Title: A WHEELCHAIR AND A CHASSIS SUITABLE FOR A WHEELCHAIR

Abstract: This invention relates to a wheelchair characterised therein that it is relatively inexpensive, completely collapsible and capable of negotiating uneven terrain. The wheelchair (10) comprises a seating member (14), a rear axle (18), including two pivotal axle shafts (26), for supporting the seating member (14) and dimensioned for engaging a rear wheel (20) at each end portion thereof; a chassis beam (22) connected to and extending from the rear axle (18); and a front wheel arrangement (24) connected to a front end portion of the chassis beam (22). It also includes a supporting connector (16) that is adapted for releasably engaging and supporting the seating member (14) on the rear axle (18). The supporting connector (16), axle shafts (26) and the elongate chassis beam (22) together constitute a collapsible chassis (12) of the wheelchair. More particularly, the seating member (14), supporting connector (16), rear wheels (20), chassis beam (22) and front wheel arrangement (24) are all disconnectably connected to each other, while the rear axle (18) is collapsible in that the axle shafts (26) are pivotable about the supporting connector (16). The invention also includes a chassis suitable for a wheelchair (10), as well as a supporting connector (16) suitable for connecting different component parts of the collapsible wheelchair (10), and a seating member (14) suitable for use on the wheelchair (10).
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

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A WHEELCHAIR AND A CHASSIS SUITABLE FOR A WHEELCHAIR

Technical field

This invention relates to a wheelchair.

Background art

Numerous wheelchairs, handcycles or the like wheeled conveyances for disabled or handicapped persons are available in the market. However, known wheeled conveyances of this nature suffer from at least three major disadvantages which this invention seeks to overcome.

The first disadvantage associated with a conventional wheelchair, handcycle or the like is that it is extremely difficult to negotiate uneven terrain, such as uneven pavement or a brick laden pathway, not to mention a dirt road, since the wheelchair or handcycle is often not easily maneuverable and tends to tip over on uneven terrain. In addition, as a result of current wheelchair designs, the chassis of the wheelchair often becomes bent or twisted out of shape through continuous long-term use, especially if a user often travels on a relatively uneven surface. Such a warped chassis not only makes steering of the wheelchair increasingly difficult, but eventually necessitates replacement of the wheelchair altogether.

The second major disadvantage associated with known wheelchair designs is that the wheelchairs are relatively heavy and bulky, making transport, fold-up and assembling thereof difficult, especially for a user who is already at a physical disadvantage. The manual difficulties experienced with folding up and assembling of known wheelchairs
also increase substantially when the chassis is even slightly warped. Also, since wheelchairs are not collapsible, but at best partially foldable, paraplegic persons who are otherwise capable of driving a motor vehicle, are forced to incur huge capital expenses to attach a wheelchair lift mechanism to the roof of their vehicle to enable them to have access to their wheelchair. This is not only an expensive exercise, but also draws often unwanted public attention to such a user.

Yet a further disadvantage associated with known wheelchairs is the costs associated with the same, which makes it extremely difficult for people in especially third world countries to afford a wheelchair of any kind, let alone one that provides for easy maneuvering and transport.

**Object of the invention**

It is accordingly an object of the present invention to provide a novel wheelchair that will overcome or minimize some of the disadvantages associated with known wheelchairs, or at least to provide a useful alternative to the same.

More particularly, it is an object of the invention to provide a relatively inexpensive wheelchair that is completely collapsible and that it capable of negotiating uneven terrain.

It is a further object of the invention to provide a chassis suitable for a wheelchair.
Disclosure of the invention

According to a first aspect of the invention there is provided a wheelchair comprising a seating member; a rear axle for supporting the seating member and dimensioned for engaging a rear wheel at each end portion thereof; a chassis beam connected to and extending from the rear axle; and a front wheel arrangement connected to a front end portion of the chassis beam.

For the purpose of this specification, the term “wheelchair” will be interpreted to include similar wheeled conveyances, such as handcycles.

