

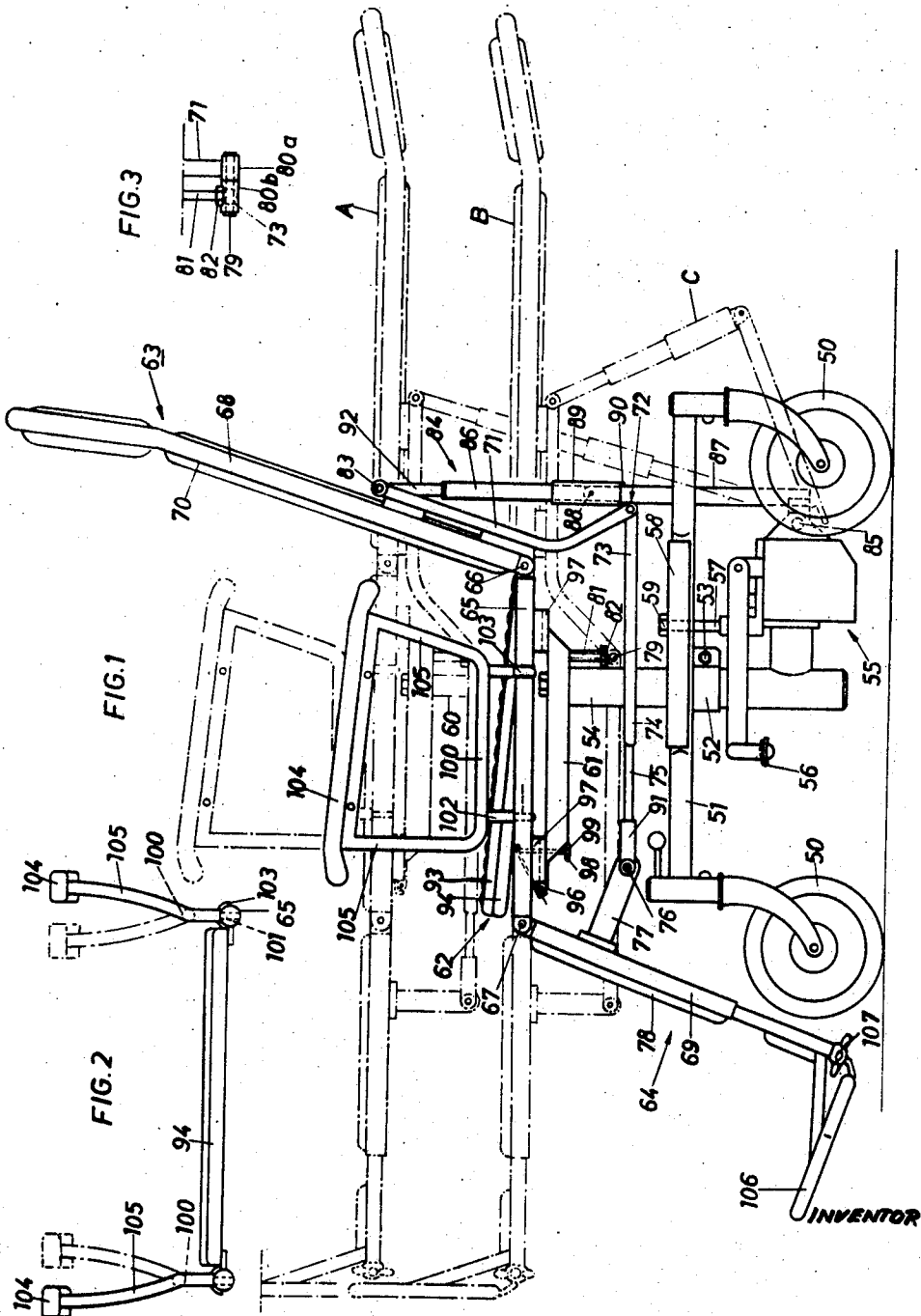
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WHEEL CHAIR

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WHEEL CHAIR

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8 Claims

ABSTRACT OF THE DISCLOSURE

A wheel chair with power adjustable back and leg rests in which the back rest is connected to the frame by a jointed rod and which is adjustable to a position in which the joint is uncovered by a slideable sleeve.

