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(54) **Wheelchair**

Rollstuhl

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Description

This invention relates to wheelchairs and more particularly to power driven unitary wheelchairs.

It is well known to provide power driven wheelchairs with arms, foot rests and a battery pack which can be removed from the main frame of the chair. However, the remaining main frame with the wheels and the motors is still a very heavy and bulky single item for lifting, transportation and storage.

In DE 2729267, there is disclosed a power driven wheelchair comprising left and right drive wheel assemblies and a battery pack that are manually removable, however the wheel units are mounted simultaneously and have to be placed facing upwards so that the wheelchair frame is lowered onto the wheel units and then the whole arrangement is rotated through 90° so that the wheel units can be fastened thereto. The whole procedure is cumbersome and unwieldy.

According to one aspect of the present invention there is provided a wheelchair comprising a main frame having two front wheels, a battery pack and a drive unit, comprising two rear wheel units, each rear wheel unit being individually removably mountable on the main frame by means of quick release fastener means, and being releasably connectable to the battery pack.

Preferably, each rear wheel unit is provided with a drive motor.

In a preferred embodiment, the frame incorporates longitudinal support members which extend horizontally when the chair is in the use position, each rear wheel unit being mountable on at least one support member by means of mutual insertion in the direction of extension of the at least one support member.

In a particularly preferred embodiment, each rear wheel unit is mounted on two support members, the two members being vertically spaced apart when the chair is in the use position. Each rear wheel unit may be releasably mountable on one of the two support members by means of a spring-loaded catch.

Each rear wheel unit may be mounted on the other of the two support members by means of a screw connection.

Preferably the spring-loaded catch is provided on the upper of the two support members.

In a particularly preferred embodiment the main frame is additionally provided with removably mountable back, seat, arms and foot rests.

According to another aspect of the present invention there is provided a wheelchair comprising a number of components including a main frame having two front wheels, a battery pack, and two rear wheel units, each rear wheel unit being provided with a drive motor, wherein said components are detachable for dismantling the wheelchair into its component parts.

The present invention will now be described in more detail by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a general perspective view of a power-drive wheelchair;

Figure 2 shows a part of a rear wheel drive unit in detail;

Figure 3 shows in detail a further part for connecting a rear wheel drive unit to the wheelchair;

Figure 1 illustrates a typical power driven wheelchair comprising, in general, a main frame 10, a seat 12, a back 14, arms 16, front wheels 18 and rear wheels 20. A battery pack 22 provides the power for two motors 24, one motor being associated with each rear wheel 20 to drive that rear wheel. A control unit 26 supported on one of the arms 16 provided a stop/start switch 28 and a directional control lever 30. Foot rest plates 32 are mounted on support members 34 for releasable attachment to the main frame 10 by means of pins 36 and a latch assembly 38. A strap 40 is provided between the support members 34 for preventing the feet of an occupant of the wheelchair from slipping down between the front wheels 18.

In accordance with the present invention, each rear wheel 20 and its associated drive motor 24 are supported on a rear frame portion 42 releasably connectable to the main frame by way of a spring-biassed pin 44 and a screw locking connection 46. The rear frame portion can be seen in more detail in Figure 2, and comprises a straight tube 48 and an angled tube 50 attached to the straight tube 48, by welding or any other suitable means, at one end of one leg 52 of the angled tube. The other leg 54 of the angled tube extends parallel to the straight tube 48.

A plate 56 (see Figure 1) is connected to the rear frame portion 42 by means of bolts through holes 58 in the angled tube 50 and by means of mounting bracket 60 fixed to the straight tube 48. The plate 56 supports both a rear wheel 20 and its associated drive motor 24, such that the motor and rear wheel form a single unit. A further support member 62 may extend from the straight tube 48 to provide support for a rear anti-tipping wheel 64.

The main frame has rearwardly extending members 66 and 68 positioned to align with tubes 48 and 54 respectively such that the rear frame portion 42 can be slid over members 66 and 68. The spring-biassed pin 44 on member 66 is biassed to pass through hole 69 in the tube leg 54 to lock the rear frame portion 42 to the main frame 10. Because the connection between the rear frame portion and the main frame is formed by horizontally cooperating members and tubes, the connection is very firm and the spring-biassed pin is sufficient to maintain the connection. However, in order to provide a yet stronger connection with an additional degree of security, the screw locking connection 46 should also be utilised.

A sectional view of the locking connection 46 is shown in Figure 3. The rearwardly extending member

66 of the main frame is fitted with a plug 70 having a screw-threaded central bore 72. The locking connection comprises a cylindrical cap 74 having a knurled outer surface for ease of gripping, the cylindrical cap having an internal threaded stem 76. A washer 78 is slid over the threaded stem followed by a stepped bush 80. A nut 82 is then threaded on to the stem 76 and set with a preselected gap between the nut 82 and the bush 80. The bush 80 is chosen such that it is a press fit in the end of tube 48. The cap 74 can then be turned to screw the threaded stem into the bore 72 to lock the rear frame portion 42 to the main frame 10.

The rear frame portion 42, the rear wheel 20 and motor 24 are thus readily removable and reconnectable to the main frame by means of the spring-biased pin 44 and the locking connection 46. Because the rearwardly extending member 66 extends further than the rearwardly extending member 68, it is easy for the tube 48 to be first located on member 66, the tube 54 then being aligned with member 68 for full connection.