The wheelchair may include a substantially upright supporting connector adapted for releasably engaging and supporting the seating member on the rear axle. The supporting connector also may engage the rear axle releasably such that the rear axle is orientated substantially perpendicularly relative to the supporting connector in a T-shaped configuration.

The rear axle may include at least two axle shafts extending from opposite sides of the supporting connector and releasably connectable to the same, the arrangement being such that in an extended position the axle shafts together form the rear axle of the wheelchair with each axle shaft engaging a rear wheel at an end thereof. More particularly, the axle shafts may be connected to and extend from a bottom portion of the supporting connector.

The axle shafts may be pivotally connectable to the supporting connector and may be pivotable between an extended position, wherein the axle shafts extend at opposite
sides away from the supporting connector such that the axle shafts and supporting connector are arranged in a substantially T-shaped configuration; and a collapsed position. When the axle shafts are in the extended position, the chassis beam also may be orientated relative to the axle shafts in a substantially T-shaped configuration. In the collapsed position the axle shafts may either be arranged parallel to and adjacent the supporting connector, or may be arranged parallel to and adjacent the chassis beam.

In one embodiment of the invention, the supporting connector may include axle shaft receiving means, such as shaft receiving bores, dimensioned for releasably engaging disconnectable axle shafts at opposite sides of the supporting connector.

The supporting connector, axle shafts and the elongate chassis beam together may constitute a collapsible chassis of the wheelchair.

The wheelchair further may include locating means for locating the axle shafts in their extended positions. Particularly, each axle shaft may include its own locating means arranged for preventing pivoting of the axle shafts back to the collapsed position when it is in the extended position. The locating means may include a locater shaft connected to and orientated substantially perpendicularly relative to the axle shaft and being pivotable together with the axle shaft; and a locating bracket dimensioned for removably accommodating the locater shaft therein when the axle shafts are in the extended position. The locating bracket may be connected to the supporting connector.

The wheelchair further may include pivoting means for effecting pivoting of the axle shafts about the supporting connector. Particularly, each axle shaft may be operatively
associated with its own pivoting means in the form of a post-and-sleeve arrangement wherein the post is rotatable within the sleeve. More particularly, the pivoting means may include a pivot post connected to the axle shaft and extending substantially perpendicularly relative to both the axle shaft and the locator shaft; and a rigid sleeve connected to the supporting connector and dimensioned for at least partially accommodating the pivot post therein, the arrangement being such that rotation of the pivot post within the sleeve effects pivoting of the axle shaft and the locator shaft about the supporting connector. The pivot post also may be axially displaceable relative to the sleeve and the supporting connector for effecting engagement and disengagement of the locator shaft with the locating bracket.

Accordingly, the axle shafts, and hence the rear axle as a whole, may be movable between an extended position (for enabling use of the wheelchair) wherein the axle shafts extend away from the supporting connector and are orientated substantially perpendicularly relative to the chassis beam in a T-shaped configuration with the locator shafts located in the locating bracket; and a collapsed position (for facilitating transport and storage of the wheelchair) wherein the axle shafts are pivoted so as to be arranged adjacent the supporting connector, orientated either parallel to or perpendicularly relative to the chassis beam, while the locator shafts are disengaged from the locating bracket.

The wheelchair further may include at least one primary reinforcing web extending between the supporting connector and the chassis beam. The wheelchair also may include secondary reinforcing webs extending between each one of the axle shafts and its corresponding locator shaft.
The elongate chassis beam extending from the supporting connector may be a substantially bent chassis beam.

The front wheel arrangement may be characterized therein that it is articulately suspended so as to enable a user to negotiate uneven terrain. In particular, the front wheel arrangement may include a suspension shaft that is releasable connectable to an end portion of the chassis beam in a substantially T-shaped configuration; connection means attached to the suspension shaft for enabling connection of front wheels to the suspension shaft; and a pair of wheels connected to the connection means. The connection means may be dimensioned for accommodating a range of castor wheels of varying sizes.

