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[54] SELF-MOUNTING POWER UNIT FOR WHEEL CHAIRS

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[51] Int. Cl. B60k 1/04

[58] Field of Search 180/6.5, 11, 14 C, 14 E, 33 D, 180/74, DIG. 3; 74/221

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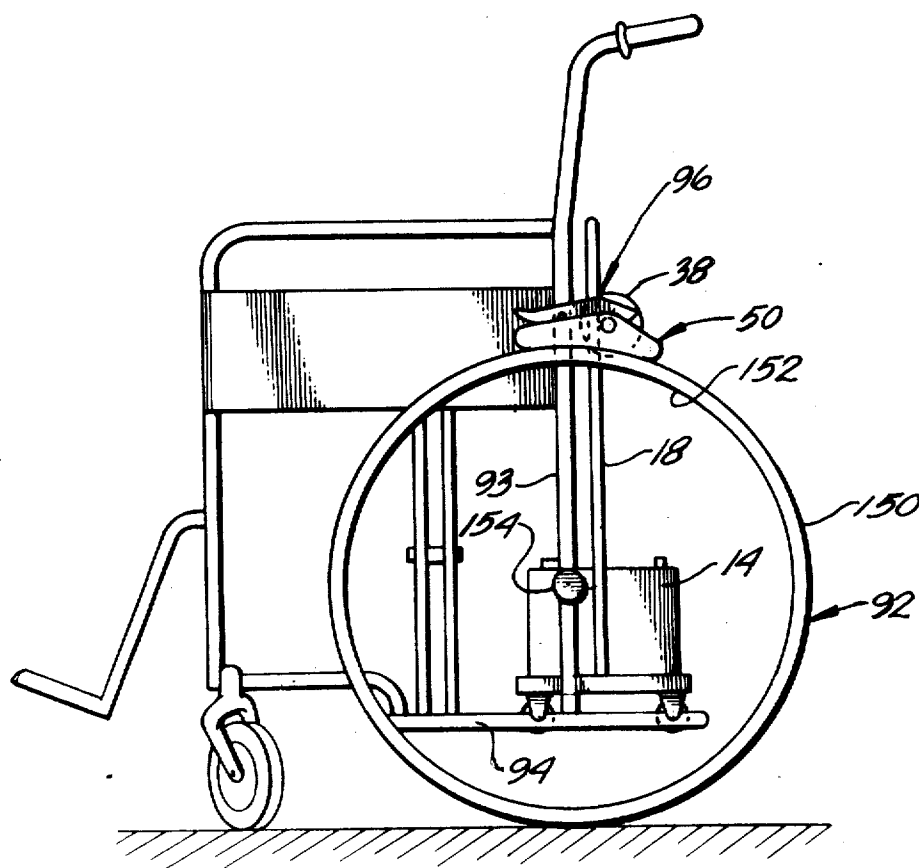
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[57] ABSTRACT

A wheel chair has a pair of main wheels and an associated detachable power unit for driving them. The power unit includes traction means for advancing upwardly along the main wheels until the power unit releasably engages in means carried by the chair adjacent the main wheels. Thereafter, the traction means are used to drive the chair main wheels.

17 Claims, 12 Drawing Figures



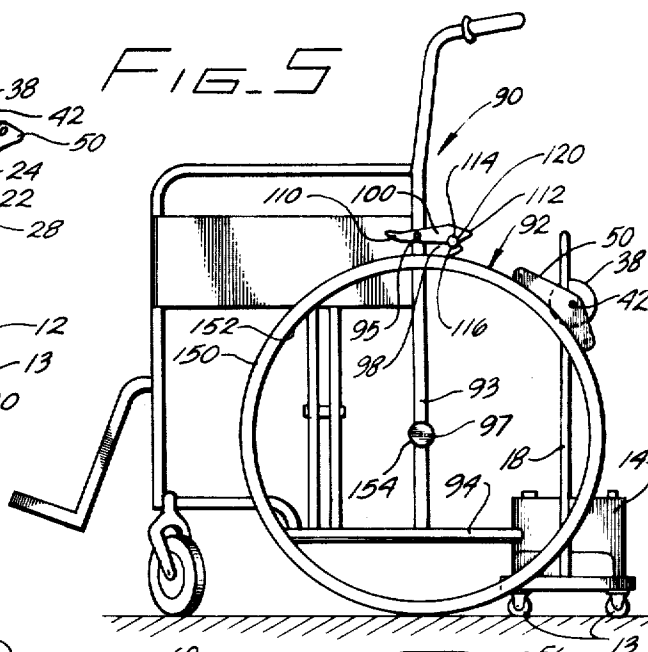
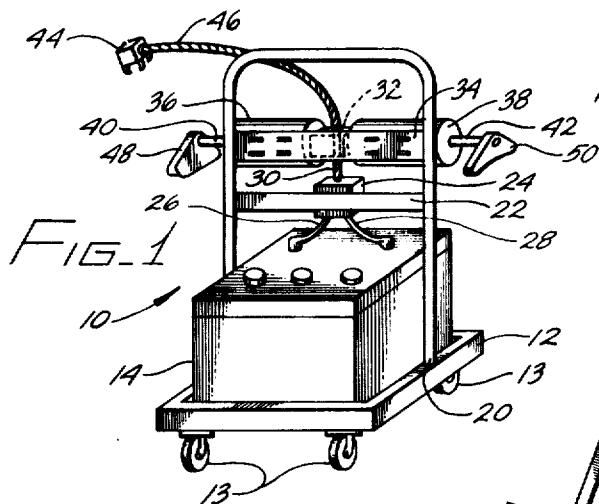