This invention relates to a wheel chair designed for the use of sick and old persons, in that it can be readily converted to a horizontal supporting structure with a view to facilitate the removal of the patient from his bed to the wheel chair and to wheel him in a horizontal, semi-inclined or sitting position.

The wheel chair according to the invention is generally characterized in that it comprises a chassis frame with caster wheels and provided with a source of power, such as a hydraulic unit, and a supporting structure which consists of two end supporting members forming a back rest and a leg rest respectively of the wheel chair and a horizontal intermediate supporting member forming the seat of the wheel chair and being pivoted to the end supporting members and by means of the source of power adapted to be vertically adjusted on the chassis frame. One of said end supporting members is connected to the chassis frame and to the opposite end supporting member, so that the end supporting members upon raising of the intermediate supporting member are simultaneously compulsorily set either in true horizontal alignment with the intermediate supporting member or in an optional inclined positioned with respect to the intermediate supporting member.

For converting the wheel chair to a horizontal supporting structure or to a comfortable easy-chair, it is therefore only necessary, by means of the source of power, to raise the intermediate supporting member to a desired level, whereupon the end supporting members, owing to their interconnection and to the connection of one of the end supporting members to the chassis frame, for instance by means of connecting rods, will automatically swing to a horizontal position or to an angularly inclined position.

The three supporting members will be in a true horizontal alignment only when the intermediate supporting member is raised to its topmost position. However, occasions occur when it is necessary to rapidly lay the patient on his back from a sitting or semi-inclined position, for instance when in case of sudden illness, heart affections etc. According to a further aspect of the invention, such a rapid adjustment may be accomplished in that the connection rod connecting one of the end supporting members to the chassis frame consists of an upper portion and a lower portion which are interconnected by means of a joint covered by a sleeve which is axially slidable along the connection rod in order to uncover the joint.

The level of the horizontal supporting structure can be adapted to beds at different levels above the floor so that a side portion of the horizontal supporting structure can overlap the bed in order to facilitate the removal of the patient from or to the bed. For this purpose the source of power is vertically adjustable on the chassis frame and connected to said end supporting member by means of the connecting rod.

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Other and more specific details of the preferred form of the invention will be described in connection with the accompanying drawings wherein:

FIGURE 1 is a side elevation view of the wheel chair with the supporting members in their normal sitting position and two horizontal positions A and B of the supporting members indicated by chain dotted lines.

FIGURE 2 is a front view of the seat of the wheel chair.

FIGURE 3 is a view from behind of a detail of the wheel chair.

The chassis of the wheel chair consists of a frame 51 of tubes and is provided with four lockable caster wheels 50. On the underside the frame 51 is provided with a clamping member 52 which, by means of a bolt 53, is braced around the vertical cylinder 54 of a hydraulic unit generally indicated at 55 which is operated by a foot pedal 56. A bolt 57 is screwed into a bore in the cover of the hydraulic unit housing 55 and engages an opening in a horizontal plate 58 mounted on the frame 51, and the underside of the bolt head 58 is in close contact with the top-side of the plate. Thus, when the bolt 53 of the clamping member 52 has been loosened and the bolt 57 is turned, the hydraulic unit 55 will be lowered or raised on the chassis frame 51, and in this way the wheel chair can be adapted to beds at different levels. After lowering or raising the hydraulic unit 55 the bolt 53 of the clamping member 52 must again be firmly tightened.

The piston rod 60 of the hydraulic cylinder 54, which is indicated by chain dotted lines in the position A, is provided at its top end with a horizontal rectangular frame 61, which supports the intermediate supporting member or seat of the wheel chair. The seat is generally indicated at 62 and is pivoted to the end supporting members, viz the back rest generally indicated at 63 and the leg rest generally indicated at 64.

The seat 62 comprises a frame 65, to the rear and forward ends of which a back rest frame 68 and a leg rest frame 69 are pivoted by means of transverse shafts 66 and 67 respectively. In the back rest frame 68 is mounted a plate 70 with cushion, and to the back of the plate there are rigidly attached two tubular and downwards extending arms 71 which are bent at an obtuse angle. The lower ends of the arms 71 are connected, by means of joints generally indicated at 72, to a horizontal yoke extending under the seat 62 with a leg 73 of the yoke on each side of the cylinder 54. The forward end 74 of the yoke is provided with an arm 75 which is screwed into a bushing 91. The bushing 91 is pivoted, by means of a joint 76, to a lug 77 on the back of a plate 78 with cushion mounted in the leg rest frame 69.