The ability to remove each of the rear wheel units (rear frame portion 42, rear wheel 20 and motor 24) separately means that the wheelchair can be more easily carried or fitted into smaller spaces for storage or transportation, for example in the boot of a car.

In a particularly preferred embodiment, the arms 16, the back 14, the seat 12 and the battery pack 22 are each individually removable from the main frame 10, and the main frame itself is foldable to occupy minimum storage space.

Claims

1. A wheelchair comprising: a main frame (10) having two front wheels (18); a battery pack (22); and two rear wheel units, each rear wheel unit including a wheel (20) and a drive motor (24) which, in use, drives the wheel (20) by means of power derived from the battery pack (22), Characterised in that the rear wheel units being individually removably mounted on the main frame (11) by means of quick release fastener means (42, 46), and being releasably connected to the battery pack (22).
2. A wheelchair according to Claim 1 wherein the frame (11) incorporates longitudinal support members (66, 68) which extend horizontally when the chair is in the use position, each rear wheel unit being mountable on at least one support member (66, 68) by means of mutual insertion in the direction of extension of the at least one support member (66, 68).
3. A wheelchair according to Claim 2 wherein each rear wheel unit is mounted on two said support members (66, 68), the support members (66, 68) being vertically spaced apart when the chair is in the use position.
4. A wheelchair according to Claim 3 wherein each rear wheel unit is releasably secured to one of its associated support members (66, 68) by means of a spring loaded catch (44).
5. A wheelchair according to Claim 3 or Claim 4 wherein each rear wheel unit is releasably secured to the other of its associated support members (66, 68) by means of a screw-threaded connection (46).

Patentansprüche

1. Ein Rollstuhl mit einem Hauptrahmen (10), der zwei Vorderräder (18), einen Akkusatz (22) und zwei Hinterradeinheiten mit jeweils einem Rad (20) und Antriebsmotor (24) aufweist, der das Rad (20) in Gebrauch durch die von Akkusatz (22) aufgebrauchte Energie antreibt, dadurch gekennzeichnet, daß die an dem Hauptrahmen (10) einzeln angebrachten und abnehmbaren Hinterradeinheiten mit schnell lösbaren Befestigungsmitteln (42, 46) befestigt und mit dem Akkusatz (22) lösbar verbunden sind.
2. Ein Rollstuhl entsprechend Anspruch 1, dessen Rahmen (10) Längsstützelemente (66, 68) aufweist, die sich horizontal erstrecken, wenn der Rollstuhl in Gebrauchsstellung ist, wobei jede Hinterradeinheit durch gegenseitige Einfügung in Ausdehnungsrichtung mindestens eines Stützelements (66, 68) an mindestens einem Stützelement (66, 68) angebracht werden kann.
3. Ein Rollstuhl entsprechend Anspruch 2, an dem jede Hinterradeinheit auf zwei besagten Stützelementen (66, 68) angebracht ist, wobei die Stützelemente (66, 68) vertikal mit Zwischenraum angeordnet sind, wenn der Rollstuhl in der Gebrauchsstellung befindet.
4. Ein Rollstuhl entsprechend Anspruch 3, an dem jede Hinterradeinheit jeweils durch einen Federschnapper (44) an einem ihr zugehörigen Stützelement (66, 68) lösbar befestigt ist.
5. Ein Rollstuhl entsprechend Anspruch 3 oder Anspruch 4, an dem jede Hinterradeinheit jeweils durch eine Gewindeverbindung (46) an dem anderen ihrer zugehörigen Stützelemente (66, 68) lösbar befestigt ist.

Revendications

1. Un fauteuil roulant qui comporte un bâti principal (10) avec deux roues avants (18); une batterie (22); et deux ensembles à roue arrière, dont chacun se compose d'une roue (20) et d'un moteur de propulsion (24) qui, pendant l'emploi, mène la roue (20)

au moyen de l'énergie fournie par la batterie (22); caractérisé en ce que les ensembles à roue arrière sont montés sur le bâti principal (10) au moyen de fixations rapides (42,46) qui permettent de les détacher individuellement, et qui sont raccordés de manière amovible à la batterie (22). 5

2. Un fauteuil roulant selon la revendication 1, dans lequel le bâti (10) incorpore des éléments de support longitudinaux (66,68) qui se déploient horizontalement quand le fauteuil est en cours d'utilisation, chaque ensemble à roue pouvant être monté sur au moins un élément de support (66,68) par insertion mutuelle dans la direction d'extension d'au moins un élément de support (66,68). 10 15
3. Un fauteuil roulant selon la revendication 2, dans lequel chacun des ensembles à roue est monté sur deux des dits éléments de support (66,68), les éléments de support (66,68) étant espacés verticalement l'un par rapport à l'autre quand le fauteuil est en position d'utilisation. 20
4. Un fauteuil roulant selon la revendication 3, dans lequel chacun des ensembles à roue arrière est fixé de manière amovible sur l'un des éléments de support associés (66,68) au moyen d'un doigt d'encliquetage chargé par ressort (44). 25
5. Un fauteuil roulant selon la revendication 3 ou la revendication 4, dans lequel chacun des ensembles à roue arrière est fixé de manière amovible au second de ses éléments de support (66,68) au moyen d'un raccord fileté (46). 30 35

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