FIG. 2

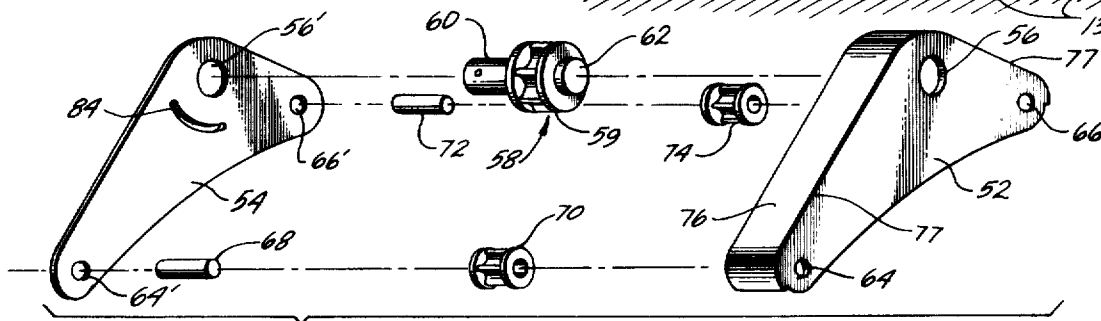


FIG. 6

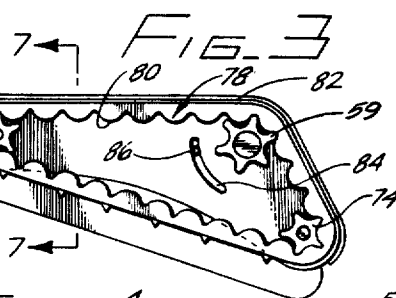
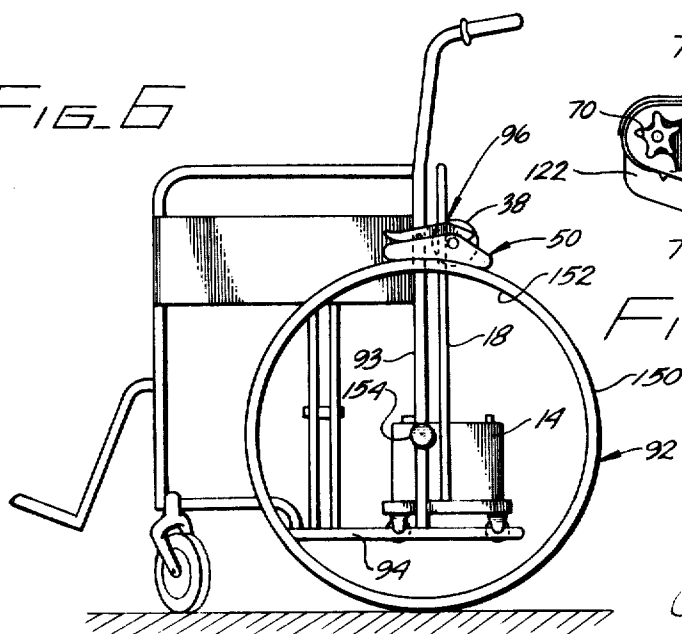
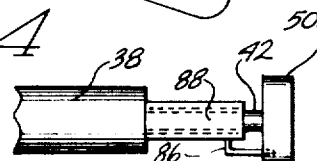


