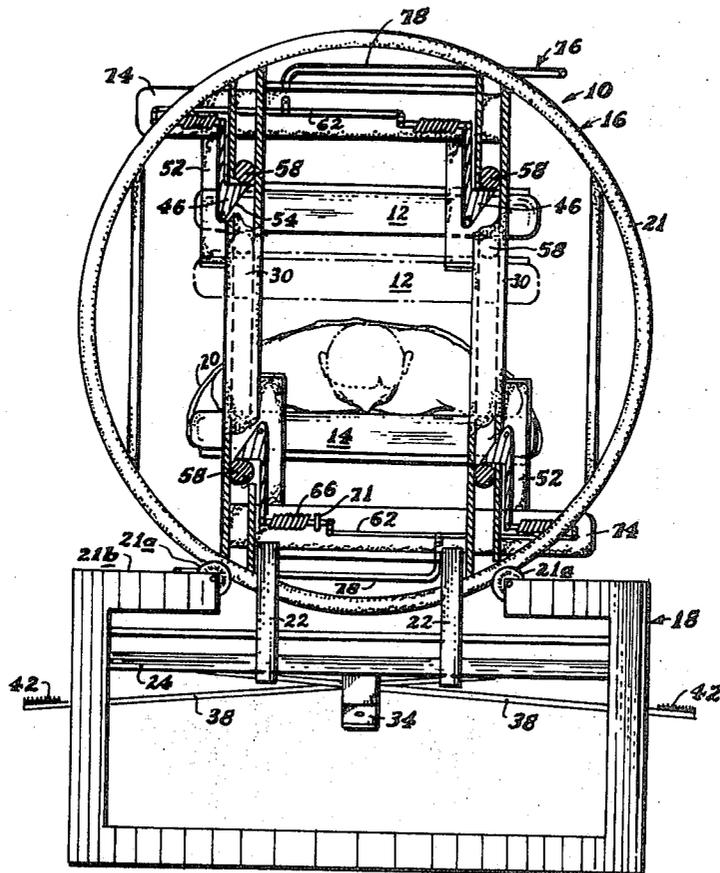


Fig. 5

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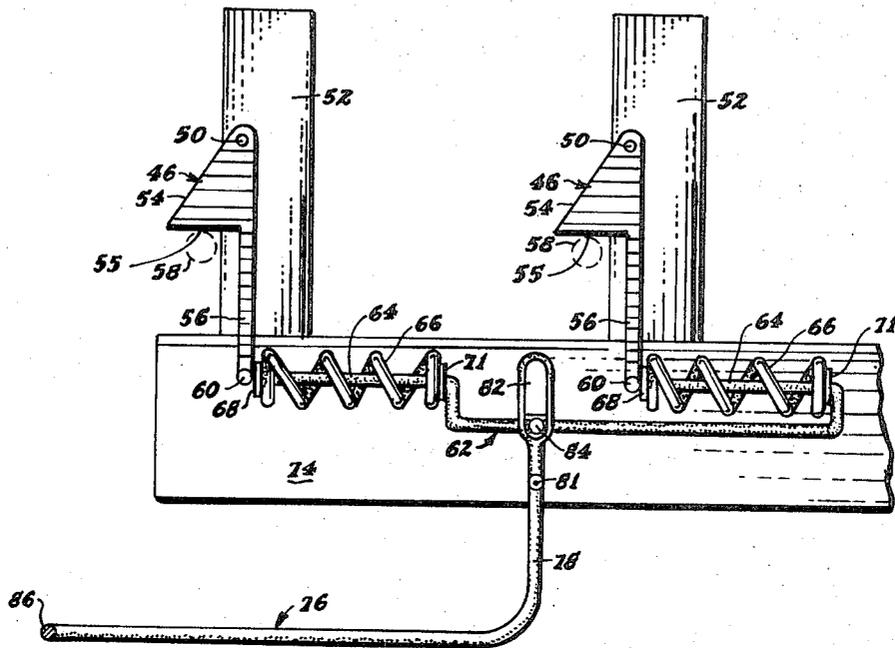


