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Limpach

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[54] SWING-AWAY FOOTREST FOR INVALID WHEELCHAIRS

[75] Inventor: Paul D. Limpach, Napoleon, Ohio

[73] Assignee: Gendron-Diemer, Inc., Archbold, Ohio

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[51] Int. Cl. A47c 7/50

[58] Field of Search 297/417, 429, 433; 248/407-409; 5/331

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| 2,835,475 | 5/1958 | Enghauser | 5/331 X |
| 2,909,212 | 10/1959 | Scherer | 248/408 |
| 3,376,066 | 4/1968 | Kernes | 5/331 X |
| 3,453,027 | 7/1969 | Pivacek | 297/429 |

Primary Examiner—Casmir A. Nunberg
Attorney, Agent, or Firm—David H. Wilson

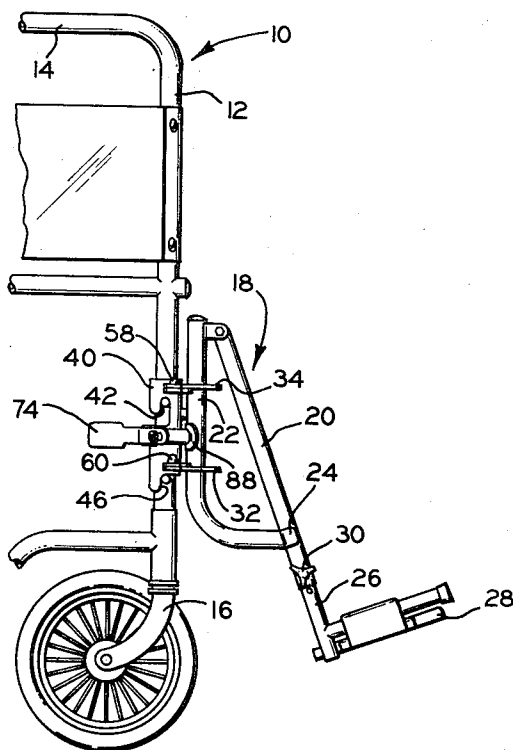
[57] ABSTRACT

A swing-away footrest assembly for invalid wheelchairs having an improved latching mechanism for effectively locking the footrest in a position of use and facilitating unlocking the footrest to permit the same to be swung to a position of non-use or completely removed from the wheelchair.