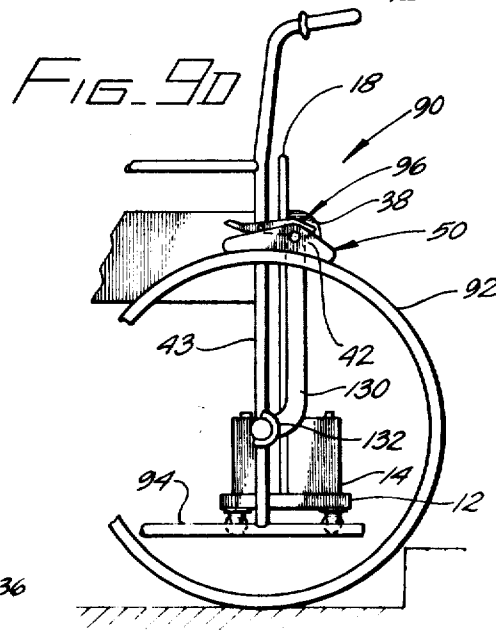
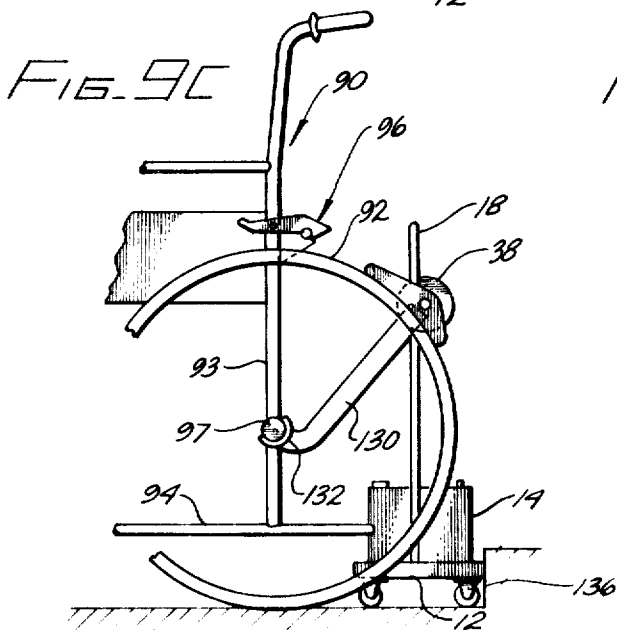
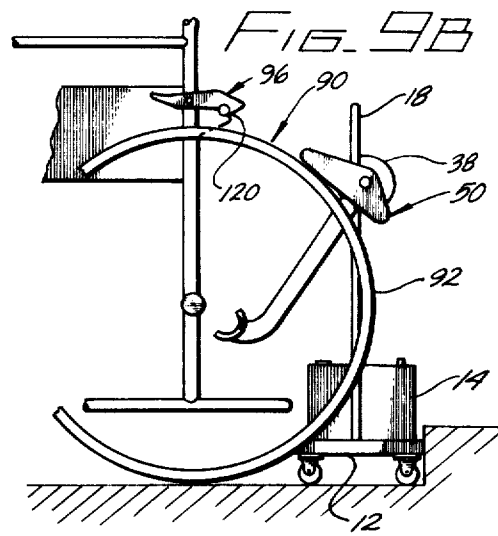
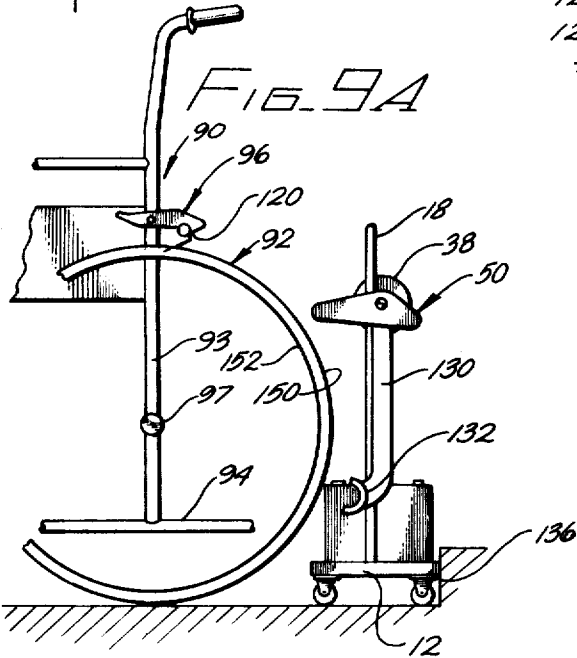
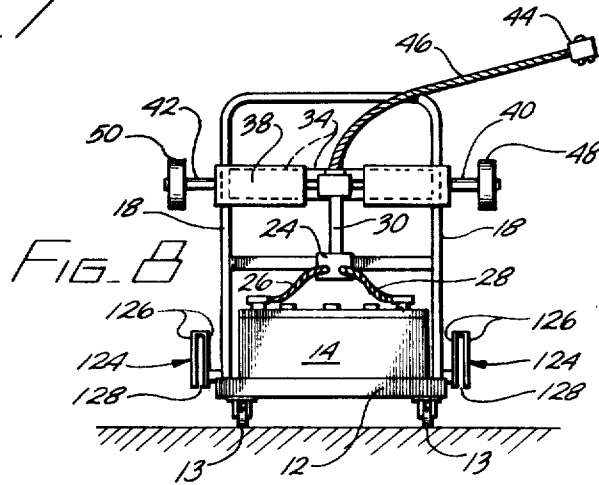
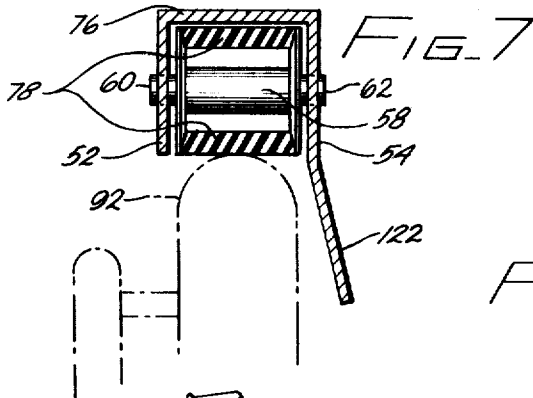
FIG. 4



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SELF-MOUNTING POWER UNIT FOR WHEEL CHAIRS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to wheel chairs and, more specifically, to motorized wheel chairs having detachable motor power units.

