SWING-AWAY DETACHABLE WHEELCHAIR FOOTREST

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ABSTRACT
This footrest rotates or swings around the vertical axis of the front vertical support member of a wheelchair frame and has a hanger member which fits between two circular flanges positioned on the vertical support member. The hanger member has the shape of a section of a cylinder in order to mate smoothly with the round or cylindrical shape of a vertical support member when positioned between the two circular flanges. One of the circular flanges has a camming surface with a notch in the forward direction into which a spring biased release latch, which operates a locking member, connects to lock the footrest in the forward position. The release latch is used to unlock a locking member from the notch in the circular flange to allow the footrest to be swung around the vertical support member for removal of the footrest.

6 Claims, 6 Drawing Figures
SWING-AWAY DETACHABLE WHEELCHAIR FOOTREST

BACKGROUND OF THE INVENTION

In many instances the occupant of a wheelchair in order to gain better mobility needs to remove the footrest. The removal of the footrest from the front of the wheelchair substantially reduces the overall size of the wheelchair and allows the wheelchair to be maneuvered in smaller places with a minimum amount of effort. Also the protruding wheelchair footrests are a possible source of damage to furniture as the wheelchair is being maneuvered within a home as well as a hazard to persons moving about adjacent the wheelchair. Consequently, a handicapped person confined to a wheelchair desires a wheelchair which has capability of removing the footrest not only to provide greater mobility, but also to eliminate hazards to furniture and other people adjacent the wheelchair.

An additional common instance where the removal of the footrest is desired occurs when an occupant of the wheelchair wants to position the wheelchair close to a table or desk and the footrest prevents the positioning of the wheelchair close enough in order to present a comfortable location for the occupant.

The use of detachable wheelchair footrests is well known in the art. However, many of the prior art devices utilize rather complicated mechanisms for the removal and replacement of the footrest. These complex devices present problems to the handicapped individual by making it difficult not only to remove the footrest, but also to replace the footrest on the wheelchair. Also, in the prior art devices, in order to move the footrest from a position directly in front of the wheelchair it is necessary to completely remove the footrest.

Once the footrest has been removed from many of the prior art devices, the attachment hardware remaining on the wheelchair frame presents an unattractive wheelchair with several protrusions from the frame member which could be the source of possible damage to either the occupant or persons adjacent the wheelchair.

SUMMARY OF THE INVENTION

When the footrest represented in this invention is removed from the wheelchair frame, no unattractive and dangerous protrusions remain on the vertical support of the wheelchair. The present invention uses two circular flanges in opposing relation to receive the upper and lower ends of a smooth cylindrical section shaped hanger member. Extending from this hanger member is the mounting tube for connection of the footrest plate. The removal of the footrest is quite simple by the use of a release latch which is depressed in order to unlock the footrest from the forward position, permitting the footrest to be swung to a position at the side of the wheelchair to allow easy removal. Also, the footrest, once the release latch is pushed, may be swung to a position beneath the seat as a storage place when the occupant of the wheelchair desires to move closer to a table.

When the footrest is removed from the wheelchair, replacement is quite simple, since all that is necessary is to position the respective ends of the hanger member within the opposing circular flanges and then swing the footrest to the forward position where the locking portion of the release latch is received into a notch within the upper circular flange to lock it securely in the forward position. This procedure, therefore, eliminates much of the difficulty of many previous footrests, requiring the difficult operation of aligning certain apertures on the flanges of the footrest with respective pivot pins on the wheelchair frame member in addition to the operation of a locking device which must be snapped into place once the wheelchair footrest is in the forward position. Hence, the invention disclosed herein provides a wheelchair footrest which is not only simple and easy for the handicapped occupant to operate, but also provides a safer and more aesthetic device. Also, the ability to swing the footrest beneath the seat of the wheelchair provides a means to store the footrest when they are not needed.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a wheelchair with the footrest shown in phantom in the swing-away position; FIG. 2 is a detailed perspective view of the hanger member connected to the wheelchair frame member; FIG. 3 is an exploded view of the locking mechanism; FIG. 4 is a perspective view of the upper collar showing the cammed surface; FIG. 5 is a partial cross-sectional view of the hanger member connected to the wheelchair member; and FIG. 6 is a side elevation view of the attachment portion of the footrest invention.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 shows a typical wheelchair 10 with large rolling support wheels 12 and small front guide wheels 14. Supporting the front portion of the seat 16 are vertical front members 18. Attached to the front or frame member 18 is the footrest mechanism 20, which is comprised of a hanger member or saddle 22 having a footrest support member 24 into which the footrest plate 26 is positioned by conventional means.