FIGURE 3 shows the right-hand joint 72 as viewed from behind. Each joint 72 comprises a transverse shaft 79, which is carried in a horizontal bearing bushing 80a at the lower end of the arm 71 and in a horizontal bearing bushing 80b at the rear end of the respective horizontal yoke leg 73. The frame 61 on each side is provided with a bolt 81 which is directed downwards and situated in the same vertical plane as the bearing bushing 80b. The bolt head 82 acts as a stop which limits the movement of the supporting members exactly in a position in which they are in true horizontal alignment.

The top ends of the arms 71 and the top end of a connection rod generally indicated at 84 are pivoted to the back rest by way of a joint 83. The lower end of the connection rod 84 is pivoted to the housing of the hydraulic unit 55 by means of a joint 85. The connection rod 84 comprises an upper portion 86 and a lower portion 87 which are pivotally interconnected by means of a joint 8. Normally, the joint 88 is covered by a sleeve 89 which is slidably mounted on the connection rod and in its cov-

ering position rests upon shoulders 90 on the lower portion 87 in order to prevent a pivotal movement of the portions. If the sleeve 89 is moved upwards to a position in which it uncovers the joint 88, the portions 86, 87 can be set in an angular position C indicated by chain dotted lines.

The upper portion 86 is tubular and provided at its top end with internal threads into which there is screwed a pin 92 which is pivoted to the back rest by means of the joint 83.

In the seat frame 65 is mounted a plate 94 with cushion 93 which at its rear end is pivotally supported by the transverse shaft 66. The forward part of the plate 94 rests on the rear edge of an inclined plate 95 which transversely extends under the plate 94 and at its forward end is pivotally supported by a horizontal transverse shaft 96 mounted on a spacer block 97 between the rectangular frame 62 and the seat frame 65. The rear part of the plate 95 rests on the top end of a vertical shaft 98 which is vertically adjustable in a threaded bore in the spacer block 97 and at its lower end provided with a hand wheel 99. By turning the shaft 98 the seat plate 93, 94 can be set in any desired inclined position.

Each side portion of the seat frame 65 is provided with two vertical openings for the attachment of the arm rests of the wheel chair. Each arm rest consists of an approximately rectangular frame, the lower portion 100 of which is provided with a cylindrical pin 102 with a reduced projection 101 and a transverse yoke 103. The arm rest is attached to the seat frame 65 by inserting the reduced projection 101 into the forward opening in the frame 65, so that the yoke 103 will straddle the side portion of the seat frame. As shown in the drawing, the upper portion 104 of the arm rest is somewhat inclined backwards. By turning the arm rest and inserting the reduced projection 101 into the back opening in the seat frame 65 the upper side portion 104 of the arm rest will be inclined in the opposite direction.

As shown in FIGURE 2, the upper side portion 104 and the lower side portion 100 are situated in different vertical planes, since the forward and back portions 105 are slightly curved. By turning or shifting the arm rests they will receive the positions shown by chain dotted lines in FIGURE 2, so that the distance between the upper side portions 104 will be considerably reduced. In this way the arm rests can be adapted to the more or less voluminous body of the patient using the wheel chair.

The leg rest frame 69 is provided with a separate foot rest frame 106 which is telescopically adjustable in the leg rest frame by means of a spindle with a hand wheel 107 at either side of the wheel chair.

In operation, when the patient should be removed from his bed to, for instance, a day room in a hospital, the seat 62 is raised by means of the hydraulic unit 55 from the normal sitting position shown with full lines in FIGURE 1. Since the back rest 63 is connected to the chassis frame 51 (via the hydraulic unit 55) by way of the connection rod 84, the back rest will swing clockwise (according to FIGURE 1) until it is in true horizontal alignment with the raised seat 62. The yoke 73 will be pushed to the left by means of the arms 71 and simultaneously raised, so that the bearing bushings 80b abut the bolt heads 82 exactly when the supporting members 62 and 63 are horizontally aligned. Also the leg rest 64 will swing clockwise by way of the arm 75 until it is horizontally aligned with the seat and the back rest, so that the three supporting members will form a horizontal supporting structure at the level A. As previously described this level A can be adapted to the level of the actual patient's bed by vertical adjustment of the hydraulic unit 55 in relation to the chassis frame 51, so that the horizontal supporting structure 62-64 overlaps the bed and the patient, after removal of the adjacent arm rest, can readily be transferred from the bed to the wheel chair.