2. Description of the Prior Art

Detachable power units for wheel chairs are known. The more recent of such units include a battery for operating a pair of motors by means of a control switch. The control switch is electrically coupled to the battery and the motors for providing control of the speed and direction of revolution of each motor. Each motor is associated with a distinct one of the chair's pair of main wheels and has a drive shaft carrying a sleeve of a frictional material, such as hard rubber or the like, on one end thereof. The frictional materials on the drive shafts are spaced apart a distance equal to the distance between the main pair of wheels of the wheel chair. Thus, the material is adapted for engagement with the tires engaged about the wheel rims so that when the unit is physically mounted on the chair and in position relative to the wheels, the motors can be actuated to rotate their associated drive shafts thereby causing the material to frictionally drive the wheels.

The above power units are useful because they may be detached from the wheel chairs when it is unnecessary for the wheels to be powered. This may occur when the chair is needed to be collapsed in order to be placed in an automobile or the like, or when the chair and occupant have to be hoisted up steps or the like. Because of the great weight of power units relative to the wheel chair, the detachability of such unit from the chair when the latter is sought to be hoisted up steps is extremely beneficial.

Notwithstanding the substantial advantages of the detachable power units above described, one disadvantage still remains prevalent. If no-one is present to aid the handicapped person using the chair in physically attaching the power unit, the unit may not readily be used. For instance, either someone other than the handicapped person using the wheel chair must be present in order to attach and detach the power unit from the wheel chair or additional structure must be provided for the power unit to enable the handicapped, himself, to load the power unit. This latter method may not always be satisfactory if the disabling feature of the person includes lack of muscular coordination or the like.

SUMMARY OF THE INVENTION

The present invention provides an improved detachable power unit for wheel chairs. Specifically, the improvement comprises traction means, carried by the power unit, for advancing upwardly along the pair of main wheels of the chair until the unit releasably engages in means carried by the chair adjacent the pair of main wheels and then, thereafter, for driving the main wheels.

In a further aspect of the invention, the improved wheel chair power unit further comprises stabilizing means for providing stability to the power unit as the traction means advances upwardly along the chair main wheels.

In a specific embodiment according to the present invention, the traction means includes a pair of motor controlled traction assemblies carried by the drive shafts of respective ones of a pair of electric motors. Each traction assembly includes a shaft driven traction belt which engages a substantial portion of a tire engaged about the rim of an associated chair main wheel. The traction belts of the assemblies are spaced from one another a distance equal to the distance between the chair main wheels. The power unit also includes a battery and a control unit electrically coupling the battery to the motors for selective control of each traction belt. The chair carries a pair of latching assemblies adjacent the main wheels for rotatably engaging respective ones of the motor drive shafts in a position allowing the traction belts to operatively engage the main wheels of the chair.

In operation of the above-described specific embodiment, a handicapped person, from a seated position in the chair, manually backs the chair up to the power unit which is itself restrained from rearward movement as by abutment against a wall or the like. Once the chair is positioned so that the main wheels are abutting the traction assemblies, the handicapped person operates the control unit to cause simultaneous reverse mode drive of each motor. Since the main wheels of the chair are stationary, the reversely driven motor drive shafts cause a corresponding reverse drive of the traction belts of the traction assemblies. The traction assemblies thereby climb up their associated main wheels until the motor drive shafts engage within the latching assemblies to fix the assemblies relative to the frame of the wheel chair. Thereafter, further use of the traction assemblies is restricted to enabling movement of the main wheels relative to the fixed assemblies and to the chair frame for moving the chair. Each motor, and its associated traction assembly, preferably is individually controllable from the control unit in regard to determining the speed and direction of movement of the wheel chair.

In order to detach the power unit from the wheel chair, all the handicapped person need do first is to enable the forward drive of each motor via the control unit. Then, from within the chair, he opens the latching assemblies in order to free the motor drive shafts therefrom and, with forward mode operation of the motors, the traction assemblies climb back down their associated main wheels. Once the power unit reaches the ground, the control unit is operated to decouple its battery from the motors thereby deactuating the power unit which may now be left behind and stored.

The present invention is highly desirable in that the handicapped person may, by himself, easily attach and detach a power unit for his wheel chair while remaining comfortably seated in the chair. No physical help is required from any other person.

BRIEF DESCRIPTION OF THE DRAWING

These and other aspects and advantages of the present invention are more clearly described with reference to the accompanying drawing in which:

FIG. 1 is a perspective view of an embodiment of a power unit according to the present invention;

FIG. 2 is an exploded view of one of the pair of traction assemblies employed in the power unit of FIG. 1, absent the traction belt;

FIG. 3 is an orthographic view of the traction assembly of FIG. 2 with the front plate removed and with a guide flange shown thereon for mounting stability;

FIG. 4 is a front elevation view of a traction assembly adjacent its associated motor and motor drive shaft and shows the rotation limiting means for the assembly;

FIG. 5 is a side elevation view of the power unit of FIG. 1 commencing its self-mounting onto a wheel chair;

FIG. 6 is a side elevation view of the power unit of FIG. 1 mounted and locked into position relative to the wheel chair;

FIG. 7 is an end view of the traction assembly of FIG. 3 showing its driving position relative to a chair main wheel;

FIG. 8 is a front elevation view of the power unit of FIG. 1 additionally containing a pair of guide shoes for mounting stability; and

FIGS. 9A-9D are side elevation views of the self-mounting procedure of a power unit similar to the power unit shown in FIG. 1 but additionally including a pair of functional stabilizing struts for mounting stability.

DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

The self-mounting wheel chair power unit, according to the present invention, is shown generally by reference numeral 10 in FIG. 1. The unit contains a carriage 12, having caster wheels 13, on which a standard rechargeable automotive storage battery 14 is supported. Power unit 10 also includes an upstanding U-shaped frame 18 having ends 20 (only one shown) fixed at opposite sides of carriage 12. A cross-bar 22 is supported between opposite sides of frame 18 and has a battery terminal box 24 mounted thereon. Terminal box 24 has two inputs for receiving leads 26 and 28 from battery 14. A single coaxial cable 30, representing leads 26 and 28, is coupled from box 24 to the input of a motor box 32 which is mounted on a motor support plate 34 coupled between opposite sides of U-shaped frame 18.

A pair of d-c motors 36 and 38 are also mounted on support plate 34 at either end thereof with their drive shafts 40 and 42, respectively, in coaxial alignment. Motor box 32 includes circuitry (not shown) designed to selectively couple each motor to battery leads 26 and 28 in either a forward mode connection or a reverse-mode connection, through a control unit 44 coupled to motor box 32 by means of a control cable 46. In other words, control unit 44 can be operated to actuate either or both motors in either direction. The circuitry (not shown) in junction box 32 further allows control of the rotational speed of each motor. Circuitry designed to perform these functions are well known in the art of d-c motor control.

The present invention provides means for enabling power unit 10 to mount itself on an essentially standard wheel chair by traction assemblies 48 and 50 disposed on the outer (non-adjacent) ends of motor shafts 40 and 42, respectively. The distance between assemblies 48 and 50 is preselected to be equal to the distance between the main wheels of whatever wheel chair power unit 10 with which it is to be used. The precise relationship between traction assemblies 48 and 50 and the wheel chair to which power unit 10 is to be affixed

is explained in detail below with reference to FIGS. 2-6. As therein described, the traction assemblies climb up the tires engaged about the rims of the main pair of wheels of the wheel chair and then, after the motor drive shafts are locked into position relative to the chair main wheels, drive the main wheels.

FIGS. 2-4 show different views of traction assembly 50; it being noted that assembly 48 is essentially identical therewith. Specifically, assembly 50 contains a front plate 52 of substantially triangular configuration and a rear plate 54 of similar configuration as plate 52 and disposed in parallel relation therewith. Each of plates 52 and 54 contain a circular aperture 56, 56' at the upper extent thereof. Apertures 56, 56' are rotatable house opposing ends of a belt-engaging sprocket assembly 58. Specifically, a hollow sleeve 60 of sprocket assembly 58 is positioned through aperture 56' in rear plate 54 and is fixed about shaft 42 of motor 38. The other closed end 62 of sleeve 60 is rotatably engaged in aperture 56 of front plate 52. A sprocket wheel 59 is fixed about sleeve 60 between plates 52 and 54. Thus, sprocket assembly 58 may be rotated by motor shaft 42 about its axis relative to plates 52 and 54.

Each of plates 52 and 54 further includes a pair of circular apertures 64, 64' and 66, 66' disposed at opposite lower corners thereof. Each aperture 64, 64' fixedly houses an end of a tension pulley axle 68 rotatably disposed through an associated toothed, traction belt tensioning idler pulley 70. Similarly, each aperture 66, 66' fixedly houses an end of a tension pulley axle 72 rotatably disposed through an associated toothed, traction belt tensioning idler pulley 74. The longitudinal extent of each of sprocket wheel 59 and pulleys 70 and 74 is identical.

A sheet-like shroud 76 has one edge thereof fixed to the upper peripheral boundary 77 of front plate 52. The dimension of shroud 76 laterally of plate 52 laterally toward rear plate 54 is at least equal to the distance between the plates to effectively shield the driving belt of traction assembly 50 from adverse environmental elements such as the clothing of a person using power unit 10.

A traction belt 78 fabricated of a frictional material, such as reinforced rubber or the like, has a lobed inner surface 80 which is configured to mate with the spacings between the radial projection of each of sprocket wheel 59 and tensioning idler pulleys 70 and 74. Sprocket wheel 59, when rotated by drive shaft 42, causes the driving of belt 78 about idler pulleys 70 and 74 within traction assembly 50. The proper tension for the belt is established by selection of an appropriate distance between pulleys 70 and 74. Belt 78 has a cleated outer surface 82 which is designed to grippingly engage a substantial portion of the tire engaged about the rim of an associated one of a pair of main wheels 92 of a wheel chair 90 along the portion of surface 82 between pulleys 70 and 74. To this end, the lower edge of plate 54 is concave with a radius of curvature equal to the radius of curvature of the chair main wheels. As shown in FIG. 3, inner surface 80 of traction belt 78 resembles that of a timing belt, while the outer surface 82 of belt 78 resembles that of the tread belt for a toy tank.

