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Limpach

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[54] **HORIZONTALLY ADJUSTABLE ARMRESTS FOR WHEELCHAIRS**

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[51] **Int. Cl.** **A47c 7/54**

[58] **Field of Search** ..... 297/417, DIG. 4, 297/422, 21, 397, 330

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[57] **ABSTRACT**

A horizontally adjustable armrest assembly for invalid wheelchairs incorporating mechanism for selectively positioning the armrest to facilitate ingress or egress and positioning of the wheelchair relative to a table, desk, or the like.

8 Claims, 3 Drawing Figures

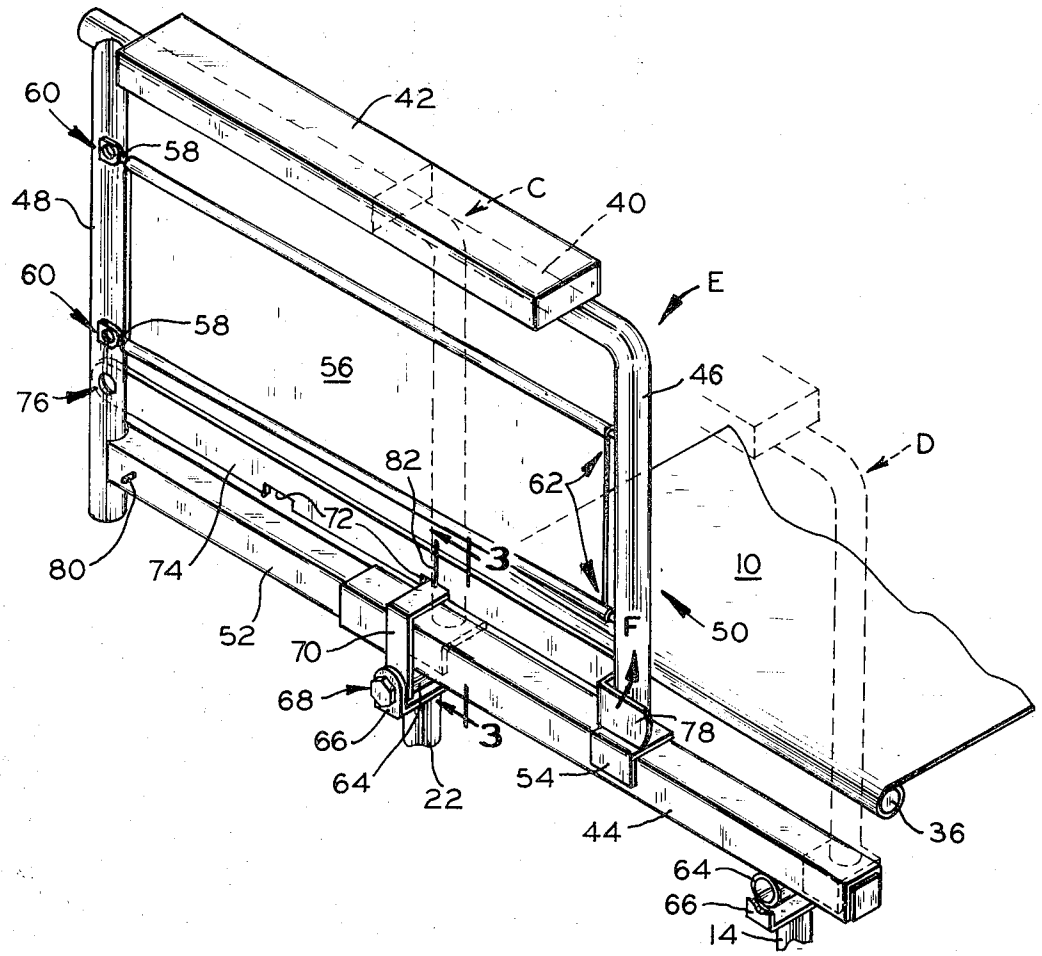


FIG. 1

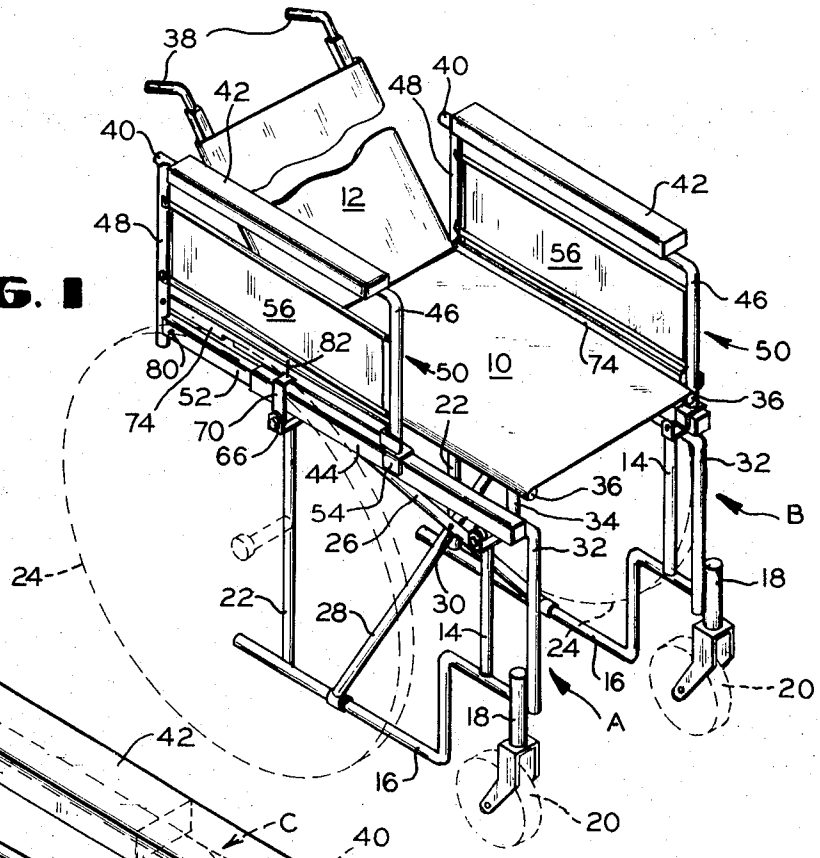


FIG. 2

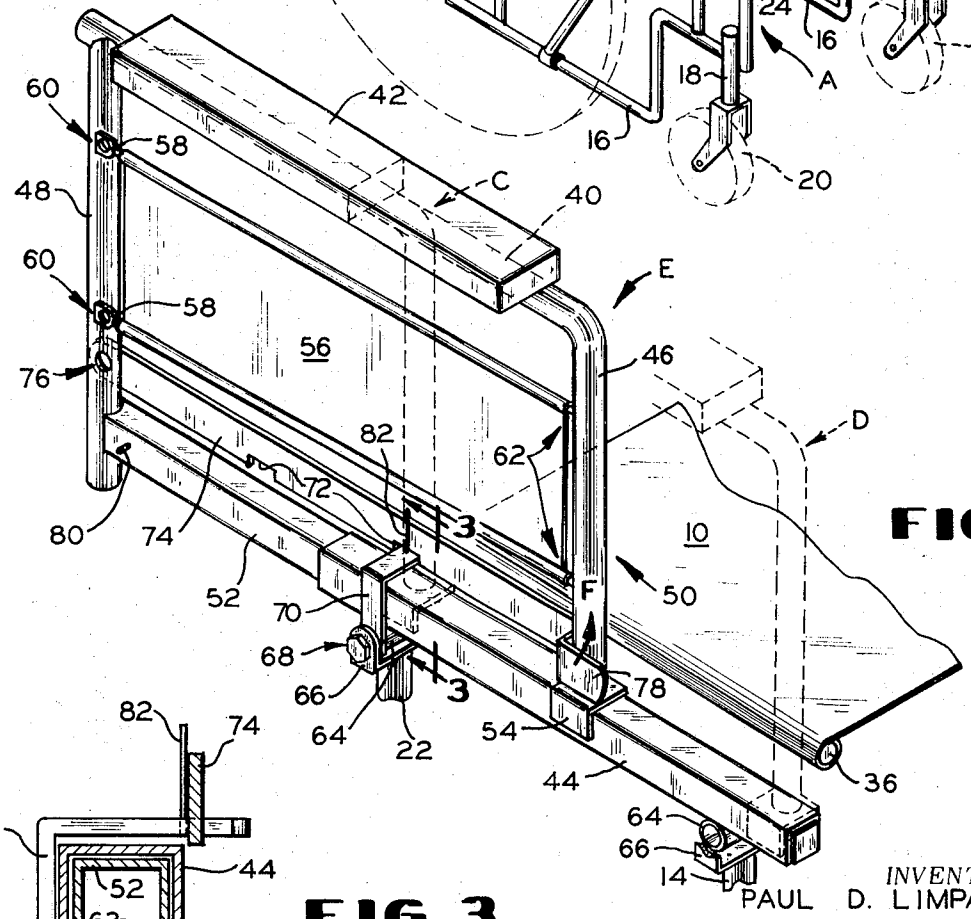
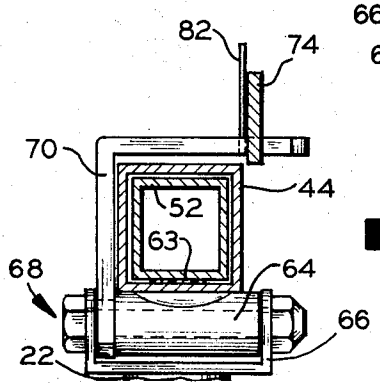


