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(54) **Constant center of gravity tilt seat of a wheelchair**

Kippbarer Sitz mit konstantem Schwerpunkt für Rollstühle

Siège basculant à centre de gravité constant pour fauteuil roulant

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Description**FIELD OF INVENTION**

5 **[0001]** The present invention relates to a wheelchair having a tiltable seat containing a reclinable back member and a bottom member which seat is tilted as an integral unit while maintaining the center of gravity of a person seated therein. The wheelchair also has marking elements, which show the tilt angle of the seat.

BACKGROUND OF THE INVENTION

10 **[0002]** Heretofore, wheelchairs have existed wherein the chair or seat portion thereof was rockable about a common axis, or tilted about the rear apex of the seat, or which was pivotally connected to side members of a chair at a plurality of points to allow tilting thereof.

15 **[0003]** For example, U.S. Patent No. 4,893,827 relates to a chair for use by an incapacitated person having a wheeled frame which carries a body support assembly composed of a seat, a back, and a foot rest. The back is angularly adjustable relative to the seat and the footrest is angularly adjustable relative to the seat. The body support assembly is rockable as a unit relative to the frame to enable the entire assembly to occupy any one of a number of tilted positions. The body support assembly may be removed as a unit from the frame for use as a car seat or the like.

20 **[0004]** U.S. Patent No. 5,785,384 relates to a device for an adjustable chair where the back of the chair at a first mounting site on each side thereof is pivotally connected to respective side members of the chair and at a second mounting site forms a hinged connection with a rear part of the chair set frame, where the chair seat frame at a front mounting site on each side thereof is slidably connected to a respective side member along a front guide which forms a part of the side member. The first mounting site on the chair back is designed to slide along a rear, forward and downward inclining guide in the side member and the seat frame has on each side a rear mounting site between said front mounting site and said second mounting site for the chair back, said rear mounting site forming a slidable connection with a guide in each respective side member, which is located between the front and rear guides when seen in the longitudinal direction of the side member which is either horizontal or inclines slightly forward and upward.

25 **[0005]** U.S. Patent 5,044,647 relates to a kit or assembly which can be used in the manufacture of a new wheelchair or to retrofit an existing wheelchair. The basic wheelchair structure includes a base portion having a pair of cross members mounted in the rear half of the upper portion of the wheelchair base structure. A pair of parallel guide rails are mounted between the cross members with a seat support bar attached to a pair of pillow blocks mounted on the guide rails. A linear actuator is centrally positioned within the wheelchair base structure to longitudinally move the seat support bar forwardly or rearwardly within the wheelbase of the wheelchair. A rear edge of a wheelchair seat unit is pivotally attached to the upper surface of the seat support bar. Cam plates, each having a curved cam slot, are provided on each side of the seat unit with the cam slots engaging cam followers mounted on a pair of stanchions provided on each side of the rear portion of the base structure. A control switch causes the linear actuator to move the seat support bar in a forward or rearward direction which causes the seat unit to move causing the cam follower pins positioned within the cam slots to tilt or angularly move the seat unit to a maximum reclined position of 60 degrees. The entire seat unit is moved forward a predetermined distance to obtain the desired degree of tilt and to maintain the center of gravity substantially centered within the base structure to maintain the balance and stability of the wheelchair and the safety of the patient.

30 **[0006]** The European patent application EP 0 405 542 A2 discloses a wheelchair comprising a frame and tiltable seat operatively connected to the frame. The seat has a backrest or back member and a bottom member. The seat is connected to a curvilinear support member which is operatively and moveably engaging in the frame.

SUMMARY OF INVENTION

35 **[0007]** A tiltable seat of a wheelchair according to claim 1 has a back member and a bottom member with the bottom member being supported by an curvilinear support member which slides or rolls over a support arm which is connected to the frame of the wheelchair. The seat, generally at the junction of the back member and the bottom member, is also slidably attached through a link and a bracket, having a pivot pin, to a gear rack which in turn is connected to the frame. The radius of curvature of the curvilinear support member is desirably such that the end point of the radius generally coincides with the center of gravity of a hypothetical or composite person seated within the chair, and the angle of the gear rack is generally such that it approximates the arc of the bracket pivot pin about the center of gravity location if the seat were not connected to the gear rack. Through the use of a spring loaded hand grip and pull cable, the seat can be inclined to any desired tilt position and maintained there until the hand grip is subsequently released and the seat moved to another position. The wheelchair can also have marking elements which show the tilt angle of the seat, and also a reclinable back seat member.

BRIEF DESCRIPTION OF THE DRAWINGS**[0008]**

Fig. 1 is a perspective view of a wheelchair containing a tiltable seat according to the present invention.

Fig. 2 is a side elevational view showing the seat in an up- right position.

Fig. 3 is a side elevational view showing the seat in a tilted position. position.

Fig. 4. is a top plan view taken in line 4-4 of Fig. 2 showing the wheelchair frame assembly, the curvilinear support member, cross frame members, and the like.

Fig. 5 is a perspective view showing the curvilinear support member connected to a seat bottom member, and

Fig. 6 is a perspective view of the gear rack.

Fig. 7 is a perspective view of a wheelchair containing a tiltable seat according to the present invention, a recessed seat, and marking elements which show the tilt angle of the seat.

Fig. 8 is a side elevational view of a wheelchair having a reclinable back member as well as a tiltable seat. The seat is shown at 0 degrees tilt and 90 degrees recline.

Fig. 9 is a side elevational view showing the seat tilted 0 degrees and 100 degrees recline.

Figure 10 is a perspective view of the tiltable and reclinable wheelchair showing a recliner bracket plate, recliner cylinders, re-cliner release handles, and a pull cable release grip.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0009] A tiltable seat according to the present invention can be utilized on any conventional or typical wheelchair such as a powered wheelchair but desirably is utilized in association with a manual wheelchair. Wheelchair 10 contains mainframe 12 which has a front portion 14 and a rear portion 16 upwardly inclined at a predetermined angle with respect to the horizontal. The front end of frame front portion 14 contains a pivotal caster assembly 32 so that wheelchair 10 can be readily pivoted and turned in any desirable direction. Rear frame portion 16 contains a front leg 18A and a rear leg 18B depending therefrom; which each containing a plurality of apertures 22 so that wheel 30 can be attached thereto at any desirable height through the utilization of a suitable or conventional wheel attachment structure. Such structure, which can be a bracket, can contain a plurality of slots or recesses so that the wheel axle can be located at any horizontal position. Connected to front frame portion 14 is support arm or clevis 24, which at the upper end thereof can have any convenient element such as roller 26 to allow a seat support member to slide or travel there over while being supported.

[0010] While various components will be shown by the drawings as being located on the right-hand side or left-hand side of the wheelchair, it is to be understood that such components exist on both sides of the chair and are very similar, and usually identical.

[0011] Gear rack 40 is connected to rear portion 16 of the frame through any suitable fastener 42 such as a cap screw. The gear rack can generally be of any shape or configuration such as a rectangle, a flange, a channel, or an annular tube 44 having along one side thereof recesses 46 with teeth 48 located there between. The recesses and teeth as shown in Fig. 6, generally extend along the entire length of the gear rack. Slidably engaging gear rack 40 is bracket 50 which generally can be of any size or shape and has an aperture 52 for receiving bracket pin 54 which pivotally receives a seat extension link discussed herein below in greater detail. Slidable bracket 50 can be operated manually as shown or by power (not shown). When operated manually, gear rack bracket 50 also receives pull cable 60 which is connected at the other end to a handgrip. The pull cable is received by spring loaded housing 56 of the gear rack bracket so that a projection, not shown, is always pressed or forced into a recess 46 of the gear rack thereby maintaining bracket 50 in a set or fixed position.