In order that traction belt 78 of traction assembly 50 (as well as that of assembly 48) always be in an ap-

propriate position, when the chair is backed up to power unit 10, to grippingly engage the tire engaged about the rim of the associated chair main wheel, a limit to the rotatability of assembly 50 about an axis concentric with the longitudinal axis of shaft 42 is programmed into assembly 50. Specifically, an arcuate groove 84 is defined in plate 54 adjacent the lower front part of aperture 56' therein. The curvature of groove 84 is concave toward and concentric to aperture 56'. Groove 84 is adapted to receive, in perpendicular relationship, a limit pin 86 (FIGS. 3 and 4). Pin 86 is L-shaped with one end disposed through groove 84 and another end coupled to a non-rotatable shaft shroud 88 disposed over shaft 42 and coupled, at one end, to the associated motor 38. With pin 86 at the upper extent of groove 84, the portion of belt 78 between pulleys 70 and 74 is substantially parallel with the ground. With pin 86 at the lower extent of groove 84, the above portion of belt 78 is substantially at a 45° angle relative to the ground. Thus, no matter what point the limit pins are in the grooves, the traction assemblies will always be in an angular position for properly engaging the wheel rims.

Power unit 10 is arranged for use with a slightly modified standard collapsible wheel chair 90, as shown in FIGS. 5 and 6. The chair has a pair of main wheels 92 (only one being shown), each having a tire 150 engaged about a rim 152, the rim being coupled to a hub 154 by spokes (not shown). The chair further has a pair of vertical supports 93 (only one being shown) onto which axles 97 of the pair of main wheels are rotatably mounted, the axles being fixedly coupled between hubs 154. Vertical supports 93 are, in turn, carried by an associated pair of horizontal supports 94 forming a portion of the wheel chair side frame. Each vertical support carries a spring-biased shaft-clamping assembly 96 adjacent the upper extent of the associated main wheel. Each shaft-clamping assembly 96 has a lower member 98 fixedly secured, at one end, to the associated vertical support 93, and an upper member 100 pivotally connected and spring-loaded to the associated vertical support 93 by pivot pin 95, the upper member having a pair of free ends.

The forward free end 110 of upper member 100 is in the shape of an upwardly inclined handle extending toward the front of wheel chair 90. Thus, a handicapped person, in and from the chair, is able to pivot upper member 100 about pin 95, against the bias of the spring-load on the members, by pushing down on handle end 110. This is important during the dismounting sequence, described below. Upper member 100 is spring-biased in a direction forcing it against lower member 98. Such bias force, however, may be overcome by a reasonable downward force on handle end 110 by the handicapped person. The rear free end 112 of upper member 100 has a semi-circular notch 114 defined in the lower edge thereof. In its normally biased state, notch 114 is aligned with a semicircular notch 116 defined in the upper edge of lower member 98 of clamp assembly 96. A circular aperture 120 (see FIG. 5) is thus defined between rear ends 112 and 118 of sections 100 and 98, respectively; such aperture is sized to receive an associated stationary shroud 88 for the shaft of motor 38, for example.

In operation, the mounting sequence of power unit 10 onto wheel chair 90 is shown in FIGS. 5 and 6. With power unit 10 normally backed up against a supporting structure, such as a wall or the like, the handicapped person moves the wheel chair adjacent the power unit. He then maneuvers the chair until tires 150 of main wheels 92 abut their associated traction assemblies of power unit 10. It is to be noted that such abutment is along a substantial portion of the tires, as above described, thereby providing sufficient traction to enable unit 10 to self mount the chair. It is also to be noted that abutment is facilitated by the operation of limit pins 86 which inhibit the pivotal rotation of traction assemblies 48 and 50 beyond certain programmed limits, as above described.

When abutment is established, the handicapped person then picks up control unit 44 and operates it to enable battery 14 to actuate motors 36 and 38 in their synchronized reverse mode. Since chair main wheels 92 are stationary, the reverse-mode drive of belts 78 causes the belts, and thus traction assemblies 48 and 50 to grippingly advance upwardly along tires 150 of main wheels 92. Correspondingly, the entire power unit is lifted off the ground, as shown in FIG. 6. The configuration and arrangement of traction assemblies 48 and 50 provides the necessary main wheel engaging traction and upward driving force to enable power unit 10 to self-mount to chair 90.

When traction assemblies 48 and 50 reach the upper extent along main wheels 92, the motor shaft shrouds 88 engage ends 112 and 118 of upper and lower clamp members, respectively. Continued movement of each traction assembly along wheels 92 causes ends 112 of each clamp member 100 to wedge upwardly and to pivot upwardly about pin 95. In other words, the force of engagement of assemblies 48 and 50 with their associated clamps 96 overcomes the normal biasing force maintaining such clamps in a closed state. Still further movement of assemblies 48 and 50 causes motor shaft shrouds 88 to advance into associated apertures 120 defined in each clamp assembly 96. The radius of each shroud 88 is slightly less than the radius of apertures 120. Therefore, once shrouds 88 are within apertures 120, the normal bias on clamps 96 repivots upper section 100 into closed relation with lower member 98, thereby locking shrouds 88 in apertures 120.

When shrouds 88 for motor shafts 40 and 42 are rotatable locked into clamps 96, in the manner above described, continued reverse rotation of the shafts causes a corresponding reverse movement of the chair since belt 78 is traveling in a direction that would normally continue its forward advance along the wheel rims. This normally forward advance is translated into actual rearward movement of the main wheels since assemblies 48 and 50 are fixed in position relative to the wheels. When this occurs, the handicapped may control future direction and speed of the chair by operating control unit 44. Thus, he may cease rearward movement of the chair and cause forward movement of each of either of the wheels. For instance, forward movement of only the left main wheel by assembly 50, with the right main wheel stationary due to the non-actuation of motor 36, causes the chair to make a right turn.