FIG. 3



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HORIZONTALLY ADJUSTABLE ARMRESTS FOR WHEELCHAIRS

BACKGROUND OF THE INVENTION

Heretofore, it has been known that changing the profile of an armrest portion of a wheelchair enables the wheelchair to be positioned closely adjacent to a desk or table, and that moving the armrest assembly to a rearward position provides ready ingress or egress to the user of the wheelchair.

Some of the problems associated with the designs of the prior art include the requirement of complex and difficult motions on the part of the user where the armrest frame assembly is removable from the obstruction position and must be equipped with plungers and similar securing means to provide adequate locking means for the armrest assembly. Where the motions required have been simple, the design has been such that only the armrest or arm cushion means moves relative to the frame assembly. Further, the designs, where the frame assembly can be moved to a non-obstructive position, have relied on support and guidance from attachments to the framework of the back portion of the wheelchair which could not be employed in wheelchair structures wherein the back support is reclinable. The combining of the armrest mechanism with the pusher tube of the wheelchair gives rise to the possibility of unnecessary stresses being applied to the mechanism by the pusher tube in moving the wheelchair. In some instances, the securing means for the positioning mechanism of the armrest assembly is dependent on the exactness of alignment which can be applied to the securing means for securing the position of the assembly, such as aligning plungers with associated holes.

The present armrest assembly overcomes the above problems by providing a slidable armrest assembly supported from a position below the level of the wheelchair seat and operable by a single latching mechanism responsive to finger pressure and provides for selective positioning of the armrest assembly relative to the wheelchair frame assembly.

SUMMARY

The present invention relates to wheelchairs and more particularly to horizontally adjustable armrests for wheelchairs. A wheelchair in accordance with the present invention may have a pair of spaced apart side frame members interconnected by a suitably disposed X-frame. Generally, an invalid supporting seat structure is affixed to extend between the side frame members. Each of the side frame members includes vertically extending front and rear tubes having a horizontally disposed member extending therebetween. The horizontally disposed member is positioned below the elevation of the wheelchair seat. An armrest assembly is slidably connected to the horizontally disposed member and may include a tube telescopingly received within the horizontally disposed tube.

The armrest assembly can be slidably advanced to a forward position for arm support or retracted to a rearward position to remove the obstruction presented by the armrest assembly above the elevation of the support means for the seat to thereby facilitate lateral movement of the user.

Extreme and intermediate positions of the armrest frame may be established by means for selectively positioning the armrest assembly such as latch means which may include a pivotal lever attached thereto having notches for engaging a detent on the horizontally disposed tube. Upward movement of the lever disengages the notches allowing movement of the armrest frame. The lever returns by the force of gravity to a position of engagement between the latch and any notch passing thereover.

The present armrest frame assembly is a simplification in design and operation over the piror art armrests. Simplification of design results in a rugged mechanism of lower cost because of its more economical manufacture.

BRIEF DESCRIPTION OF THE DRAWINGS

The other objects and advantages of the invention will become readily apparent from reading the following detailed description of an embodiment of the invention when considered in the light of the accompanying drawings, in which:

FIG. 1 is a perspective view of the wheelchair assembly incorporating the features of the invention;

FIG. 2 is an enlarged fragmentary perspective view of the side of the wheelchair assembly illustrated in FIG. 1; and

FIG. 3 is an enlarged fragmentary sectional view of the wheelchair illustrated in FIG. 2 taken along line 3-3 thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1 through 3, the wheelchair consists primarily of two laterally spaced substantially identical side frames A and B, an interconnecting seat 10, and a backrest 12. Each of the side frames A and B includes a front vertically disposed rail or tube 14 affixed to a forward portion of a horizontal base tube 16. Mounted on the extremity of the forward portion of the base tube 16 is a caster wheel supporting cylinder 18 from which a front caster wheel 20 depends. At the rear of each of the side frames A and B is a vertically disposed rear rail or tube 22 on which a large or drive wheel 24 is mounted.