The footrest mechanism 20 is attached to the vertical front member 18 by two circular collar flanges or guide rings, consisting of a bottom circular flange 28 and a top circular flange 30, which are attached in opposing relation to the vertical front member 18. As shown in FIG. 5, the combination of the bottom circular flange 28 and the outer surface of the front member 18 form an upward extending channel 32. The top circular flange 30 in conjunction with the outer surface of the front support 18 forms a downward extending facing circular channel 34. Referring to FIG. 3, the hanger member has a bottom edge 36 and a top edge 38, which are received within the respective upward extending channel 32 and the downward extending channel 34 of the collar flanges 28 and 30.

As shown more clearly in FIGS. 2 and 3, in order to position the footrest in a secured or locked forward orientation for use by the handicapped person, a locking mechanism 40 is necessary. The locking mechanism 40 is comprised of an L-shaped member or release latch 42 consisting of a vertical locking tab 44 and a horizontal actuating tab 46. The locking tab 44 is slidably engaged within a slot 48 in the hanger member 22 while the release latch 42 is attached to the mounting tube 24 of the footrest 20 by a spring biased bolt 50. The lower surface 52 of the actuating tab 46 is attached to the top 54 of the bolt 50, shown in FIG. 5, so that any motion of the bolt 50 will cause a respective motion of the release latch 42. Referring to FIG. 3, the lower portion
3 of the bolt 50 is of reduced diameter in order to receive a spring 58. The bolt 50 is slidably oriented within apertures 60 and 62 in the mounting tube 24. The lower end 56 of the bolt 50 is threaded to receive a nut 64 in order to adjust the amount of spring biased tension in the spring 58 which is exerted on the bolt 50. The spring 58 forces the bolt 50 to be situated in the uppermost position allowed by the position of the nut 64. Therefore, the release latch 42 is always positioned in an uppermost orientation within the slot 48, resulting in the upper edge 66 of the vertical locking tab 44 to be higher than the top edge 38 of the hanger member 22.

As seen in FIG. 4, the top collar flange 30 has a cammed surface 67 which forces the release latch 42 down in the slot 48, so that the upper edge 66 of the vertical locking tab 44 is at the same level with the top edge 38 of the hanger member 22 when the hanger member is rotated within the collar flanges 28 and 30 toward the forward position. Also located within the circular collar flange 34 is a locking notch 68 into which the vertical locking tab 44 is positioned by the spring biased bolt 50 when the footrest mechanism reaches the proper forward position.

The distance between bottom edge 69 of the cammed surface 67 and the bottom 71 of the channel 32 is slightly larger than the distance 70 between the top edge 38 and the bottom edge 36 of the hanger member 22. This allows for a relatively close fit of the hanger member 22 within the footrest mechanism 20 when in the forward position and prevents the footrest from being removed in this position. Also, it is to be noted that the front portion 74 of the circular flange 30 has an additional thickness 76 in the arcuate area below the cammed surface 67 and the locking notch 68. This additional thickness provides for a secure attachment of the hanger member 22 to the front member 18 when the footrest 20 is in the forward position.

Turning to the operation of the swing-away footrest invention, when the occupant of a wheelchair desires the removal of the footrest, he depresses the horizontal actuator tab 46 in order to remove the vertical locking tab 44 out of the locking notch 68. The footrest mechanism 20 is then swung to the side of the wheelchair approximately 90°, as shown in phantom in FIG. 1, wherein the depth of the downward extending channel 34 within the upper circular flange 30 provides enough room in conjunction with the channel 32 within the lower circular flange 28 to permit the hanger member to be lifted out away from the circular flanges as shown in FIG. 6. Since the upward extending channel 32 of the circular collar flange 28 is relatively shallow, the footrest is lifted upward within the deeper channel 34 of the upper collar flange 30, so that the bottom edge 36 of the hanger member 22 can be tilted away from the vertical front member 18, allowing the complete removal of the footrest mechanism by a slight downward motion of the footrest to remove the upper edge 38 from the channel 34 in the upper collar flange 30.