Dismounting of power unit 10 from the drive position shown in FIG. 6 is most easily accomplished. By

setting control unit 44 to a forward drive condition for both motors 36 and 38 and then pushing down on the handle ends 110 of upper sections 100, drive shaft shrouds 88 unlock themselves from within apertures 120 of clamps 96. The forward drive of each drive shaft engages belts 78 of traction assemblies 48 and 50 to faithfully climb down their associated main wheels which are fixed in position relative to the belts. Once wheels 13 of power unit 10 touch the ground, control unit 44 is operated, by the handicapped person seated in the chair, to decouple both motors 36 and 38 from battery 14, thereby disabling traction assemblies 48 and 50 and thus the power unit 10 which is now ready for storage. Wheel chair 90 may then be carried up steps, or collapsed and put into automobiles and the like without the added weight of the power unit.

It is important, during the actual climbing operation of the traction assemblies, that the unit be properly stabilized to insure that the assemblies do not slip off the wheel rims. This could occur, for example, if the motors are not properly synchronized. One method for achieving power unit stability is shown in FIGS. 3 and 7 and includes a guide flange 122 downwardly projecting from the lower extent of the traction assembly rear backing plates 54. Each guide flange 122 is designed to contact inner rim 152 of the associated main wheel if the traction assembly is slipping off the main wheel. The traction assembly drive belts 78, therefore, always remain in contact with the wheel treads.

As shown in FIG. 8, a second method for achieving power unit stability during traction assembly climbing along the wheel rims is achieved by the use of a pair of guide shoes 124 mounted laterally apart from either side of power unit carriage 12. Each guide shoe 124 is defined by an inverted U-shaped member having planar sides 126 which define a space 128 therebetween. Each space 128 is adapted to received, during movement of the traction assemblies along the main wheel, an associated one of the pair of wheel chair horizontal supports 94. The vertical extent of space 128 preferably is at least equal to the vertical distance moved by the power unit in the self-mounting process so that sides 126 of shoes 124 are disposed in straddling relation to horizontal supports 94 throughout the self-mounting process. In this manner, as the traction assemblies climb up wheels 92, power unit 10 maintains stability because of horizontal supports 94 being guided through associated spaces 128 in guide shoes 124.

A third method of power unit stability during climbing is shown in FIGS. 9A-9D which also demonstrates a complete mounting sequence. A pair of stabilizer struts 130 are each fixedly mounted to the inner side of rear backing plate 54 of the corresponding traction assembly 48, 50. Each strut has a hooked lower end 132 for engagement with the adjacent chair main wheel axle 97. At the start of the mounting sequence, power unit 10 is shown in FIG. 9A with its carriage 12 positioned against a vertical support, such as curb 136 or the like. Additionally, wheel chair 90 is shown adjacent the power unit. In step two of the mounting procedure, as shown in FIG. 9B, the handicapped person, from within the chair, moves the chair rearwardly until the pair of main wheels abuttingly engage the traction assemblies of power unit 10. Further rearward movement causes the traction assemblies to pivot until their lower

extents fully mate with the associated wheel rim (FIG. 9C). Thus, the portion of drive belts 78 in contact with tires 50 of main wheels 92 take on an arcuate shape conforming to the radius of curvature of the main wheel. In such a position, stabilizer struts 130 are moved so that hook ends 132 thereof engage wheel axle 97.

The traction assemblies then commence their upward gripping progression along tires 150 by the actuation of motors drive shafts 40 and 42 into reverse rotation, as above described. As the traction assemblies proceed upwardly along the main wheel rims, power unit 10 is maintained stabilized since hook ends 132 are engaged with wheel axles 97. The mounting operation is complete when drive shaft shrouds 88 engage within respective apertures 120 in clamp assemblies 96; this is shown in FIG. 9D.

What has been described, therefore, is an improved detachable power unit for wheel chairs which includes traction means for enabling the unit to advance upwardly along the wheel chair main wheels until it engages in engaging means carried by the chair adjacent the main wheels. Thereafter, the traction means enable the automated movement of the wheel chair.

Although the present invention has been described specifically with regard to the disclosed embodiments, those skilled in the art will appreciate that numerous modifications may be made to the disclosed embodiments without departing from the spirit and scope of this invention as defined in the following claims.

What is claimed is:

1. In combination with a wheel chair having a pair of main wheels, a detachable power unit for driving the pair of main wheels, and engaging means carried by the chair adjacent the pair of main wheels for releasably engaging the power unit in operative relationship relative to the chair main wheels, the improvement comprising:

traction means, carried by the power unit and powered thereby, for advancing upwardly along the main wheels into engagement of the power unit with the engaging means and then, thereafter, for driving the main wheels.

2. The combination of claim 1, further comprising stabilizing means for providing stability to the power unit as the traction means advance upwardly along the chair main wheels.