The front wheel arrangement also may include footrest formations. The footrest formations may removably be attached to the suspension shaft.

The seating member may include a seat and a backrest. The seating member may at least partially be foldable. In one form of the invention, the seat and backrest of the seating member may be of a substantially rigid material, such as plastics, wood or the like. In this embodiment of the invention, the seat and the backrest may hingedly be connected to each other. Particularly, the seating member may be characterized therein that the seat and backrest are hingedly foldable towards each other so as to define a housing between the seat and backrest when in the folded condition, the housing being dimensioned for accommodating at least some of the wheelchair components therein for facilitating transport and storage of the wheelchair.
The seating member also may include an armrest formation extending from the backrest and arranged at one or both sides of the seat. The armrest formation may removably be connected to the seating member.

The seating member further may include a seat shaft extending from the seat and dimensioned for cooperating with the supporting connector in use so as to enable connection of the seating member with the supporting connector. For this purpose, the supporting connector may include a bore suitably dimensioned removably to receive the seat shaft therein.

In one form of the invention, the seating member may include a seat frame dimensioned for accommodating the seat and backrest thereon. The seat frame may removably be connected to the chassis. In particular, the seat shaft may be connected to and extend from the seat frame, the arrangement being such that in use, the seat frame is removably connected to the supporting connector.

The wheelchair also may include at least one anti-tip wheel connected to the supporting connector and extending in a direction oppositely from the chassis beam. In particular, the supporting connector may include tip shaft receiving means dimensioned releasably to accommodate an anti-tip wheel shaft therein.

The wheelchair may be characterized therein that it is wholly collapsible. Particularly, different components of the wheelchair may disconnectably be connected to each other so as to enable collapse of the wheelchair. More particularly, the seating member, supporting connector, rear wheels, chassis beam and front wheel arrangement may
define different components of the wheelchair that are all disconnectably connected to each other. In addition, the rear axle may be collapsible in that the axle shafts may be pivotable about the supporting connector to the collapsed position.

According to another aspect of the invention there is provided a chassis suitable for a wheelchair, the chassis comprising a supporting connector suitable for releasably engaging a seating member; a rear axle connected to the supporting connector and dimensioned for engaging a rear wheel at each end portion thereof; and an elongate chassis beam connected to and extending from the supporting connector and the rear axle and adapted releasably to engage a front wheel arrangement of the wheelchair.

The rear axle may comprise of at least two axle shafts that are pivotally connected to the supporting connector at opposite sides thereof such that the axle shafts may extend perpendicularly from the supporting connector so as to define the rear axle.

The chassis may at least partially be collapsible in that one or more of the supporting connector, rear axle and elongate chassis beam may disconnectably be connected to each other. The supporting connector, rear axle and elongate chassis beam may also disconnectably be connected to the seating member, rear wheels and front wheel arrangement of the wheelchair.

According to another aspect of the invention there is provided a supporting connector suitable for connecting different component parts of a collapsible wheelchair so as to effect erection of the wheelchair, the supporting connector comprising wheel axle engaging means for engaging the supporting connector to at least one wheel axle of the
wheelchair; seat engaging means for engaging and connecting a seating member to the supporting connector and the wheel axle; and chassis beam engaging means dimensioned for engaging a chassis beam to the supporting connector.

In one embodiment of the invention the supporting connector may include at least two axle shafts releasably connectable to and extending from opposite sides thereof such that in an extended position the axle shafts together form the rear axle of the wheelchair with each axle shaft engaging a rear wheel at an end thereof.

The supporting connector also may include at least one locating bracket for locating the axle shafts in the extended position.

The supporting connector further may include tip shaft receiving means dimensioned releasably to accommodate therein an anti-tip wheel shaft of an anti-tip wheel connectable to the wheelchair.