To replace the footrest on the wheelchair the reverse procedure is followed. The upper edge 38 of the hanger member 22 is inserted within the channel 34 of the upper collar member 30 and the cylindrically sectioned shaped hanger member 22 is tilted down to a face-to-face relation with the rounded front member 18 of the wheelchair, so that the bottom edge 36 of the hanger member is positioned within the channel 32 of the lower collar flange 28. The footrest mechanism 20 is then rotated toward the front position for use by the occupant which will cause the upper edge 66 of the vertical locking tab 34 to be compressed down along the cammed surface 67 until the vertical locking tab snaps up into the locking notch 68 within the upper collar flange 30. Consequently, the footrest is securely locked in the forward position for ready use by the occupant as a sturdy footrest member.

When it is desired by the occupant to remove the footrest from the forward position and temporarily store the footrest, the horizontal actuator tab 46 is depressed in order to remove the vertical locking tab 44 from the locking notch 68, and the footrest mechanism 20 is swung to a position beneath the seat 16 of the wheelchair to clear the front portion of the wheelchair. Because the height 70 of the hanger or saddle member 22 is slightly greater than the distance between the bottom 71 of the channel 32 in the lower collar flange 28 and the bottom edge 72 of the circular flange 30, the hanger member 22 will remain attached to the front member 18.

What is claimed is:

1. A swing-away footrest for connection to a wheelchair having a front member, said footrest comprising:
   a hanger plate mounted in face-to-face relation on said front member;
   a downward extending collar flange around said front member forming an upper circular channel;
   an upward extending collar flange around said front member forming a lower circular channel, said upper and lower circular channels facing each other to receive the upper and lower ends of said hanger plate;
   a footrest support member connected to said hanger plate; and
   means acting cooperatively with said front member and said footrest support member for locking said footrest in the forward position.

2. A swing-away detachable footrest assembly for connection to a frame member, comprising:
   a hanger member;
   a pair of opposing guide rings attached around said frame member, said guide rings forming a pair of opposing channels for receipt of said hanger member;
   means attached to said hanger member for locking and unlocking said leg member in the forward position; and
   means within one of said guide rings for allowing the removal of said hanger member from said frame member when said leg member is swung away from said forward position.

3. A swing-away detachable footrest assembly as defined in claim 2 wherein one of said pair of opposing channels has a thicker front portion to provide a secure receipt of said hanger member when it is in said forward position.

4. A swing-away detachable footrest assembly as defined in claim 2, wherein said means for allowing removal of said hanger member comprises a cam surface tapered to a point in one direction where the distance between the internal surfaces of said pair of opposing guide rings is large enough to permit removal of said hanger member from said pair of guide rings.

5. A swing-away detachable footrest assembly as defined in claim 4 wherein said cam surface is tapered to
a point in another direction where said distance between said internal surfaces of said pair of opposing guide rings is small enough to prevent removal of said hanger member.

6. A removable wheelchair footrest assembly, comprising:
   a wheelchair frame;
   an upper retaining ring connected to the front support member of said wheelchair frame;
   a lower retaining ring connected to said front support member, said upper and lower retaining rings forming opposing circular channels with said support member, said channels having a spaced relation sufficient to allow removal of said footrest;
   a hanger member having upper and lower edges which are received respectively within said upper and lower circular channels;
   a footrest depending from said hanger member; means attached to said hanger member for locking said hanger member to said front support member; and
   means within said upper retaining ring for retaining said footrest in the forward position.

* * * * *
CERTIFICATE OF CORRECTION


Inventor(s) Keith S. Rodaway

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

Col. 4, between lines 46 and 47 insert the following paragraph --a leg member depending from said hanger member;--

Signed and sealed this 1st day of April 1975.

(SEAL)
Attest:
RUTH C. HASON At testing Officer

C. MARSHALL DANN Commissioner of Patents and Trademarks