[0012] Seat 70 of the wheelchair contains back member 72 and bottom member 82 which constitutes a frame for the seat and exist on each lateral side of the seat as shown in Fig. 1. Back member 72 can be a metal tube or any other suitable article containing a handle 73 for gripping by an individual as well as pull cable release grip 74. Application of an upward pressure to the release grip or a squeezing pressure thereto by an individual causes pull cable 60 to be pulled upwardly along the back member and at its other end pulls the projection out of gear rack recess 46 so that the gear rack bracket can then be manually slid upwardly or downwardly and repositioned in another recess upon release of grip 74. When operated by power, not shown, bracket 50 can be moved in a number of different ways such as by a hydraulic piston connected to the frame, or by gear rack 40 being a worm gear meshing with teeth within the bracket. The back member also contains a transverse tilt bar 76, which in addition to handle 72, can be grasped by an individual to either push a manual wheelchair or to cause the seat to be manually tilted backward or forward. The height of the tilt bar can be adjusted by positioning the same in any of a plurality of apertures 77 which extend along the length of the back member. Located at a lower portion of back member 72 is seat back pin 78 which in part connects seat back 72 to connection plate 90. Typically, at the bottom end of the seat back, hinge pin 79 pivotally connects the seat back member to connection plate 90.

[0013] Rear portion 16 of frame 12 optionally can contain marking elements 17, which correspond to the degree that seat 70 is tiltable, as in a forward or backward direction. The seat may be tilted in a range generally of from about 10 degrees forward to about 45 degrees rearward. Markings 17 can be in the form of a decal, etching, scoring, or any suitable graduation marks or such. The markings 17 are capable of being lined up with a suitable marking point 19 located on gear rack bracket 50. Marking point 19 can also be a decal, etching, scoring, or other suitable locating element.

[0014] Marking point 19 in association with markings 17 readily allow the seat to be set at a desirable degree of tilt such as that recommended by physical therapist or other medical person. This ability imparts several advantages to a patient, such as ease of breathing, relief of pressure, improved ability to swallow, and improved posture.

[0015] Seat bottom member 82 can be a metal tubular seat frame member generally located on the lateral sides of the seat and contain various fittings and the like upon which a seat, a seat cushion, and the like can be placed. At the back end of bottom members 82 are generally located two bolts, i.e., front bolt 84 and rear bolt 86, which through corresponding apertures of the bottom member secure connection plate 90 to the bottom member.

[0016] Connection plate 90 serves to fixedly secure seat back member 72 to seat bottom member 82 as an integral unit such as at an angle of 90 degrees with respect to each other. Moreover, connection plate 90 permits back member 72 to be fixedly secured to the bottom member at a number of recline positions other than 90 degrees, for example, up to a reclining angle of about 30 degrees at generally 10 degree increments. This is accomplished through the utilization of apertures 98A, 98B, and 98C. Thus, in lieu of utilizing seat bottom bolt 86 in the position indicated in Fig. 2, the bolt can be inserted in aperture 98C to recline the back an additional 10 degrees, i.e., a 100 degree angle with respect to seat bottom member 82. Similarly, angles of an additional 20 degrees or 30 degrees can be obtained by utilizing aperture 98B or 98A, respectively, to achieve an overall angle of 110 and 110 degrees respectively with regard to the seat bottom member.

[0017] The utilization of spring loaded latch 92 permits seat back member 72 to be quickly disengaged from an integral connection with bottom member 82 and lowered to essentially a horizontal position when not in use. Spring latch 92 is pivotally attached to connection plate 90 through latch pivot pin 94. When wheelchair 10 is not in use, latch 92 can be pressed downwardly thereby freeing seat back pin 78 from mechanical engagement with a recess in latch 92 whereby the seat back can be lowered to reside over the seat bottom. Obviously, when the seat back is in use, it is utilized in an upward position as shown in Fig. 2. The lower portion of seat back member 72 which hinges about hinge pin 79 is prevented from moving backward by the engagement thereof with a stop block, not shown, which is secured to connection plate 90 through the utilization of stop block bolts 96A and 96B.

[0018] An important aspect of the present invention is the utilization of a curvilinear member 110 in conjunction with frame support or clevis arm 24. Curvilinear support member 110, of course, is generally in the form of an arc of a circle. The radius of the arc, as noted above, terminates in an end point or center point which is generally located within 10.16 cm of the center of gravity of a hypothetical or composite person. Such a person is defined as being representative of an average of a variety of different sized and shaped people. The location of the center of gravity of the hypothetical person is about 19.05 cm (7.5 inches) forward of back members 72 and 16.51 cm (6.5 inches) above bottom members 82. A different center of gravity location will exist if curvilinear support member 110 is tailor made for a specific person or a class of persons (e.g., small or large) since the radius of the support member will be different. The radius end point of support member 110 is generally located within 10.16 or 7.62 cm (4 or 3 inches) desirably within 5.08 cm (2 inches), and preferably within 2.54 cm (1 inch) of the center of gravity of the hypothetical or composite person or other person. During tilting of seat 70, the radius end point or center point of support member 110 will generally reside within a circle and more preferably along a horizontal line having, respectively, a diameter or length of less than about 10.16; 7.62 or 5.08 cm (4, 3, or 2 inches), or preferably less than about 2.54 cm (one inch) from the center of gravity location. Curvilinear support member 110 is connected to generally horizontal foot member 112 which in turn is connected to leg member 114 attached to the underside of bottom seat member 82. In order to assure lateral rigidity of the archial support members, each left and right side member is connected to each other through front cross member 116 and rear cross member 118 as shown in Fig. 4. Similarly, lateral stability of the main frame is accomplished by connecting left and right sides of main frame 12 to each other through frame front cross member 23 and frame rear cross member 29A and 29B.

[0019] Recessed seat bottom member 71 is located on foot members 112 and/or front and rear cross members 116 and 113 respectively as shown at least in Figs. 1, 2 and 3. The recessed seat is generally located from about 3.81 cm (1-1/2 inches) to about 7.62 cm (3 inches), and preferably from about 5.08 cm (2 inches) to about 6.35 cm (2-1/2 inches) below bottom member 82. If the seat were located higher or lower, the center of gravity of an individual in the seat would often change. The recessed seat offers better stability to the user and allows one to be more comfortable and closer to frame member 14. The recessed seat also compensates for cushions, thick or thin, that can be utilized with wheelchair 10.

[0020] A key aspect of the present invention is that the curvilinear member has a shape such that when seat 70 is rotated on said member over support arm 24, the center of gravity of the hypothetical or composite person, etc., seated in the wheelchair is a point, located a specific distance forward of the back member and a specific distance above the bottom member, which point is generally maintained in a fixed position or relatively small locus as the seat is tilted backward or forward. Such locus is generally an area as noted above.

[0021] Extending generally from the vicinity of the junction of the back member and the bottom member such as from the rear of bottom seat member 82 is rigid link 120 which is pivotally attached to gear rack bracket 50. Gear rack 40 has an inclination which generally coincides with a straight line through or approximates an arc created by bracket pin 54 as the seat is moved from an upright position as shown in Fig. 2 to a rearward position as shown in Fig. 3. Thus, the angle of gear rack will vary depending upon the length of link 120 with the angle being more vertical for longer links (not preferred) and more longitudinal with regard to shorter link (preferred) lengths. Upon gripping pull cable : release grip 74, seat 70 can be tilted as a unit rearwardly either through the use of handle 73 or transverse tilt bar 76. Generally, the seat can be tilted up to about 50 or 60 degrees. Rearward tilting of the seat causes bracket 50 to slide downwardly along gear rack 44 and at the same time cause seat bottom member 82 to move forwardly with curvilinear support member 110 moving forward along roller 26. The combination of the inclination of rack 40 and the radius of curvature of support member 110 riding upon support arm 24 thus causes the center of gravity of a hypothetical or composite person, etc., seated within seat 70 to be substantially maintained as the seat bottom is moved forwardly and the back tilted rearwardly. In other words, the angle of inclination of the gear rack is such that the gear rack is parallel to the line that coincides with bracket pin 54 at both the maximum and minimum tilt of the seat when the seat is rotated about the center of gravity of a person independent of the frame 12.