After attachment of the arm rest the seat 62 is lowered by means of the hydraulic unit 55, so that the back portion 63 and the leg portion 64 will swing counter-clockwise (according to FIGURE 1) to the full line position (or to an intermediate position) and the patient will be raised to sitting or semi-inclined position.

Independent of the level of the seat 62 it is possible to rapidly lay a sitting or semi-inclined patient on his back in horizontal position without operation of the hydraulic unit 55. Such a rapid adjustment sometimes may be necessary in case of sudden illness, heart affections etc. and is accomplished by moving the sleeve 89 upwards on the upper portion 86 of the connection rod 84 in order to uncover the joint 88, and simultaneously "breaking" the connection rod 84 to the position C. The back rest 63 and the leg rest 64 will then swing clockwise to horizontal alignment with the seat 62 at the level B.

The wheel chair can also be equipped with a manual control, by means of which the patient himself can adjust the supporting members 62-64.

Other embodiments may be made of this inventive concept, and modifications may be made in the embodiment hereinbefore shown and described, and it is to be understood that all matters herein are to be interpreted merely as illustrative, and not limiting.

I claim:

1. In a wheel chair comprising a chassis frame having caster wheels and provided with a source of power and a supporting structure consisting of end supporting members forming a back rest and a leg rest respectively and a horizontal intermediate supporting member forming the seat of the wheel chair and pivoted to said end supporting members and adapted to be vertically adjusted on the chassis frame by means of said source of power, one of said end supporting members being connected to the chassis frame and to the opposite end supporting member so that the end supporting members upon raising of the intermediate supporting member are simultaneously set in horizontal alignment with the intermediate supporting member, the improvement in which the end supporting member forming the back rest is connected to the chassis frame by means of a first connection rod consisting of an upper portion and a lower portion interconnected by a joint, the rod being provided with an axially slidable sleeve which is adjustable to a position in which the joint is uncovered by the sleeve, the intermediate supporting member forming the seat being provided with a stop which cooperates with a second connection rod between the end supporting members in the horizontal position of the supporting structure.

2. A wheel chair, according to claim 1, wherein the intermediate supporting member is provided with a stop which cooperates with the connection rod between the end supporting members in the horizontal position of the supporting structure.

3. A wheel chair, according to claim 2, wherein the stop is vertically adjustable.

4. A wheel chair, according to claim 1, wherein the intermediate supporting member comprises a frame which is pivoted to the end supporting members and provided with a seat plate which is pivoted at its rear end to a transverse shaft and is adjustable in inclined positions.

5. In a wheel chair according to claim 1, the improvement in which said first connection rod is coupled to the chassis frame by means of the source of power, which is vertically adjustable in relation to the chassis frame.

6. In a wheel chair according to claim 5, the improvement in which the source of power is a hydraulic unit having a cylinder, and the chassis frame is provided with a clamping member adapted to be braced around the cylinder of the hydraulic unit.

7. In a wheel chair according to claim 5, the improvement in which the hydraulic unit is provided with a vertically adjustable stop member which cooperates with

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the chassis frame for the adjustment of the level of the hydraulic unit in relation to the chassis frame.

8. In a wheel chair according to claim 6, the improvement in which the hydraulic unit is provided with a vertically adjustable stop member which cooperates with the chassis frame for the adjustment of the level of the hydraulic unit in relation to the chassis frame.

References Cited

UNITED STATES PATENTS

2,609,862	9/1952	Pratt	297—347
2,587,068	2/1952	Sanders	5—81

10

5—81; 297—91, 330

6

2,694,437	11/1954	Glaser	280—34
2,869,614	1/1959	Wamsley	280—230
3,038,174	6/1962	Brown et al.	5—63
3,142,509	7/1964	Ehrke et al.	297—71 XR
3,147,039	9/1964	Smith et al.	297—90

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