The supporting connector also may include pivoting means for effecting pivoting of the axle shafts about the supporting connector. The pivoting means may be at least one rigid sleeve connected to the supporting connector and dimensioned for at least partially accommodating a pivot post therein, the arrangement being such that rotation of the pivot post within the sleeve effects pivoting of an axle shaft about the supporting connector.

According to yet a further aspect of the invention there is provided a seating member suitable for use on a wheelchair, comprising a seat and a backrest, the seating member
being characterised therein that the seat and backrest are locatable in abutting relationship so as to define a housing between them, the housing being dimensioned removably to house at least some of the components of the wheelchair. In one form of the invention the seat and backrest may hingedly be connected to each other.

The seating member also may include a seat shaft extending from the seat and connectable to a chassis of the wheelchair for supporting the seating member on the chassis.

The invention further provides a wheelchair comprising a chassis including a chassis beam; a rear axle connected to the chassis and dimensioned for engaging two rear wheels at opposing ends thereof; a front wheel arrangement connected to a front portion of the chassis; and a seating member supported on an upper side of the chassis for accommodating a user; the wheelchair being characterised therein that the rear wheels, the front wheel arrangement and the seating member are all disconnectably connected to the chassis.

The rear axle may be connected to the chassis such that it is substantially perpendicularly orientated relative to the chassis beam is a T-shaped configuration.

**Specific embodiment of the invention**

Without limiting the scope thereof, embodiments of the invention will now be described by way of example only and with reference to the accompanying drawings wherein –

Figure 1 is a front perspective view of a wheelchair according to the invention;
Figure 2 is a rear perspective view of the wheelchair according to the invention, illustrating an alternative arrangement of the wheelchair chassis including an anti-tip wheel;

Figure 3 is an exploded rear perspective view of a wheelchair according to the invention, illustrating disengagement of the wheelchair components to effect collapse of the wheelchair;

Figure 4 is a rear perspective view of the wheelchair chassis according to the invention, as illustrated in Figure 1, with the axle shafts arranged in the collapsed position;

Figure 5 is a front perspective view of the wheelchair chassis according to the invention, as illustrated in Figure 2, with the axle shafts arranged in the collapsed position and the seating member and the front wheel arrangement removed;

Figure 6 is a front perspective view of the wheelchair chassis of Figure 4 with the front wheel arrangement attached to the chassis beam and the axle shafts arranged in the extended position; and

Figure 7 is a front perspective view of the wheelchair chassis of Figure 4 illustrating removal of the front wheel arrangement and with the axle shafts in the collapsed position.

A wheelchair according to the invention is generally designated by reference numeral 10. The wheelchair 10 includes a number of wheelchair components, all of which are disconnectably connected to a chassis 12 to permit disengagement of the respective components from the chassis 12 so as to effect collapse of the wheelchair 10.
The wheelchair 10 includes a seating member 14 and a substantially upright supporting connector 16 for engaging and supporting the seating member 14. The wheelchair 10 also includes a rear axle 18 connected to the supporting connector 16. The rear axle 18 is substantially perpendicularly orientated relative to the supporting connector 16 and is dimensioned for engaging a rear wheel 20 at each end portion of the rear axle 18.

The wheelchair 10 further includes an elongate chassis beam 22 which is connected to and extends from the supporting connector 16. The chassis beam 22 is substantially perpendicularly orientated relative to the supporting connector 16 and the rear axle 18.

The wheelchair also includes a front wheel arrangement 24 connected to a front-end portion of the chassis beam 22.

The chassis 12 constitutes a core component of the wheelchair 10. In particular, the chassis 12 comprises of the substantially upright supporting connector 16 for releasably engaging and supporting the seating member 14; and the elongate chassis beam 22 connected to and extending from the supporting connector 16.