[0022] Another preferred embodiment relates to a tilt and recline seat in which seat back member 72 is reclinable. In this embodiment, connection plate 90 is replaced with recliner bracket plate 130 as can be generally seen in at least Figs 9, 10 and 11. Seat back member 72 is hingedly or rotatably attached to recliner bracket plate 130 making seat back member reclinable. A recliner cylinder 140 at one end is operatively and fixedly attached to a rear portion of recliner bracket plate 130 and at the opposite end to seat back cylinder mounting bracket 144. through cylinder release bracket 142. Seat back cylinder mounting bracket 144 is mounted on seat back member 72. Back member 72 can have a handle 73 as seen in Fig. 1, or a stroller handle 150 such as those seen in Figs. 8, 9 and 10. No matter what type of handle is used, pull cable release grip 74 and recliner release handle 146 are fixedly attached thereto or to seat back member 72. Preferably recliner release handle 146 is mounted under stroller handle 150 so that applying pressure on the recliner release handle lever causes recliner cable 143 to allow recliner cylinder 140 to be released thereby hallowing the seat back member to be reclined from a range of about 90 degrees to about 180 degrees in relation to seat bottom member 82. Pull cable release grip 74 is preferably mounted on the inside of stroller handle 150 so that upon applying pressure thereto the wheelchair can be tilted as described herein above.

[0023] Although recliner cable 148 can run from recliner release handle 146 to cylinder release bracket 142 on the same side of the wheelchair, it is preferred that recliner cable 148 is attached to a recliner release handle and cylinder release bracket on opposite side of the wheelchair to prevent kinking or binding of recliner cable 148.

[0024] Generally two recliner cylinders 140 are utilized, but any number will suffice. The cylinders are preferably gas-locking cylinders, but oil or other fluid type cylinders can also be used. The gas pressure counteracts the weight of the person in the chair and thus aids an attendant raising the seat back member.

[0025] The following table is only an example of the possible recline angle ranges at various degrees of tilt for a specific wheelchair geometry as shown in Figs. 8, 9, and 10. It is foreseeable that wheelchairs with other dimensions could be made to tilt and recline at other angles and ranges.

TILT ANGLE (relative to the floor)	MINIMUM RECLINE ANGLE (relative to the seat)	MAXIMUM RECLINE ANGLE (relative to the seat)
-10 deg (forward)	90 deg	180 deg
-5 deg (forward)	90 deg	130 deg
0 deg	90 deg	180 deg
5 deg	90 deg	168 deg
10 deg	90 deg	158 deg
15 deg	90 deg	149 deg
20 deg	90 deg	141 deg
25 deg	90 deg	134 deg
30 deg	90 deg	126 deg
35 deg	90 deg	119 deg
40 deg	90 deg	112 deg
45 deg	90 deg	106 deg

[0026] It is noted that as the tilt angle increases, the maximum possible recline angle is reduced due to chair geometry.

[0027] From the above description, it should be understood that the wheelchair seat embodiments of Figs. 8, 9 and 10 of the present invention are both tiltable and reclinable.

[0028] Although the constant center of gravity tilt seat of the present invention has been described in association with a preferred embodiment, having a manual tilt, as well as with a manual tilt and manual recline seat back, it can use a power tilt and also a power recline seat back. The tilt seat, as well as the tilt and recline seatback seat, can also be utilized with any wheelchair base including power wheelchairs, i.e., powered by one or more batteries, as well as with different types of wheel drives, for example, a front-wheel drive, a mid-wheel drive, or a rear-wheel drive. All that is required is seat 70 and related structural components such as curvilinear support member 110 and gear rack 40 be attached to the frame work of such vehicles in a manner as shown and described herein. Moreover, with regard to manual wheelchairs such as that shown in the drawings, different wheel sizes and locations can be utilized such as where the front wheels have a large diameter and the rear wheels have a smaller diameter.

[0029] While in accordance with the patent statutes the best mode and preferred embodiment have been set forth, the scope of the invention is not limited thereto, but rather by the scope of the attached claims.

Claims

1. A wheelchair (10), comprising;

a frame (12); and
a tiltable seat (70) operatively connected to said frame (12), said seat (70) having a back member (72) and bottom member (82);
a curvilinear support member (110) connected to said seat bottom member (82) and operatively and movably engaging in said frame (12),

characterized by

said curvilinear support member (110) having a radius the end point of which is within 10,16 cm (4 inches) of the center of gravity of a person when seated in said seat (70) and wherein the center of gravity is maintained within 10,16 cm (4 inches) of said end point during tilting of the seat.

2. A wheelchair (10) according to claim 1,
further comprising an inclined gear rack (40) having a bracket (50) slidable thereon, said bracket (50) operatively connected to the rear portion (16) of said seat, said bracket (50) causing said seat (70) to tilt backward or forward as said bracket (50) is respectively slid downward along said gear rack (40) so that said center of gravity is substantially maintained.

3. A wheelchair (10) according to one of claims 1 or 2,
characterized in that said frame (12) has a support arm (24) and said curvilinear support member (110) movably engages said support arm (24).

4. A wheelchair (10) according to one of claim 2 or 3,
characterized in that said seat (70) is manually tiltable, wherein said slidable bracket (50) has a cable (60) connected thereto, and wherein said cable (60) is capable of causing said slidable bracket (50) to engage or disengage said gear rack (40) at different angles of tilt:

5. A wheelchair (10) according to one of claims 2 to 4,
characterized in that said gear rack (40) contains a plurality of releasable engagement positions engagable by said slidable bracket (56) to maintain said seat (70) in a desired tilt position.

6. A wheelchair (10) according to claim 1 or 4,
further comprising a connector plate (90), said connector plate (90) having a latch (92) to releasably engage said seat back (72) to said seat bottom (82).

7. A wheelchair (10) according to claim 6,
characterized in that said connector plate (90) has a plurality of apertures (98A, 98B, 98C) so that said seat back (72) can be connected to said seat bottom (82) at a plurality of angular positions.

8. A wheelchair (10) according to anyone of the preceding claims,

characterized in that said wheelchair (10) is a manual chair.

9. A wheelchair (10) according to anyone of claims 1 to 7,
characterized in that said wheelchair (10) is a power wheelchair.

Patentansprüche

1. Rollstuhl (10) mit:

einem Rahmen (12);
einem mit dem Rahmen (12) wirksam verbundenen kippbaren Sitz (70), wobei der Sitz (70) ein Sitzrückenteil (72) und ein Sitzunterteil (82) aufweist; und
einem gekrümmten Halterungselement (110), das mit dem Sitzunterteil (82) verbunden ist und mit dem Rahmen (12) wirksam und beweglich in Eingriff steht;

dadurch gekennzeichnet, dass

das gekrümmte Halterungselement (110) einen Radius aufweist, dessen Endpunkt sich innerhalb von 10,16 cm (4 Zoll) vom Schwerpunkt einer im Sitz (70) sitzenden Person befindet, wobei der Schwerpunkt während einer Kippbewegung des Sitzes innerhalb von 10,16 cm (4 Zoll) vom Endpunkt gehalten wird.