Fig. 6

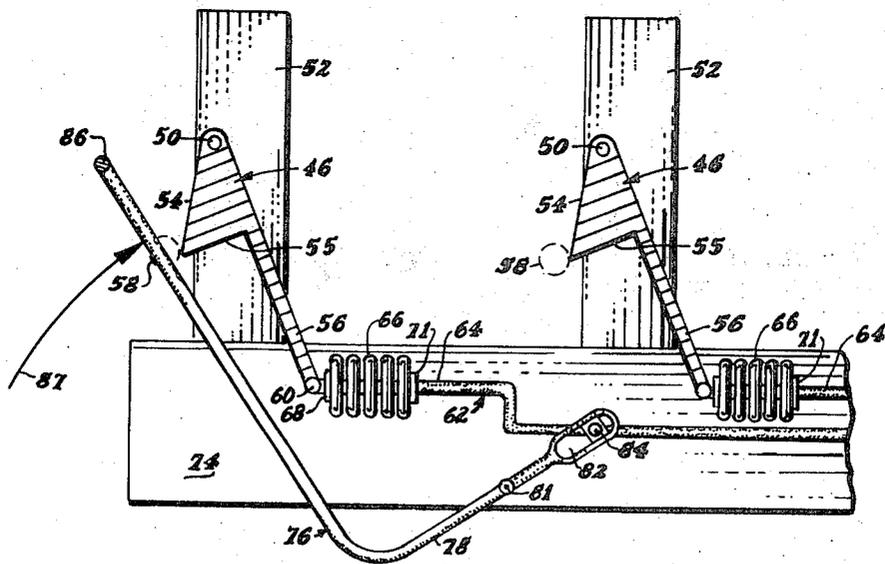


Fig. 7

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### TURNOVER BED ASSEMBLY

This invention relates to a turnover bed assembly, particularly useful as in hospitals or nursing homes where an invalid must be assisted in changing his position from face-up to face-down and vice versa.

The care by hospital and nursing home personnel is of course relatively expensive; and in spite of the great expense, many invalids and semi-invalids must be kept in such institutions just for the reason of difficulty of changing the person's position of bed-rest. Accordingly, an important advantage of the present invention is that it permits and provides a handy yet effective way of changing an invalid's bed-rest position, even by a single and untrained attendant, saving the cost and inconvenience of institutionalized care.

Another advantage of the inventive concepts is the provision of a turnover bed whereby an invalid need not undergo long periods of unrest waiting for more than a single attendant to become available to assist in the position-changing task.

The inventive concepts further provide the advantage of a turnover bed which is relatively convenient to operate, not unduly frightening, and which permits the invalid turnover with specific limbs specifically supported thus minimizing chance of aggravation of limb-injury.

A further advantage of the inventive concepts is that it provides a turnover bed which requires no significant strength to operate or to manually turn an invalid over, thus further rendering possible the bed care at home by relatively weak family members, by female nurses, etc.

The inventive concepts provide a turnover bed assembly embodying two parallel mattresses. These are movably supported on a frame, that is they are movable relative to one another and to the frame. The frame itself is movable, it being revolvable upon a base. Latches maintain the position of each mattress relative to the frame and the frame relative to the base.

In use, an invalid who is lying on the lower mattress, and who wishes to change position from face-down or face-up to the other position, is strapped to that mattress; then the assembly is rotated a quarter-revolution, and his mattress is supported for movement towards the other mattress. Then a succeeding quarter-turn positions him in his desired position-changed position on the other mattress.

The above description is rather generalized and of introductory nature. More specific details and features of the inventive concepts are set forth more fully in the following description of an illustrative embodiment, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a pictorial view generally of the lower portions of a turnover bed, according to an embodiment illustrative of the concepts of the present invention, certain portions which are shown in other Figures being omitted to avoid obscuring of other details;

FIG. 1a and FIG. 1b are schematic end views, on a very small scale, illustrating relative movement of the two mattress units and a spring and link mechanism which urges the mattress units to spaced-apart relative position;

FIG. 2 is an end view of the turnover bed, the parts being in the rest position in which the user has been lying, a user shown as lying on his back on the lower mattress in a preliminary strapped-down position, as in

FIG. 1, prior to his being turned over to a subsequent face-down position;

FIG. 3 is an end view similar to FIG. 2, but with the parts shown in an intermediate or turning-over position in which the invalid is in an intermediate on-the-side position prior to the movement being completed by his being turned to a face-down position; and in chain lines the mattress is shown in a position preliminary to that shown in the solid lines; and