The chassis 12 further includes at least two axle shafts 26 defined at opposite sides of the supporting connector 16 and connected to the supporting connector 16. The axle shafts 26 are connected to and extend from a bottom portion of the supporting connector 16. The axle shafts 26 are pivotally connected to the supporting connector 16 and are pivotable between an extended position, wherein the supporting connector 16 and the axle shafts 26 are arranged in a substantially T-shaped configuration, as illustrated in Figures 1, 2 and 6; and a collapsed position. In the collapsed position the
axle shafts 26 are either arranged parallel to and adjacent the supporting connector 16, as illustrated in Figures 3 and 4, or are arranged parallel to and adjacent the chassis beam 22, as illustrated in Figures 5 and 7.

When in the extended position, the axle shafts 26 are also arranged substantially perpendicularly relative to the chassis beam 22, such that the axle shafts 26 and the chassis beam 22 are connected in a substantially T-shaped configuration.

The chassis 12 includes locating means for locating the axle shafts 26 in the extended position. In particular, each axle shaft 26 is connected to a locator shaft 32 extending substantially perpendicularly from the axle shaft 26 and being pivotable together with the axle shaft 26, the locator shaft 32 being releasably locatable in a locating bracket 27 when the axle shafts 26 are in the extended position so as to prevent pivoting of the axle shafts 26 back to the collapsed position.

The chassis 12 further includes pivoting means for effecting pivoting of the axle shafts 26 about the supporting connector 16, the pivoting means being a post-and-sleeve arrangement wherein the post 30 is rotatable within the sleeve 31. Each axle shaft 26 includes its own pivoting means. More particularly, the pivoting means includes a pivot post 30 connected to the axle shaft 26 and extending substantially perpendicularly relative to both the axle shaft 26 and the locator shaft 32; and a rigid sleeve 31 connected to the supporting connector 16 and dimensioned for at least partially accommodating the pivot post 30 therein, the arrangement being such that pivot post 30 is rotatable within the sleeve 31 to effect pivoting of the axle shaft 26 and the locator shaft 32 about the supporting connector 16.
The elongate chassis beam 22 extending from the supporting connector 16 is a substantially bent beam. More particularly, the chassis beam 22 includes at least three elongate beam segments 22.1, 22.2, 22.3 connected to each other in end to end relationship, the arrangement being such that the first and third beam segments, 22.1 and 22.3 are orientated substantially parallel to each other, with the second beam segment 22.2 being similarly angularly orientated relative to both the first and the third beam segments 22.1, 22.3 so as to define the bend.

The chassis 12 further includes a primary reinforcing web 34 extending between the supporting connector 16 and the chassis beam 22. The chassis 12 also includes a pair of secondary reinforcing webs 36 extending between the respective axle shafts 26 and the locator shafts 32.

The seating member 14 includes a seat 14.1 and a backrest 14.2. The seating member 14 is foldable. In one form of the invention, the seat 14.1 and the backrest 14.2 of the seating member 14 are of a substantially rigid material and are hingedly connected to each other at 14.3.

The seating member 14 also includes a seat shaft 13 connected to and extending from an underside of the seat 14.1 and dimensioned for cooperating with the supporting connector 16 in use so as to support the seating member 14 on the chassis 12. In this regard, the supporting connector 16 defines a bore 38 suitably dimensioned removably to receive the seat shaft 13 therein.
The front wheel arrangement 24 is characterised therein that it is articulately suspended so as to enable a user to negotiate uneven terrain. In particular, the front wheel arrangement 24 includes a suspension shaft 40 that is releasable connectable to an end portion of the chassis beam 22 in a T-shaped configuration; connection means 42 attached to the suspension shaft 40 for enabling connection of front wheels 44 to the suspension shaft 40; and a pair of wheels 44 connected to the connection means 42. The connection means 42 is dimensioned for accommodating a range of castor wheels 44 of varying sizes.

The front wheel arrangement 24 also includes footrest formations 41 that are removably attached to the suspension shaft 40.

The wheelchair 10 further includes at least one anti-tip wheel 46 connected to the supporting connector 16 and extending oppositely from the chassis beam 22. In particular, the chassis 12 includes tip shaft receiving means (not shown) connected to the supporting connector 16 oppositely from the chassis 12 beam and dimensioned releasably to accommodate a anti-tip wheel shaft 50.