2. Rollstuhl nach Anspruch 1, ferner mit einer schrägen Zahnstange (40) mit einem darauf gleitend angeordneten Halter (50), wobei der Halter (50) mit einem hinteren Abschnitt (16) des Sitzes wirksam verbunden ist, wobei der Halter (50) veranlasst, dass der Sitz (70) nach hinten oder nach vorne kippt, wenn der Halter (50) entlang der Zahnstange (40) nach unten bzw. nach oben gleitet, während der Schwerpunkt im Wesentlichen beibehalten wird.
3. Rollstuhl (10) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Rahmen (12) einen Halterungsarm (24) aufweist und das gekrümmte Halterungselement (110) mit dem Halterungsarm (24) beweglich in Eingriff steht.
4. Rollstuhl (10) nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** der Sitz (70) manuell kippbar ist, wobei der gleitende Halter (50) ein damit verbundenes Kabel (60) aufweist, und wobei das Kabel (50) dazu geeignet ist, zu veranlassen, dass der gleitende Halter (50) bei verschiedenen Kippwinkeln an der Zahnstange (40) angreift bzw. die Zahnstange loslässt.
5. Rollstuhl nach einem der Ansprüche 2 bis 4, **dadurch gekennzeichnet, dass** die Zahnstange (40) mehrere lösbare Eingriffspositionen aufweist, bei denen der gleitende Halter (50) mit der Zahnstange in Eingriff kommen kann, um den Sitz (70) in einer gewünschten Kippposition zu halten.
6. Rollstuhl (10) nach Anspruch 1 oder 4, ferner mit einer Verbinderplatte (90), wobei die Verbinderplatte (90) einen Riegel (92) zum lösbaren Ineingriffbringen des Sitzrückenteils (72) mit dem Sitzunterteil (82) aufweist.
7. Rollstuhl (10) nach Anspruch 6, **dadurch gekennzeichnet, dass** die Verbinderplatte (90) mehrere Öffnungen (98A, 98B, 98C) aufweist, so dass das Sitzrückenteil (72) an mehreren Winkelpositionen mit dem Sitzunterteil (82) verbindbar ist.
8. Rollstuhl (10) nach einem der vorangehenden Ansprüche, **dadurch gekennzeichnet, dass** der Rollstuhl (10) ein manueller Rollstuhl ist.
9. Rollstuhl (10) nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet, dass** der Rollstuhl (10) ein motorbetriebener Rollstuhl ist.

Revendications

1. Fauteuil roulant (10), comprenant :

un cadre (12) ; et
un siège (70) inclinable, relié fonctionnellement audit cadre (12), ledit siège (70) comprenant une barre arrière

(72) et une barre inférieure (82) ;
une barre support (110) curviligne, relié à ladite barre inférieure (82) et venant en prise, fonctionnellement et de façon déplaçable, avec ledit cadre (12),

- 5 **caractérisé en ce que**
ladite barre support (110) curviligne présente un rayon dont le point extrême est situé dans la limite de 10,16 cm (4 pouces) du centre de gravité d'une personne lorsqu'elle est assise dans ledit siège (70), et dans lequel le centre de gravité est maintenu dans la limite de 10,16 cm (4 pouces) dudit point extrême, durant l'inclinaison du siège.
- 10 **2.** Fauteuil roulant (10) selon la revendication 1, comprenant en outre une crémaillère inclinée (40), comprenant un support (50) susceptible de coulisser sur elle, ledit support (50) étant relié fonctionnellement à la partie arrière (16) dudit siège, ledit support (50) faisant que ledit siège (70) s'incline vers l'arrière ou vers l'avant lorsque ledit support (50) est respectivement coulissé vers le bas le long de ladite crémaillère (40), de manière que ledit centre de gravité soit sensiblement conservé.
- 15 **3.** Fauteuil roulant (10) selon l'une des revendications 1 ou 2, **caractérisé en ce que** ledit cadre comprend un bras support (24) et ledit organe support (110) curviligne vient en prise de façon déplaçable avec ledit bras support (24).
- 20 **4.** Fauteuil roulant (10) selon l'une des revendications 2 ou 3, **caractérisé en ce que** ledit siège (70) est inclinable manuellement, dans lequel ledit support (50) coulissant comprend un câble (60) lui étant relié, et dans lequel ledit câble (60) est capable de provoquer la mise en prise ou hors de prise dudit support (50) coulissant avec ladite crémaillère (40), à différents angles d'inclinaison.
- 25 **5.** Fauteuil roulant (10) selon l'une des revendications 2 ou 4, **caractérisé en ce que** ladite crémaillère (40) comprend une pluralité de positions de mise en prise désolidarisable, susceptible d'être adoptée par ledit support (50) coulissant, pour maintenir ledit siège (70) en une position d'inclinaison souhaitée.
- 30 **6.** Fauteuil roulant (10) selon l'une des revendications 1 ou 4, comprenant en outre une plaque de connecteur (90), ladite plaque de connecteur (90) comprenant un verrou (92), pour mettre en prise, de manière désolidarisable, ladite barre arrière (72) avec ladite barre inférieure (82).
- 35 **7.** Fauteuil roulant (10) selon la revendication 6, **caractérisé en ce que** ladite plaque de connecteur (90) comprend une pluralité d'ouvertures (98A, 98B, 98C), de manière que ladite barre arrière (72) puisse être relié à ladite barre inférieure (82), en une pluralité de positions angulaires.
- 40 **8.** Fauteuil roulant (10) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit fauteuil roulant (10) est un fauteuil manuel.
- 9.** Fauteuil roulant (10) selon l'une des revendications 1 à 7, **caractérisé en ce que** ledit fauteuil roulant (10) est un fauteuil motorisé.