FIG. 4 is a fragmental or detail view as taken by view-line 4-4 of FIG. 3;

FIG. 5 is an end view similar to FIGS. 2 and 3, but with the parts shown in the position subsequent to that of those Figures, here in FIG. 5 showing the parts in the completely turned-over position with reference to FIGS. 1 and 2, the invalid now having been turned to the face-down position; and in this FIG. 5, the full lines show the earlier-mentioned mattress in a fully retracted position, the chain-line representation thereof showing it in a position of intermediate or partial retraction;

FIGS. 6 and 7 are views of one of the latch mechanisms which control stability and movability of each mattress unit with respect to the movable frame.

(In the drawings, certain components are shown only fragmentally or as broken away or omitted, for clarity of presentation of other features or details in that drawing.)

As shown in the drawings, a roll-over bed 10 is shown comprising as its largest or most conspicuous details, a pair of mattress units 12 and 14 supported on a movable frame 16, the mattresses 12-14 and the frame 16 being supported on a base 18. Each of the mattresses has straps 20 for a purpose of securing the person or invalid to that particular mattress during a position turnover procedure detailed herein.

Support of the frame 16 is shown by its having at each end a large circular frame-member 21 which is rotatably supported by bearings 21a on a top piece 21b of the base 20. The circular end-frames are interconnected by longitudinal frame members 21c.

A latch means for the frame 16 (controlling its stability and movability with respect to the base 18) is shown at each end of the bed 10, each having a pair of L-shaped latch members 22, which as shown in FIG. 1, are rotationally movable, about a shaft 25 to which they are rigidly connected (see movement arrows 26 in FIG. 1) between a latching (full-line) position and a retracted or non-latching position (shown in chain lines). In the latching position, the upper legs 28 of latch members 22 abuttingly engage the side face of rails 30 of the movable frame 16, when the frame 16 is in its position (FIGS. 1, 2, and 5) in which the mattresses 12-14 are horizontal; and those latch-legs 28 abuttingly engage a support bar 32 of the frame 16 when the frame 16 is in its 90°-turned position (FIG. 3) in which the mattresses 12-14 are vertical.

Thus in either the mattresses-horizontal or the mattresses-vertical position of the frame 16, the latches 22 releasably maintain stability of frame-position, it being noted that the rails 30 and support bars 32 are perpendicular to one another.

Release-actuation for the frame-latches 22 is shown (FIG. 1) as by a downwardly extending actuator arm 34 rigidly connected to each of the latch-shafts 24. (In FIG. 1, its full-line showing corresponds to the latched-position full-line showing of the latch members 22; and

its chain-line showing in that view corresponds to the latch-withdrawn chain-line showing thereof.)

A longitudinal latch-control cable 36 interconnects the latch-actuation arms 34 at the ends of the frame 16; and this cable 36 is shown in FIG. 1 as engaged by the central portion of each of two latch-actuator pedals 38, both lying transversely of the bed 10, and each pivoted at one of its ends 39 to a longitudinal rod 40 of the base 18, and the other or free end of each having a foot-plate 42. (The full-line and chain-line showing (FIG. 1) of cable 36 corresponds respectively to such latch-engaged and latch-released showings of latches 22 and arms 34 in FIG. 1.)

Latch actuation of latches 22 is thus seen in FIG. 1 to be by the patient's attendant pressing his foot downward (as by motion arrow 44) onto the foot-plate 42 of either pedal 38. This imparts a tension onto cable 36, in turn pulling inwardly on both actuation-control arms 34, and thus forcing the latch members 22 outwardly (26) due to the torque exerted onto each of the shafts 24.

Other components will be described in connection with an illustrative use of the bed 10, in a procedure in which the invalid who has been lying on his back wishes to be turned to a face-down position.

In FIG. 2, it will be observed that the mattress 14, not being used, is shown as parallel to the mattress 12 being used but spaced therefrom. (The spacing is not critical, it is desired that it be sufficiently far to not only accommodate the invalid between the mattress units 12-14, but also desirably to avoid being annoying or bothersome to the invalid, for it stays in that suspended position during the invalid's position (FIGS. 1 and 2) of lying on the other mattress 12, yet the spacing is desirably not so great as to cause too much bulk of overall structure.)