It will be appreciated that numerous other embodiments of the invention may be possible without departing from the spirit or scope of the invention as defined in the claims.
CLAIMS

1. A wheelchair [10] comprising a seating member [14]; a rear axle [18] for supporting the seating member [14] and dimensioned for engaging a rear wheel [20] at each end portion thereof; a chassis beam [22] connected to and extending from the rear axle [18]; and a front wheel arrangement [24] connected to a front end portion of the chassis beam [22].

2. The wheelchair [10] as claimed in claim 1 characterised therein that the wheelchair [10] includes a supporting connector [16] adapted for releasably engaging and supporting the seating member [14] on the rear axle [18].

3. The wheelchair [10] as claimed in claim 2 characterised therein that the supporting connector [16] engages the rear axle [18] releasably and such that the rear axle [18] is orientated substantially perpendicularly relative to the supporting connector [16] in a T-shaped configuration.

4. The wheelchair [10] as claimed in claims 1 to 3 characterised therein that the rear axle [18] includes at least two axle shafts [26] extending from opposite sides of the supporting connector [16] and releasably connectable to the same, the arrangement being such that in an extended position the axle shafts [26] together form the rear axle [18] of the wheelchair [10] with each axle shaft [26] engaging a rear wheel [20] at an end thereof.

5. The wheelchair [10] as claimed in claim 4 characterised therein that the axle shafts [26] are pivotally connectable to the supporting connector [16] and are
pivotable between an extended position, wherein the axle shafts [26] extend at opposite sides away from the supporting connector [16] such that the axle shafts [26] and supporting connector [16] are arranged in a substantially T-shaped configuration; and a collapsed position.

6. The wheelchair [10] as claimed in claim 5 characterised therein that when the axle shafts [26] are in the extended position, the chassis beam [22] is orientated relative to the axle shafts [26] in a substantially T-shaped configuration.

7. The wheelchair [10] as claimed in claim 5 characterised therein that when in the collapsed position, the axle shafts [26] are either arranged parallel to and adjacent the supporting connector, or are arranged parallel to and adjacent the chassis [12] beam.

8. The wheelchair [10] as claimed in claims 2 and 3 characterised therein that the supporting connector [16] includes axle shaft receiving means, such as shaft receiving bores, dimensioned for releasably engaging disconnectable axle shafts at opposite sides of the supporting connector [16].

10. The wheelchair [10] as claimed in claim 1 characterised therein that the wheelchair [10] further includes locating means for locating the axle shafts [26] in their extended positions.

11. The wheelchair [10] as claimed in claim 10 characterised therein that each axle shaft [26] includes its own locating means arranged for preventing pivoting of the axle shafts [26] back to the collapsed position when it is in the extended position; and further characterised therein that the locating means includes a locator shaft [32] connected to and orientated substantially perpendicularly relative to the axle shaft [26] and being pivotable together with the axle shaft [26]; and a locating bracket [27] dimensioned for removably accommodating the locator shaft [32] therein when the axle shafts [26] are in the extended position.

12. The wheelchair [10] as claimed in claim 11 characterised therein that the locating bracket [27] is connected to the supporting connector [16].


14. The wheelchair [10] as claimed in claim 13 characterised therein that each axle shaft [26] is operatively associated with its own pivoting means in the form of a post-and-sleeve arrangement wherein the post [30] is rotatable within the sleeve [31].
15. The wheelchair [10] as claimed in claim 14 characterised therein that the pivoting means includes a pivot post [30] connected to the axle shaft [26] and extending substantially perpendicularly relative to both the axle shaft [26] and the locator shaft [32]; and a rigid sleeve [31] connected to the supporting connector [16] and dimensioned for at least partially accommodating the pivot post [30] therein, the arrangement being such that rotation of the pivot post [30] within the sleeve [31] effects pivoting of the axle shaft [26] and the locator shaft [32] about the supporting connector [16].

