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[54] **CONVERTIBLE WHEELCHAIR CONSTRUCTION**
12 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **280/7.1,** 272/70.3, 280/289, 297/5
[51] **Int. Cl.** **B60h 3/00**
[50] **Field of Search** 280/7.1, 7.17, 289, 30, 292; 272/70, 70.3, 70.4; 297/5, 6, 115, 1.16, 117

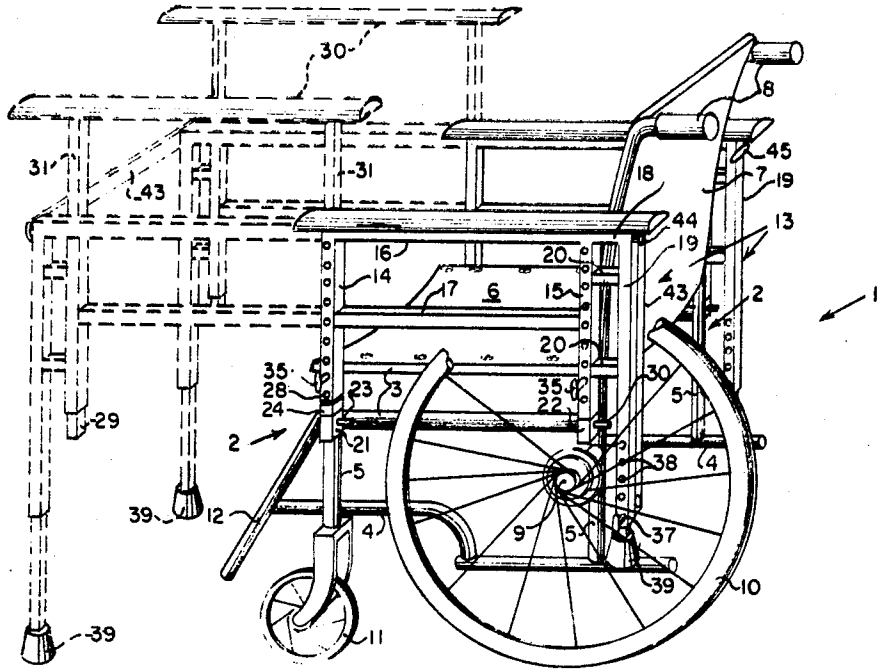
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ABSTRACT: A wheelchair having removable arm rests capable of being fitted to the chair to extend forwardly thereof and provided with extensible and retractable supports engageable with the floor, thereby enabling the chair to be converted to a structure which may be utilized to assist a patient in rising from and returning to the chair. The supports may be provided with friction means or ground engaging wheels so as to permit it to be used as parallel bars, a pickup walker or a wheeled walker. A stabilizing bar interconnects the arm rests when they are in their forwardly extended positions so as to stabilize them.