Suspension of the upper or non-used mattress 14 is shown as by latch members 46. It should be emphasized, to minimize confusion by particularly distinguishing these latch members 46 from latches 22, that these latch members 46 control stability and movability of each mattress unit 12-14 with respect to the frame 16, in contrast to the aforesaid latch members 22 controlling stability and movability of the frame 16 with respect to the base 18.

Moreover, for more ready understanding, it is pointed out that when observing the more detailed showing of the latch members 46 in FIGS. 6 and 7, it should be remembered that the latch members 46 as shown in those Figures are in the position as there shown only when the respective mattress unit 12-14 is in its horizontal position supporting the invalid above the mattress, such as the mattress 12 in FIGS. 1 and 2, and also the mattress 14 in FIG. 5, in contrast to the relatively inverted position of the latch members 46 in connection with the mattress (12 or 14) then being suspended thereabove; and thus, in considering the suspended-mattress function of latches 46, that is in connection with whichever of the mattress units 12-14 happens to be the upper or unused one at any given time, the reader may wish to consider FIGS. 6 and 7 as inverted, for in the mattress-suspending role, the frame 16 is in such a position that the mattress-suspending latches 46 are inverted from the position shown in FIGS. 6 and 7.

The operation and conceptual details of the latches 46, as to the uppermost mattress unit 12-14, are seen

in FIGS. 2, 5, 6, and 7 as having a rotatable latch member 48, rotatably pinned as at 50 to a support plate 52 of the frame 16, and having an inclined face 54 adjacent to and leading to a supporting edge 55, and a control arm 56. The functions of these are now explained.

In the frame-position in which the latches 46 support the mattress 12-14, for example in FIG. 2 in the frame-position in which the upper latches 46 are supporting the mattress unit 14 and in the fully inverted position of latches 46 from that shown in FIG. 6, the supporting edge 55 of the respective latches 46 is horizontal, facing upwardly rather than in downward-facing position shown in FIGS. 6 and 7; the support edge 55 in this upwardly facing position provides a support for longitudinal frame-bars 58 of the mattress units 12-14, latchingly supporting the respective frame-unit 12-14.

The other latches 46 (for the lower mattress 12-14) are likewise in a position such that the latch-supporting edges 55 are horizontal; and although in the mattress-horizontal position of the lower mattress those latches 46 are of course not needed to assist gravity in holding down the lower mattress (12 in FIGS. 1 and 2, and 14 in FIG. 5), just as soon as the frame 16 is begun to be rotated (FIG. 3) the latches 46 (left ones in FIG. 3) associated with the patient-occupied mattress 12 do hold that mattress unit (12) stationary relative to the frame 16 until the attendant releases those latches 46, as explained below.

Co-ordinated and simultaneous release of all of the four latches 46 relating to any one of the two mattress units 12-14, that is both the latches 46 adjacent each end of the frame 16, is provided as follows: The end of the latch control arms 56 is rotatably pinned as at 60 (FIGS. 1, 6 and 7) to a link 62 of an elongated U-shape such that its portion 64 adjacent each connection 60 is on the lateral side of the control arm 56 opposite that of the inclined face 54 of the latch 46.

A latch spring 66 of compression type surrounds each of the link portions 64; and one end of spring 66 bottoms against an abutment disk or washer 68 adjacent the connection 60, and the other end of the spring 66 bottoms against an abutment 71 secured to a frame piece 74.

Latch-release operativity of latches 46 is thus against the compression bias of the springs 66, noting the difference between FIGS. 6 and 7, and the differences relating to the full-line and chain-line showings of the latches 46 in FIG. 2.

The actuation to achieve the co-ordinated and simultaneous latch-release of all the latches 46 relating to any one of the mattress units 12-14 is also achieved in part by a single control rod 76 which extends longitudinally of the frame 16. This control rod 76, (see FIGS. 6 and 7) has its end portions 78 out-turned and pivoted at 81 to the fixed plate 74 (fixed to the frame 16, that is).