16. The wheelchair [10] as claimed in claims 14 and 15 characterised therein that the pivot post [30] is also axially displacable relative to the sleeve [31] and the supporting connector [16] for effecting engagement and disengagement of the locator shaft [32] with the locating bracket [27].

17. The wheelchair [10] as claimed in claims 1, 4 and 11 characterised therein that the axle shafts [26], and hence the rear axle [18] as a whole, are movable between an extended position (for enabling use of the wheelchair) wherein the axle shafts [26] extend away from the supporting connector [16] and are orientated substantially perpendicularly relative to the chassis beam [22] in a T-shaped configuration with the locator shafts [32] located in the locating bracket [27]; and a collapsed position (for facilitating transport and storage of the wheelchair) wherein the axle shafts [26] are pivoted so as to be arranged adjacent the supporting connector [16], orientated either parallel to or perpendicularly relative to the chassis beam [22], while the locator shafts [32] are disengaged from the locating bracket [27].
18. The wheelchair [10] as claimed in claims 1 and 2 characterised therein that the wheelchair [10] further includes at least one primary reinforcing web [34] extending between the supporting connector [16] and the chassis [12] beam.

19. The wheelchair [10] as claimed in claim 11 characterised therein that the wheelchair [10] also include secondary reinforcing webs [36] extending between each one of the axle shafts [26] and its corresponding locator shaft [32].

20. The wheelchair [10] as claimed in claim 1 characterised therein that the elongate chassis beam [22] is a substantially bent chassis beam [22].

21. The wheelchair [10] as claimed in claim 1 characterised therein that the front wheel arrangement [24] is characterized therein that it is articulately suspended so as to enable a user to negotiate uneven terrain.

22. The wheelchair [10] as claimed in claim 21 characterised therein that the front wheel arrangement [24] includes a suspension shaft [40] that is releasable connectable to an end portion of the chassis beam [22] in a substantially T-shaped configuration; connection means [42] attached to the suspension shaft [40] for enabling connection of front wheels [44] to the suspension shaft [40] and dimensioned for accommodating a range of castor wheels of varying sizes; and a pair of wheels [44] connected to the connection means [42].
23. The wheelchair [10] as claimed in claim 21 characterised therein that the front wheel arrangement [24] also includes footrest formations [41] that are removably attached to the suspension shaft [40].


25. The wheelchair [10] as claimed in claim 24 characterised therein that the seat [14.1] and backrest [14.2] of the seating member [14] are hingedly connected to each other and are foldable towards each other so as to define a housing between the seat [14.1] and backrest [14.2] when in the folded condition, the housing being dimensioned for accommodating at least some of the wheelchair [10] components therein for facilitating transport and storage of the wheelchair [10].

26. The wheelchair [10] as claimed in claim 24 characterised therein that the seating member [14] includes an armrest formation extending from the backrest [14.2] and arranged at one or both sides of the seat [14.1], and wherein the armrest formation is removably connected to the seating member [14].

27. The wheelchair [10] as claimed in claim 1 characterised therein that the seating member [14] include a seat shaft [13] extending from the seat [14.1] and dimensioned for cooperating with the supporting connector [16] in use so as to enable connection of the seating member [14] with the supporting connector [16].
28. The wheelchair [10] as claimed in claim 1 characterised therein that the seating member [14] includes a seat frame dimensioned for accommodating the seat [14.1] and backrest [14.2] thereon wherein the seat frame is removably connected to the chassis [12].


30. The wheelchair [10] as claimed in claim 1 characterised therein that the wheelchair [10] is wholly collapsible, particularly in that different components of the wheelchair [10] are disconnectably connected to each other so as to enable collapse of the wheelchair.