The two side frames A and B are collapsibly or foldably connected to one another by X-brace members 26 and 28. The X-brace members 26 and 28 are pivotally interconnected at 30 and have their upper ends affixed to the upper portion of one of the respective side frames on support tube 32 while their lower ends are pivotally connected to the lower ends of one of the respective side frames on the base tube 16. The lower ends of the X-brace members 26 and 28 are pivotally connected to the base tube 16 of the respective side frames A and B. The support rail or tube 32 extends longitudinally beneath the level of the seat 10 and extends downwardly at its forward position to attach to the caster wheel supporting cylinder 18. The seat portion 10 is suspended between two spaced apart seat tubes 36 which may be secured to the respective support tubes 32 by an upwardly extending support bracket 34. The rear portion of the seat tubes 36 are similarly secured to the support tubes 32 by brackets, not shown.

The backrest 12 is suspended between two spaced apart pusher tubes 38, the lower ends of which are pivotally mounted with the respective side frames A and B so that the backrest 12 may be selectively moved between a sitting position and a reclining position. It will

be noted that the uppermost free ends of the pusher tubes **38** are bent rearwardly to provide handle parts to be grasped to trundle the wheelchair from place to place. Where the wheel-chain is collapsible, preferrably, the seat **10** and backrest **12** portions are formed of a flexible material.

In accordance with the invention, a horizontally adjustable armrest assembly is provided and consists essentially of an armrest frame **50** and a support member **44.** The armrest frame **50** includes an upper horizontally disposed portion **40,** a vertical frame portion **46** extending from the front of the portion **40,** a vertical frame portion **48** extending from the rear of the portion **40,** and slide rod **52** secured to the vertical portion **48** and adapted to extend forwardly in a cantilevered fashion. The upper surface of the slide rod **52** is slightly lower than the free lower end of the vertical portion **46.** A guide means **54** in the shape of a saddle is affixed to the free end of the portion **46.**

The support member **44** for the armrest frame **50** is hollow and is disposed at or below the elevation of the seat tube **36** supporting the seat **10.** The horizontally disposed member **44** is adapted to slidably receive the slide rod **52.** To militate against relative rotation of the telescoping slide rod **52** and the horizontally disposed member **44,** the members are preferrably formed with mating polygonal cross-sections, as illustrated in FIG. **3.** Lubricating pad means **63,** formed of teflon, for example, may be inserted between the inner surface of the telescoping element **44** and the outer surface of the slide rod **52.** The use of such lubricating means provides for smooth movement between the telescoping members **44** and **52** and results in quieter operation.

The saddle **54** is slidable with respect to the outer surface of the horizontally disposed member **44** and guides the forward portion of the armrest frame **50** during its travel. Both the telescoping tube **52** and the saddle **54** provide firm support for the armrest frame **50** by bearing against the horizontally disposed member **44** which in turn extends between and is securely affixed to the side frame members **14** and **22.** Sleeves **64** may be welded or otherwise suitably secured to the horizontally disposed member **44** and associated yoke member **66** may be welded to members **14** and **22.** The sleeves **64** are fastened to the yokes **66** as at **68,** to achieve the above connection between the respective side frame and the member **44.** By supporting the armrest assembly completely from below the elevation of the support tube **36** of the seat **10** in a slidable manner, the armrest frame **50** may be retracted from the intermediate position illustrated to a position C (in phantom) where the entire side of the wheelchair above the elevation of the seat **10** is clear for lateral movement of the user. Also such support mechanism frees the backrest **12** for pivotal movement. When the armrest frame **50** is advanced to a position D, illustrated in phantom, full arm support is given. In intermediate positions, the armrest frame **50** may be adjusted to position the user in close proximity to a table, desk, etc. Attached to the armrest frame **50** is an enclosure panel **56** affixed to rods **58** which are fastened to the frame **50** by suitable threaded fasteners **60** and inserted in apertures in the frame **50** at **62.**

It is to be understood that other means for slidably connecting the armrest frame **50** to the horizontally disposed member **44** other than telescoping elements and a slidable saddle may be used. For example, slidable channels and a depending element from the armrest frame **50** engaging the slot in the channels.