The extreme end of rod portions 78 is provided with an elongated opening 82 which receives an abutment lug or pin 84 fixed to the aforesaid link 62; and the arrangement provides that a pushing actuation to the longitudinal portion 86 of the control rod 76 pivots its end-ports 78 about the respective one of the pins 81 (which are on a common axis although at opposite ends of the frame 16); and this in turn acts through the respective lugs 84 to move the latch-rod 62 transversely of the frame 16 (rightward in FIG. 7 in contrast to FIG. 6) in a direction to withdraw the latch-support edge 55

from abutting engagement with the mattress frame-piece 58. This permits (FIG. 7) the frame-piece 58 to clear the latch-edge 55. This latch-release is apparent in FIG. 7, and by its release-motion indicating arrow 87.

Conversely, to effect a latching of mattress unit (12 or 14) to the frame 16, all four of the latches 46 are automatically latched by pushing the mattress 12 or 14 in the direction opposite the other mattress; and in such an actuation the mattress frame pieces 58 engage the inclined face 54 of the respective latches, causing a camming force against the latch 46 which is accompanied by a compression of springs 66, until the frame-piece 58 clears the inclined edge 54, whereupon the spring 66 (acting through the respective latch-arm 56) causes the latch 46 to snap back to the FIG. 6 position in which the latch-edge 55 serves as a latched abutment which holds the respective mattress unit 12-14 fixed relative to the frame 16.

A spring mechanism also is provided (FIGS. 1a and 1b) which counter-acts the weight of the upper mattress, providing safety in case the retaining latches 46 of the upper mattress unit be accidentally released, and also retarding and resisting movement of either mattress unit 12-14 toward the other.

This spring mechanism is shown (FIGS. 1a and 1b) as a transversely extending spring 88 adjacent each end of the frame 16; and the opposite ends of the spring 88 are each connected to a pin 90 which is pinned to one end of each of two arms or links 92, the other ends of which are pivotally linked to the previously mentioned longitudinal frame-bars 58.

Contrasting FIG. 1a from FIG. 1b, it will be observed that the spring mechanism involving the springs 88 thus biases the mattress units 12-14 to spaced-apart condition; for the adjacent arms or links 92 are outwardly bowed even when the mattress units 12-14 are in fully-apart condition (FIG. 1a), and the bringing of the mattress units 12-14 relatively closer (FIG. 1b) acts to increase the tension in the spring 88, thus biasing the mattress units to spaced-apart relative position.

Continuing with the patient-turnover procedure or operativity, after the attendant has released latches 22 by pressing on the pedal foot-plate 42 he rotates the frame 16 approximately 90° (clockwise in FIG. 2), from the patient-upward position (FIG. 2) to the patient-sideways position (chain lines in FIG. 3).

Next, or even before the frame has rotated a full 90°, the attendant manually manipulates the longitudinal rod 86 of control rod 76 of the latch assembly 46 relating to the mattress unit (12) to which patient is supported, and causes that mattress unit (12) to move against the spring tension or bias of springs 88, and with the mattress bars 58 being supported in rails 30, to the full-line showing of mattress unit 12 in FIG. 3; and in this position the patient has come into facing engagement with the other mattress unit 14. (That mattress unit 14 has remained latched to frame 16 by its own latches 46, they being independent from the corresponding latches 46 of mattress unit 12.)

Next, the attendant continues the rotation in the same direction (clockwise from FIG. 3) another 90° to the patient-downward position shown in FIG. 5; and the straps 20 of mattress unit 12 are released.

The patient is now lying face-down on mattress unit 14; and the spring tension of springs 88 causes the non-used mattress unit 12, as guided by the support of

frame-rails 30 for the mattress bars 58, to go to its upwardly retracted position, through its chain-line position to its full-line position in FIG. 5. In such movement (perhaps the action of the springs 88 being assisted by the attendant pushing mattress unit 12 upwardly), the engagement of mattress bars 58 against the inclined faces 54 of its latches 46 causes those latches 46 to temporarily yield to permit the mattress unit 12 to become latched, as shown in FIG. 5.

The converse procedure will obviously achieve a return of the patient to his facing-upward position of FIGS. 1 and 2, just as conveniently, and with the ease of patient-turnover which permits patient care by the convenient and low-strength procedure described above, and with maximal support of certain injured body-portions during the patient-turnover procedure.

It is thus seen that a turnover bed according to the inventive concepts provides a desired and advantageous device, achieving the several advantages of convenience, ease and economy of patients' care, patient comfort; etc., as mentioned in this specification, achieving the operativity advantages therein mentioned.