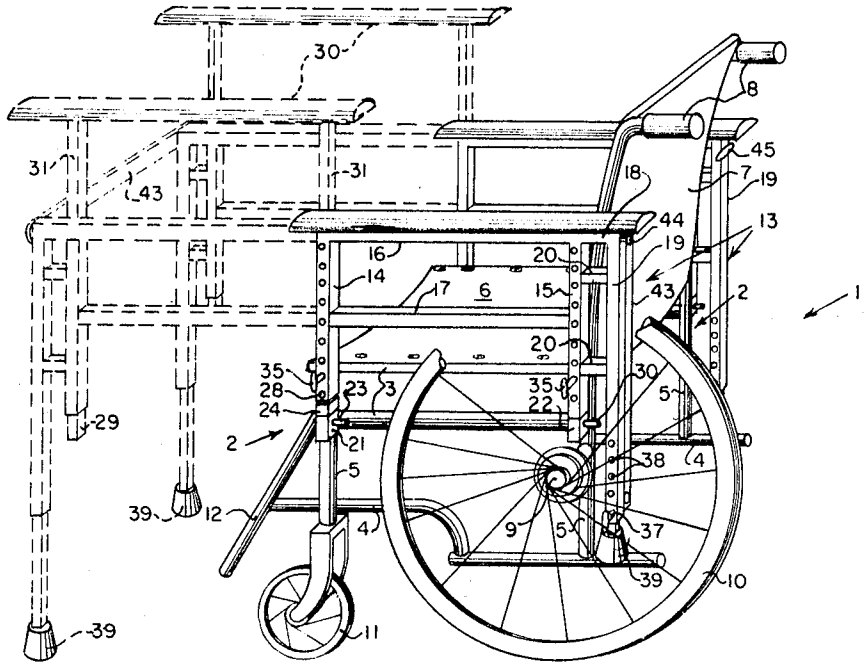


FIG. 1

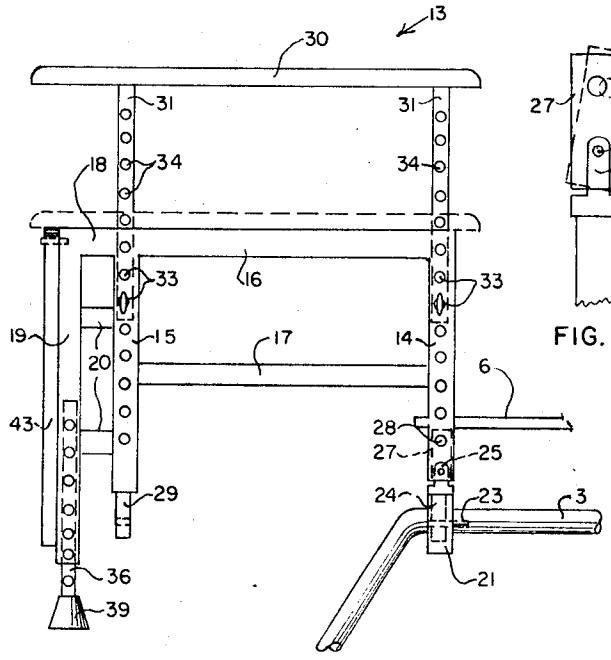


FIG. 2

FIG. 5

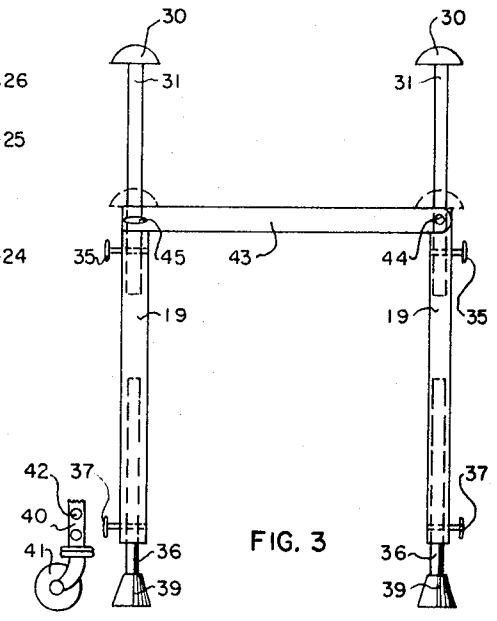


FIG. 3

FIG. 4

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CONVERTIBLE WHEELCHAIR CONSTRUCTION

The invention disclosed herein relates to a wheelchair construction for invalids and more particularly to a wheelchair having arm rests which may be shifted from a position alongside the seat to a position forwardly and in prolongation of the seat so as to enable a patient to rise from and return to the chair and, in addition, provide a support for a standing patient.

A patient confined to a wheelchair must be permitted to engage in physical activity commensurate with his ability. It is important, therefore, that wheelchairs be designed and constructed in such manner as to enable disabled patients to function at their optimum level and as independently as possible. Some patients permanently are confined to wheelchairs whereas others must utilize a wheelchair for a temporary period only. In either case, many such patients can stand erect and thereby obtain therapeutic benefits if means is provided to assist the patient to and from the erect position and to provide support for the patient when he is in the erect position. Various kinds of devices presently are available for this purpose. For example, there are walker units, both wheeled and nonwheeled, which will provide support for a patient in an erect position. Some of these units are completely independent of the wheelchair, whereas others are adapted for temporary connection to the chair. In those instances in which the walker unit is independent of the chair, the patient usually requires the assistance of another person when moving to and from the chair. In those instances in which the walker unit is attachable to the chair, the services of another person usually are required to attach the unit to the chair and, frequently, to assist the patient to and from the chair. In each case, the walker unit is an additional piece of equipment which must be handled and stored.

The prior art also includes attachments for wheelchairs which provide support for a patient in an erect position. Such an attachment forms a permanent part of the chair, but has no particular function except when it is used as a walker device. The size and weight of the chair, therefore, are increased and, in some instances, the attachment actually interferes with the transfer of a patient from the chair to a bed or other support.

An object of this invention is to provide apparatus permanently associated with a wheelchair and which may be arranged so as to provide arm rests in one position and a walker unit in another position.