3. The combination of claim 2, wherein the stabilizing means is carried by the power unit.

4. The combination of claim 2, wherein the stabilizing means is carried by the chair.

5. The combination of a wheel chair having a pair of shaft engaging clamp assemblies respectively carried by the chair adjacent a pair of main wheels, and a self-mounting chair propulsion unit comprising:

a. a pair of drive motors, each having a drive shaft;

b. a source of power for the motors;

c. control means coupled between the source of power and the motors for controlling the actuation, speed and operational mode of each motor; and

d. a traction assembly for each of the chair main wheels rotatably mounted on a corresponding motor shaft, the spacing between the assemblies being equal to the axial spacing between the main

wheels, each assembly including means for advancing upwardly along its associated main wheel to move the motor shaft into engagement with the corresponding clamp assembly and for driving its main wheel upon engagement of its motor shaft with the corresponding clamp assembly.

6. The combination of claim 5, further comprising means for stabilizing the power unit relative to the wheel chair during advancement of the traction assemblies along their associated main wheels toward the

7. In a power unit for driving the main wheels of a wheel chair, the power unit including a pair of wheel drive motors mounted to a frame and having coaxial shafts, an improved traction assembly associated with each chair main wheel for propelling the same and for enabling self-mounting of the power unit to the chair, each traction assembly; comprising:

- a. a drive belt,
- b. a belt drive wheel connected to a corresponding motor shaft for rotation therewith,
- c. at least a pair of belt idler wheels,
- d. a frame mounted to the corresponding motor shaft for rotation relative to the shaft and rotatably mounting the belt idler wheels relative to the belt drive wheel to define a closed path of belt movement in response to rotation of the drive wheel, the path being arranged so that the belt disposed along the portion of the path between the idler wheels is adapted for engagement with the periphery of the corresponding chair main wheel and the minimum but definite distance from the axis of the motor shaft to said portion of the path is less than the distance from the motor shaft to the axis of rotation of either of the idler wheels between which said path portion is defined, the belt drive wheel being disposed adjacent and spaced from an intermediate part of said portion of the belt path.

8. A wheel chair power unit according to claim 7, including means for limiting the extent of angular movement of each traction assembly frame about the corresponding motor shaft.

9. A wheel chair power unit according to claim 8, wherein each traction assembly includes a pair of idler wheels arranged in cooperation with the drive wheel to define a substantially triangular path along which the belt moves in response to rotation of the drive wheel, and the drive and idler wheels are arranged so that said portion of the path constitutes a substantial portion of the total length of the path.

10. In a power unit for driving the main wheels of a wheel chair, the power unit including a pair of wheel drive motors mounted to a frame and having coaxial shafts, an improved traction assembly associated with each chair main wheel for propelling the same comprising:

- a. a drive belt,
- b. a drive wheel connected to the motor shaft for rotation therewith and at least one idler wheel for the belt,
- c. a frame mounted on the motor shaft for rotation relative to the shaft and rotatably mounting the idler wheel in engagement with the belt and ar-

ranged to define a closed path of movement of the belt in response to rotation of the drive wheel,

- d. a sleeve around the motor shaft between the motor and the traction assembly frame and fixed relative to the power unit frame, and

- e. a releasable clamp assembly adapted for connection to the structure of a wheel chair adjacent a chair main wheel and operable for receiving and retaining therein the sleeve for connecting the power unit to the chair structure.

11. A wheel chair power unit according to claim 10 wherein each clamp assembly is arranged to rotatably receive a corresponding sleeve.

12. In a power unit for driving the main wheels of a wheel chair including a pair of wheel drive motors mounted to a frame and having coaxial shafts, an improved traction assembly associated with each chair main wheel for propelling the same and for enabling self-mounting of the power unit to the chair, each traction assembly comprising:

- a. a drive belt,
- b. a belt drive wheel connected to the corresponding motor shaft for rotation therewith and at least one idler wheel for the belt,
- c. a frame mounted on the motor shaft for rotation relative to the shaft and rotatably mounting the idler wheel in engagement with the belt and arranged to define a closed path of movement of the belt in response to rotation of the belt drive wheel, and
- d. means operable to constrain each traction assembly to movement along the corresponding chair main wheel essentially only in the plane of rotation of the chair wheel during operation of the power unit to move the power unit relative to the wheel chair.

13. A wheel chair power unit according to claim 12, wherein the traction assembly frame defines an enclosure for the belt and the drive and idler wheels, and the traction assembly constraining means comprises an extension of said enclosure beyond said belt path.

14. A wheel chair power unit according to claim 12, wherein the traction assembly constraining means comprises a strut carried by the traction assembly frame and adapted remote from said frame for engaging an axle for the corresponding chair main wheel.

15. A wheel chair power unit according to claim 14, wherein the strut and the traction assembly frame are cooperatively arranged to dispose a substantial portion of the belt path normal to a radius of the chair main wheel when the axle thereof is engaged by the strut, the radius extending from the main wheel axis to the traction assembly.

16. A wheel chair power unit according to claim 15, wherein the mounting means for the drive and idler wheels are arranged to dispose the axes of rotation of the drive and idler wheels on opposite sides of said radius along the chair main wheel.

17. A wheel chair power unit according to claim 12, wherein said constraining means comprises U-shaped shoe means carried by the power unit frame for slidably receiving a selected portion of the structure of a wheel chair.

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