31. The wheelchair [10] as claimed in claims 2, 4 and 30 characterised therein that the seating member [14], supporting connector [16], rear wheels [20], chassis beam [22] and front wheel arrangement [24] define different components of the wheelchair [10] that are all disconnectably connected to each other, and further characterised therein that the rear axle [18] is collapsible in that the axle shafts [26] are pivotable about the supporting connector [16] to the collapsed position.

32. A chassis [12] suitable for a wheelchair [10], the chassis [12] comprising a supporting connector [16] suitable for releasably engaging a seating member [14]; a rear axle [18] connected to the supporting connector [16] and
dimensioned for engaging a rear wheel [20] at each end portion thereof; and an elongate chassis beam [22] connected to and extending from the supporting connector [16] and the rear axle [18] and adapted releasably to engage a front wheel arrangement [24] of the wheelchair.

33. The chassis [12] as claimed in claim 32 characterised therein that the rear axle [18] comprises of at least two axle shafts [26] that are pivotally connected to the supporting connector [16] at opposite sides thereof such that the axle shafts [26] extend perpendicularly from the supporting connector [16] so as to define the rear axle.

34. The chassis [12] as claimed in claim 33 characterised therein that the chassis [12] is at least partially collapsible in that one or more of the supporting connector [16], axle shafts [26] and elongate chassis beam [22] are disconnectably connected to each other.

35. The chassis [12] as claimed in claim 34 characterised therein that the supporting connector [16], rear axle [18] and elongate chassis beam [22] are also disconnectably connected to the seating member [14], rear wheels [20] and front wheel arrangement [24] of the wheelchair [10].

37. The chassis [12] as claimed in claim 32 characterised therein that the chassis [12] further includes tip shaft receiving means dimensioned releasably to accommodate therein an anti-tip wheel shaft of an anti-tip wheel [46].

38. The chassis [12] as claimed in claim 32 characterised therein that the chassis [12] also includes pivoting means for effecting pivoting of the axle shafts [26] about the supporting connector [16], the pivoting means including a pivot post [30] connected to the axle shaft [26] and extending substantially perpendicularly relative to both the axle shaft [26] and the locator shaft [32]; and a rigid sleeve [31] connected to the supporting connector [16] and dimensioned for at least partially accommodating the pivot post [30] therein, the arrangement being such that rotation of the pivot post [30] within the sleeve [31] effects pivoting of the axle shaft [26] and the locator shaft [32] about the supporting connector [16].

39. A supporting connector [16] suitable for connecting different component parts of a collapsible wheelchair [10] so as to effect erection of the wheelchair [10], the supporting connector [16] comprising wheel axle engaging means for engaging the supporting connector [16] to at least one wheel axle of the wheelchair [10]; seat engaging means for engaging and connecting a seating member [14] to the supporting connector [16] and the wheel axle; and chassis beam engaging means dimensioned for engaging a chassis beam [22] to the supporting connector [16].

40. A seating member [14] suitable for use on a wheelchair [10], the seating member [14] comprising a seat [14.1] and a backrest [14.2], the seating member [14]
being characterised therein that the seat [14.1] and backrest [14.2] are locatable in abutting relationship so as to define a housing between them, the housing being dimensioned removably to house at least some of the components of the wheelchair.

41. The seating member [14] as claimed in claim 40 characterised therein that the seat [14.1] and backrest [14.2] are hingedly connected to each other.


44. The wheelchair [10] as claimed in claim 43 characterised therein that the rear axle [18] is connected to the chassis [12] such that it is substantially
perpendicularly orientated relative to the chassis beam [22] is a T-shaped configuration.

45. A wheelchair [10] substantially as herein illustrated and exemplified with reference to the accompanying drawings.


47. A supporting connector [16] suitable for connecting different component parts of a collapsible wheelchair [10] substantially as herein illustrated and exemplified with reference to the accompanying drawings.

FIGURE 2
**INTERNATIONAL SEARCH REPORT**

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC 7 A61G5/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
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Date of the actual completion of the international search: 4 March 2003

Date of mailing of the international search report: 11/03/2003

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