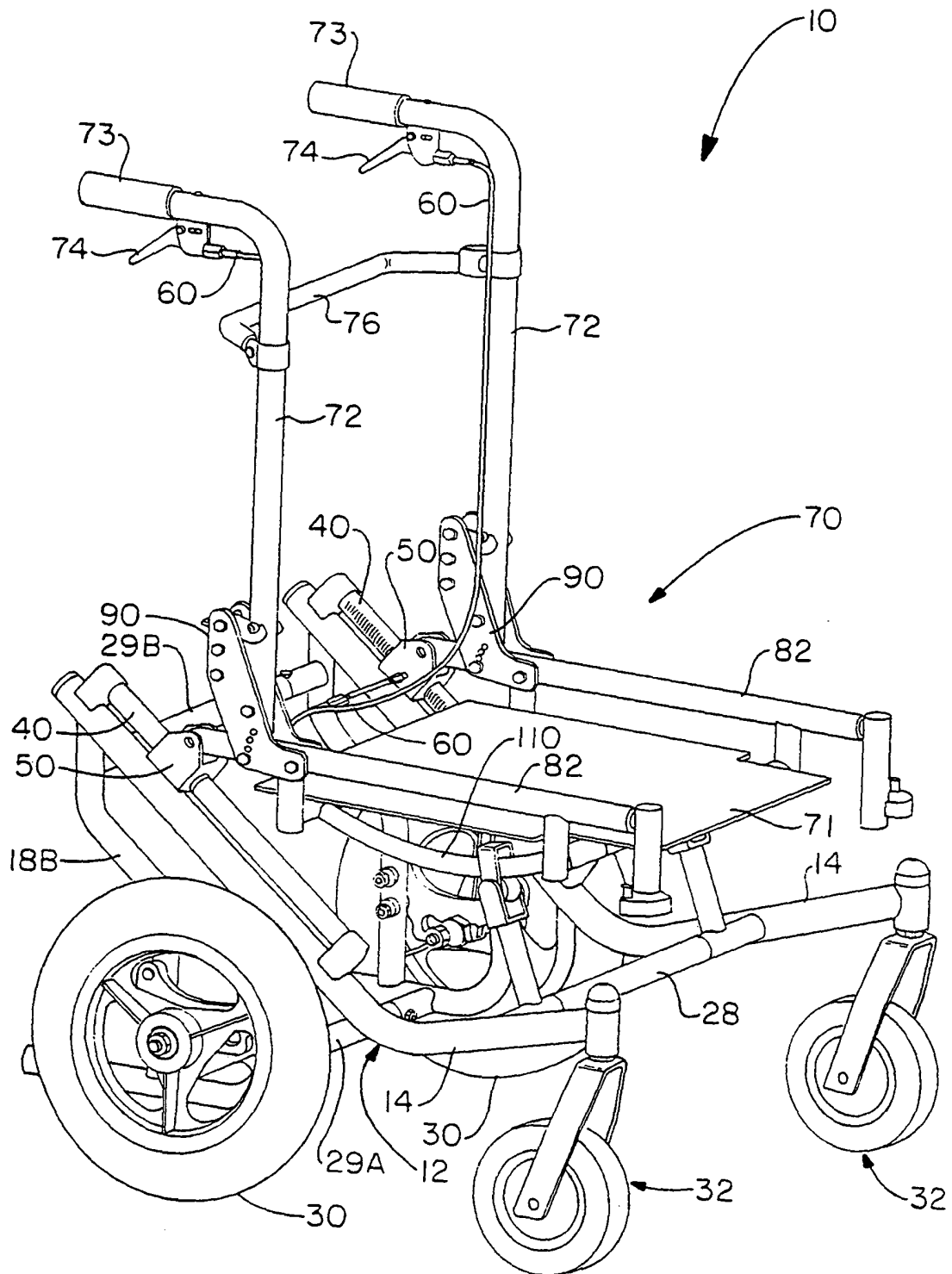


FIG. - 1

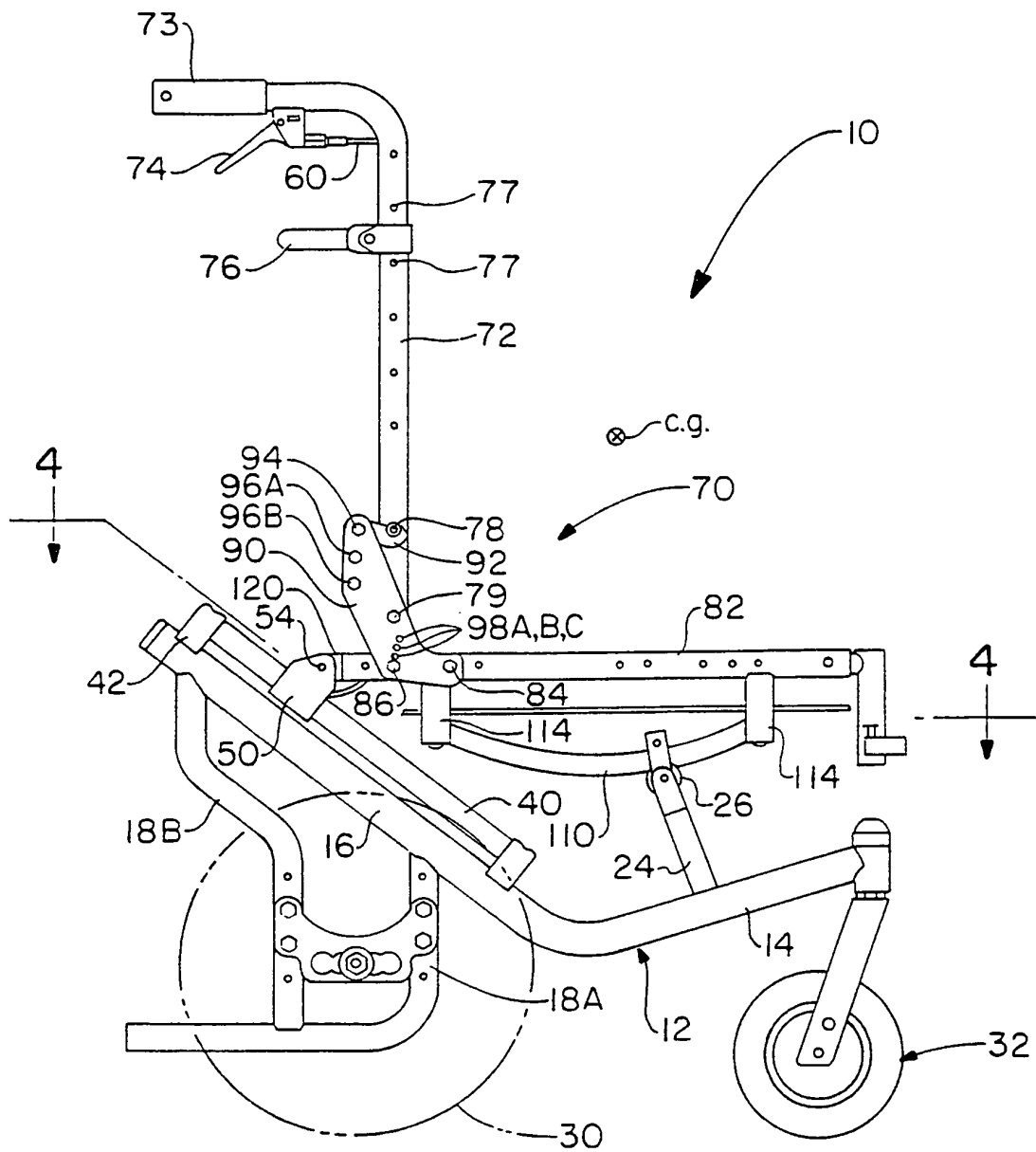


FIG. - 2

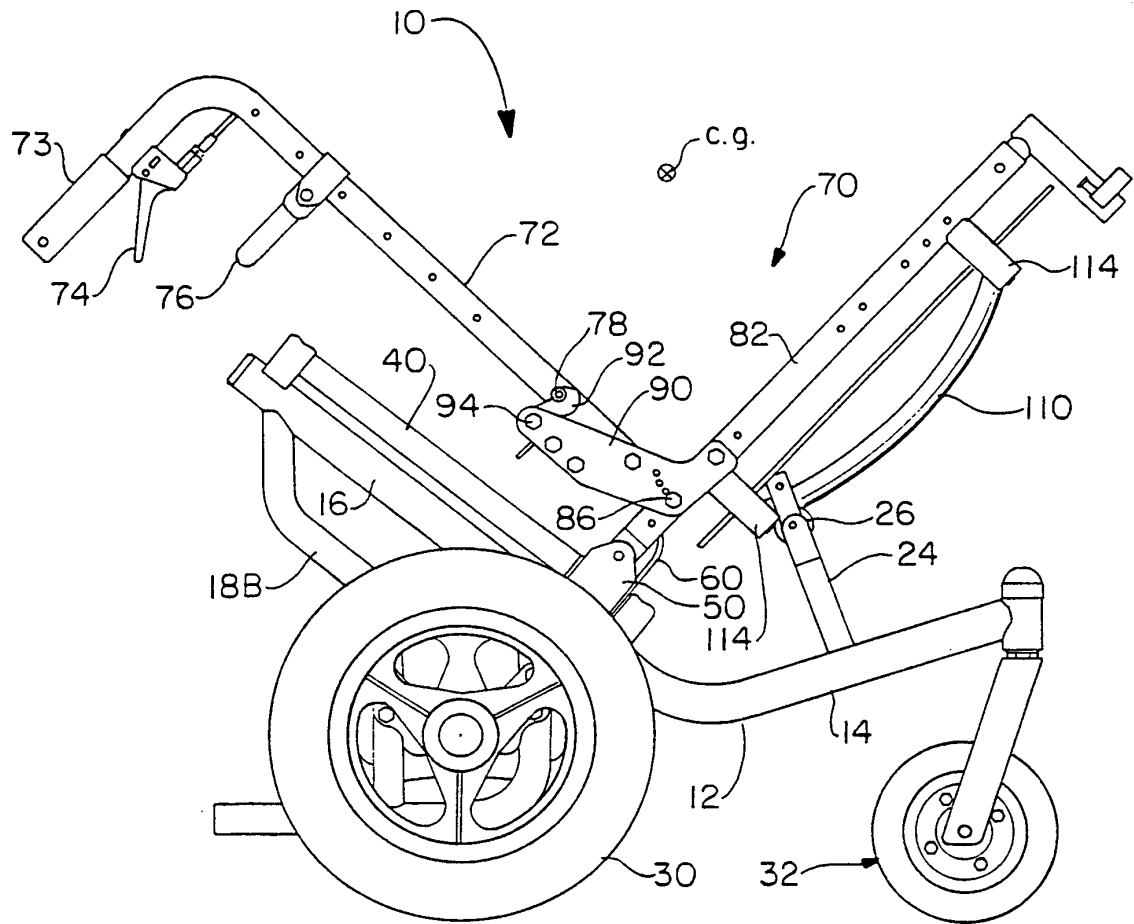