Accordingly, it will thus be seen from the foregoing description of the invention according to this illustrative embodiment, considered with the accompanying drawings, that the present invention provides a new and useful turnover bed for invalids, having desired advantages and characteristics, and accomplishing its intended objects, including those hereinbefore pointed out and others which are inherent in the invention.

Modifications and variations may be effected without departing from the scope of the novel concepts of the invention; accordingly, the invention is not limited to the specific embodiment or form or arrangement of parts herein described or shown.

What is claimed is:

1. A turnover bed assembly, comprising:

a pair of mattress units;  
a frame;  
a base;

the mattress units being supportingly connected to the frame in such a manner that each is movable relative to the frame;

means for securing a person to each of said mattress units during bed turnover regardless of which mattress unit he is lying upon at the beginning of such turnover;

latch means being provided for interengaging between each of said mattress units and said frame for respectively holding each said unit in a specific position relative to said frame and in which position the mattresses are maintained in spaced-apart relation;

the frame being rotationally movably by the base in such a manner that it is rotationally movable with respect to the base at least 180°;

in a combination in which there are provided spring means which bias the mattress units to spaced-apart relative position.

2. The invention as set forth in claim 1 in a combination in which the support of each mattress unit by the frame is such that it is movable sufficiently far toward the other mattress when said other mattress is in its said latched position that a person can be released from the above one of said mattress units and will then be supported by the below one of said mattress units.

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3. The invention as set forth in claim 1 in a combination in which frame-and-base latch means are provided for interengaging between the said frame and said base, providing stability and movability of the frame with respect to the base.

4. The invention as set forth in claim 3 in a combination in which the said frame-and-base latch means are operative to releasably secure the frame and base against relative rotation in either of the respective two positions of the frame in which in one of said two positions a certain one of said mattress units is lowermost and in the other of said two positions the other of said mattress units is lowermost.

5. The invention as set forth in claim 4 in a combination in which said frame-and-base latch means are also operative to releasably secure said frame and base against relative rotation when the frame is in a position approximately perpendicular to either of the said two positions of the mattress units.

6. The invention as set forth in claim 4 in a combination in which there are said frame-and-base latch means provided adjacent each end of the said frame, and a single control means is operative to release both of said frame-and-base latch means simultaneously.

7. The invention as set forth in claim 1 in a combina-

tion in which the spring means includes a tension spring, and there are cooperating sets of linkage means each having a respective unit thereof pivotally connected to one of said mattress units and the two such units of each set being operatively connected together and to one end of the spring means, providing that the movement of the mattress units relatively toward one another is accompanied by an increase of spring tension acting to bias the mattress units toward spaced-apart relationship.

8. The invention as set forth in claim 1 in a combination in which said beforementioned latch means, which hold each of said mattress units and frame in releasably secured relationship, are provided adjacent each end of the said frame, and a control means operatively interengages with both said latch means of each mattress unit for releasing the latch means adjacent both end of the frame simultaneously.

9. The invention as set forth in claim 8 in a combination in which for each mattress unit there are provided two of the said beforementioned latch means adjacent each end of the frame, and the said control means releases all four of the said latch means simultaneously.

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UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,827,089 Dated August 6, 1974

Inventor(s) William C. Grow

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

ABSTRACT, line 3: Insert a hyphen between "rotationally" and "movable".

ABSTRACT, line 5: Change "face-down to face-up" to "face-down or face-up".

Col. 2, line 64: Insert a hyphen between "downwardly" and "extending".

Col. 3, line 28: Change the "," to a ";".

Col. 4, line 14: Insert a hyphen between "upwardly" and "facing".

Col. 5, line 31: Insert a hyphen between "previously" and "mentioned".

Col. 5, lines 36 and 37: Insert a hyphen between "outwardly" and "bowed".

UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Page 2

Patent No. 3,827,089 Dated August 6, 1974

Inventor(s) William C. Grow

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 5, line 67: Change "non-" to "now-".

Col. 6, line 2: Insert a hyphen between "upwardly" and "retracted".

Signed and sealed this 4th day of March 1975.

(SEAL)  
Attest:

RUTH C. MASON  
Attesting Officer

C. MARSHALL DANN  
Commissioner of Patents  
and Trademarks