5 Claims, 5 Drawing Figures

[56] References Cited UNITED STATES PATENTS

2,817,854 12/1957 Pratt 5/331



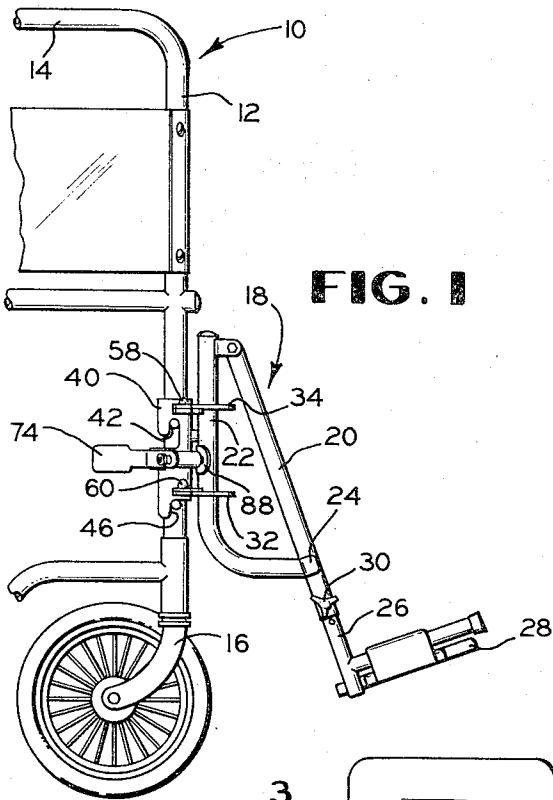


FIG. 1

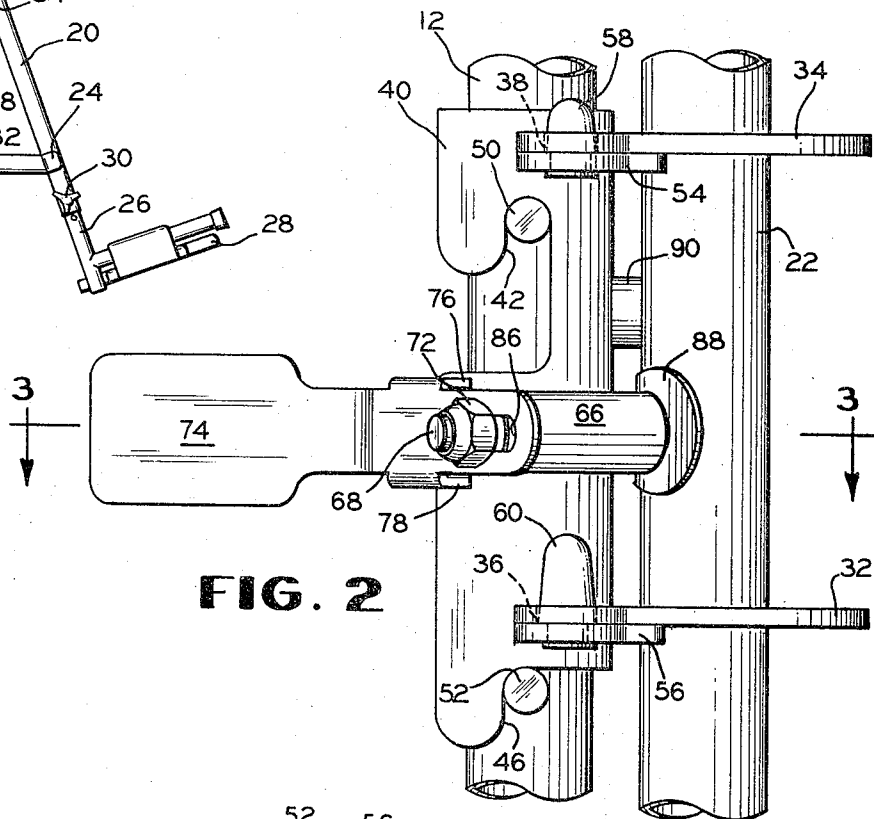


FIG. 2

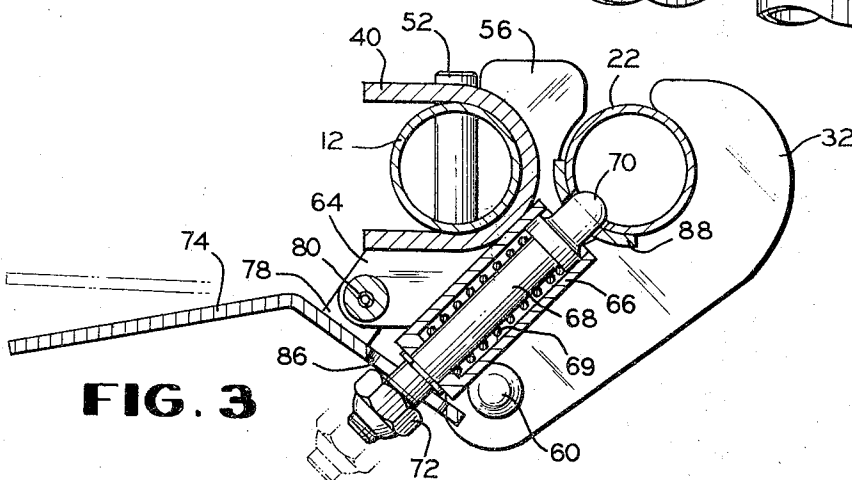


FIG. 3

SHEET 2 OF 2

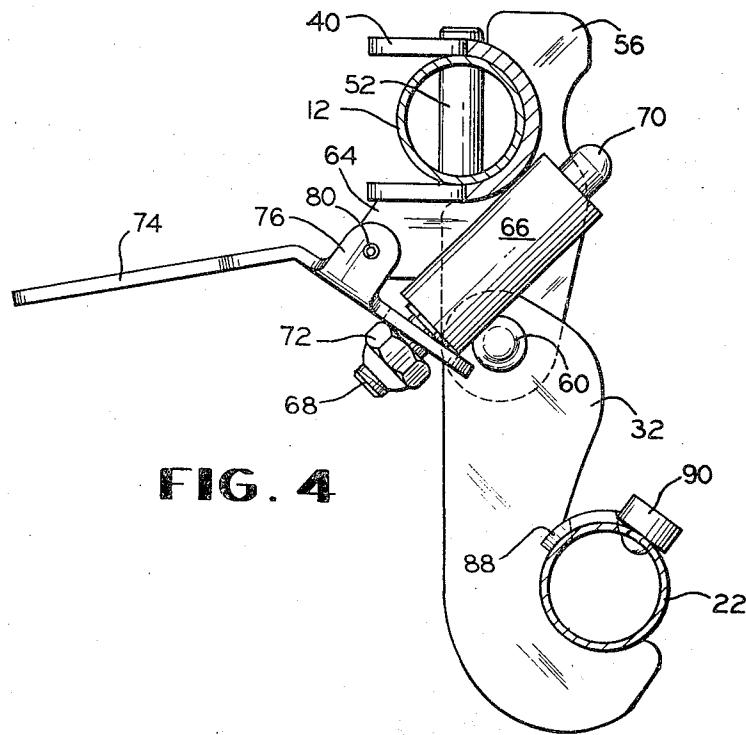


FIG. 4

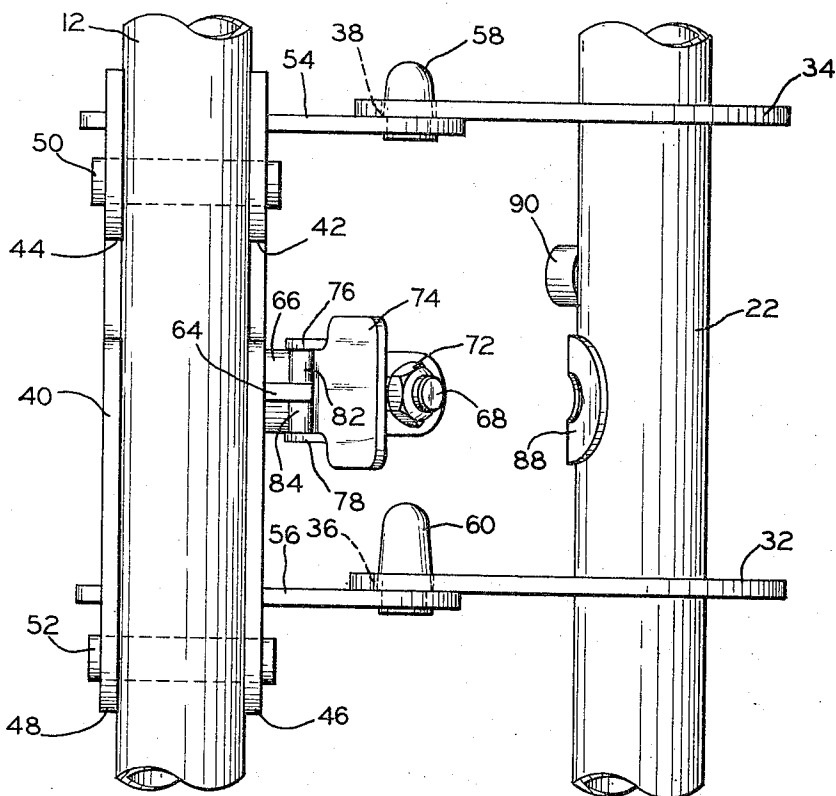


FIG. 5

SWING-AWAY FOOTREST FOR INVALID WHEELCHAIRS

BACKGROUND OF THE INVENTION

Efforts have been made to develop swingable and removable footrests. However the assemblies in the prior art have required locking pins which had to be physically or bodily removed to enable the footrest to be swung away from a locked position of non-use or completely removed from the wheelchair. The obvious problem is encountered should the locking pins be misplaced or lost. Such structure is illustrated for example in U.S. Pat. No. 2,592,449 entitled "Removable Footrest for Wheel Chairs."

Other attempts to produce an acceptable mechanism have included a spindle arrangement received in a vertically mounted and slotted socket on the front post of the wheelchair. In order to lock the footrest, a lever must be swung about a horizontal axis into a slotted head of the spindle to secure the footrest in a foot-supporting position. Manifestly such an operational mode requires a separate operation with a different motion from the actual mounting and swinging of the footrest into a working position.

SUMMARY OF THE INVENTION

The present invention has produced a latching and locking mechanism for a removable and swingable footrest assembly for wheelchairs which overcomes the problems of the prior art wherein the latching and unlatching of the removable and swingable footrest is accomplished by single integrated movement of a latching lever and swinging of the footrest. More specifically, the footrest may be readily swung to a position adjacent the side of the wheelchair, by merely depressing a latch arm against the bias of an associated spring which withdraws a plunger from a recess in the footrest, and thence swinging the footrest from the operative to the inoperative positions. In order to effect a movement of the footrest from the inoperative position to the operative position, the footrest is merely caused to be swung about its vertical mounting axis so as to cause the footrest to cam the plunger against the bias of the spring until a recess in the footrest aligns with the plunger, at which moment the plunger is biased to a locked position positively securing the footrest in the operative position.

The objects of the invention are effectively achieved by a latching mechanism for releasably locking a swingable footrest assembly to an adjacent part of a wheelchair upon which the footrest is pivotally supported to swing about a vertical axis comprising a plunger affixed to the part normally biased to a latching position, the plunger mounted to reciprocate along an axis; a detent on the footrest for engagement with the plunger; and means for reciprocating the plunger out of latching position.