FIG. - 3

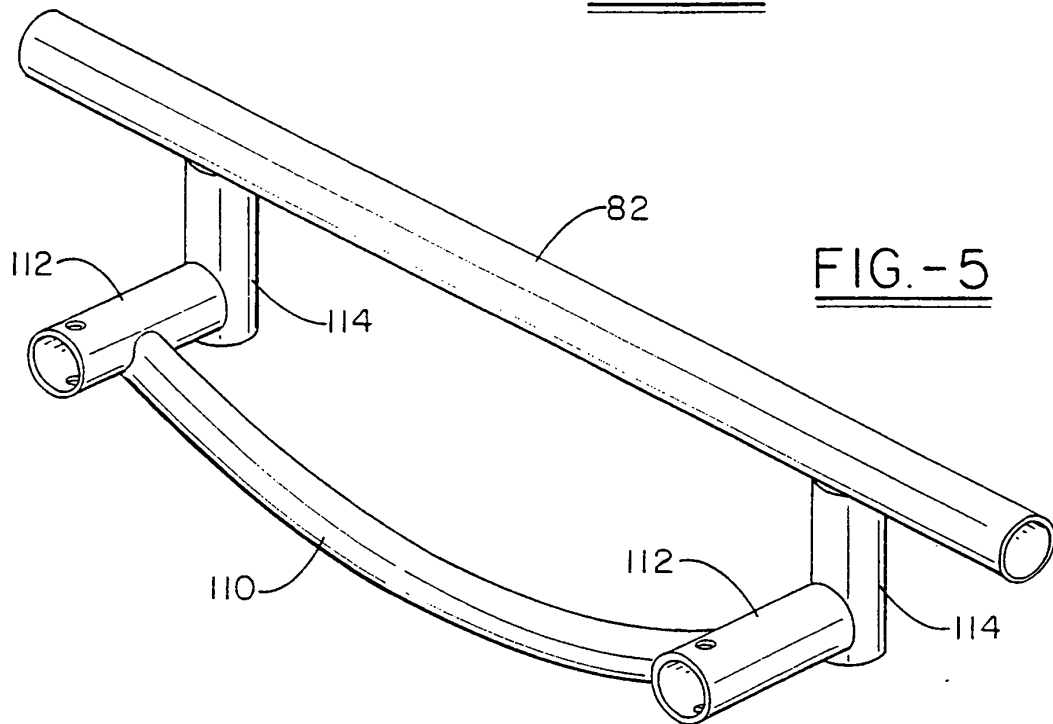


FIG. - 5

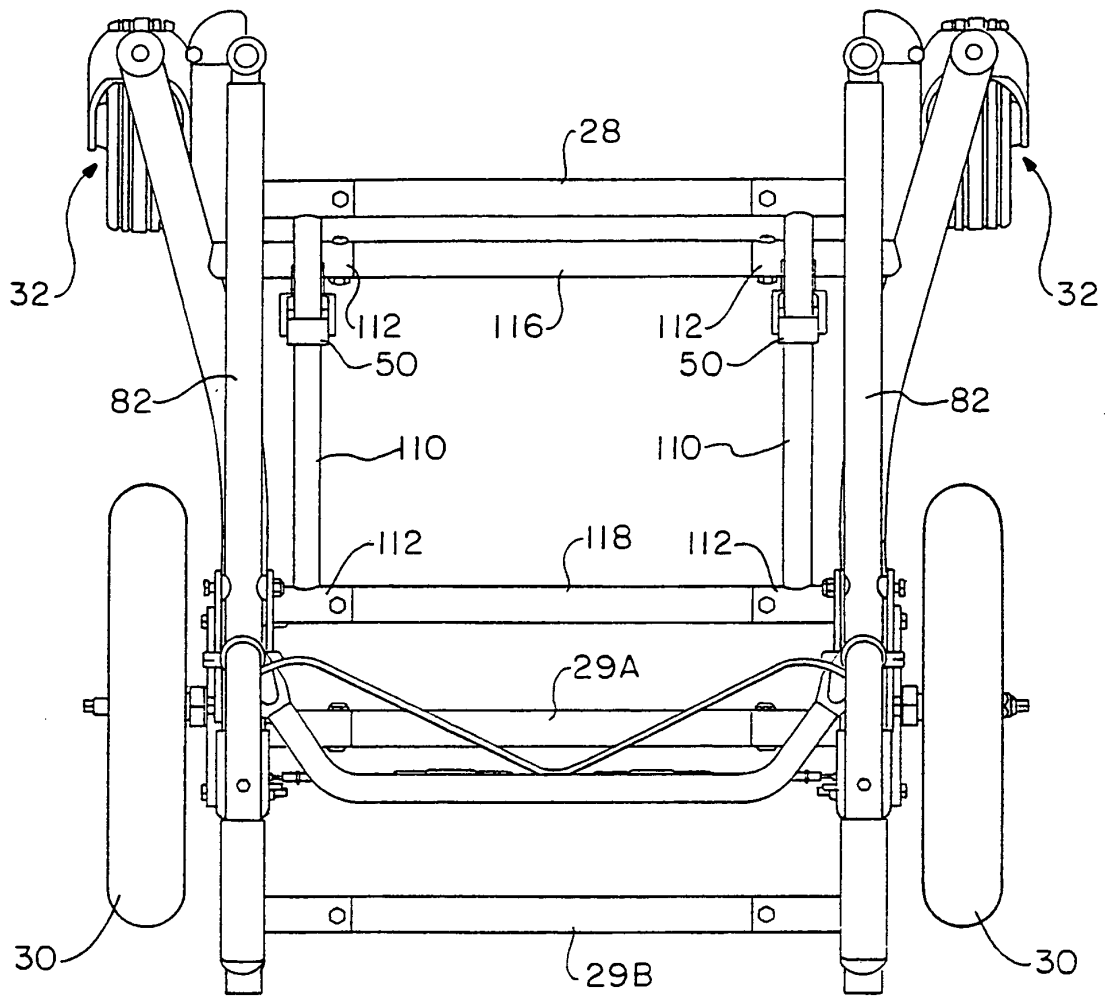


FIG. - 4

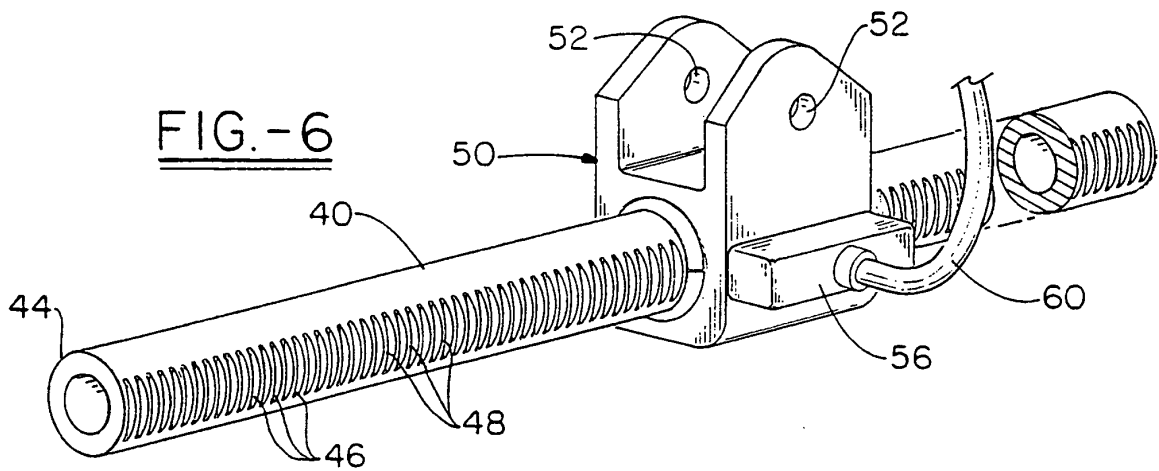