To secure the armrest frame **50** in a desired position, means for slectively positioning the armrest frame **50** can be provided in the form of a detent **70** attached to the horizontally disposed member **44** in a convenient manner, such as a threaded fastener **68.** The detent **70** is engageable by notches **72** formed in a lever **74** pivotally attached to the armrest frame **50** as at **76.** Opposite the pivotal end of the lever **74,** a tab portion **78** is formed by offsetting the end laterally to position the tab **78** in a convenient location for the user along side the frame member **46.** Finger pressure on the tab **78** in the direction of the arrow F in FIG. **2** causes the lever **74** to pivot and release the notch **72** from the positive engagement with the detent **70.** The single motion of lifting the lever **74** allows the armrest frame **50** to be moved in either forward or backward movement. Once the lever is disengaged, the tab **78** can be released and the force of gravity will cause the positive engagement between the detent **70** and any notch **72** passing thereunder. The numher of notches **72** required and their location are determined by the number and location of the armrest frame **50** positions desired.

Limitation of the overall travel of the armrest frame **50** to prevent disengagement from an associated side frame may be accomplished by mounting a protusion, such as a pin **80,** in a position on the telescoping tube **52** to engage the rearward end of the horizontally disposed member **44** when the armrest frame **50** is in the forwardmost position providing a forward stop. A rear stop is provided by the detent **70** on the horizontally disposed member **44** to engage the saddle **54** in a position corresponding to the rearward most position of the armrest frame **50.**

It will be noted that the tab **78** in its position along side the vertically extending frame portion **46** militates against movement of the lever **74** inwardly of the wheelchair. A pin **82** extending upwardly from the detent **70,** as clearly illustrated in FIGS. **2** and **3,** militates against movement of the lever **74** outwardly of the wheelchair. Coaction of the tab **78** and pin **82** in the above manner maintains the lateral alignment of the lever **74.**

The forward movement of the armrest frame **50** could be varied by causing the detent **70** to be movably positioned along the length of the horizontally disposed member **44** thereby adjusting the location of engagement between the detent **70** and the notches **72** on the lever **74.**

The present horizontally adjustable armrest frame assembly is one of simple design and operation. Operation of the positioning means is convenient for the user and requires only a single motion for activation. The simple design of only a few number of components results in a rugged device which is economically manufactured.

In accordance with the provisions of the patent statutes I have explained the principles and mode of operation of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that the invention may be practiced otherwise than as specifically illustrated and described without departing from its spirit or scope.

I claim:

1. A wheelchair having a seat and means for supporting said seat; a pair of spaced apart side frame members, each of said frame members including a vertically disposed front tube and a rearwardly spaced vertically extending rear tube; the improvement comprising:

a horizontally adjustable armrest assembly said armrest assembly consisting of an armrest frame and a horizontally disposed member extending between said front and rear vertically disposed tubes at a level which does not extend above the elevation of said means for supporting said seat;

means slidably connecting said armrest frame to said horizontally disposed member, at least a portion of said armrest frame disposed at substantially elbow height when a user is seated in said wheelchair whereby said armrest frame may be slidably advanced to a forward position for arm support or retracted to a rearward position to remove the obstruction presented by said armrest frame assembly above the elevation of said means for supporting said seat thereby providing for lateral movement of the user; and

latching lever means for positively positioning said armrest frame relative to said horizontally disposed member, said lever means including a lever carried by said armrest frame and pivotally mounted to said armrest frame at one end thereof.

2. The invention defined in claim 1 wherein said means slidably connecting said armrest frame to said horizontally disposed member includes a tube telescopingly received within said horizontally disposed member.

3. The invention defined in claim 2 wherein said horizontally disposed member and said telescoping tube having mating polygonal cross-sections.

4. The invention defined in claim 1 wherein said means slidably connecting said armrest frame to said horizontally disposed member includes guide means slidable along a portion of the outer surface of said horizontally disposed member.

5. The invention defined in claim 4 wherein said guide means includes a saddle straddling said horizontally disposed member.

6. The invention defined in claim 1 wherein said latching lever means includes a detent affixed to said horizontally disposed member for engagement with said notch on said lever.

7. The invention defined in claim 6 wherein said lever further includes at least one notch thereon for engaging said detent affixed to said horizontally disposed member.

8. The invention defined in claim 6 wherein said lever includes a plurality of notches extending along the length thereof for selective engagement with said detent affixed to said horizontally disposed member.

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