BRIEF DESCRIPTION OF THE DRAWINGS

The above, as well as other objects and advantages of the invention will become manifest to one skilled in the art from reading the following detailed description when considered in the light of the accompanying drawings, in which:

FIG. 1 is a fragmentary side elevational view of a wheelchair having a swingable footrest embodying the features of the invention;

FIG. 2 is an enlarged fragmentary view of the latching and locking mechanism of the invention;

FIG. 3 is a sectional view of the mechanism illustrated in FIG. 2 taken along line 3—3 thereof;

FIG. 4 is a view similar to FIG. 3 showing the footrest in an open and unlatched condition; and

FIG. 5 is an elevational view of the structure illustrated in FIG. 4.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings FIG. 1 illustrates a portion of an invalid wheelchair which typically comprises two opposed side frame members which generally are of the type capable of being collapsed toward one another for purposes of storage and shipping. Each of the side frames generally indicated by reference numeral 10 is formed from tubular metal stock which contributes substantial strength and light overall weight to the construction. As illustrated, each side frame 10 has a front generally vertically extending tubular member 12, the upper portion of which is bent rearwardly into a horizontal portion 14 constituting an armrest. Pivotally mounted to the bottom portion of each of the vertically extending tubular members 12 is a caster assembly 16 for effecting support of the front portion of the wheelchair.

The individual side frame members 10 may be connected one to the other by means of the conventional diagonal cross brace structure which consists of a pair of X-braces, each formed by two diagonal rods. The rods may be connected together intermediate the ends thereof to satisfactorily enable the side frames to be folded one toward the other for purposes of storage.

In accordance with the present invention, forwardly extending footrest assemblies 18 are swingably supported on the vertically extending tubular member 12 to project forwardly of the wheelchair frame. Each of the footrest assemblies 18 consists of a tubular member 20, the upper portion of which is pivotally connected to the upper portion of a tubular member 22 the lower end of which is bent to extend outwardly and terminate in a spoke 24 to receive and support the pivotally connected member 20.

The lowermost end of the tubular member 20 receives in a telescoping fashion one end of a tubular member 26, the other end of which is provided with a treadle or footrest 28 which is hingedly or swingably mounted thereto between limits. The vertical disposition of the footrest 28 may be varied by removing a threaded fastener 30 which is adapted to extend through pairs of aligned apertures in the tubular member 20 and selectively through pairs of aligned apertures in the tubular member 26. The raising or lowering of the tubular member 26 and its associated treadle 28 is effected by withdrawing the fastener 30, moving the tubular member 26, and reinserting the fastener 30 at the desired level.

A pair of spaced apart plate members 32 and 34 are mounted on the vertically extending portion of the tubular member 22 to project outwardly and rearwardly thereof. The plate members 32 and 34 are each provided with an aperture 36, and 38, respectively. The apertures 36 and 38 are disposed radially outwardly from the tubular member 22.

A U-shaped bracket or saddle 40 having diametrically spaced tapered slots 42 and 44 and vertically

downwardly projecting portions 46 and 48. On the tubular member 12 are upper and lower transverse pins 50 and 52 respectively. The slots 42 and 44 are adapted to seat onto the upper transverse pin 50 of the wheelchair frame member. The projections 46 and 48 extending downwardly from the bottom of the saddle 40 are adapted to contact the rearward side of the lower transverse pin 52. To effect a connection between the saddle 40 and the tubular frame member 12 of the wheelchair frame 10, the saddle 40 is caused to embrace the tubular member 12 at a point the slots 42 and 44 are above the transverse pin 50 and the downwardly extending projections 46 and 48 are above the transverse pin 52. The saddle 40 is then allowed to be lowered such that the extremities of the transverse pin 50 engage within the slots 42 and 44 and the extremities of the transverse pin 52 engage the upper portion of the tapered downwardly extending projections 46 and 48 such that a snug fit is achieved between the saddle 40 and the associated tubular member 12.

A pair of outwardly extending bracket members 54 and 56 are secured by welding to extend outwardly from the saddle 40. The bracket members 54 and 56 are spaced apart an amount substantially equal to the spacing between the associated plate members 32 and 34 of the footrest assemblies. The bracket members 54 and 56 are each provided with an upwardly extending pin member 58 and 60, respectively. Preferably, the lower pin 60 is somewhat longer than the upper pin 58, so that in applying the footrest assembly 18 to the saddle 40, the lower pin 60 may be caused to enter its associated aperture 36 in the member 32 before the upper pin 58 enters its associated aperture 38 in the member 34. Thus, with the entry of the lower pin into the aperture 36 in the lower plate 32, the upper pin 58 can be easily guided into the associated aperture in the plate 34 and entire footrest assembly 18 allowed to be lowered into place during assembly when the elements are in the position illustrated in FIGS. 4 and 5.