FIG. - 6

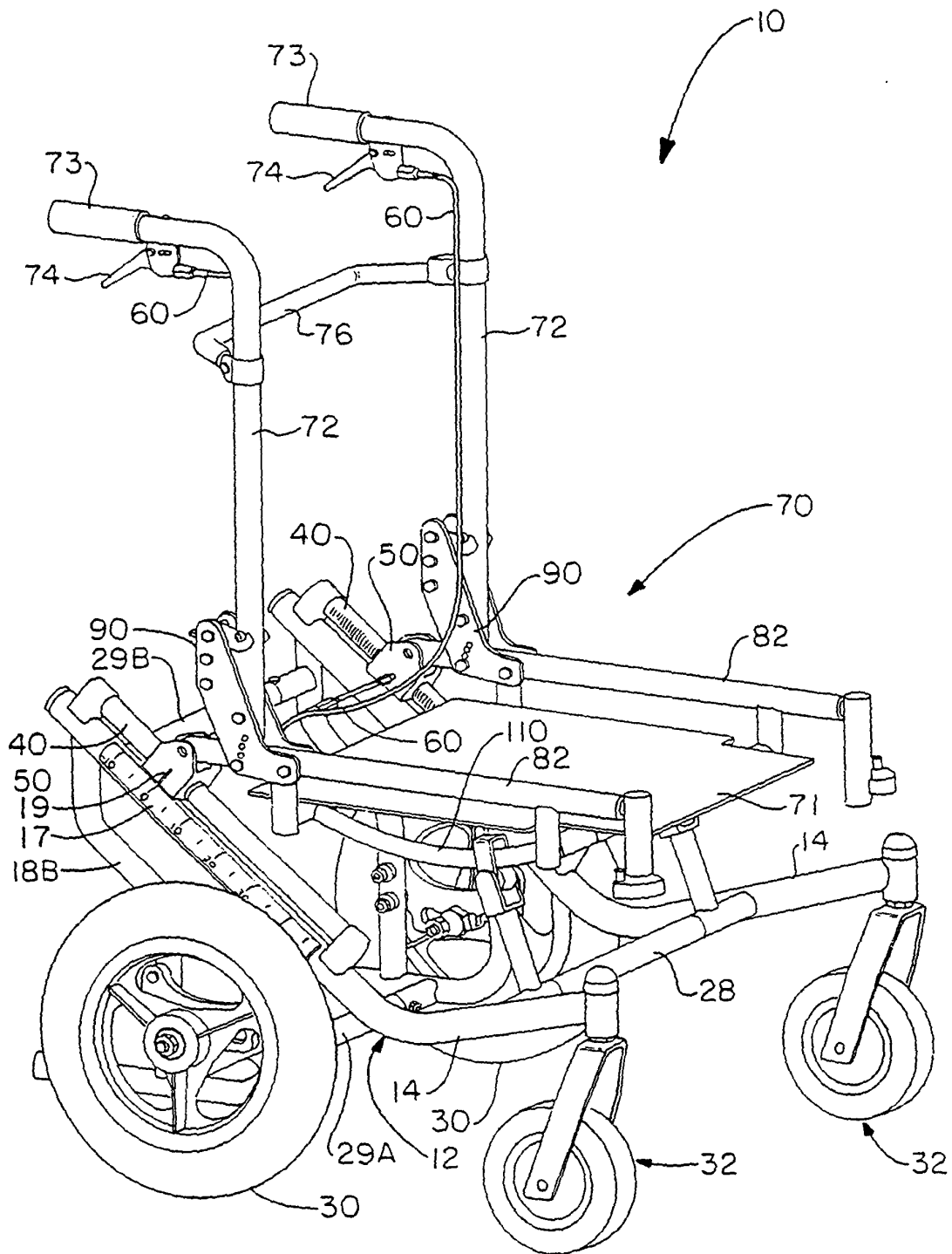


FIG. -7

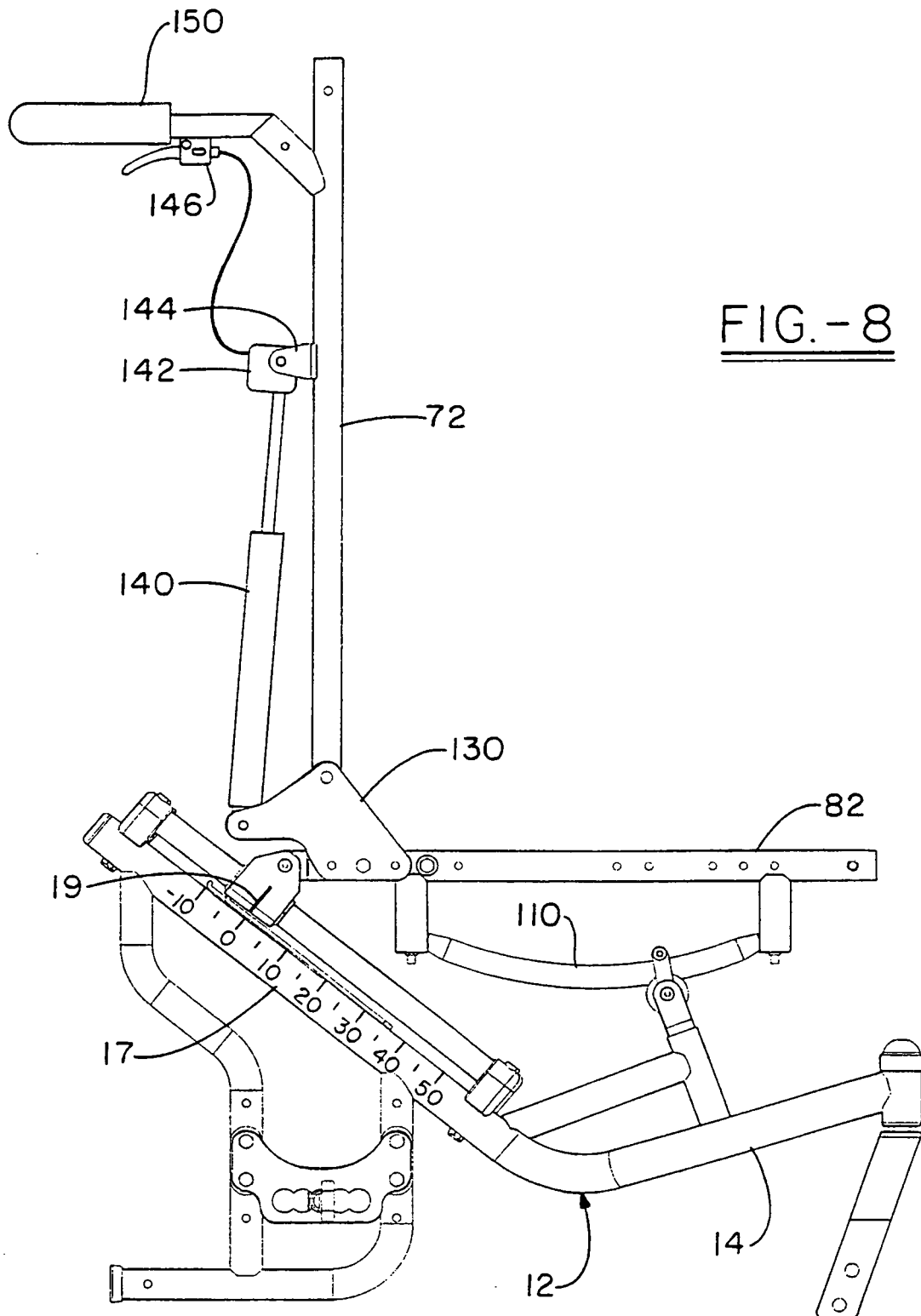
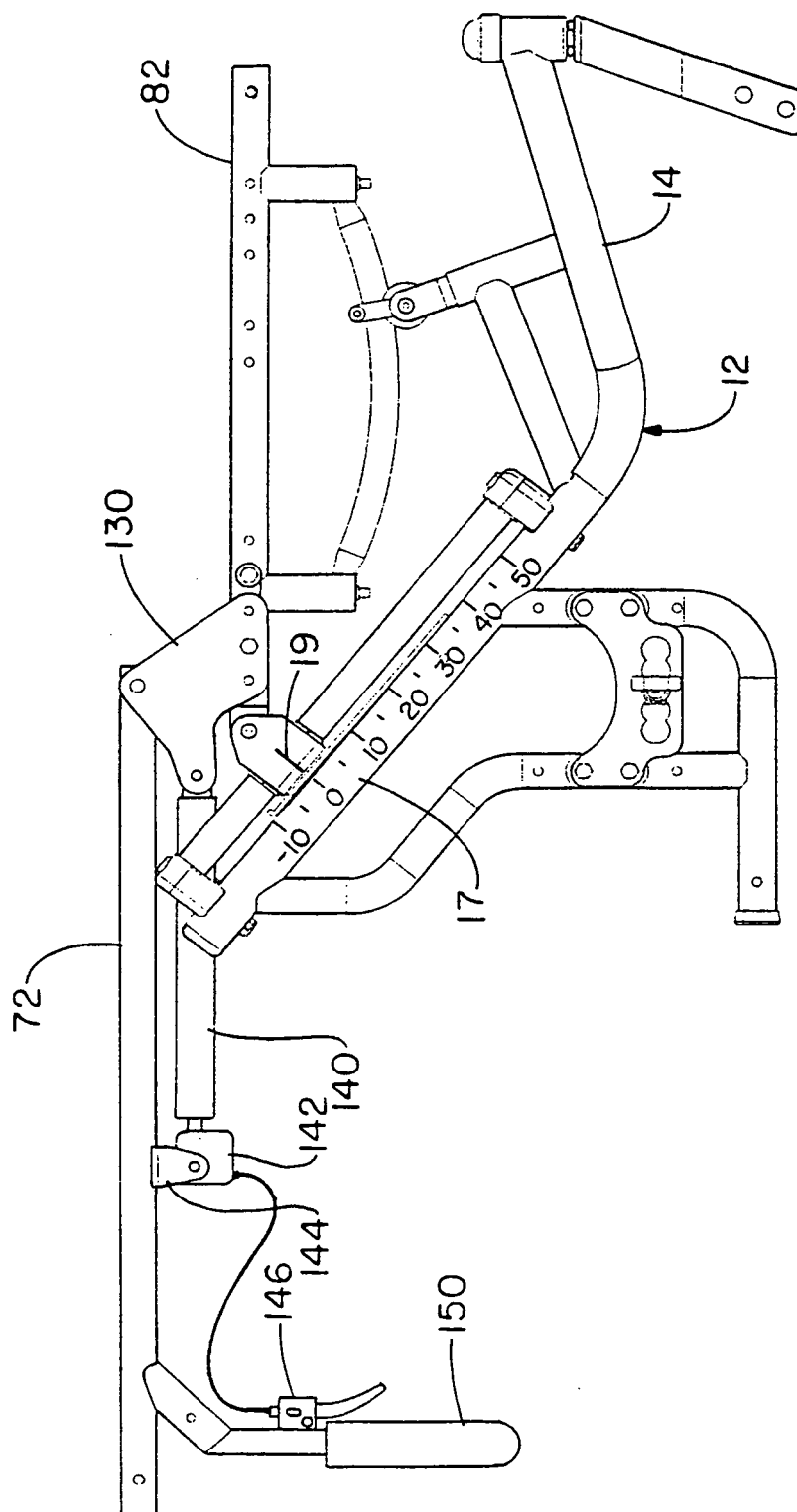