Another object of the invention is to provide apparatus of the character referred to which enables the patient to arrange the apparatus in the desired position without the assistance of any other person.

A further object of the invention is to provide apparatus of the kind described and which enables the patient to arise from and return to the chair without assistance from another person.

Another object of the invention is to provide arm rests for a wheelchair which are convertible to a walker unit which may be either wheeled or nonwheeled.

A further object of the invention is to provide apparatus of the character described which, when utilized as a nonwheeled walker, facilitates its movement across a floor or the like.

Other objects and advantages of the invention will be pointed out specifically or will become apparent from the following description when it is considered in conjunction with the appended claims and the accompanying drawing, in which:

FIG. 1 is a perspective view of a wheelchair equipped with apparatus constructed in accordance with the invention, certain parts being broken away for clarity of illustration;

FIG. 2 is a side elevational view of a typical arm rest assembly constructed in accordance with the invention;

FIG. 3 is a front elevational view of the apparatus and illustrating its use as a nonwheeled walker;

FIG. 4 is a fragmentary elevational view of a wheel unit which may be used to convert the apparatus to a wheeled walker; and

FIG. 5 is a fragmentary, elevational view of a hinge construction forming part of the apparatus.

Apparatus constructed in accordance with the invention is adapted for use in conjunction with a wheelchair of substantially conventional construction having parallel side frames 2 comprising horizontal frame bars 3, a lower frame member 4, vertical frame members 5, and cross frame members (not shown). Spanning the upper frame members 3 is seat 6 from the rear of which extends a back rest 7. The upper ends of the frame bars 5 provide handles 8 by means of which the chair may be wheeled about. Supported on the frames 2 is a rear axle 9 on which is journaled a pair of rear wheels, one of which is shown at 10. Swivelly mounted at the lower end of each vertical frame element 5 is a front wheel 11. The chair includes a supporting frame 12 for conventional foot rests (not shown).

At each side of the wheel chair is an identical arm rest assembly 13, each of which comprises a pair of parallel, preferably square, tubular front and rear members 14 and 15 joined at corresponding ends by an elongated cross bar 16. Between their ends the members 14 and 15 are spanned by a brace 17. The member 16 has an extension 18 which terminates in a preferably square, tubular member 19 which parallels the member 15 and is spaced therefrom by short brace bars 20. The member 19 is substantially longer than the members 14 and 15 for a purpose presently to be explained.

Means is provided for removably mounting each arm rest assembly 13 on the chair 1 with the front and rear members 14 and 15 adjacent the front and rear ends of the seat 6 and comprises a pair of square, tubular sockets 21 and 22 fixed to the front and rear frame members 5. Removably accommodated in the socket 21 and retained therein by a pin 23 is a bar or fitting 24 of square cross section and of such size as to fit snugly within the socket 21. The upper end of the bar 24 is provided with a clevice 25 which is hinged by a pin 26 to one end of a fitting 27 which fits snugly within the tubular member 14 and is retained therein by means of a pin 28.

Each of the arm rest units preferably includes a vertically adjustable rail 30 adjacent each end of which is a vertically adjustable rod 31 which passes through an opening in the crossbar 16 and fits into the associated tubular member 14 or 15. Each of the members 14 and 15 is provided with a plurality of openings and the rods 31 are provided with similar openings 34 for the reception of pins 35 by means of which the bars 30 can be maintained in any selected position of vertical adjustment.

The vertical member 19 of each arm rest unit 13 is adapted to accommodate an extensible and retractable rod 36 having a number of vertically spaced openings therein to accommodate a pin 37. Each member 19 also has a plurality of openings 38 for the accommodation of the pin 37, thereby enabling the rod 36 to assume any one of a number of vertically adjusted positions. The lower end of each rod 36 may be fitted with a friction member such as a conventional crutch tip 39.

In lieu of the rods 36, each member 19 may accommodate a rod 40 at the lower end of which is a swivellable wheel 41. Each rod 40 also is provided with a plurality of vertically spaced openings 42 for the accommodation of the pins 37 so as to fix the wheels 41 in any selected position of vertical adjustment.

When the apparatus is conditioned for use as a wheelchair, each arm rest assembly 13 will occupy a position alongside the seat as is shown in full lines in FIG. 1. In these positions of the parts the vertical member 14 will be at the front of the chair 1 with the fittings 24 accommodated in the forward sockets 21. The fittings 29 at the lower ends of the vertical members 15 will be accommodated in the rear sockets 22, and the pins 23 and 30 will secure the respective fittings in the respective sockets. The vertical members 19 will occupy a position rearwardly of the back rest 7, and the ground engaging members 39 or 41 will be in a retracted position, as is indicated in FIG. 1.