Then the footrest assembly 18 may be swung toward the latched or locked position illustrated in FIGS. 1, 2 and 3. To maintain the footrest 18 in a locked position with respect to the wheelchair frame 10 and the saddle 40, an improved latching mechanism is employed. The latching mechanism includes an outwardly extending mounting bracket 64 which is welded or otherwise secured to the outer wall of the saddle 40. A cylinder 66 is secured, by welding for example, to the bracket 64. A plunger 68, adapted for longitudinal movement, is disposed within the interior of the cylinder 66. One end 70 of the plunger 68 generally hemispherical in shape and normally biased by a helical spring 69 to the latching position as clearly illustrated in FIGS. 3 and 4. The opposite end of the plunger 68, is provided with exterior threads to receive a threaded fastener 72.

A lever 74, formed of sheet metal, for example, has ears 76 and 78 struck outwardly out of the plane of the lever body to contain an integral pivot pin 80 therebetween. The pivot pin 80 is adapted to pass through a suitable aperture in the bracket 64. Spacer means 82 and 84 may be employed to position the lever 74 with respect to the bracket 64. One end of the lever 74 is provided with a slot 86 of a width sufficient to permit the passage of the threaded portion of the plunger 68 but narrower in width than the threaded fastener 72.

A curved washer 88 is brazed or otherwise suitably secured to the outer wall of the tubular member 22 of

the footrest 18. Preferably, after the washer 88 is secured to the member 22, the member is drilled to form an aperture aligned with the aperture in the washer 88.

As mentioned earlier, the footrest assembly 18 may be readily moved from the open or unlatched position illustrated in FIGS. 4 and 5 to the latched position illustrated in FIGS. 1, 2 and 3. As the pivotal movement of footrest 18 occurs, the outwardly projecting portion 70 of the plunger 68 is caused to contact the curved outer surface of the washer 88 which tends to cam the plunger 68 rearwardly against the bias of the helical spring 69. When the portion 70 of the plunger 68 aligns with the apertures of the washer 88 and the tubular member 22, the spring 69 causes the portion 70 to seat within the apertures and thereby suitably lock the footrest 18. To insure for a firm and quiet connection, a resilient bumper 90 is affixed to the member 22 so that in the latched position, the bumper 90 is slightly compressed between the tubular member 22 and the outer wall of the saddle 40.

To move the footrest 18 to a position of non-use or to remove it from the side frame 10, the lever 74 is moved in a clockwise manner (as viewed in FIG. 3) about the pivot pin 80. The portion of the lever 74 which defines the slot 86 will thereupon contact the undersurface of the threaded fastener 72 and thereby urge the plunger 68 against the bias of the spring 69 to unseat the plunger end 70 from the apertures in the washer 88 and the tubular member 22. With continuing pressure on the lever 74, the entire footrest 18 will tend to swing about the pins 58 and 60. Manifestly when the plunger end 70 is free from the locking apertures, the footrest may also be grasped and swung to a position of non-use alongside the side frame 10 of the wheelchair.

In the event, it is desired to entirely remove the footrest assembly 18 from the side frame 10 of the wheelchair the footrest 18 need only be moved to an unlatched position as in FIGS. 4 and 5 and pulled upwardly until the members 32 and 34 are each above their respective pins 58 and 60.

In accordance with the provisions of the patent statutes, I have explained the principle and mode of operation of my invention and have illustrated and described what I now consider to represent its best embodiment. However, it must be understood that within the spirit and scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

What I claim is:

1. A latching mechanism for releasable locking a swinging footrest assembly to an adjacent part of a wheelchair upon which the footrest is pivotally supported to swing about a vertical axis comprising:

a plunger affixed to said part normally biased to a latching position, said plunger mounted to reciprocate along an axis;

a washer-like means affixed to said footrest for selective engagement with said plunger; and

lever means pivotally mounted on said part for reciprocating said plunger out of latching position.

2. The invention defined in claim 1 includes a helical spring for biasing and plunger.

3. The invention defined in claim 1 wherein said lever includes an elongate slot for receiving one end of said plunger.

4. The invention defined in claim 3 wherein the opposite end of said plunger is hemispherical in shape.

5. The invention defined in claim 1 wherein said plunger is mounted to reciprocate along an axis normal to said vertical axis.

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