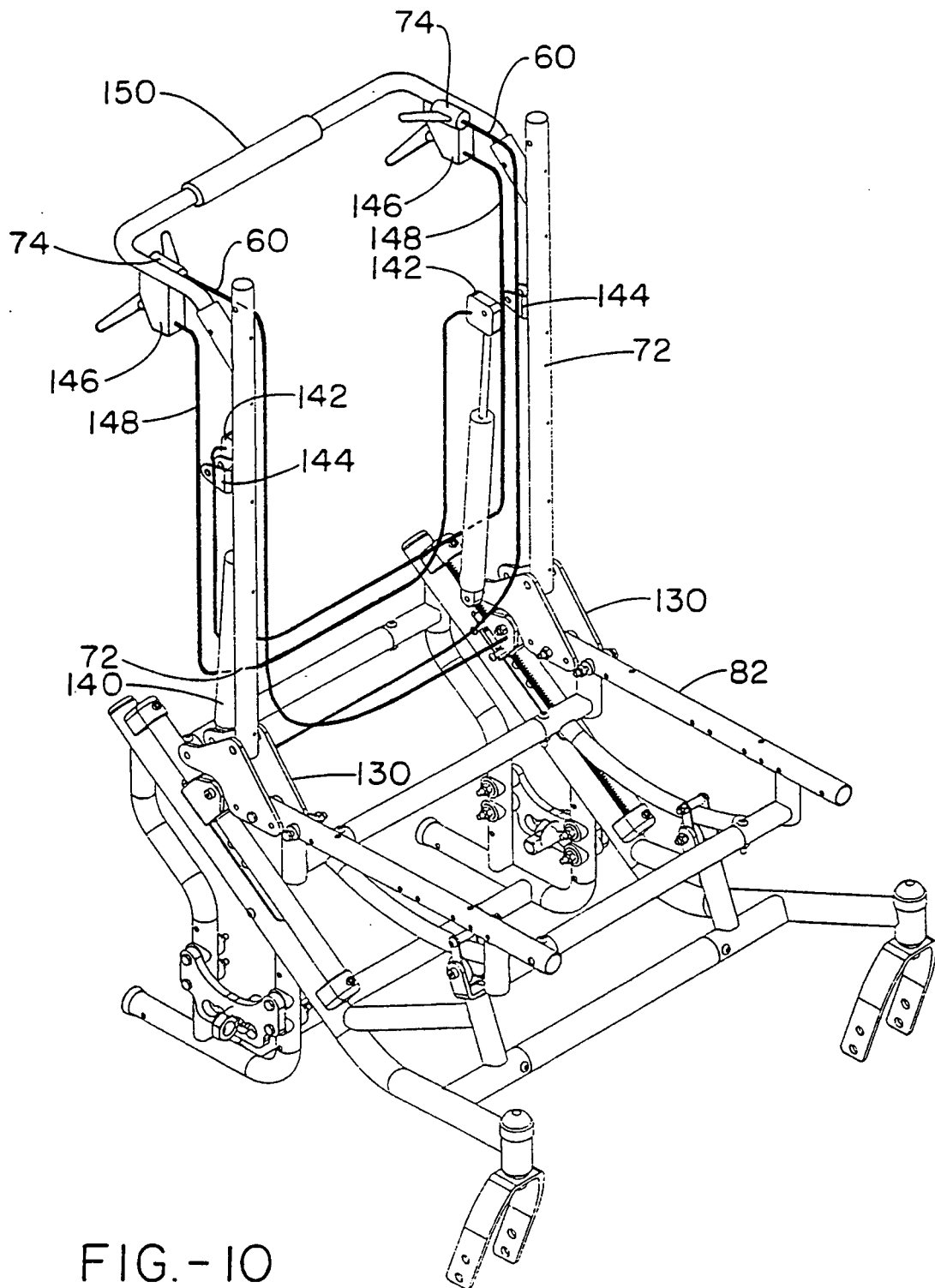


FIG.-9





REFERENCES CITED IN THE DESCRIPTION

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