When it is desired to convert the wheelchair to a walker unit, each of the arm rest assemblies 13 may be lifted, follow-

ing removal of the pins **23** and **30**, so as to remove the fittings **24** and **29** from their respective sockets. Each assembly then may be turned end for end and the fitting **24** reinserted in the socket **21** and the pin **23** restored. In these positions of the parts, both of the end members **15** will be located forwardly and in prolongation of the chair **1**.

Prior to restoring the fittings **24** to the sockets **21**, the patient should remove the pins **37** from the members **19** and extend the rods **36** so as to enable the friction members **39** to reach the floor when the assemblies **13** are refitted to the sockets **21**. This arrangement is illustrated in dotted lines in FIG. **1**.

When the frame assemblies are in their forwardly extending positions, a patient in the wheelchair may pull himself forwardly and upwardly by utilizing the rails **30**. As the patient's weight is transformed from the chair to the rails **30**, the friction member **39** will bear forcibly against the floor and prevent any tendency on the part of the wheelchair to move. The patient thus may raise himself to an erect position. The procedure is reversed when the patient wished to return to a sitting position.

Due to the noncircular construction of the fittings **24** and the sockets **21**, the assemblies **31** will be quite stable in their forwardly extended position. If further stability is either desired or required, however, one of the members **19** may include a stabilizer bar **43** pivoted at one end as at **43** to the member **19** and provided with an opening at its other end adapted to accommodate a latch bolt **45** carried by the other member **19**.

In any position of the arm rest units **13**, the rails **30** may be adjusted vertically to a comfortable height by inserting the pins **35** through appropriate openings in the members **14**, **15** and **31**.

Even though the friction members **39** may be utilized, the apparatus nevertheless may be used as a walker due to the hinged connection between the fittings **24** and **27**. Thus, when a patient stands erect between the assemblies **13**, he may rock the assembly clockwise from the position shown in FIG. **2** so as to lift the friction members **39** a short distance off the floor, whereupon the entire assembly may be moved forwardly on the wheels **10** and **11**.

It it is desired to use the apparatus as a wheeled walker, the rods **36** may be replaced by the members **40** and the latter adjusted to such positions as to enable the wheels **41** to engage the floor.

The disclosed embodiment is representative of a presently preferred form of the invention, but is intended to be illustrative rather than definitive thereof. The invention is defined in the claims.

I claim:

1. A wheelchair construction comprising a frame supporting a seat having forward and rearward ends; a pair of removable arm rests having front and rear ends; means for removably mounting said arm rests on said frame at opposite sides of the latter with the front and rear ends of said arm rests adjacent the forward and rearward ends of said seat; extensible and retractable means carried by said arm rests and adapted to provide supports therefor; and means for mounting one end of said arm rests at the forward end of said frame with the other end of said arm rests located forwardly and in prolongation of said seat, whereby said arm rests and said extensible and retractable means may provide support for a person.

2. The construction set forth in claim **1** including friction means carried by said extensible and retractable means.

3. The construction set forth in claim **1** including wheel means carried by said extensible and retractable means.

4. The construction set forth in claim **1** wherein the means for removably mounting said arm rests at the forward and of said frame includes hinge means.

5. The construction set forth in claim **1** including stabilizing means for connecting said arm rests to one another.

6. The construction set forth in claim **1** including a substantially horizontal rail carried by each of said arm rests, and including means for adjusting each of said rails vertically.

7. The construction set forth in claim **1** wherein the first mentioned mounting means is nonrotatable.

8. An arm rest construction to a wheelchair having a frame on which is supported a seat having forward and rearward ends, said construction comprising an elongated bar having front and rear ends; means for removably mounting said bar on said frame selectively in a first substantially horizontal position along side said seat with the front and rear ends of said bar adjacent the forward and rearward ends of said seat or in a second substantially horizontal position with one end of said bar adjacent the forward end of said seat and the other end thereof located forwardly and in prolongation of said seat; and vertically adjustable ground engaging means carried by said bar at said other end thereof and adapted to provide support therefor.

9. The construction set forth in claim **8** including friction means carried by said ground engaging means at its lower end.

10. The construction set forth in claim **8** including wheel means carried by said ground engaging means at its lower end.

11. The construction set forth in claim **8** wherein said mounting means includes a hinge.

12. The construction set forth in claim **8** including means on said ground engaging means for connecting the latter to a stabilizing structure.