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(54) **MOTORIZED WHEELCHAIR WITH ANTI-TIP WHEELS**

MOTORISIERTER ROLLSTUHL MIT ANTIKIPPRÄDERN

FAUTEUIL ROULANT MOTORISÉ DOTÉ DE ROUES ANTIBASCULEMENT

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• **JOST, Peter**
32689 Kalletal (DE)

(30) Priority: **02.03.2009 EP 09154153**

(74) Representative: **Ganguillet, Cyril et al**
ABREMA Agence Brevets & Marques
Ganguillet
Avenue du Théâtre 16
P.O. Box 5027
CH-1002 Lausanne (CH)

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(73) Proprietor: **Invacare International Sàrl**
1196 Gland (CH)

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(72) Inventors:
• **RITTER, Ralf**
32547 Bad Oeynhausen (DE)

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Description**Technical Field**

[0001] The present invention relates to the field of wheelchairs and in particular to a wheelchair chassis. More particularly, the present invention relates to a wheelchair chassis that can be stored in a space-saving manner.

Prior Art and the Problem Underlying the Invention

[0002] Wheelchairs, and in particular motorized wheelchairs are relatively encumbering devices. This characteristic stems from the fact that motorized wheelchairs, for example, are composed of a multitude of different parts that are arranged in a relatively narrow space in the chassis of the wheelchair.

[0003] GB 2448110 discloses a foldable electric wheelchair.

[0004] In wheelchair fabrication units and maintenance workshops a high number of wheelchairs and wheelchair chassis are generally stored. It is an objective of the present invention to provide a wheelchair or a wheelchair chassis that can be stored in space-saving manner.

[0005] The problem of the high space requirements of wheelchairs is also important during transport of wheelchairs, for example to a maintenance workshop or due to travel of a wheelchair user. It is thus also an objective to provide a way to transport wheelchair or wheelchair chassis in a space-saving manner.

[0006] The present invention also addresses the problem of providing a wheelchair chassis that can be partially dismantled and stored in a space-efficient way.

[0007] The present invention further addresses the problem of a wheelchair or a wheelchair chassis that is transformable to a position of storage or transport, which covers less surface than when the wheelchair or wheelchair chassis is in a position of use.

Summary of Invention

[0008] The present invention provides a wheelchair chassis comprising a pair of anti-tip wheels, wherein said wheelchair chassis has an horizontal position of use and a vertical position of storage, wherein each anti-tip wheel is provided on a curved support arm movably mounted with respect to said wheelchair chassis, and wherein, in said position of storage said curved support arm is in a position that is moved with respect to the position of use, in order to allow the wheelchair to be positioned in said vertical position.

[0009] In said position of storage said curved support arm may be in a position that is rotated with respect to the position of use by an angle of about 90 to 270°.

[0010] In said position of storage, the wheelchair chassis may lie on motorized drive wheels and on said anti-tip wheels.

[0011] Said anti-tip wheels may be provided on a rotatable support arm, wherein in said position of storage the wheelchair chassis may lie on motorized drive wheels and on said anti-tip wheels.

[0012] In a position of use, the curved support arm may be blocked against any rotation.

[0013] Said curved support arm may be associated with a lock mechanism preventing rotation of said support arm in the position of use and/or in the position of storage.

[0014] Said lock mechanism may be actuated and unlocked by hand.

[0015] Said lock mechanism may comprise at least one pin, which, in a position of use and/or in a position of storage blocks any relative movement between said support arm and a holding structure provided on the chassis of the wheelchair.

[0016] Said pin may engage said support arm and said holding structure in a position of use and/or in a position of storage and may be disengaged from one or both of said support arm and/or said holding structure by hand and/or without the need of a special tool.

[0017] A disengagement of said pin from the support arm and/or said holding structure may allow the rotation of the support arm.

[0018] One selected from said holding structure and the support arm may comprise a hollow cylindrical section and the respective other of said holding structure and the support arm may comprise a cylindrical or tubular section, wherein tubular section engages in said hollow cylindrical section.

[0019] A hand-actuatable lock mechanism may prevent rotation of said tubular section in said hollow cylindrical section.

[0020] Said support arm or said holding structure may comprise a limiting structure limiting transversal movement of the support arm with respect to said holding structure in at least one direction when the said lock mechanism is unlocked.

[0021] Said support arm and said holding structure may both comprise an opening, wherein, in a position of use and/or in a position of storage, when relative movement between said support arm and said holding structure is blocked, the openings are aligned and said pin crosses said openings and thereby blocks said relative movement.

[0022] The wheelchair chassis of the present invention may be the wheelchair chassis of a motorized wheelchair, wherein in said position of storage batteries are removed from the wheelchair chassis.

[0023] The present invention also relates to a wheelchair comprising the chassis of the present invention.

Brief Description of the Drawings

[0024] The wheelchair chassis of the present invention will be described in further detail further below, when useful with reference to the drawings, which show an exemplary wheelchair according to the invention.

Figure 1 is a rear perspective view showing the base or chassis of a wheelchair according to an embodiment of the invention. The base shows a motorized wheelchair chassis from which the seat construction including arm and legrests were removed.

Figure 2 is a rear perspective view of the same wheelchair chassis as shown in Figure 1, with battery boxes being removed.

Figure 3a is a right side view to the embodiment of a wheelchair chassis shown in Figure 1.

Figure 3b is an extract of Figure 3a showing in more detail the support arm of the anti-tip wheel and its connection the wheelchair chassis.

Figure 4 is rear perspective view of the anti-tip wheel shown in Figure 3b and its connection the wheelchair chassis.

Figure 5 is a front perspective view of the right support arm of the right anti-tip wheel, the support arm being removed from the chassis of the wheelchair shown in the previous figures.

Figure 6 is the same lateral closer extract view as Figure 4, with the right support arm of the anti-tip wheel being drawn in the direction of the arrow.

Figure 7 is the same view as Figure 3, with the right support arm being pivoted upwardly for preparing a position of storage.

Figure 8 is an extract of Figure 7 showing in more detail the rear right anti-tip wheel and the support arm on the position of Figure 7.

Figure 9a is the same lateral view as Figures 3a and Figure 7, with the support arm of the right anti-tip wheel being pushed back in a holding structure as indicated by the arrow.

Figure 9b is an extract of Figure 9a showing in a closer view the arrangement of the support arm and the structure by which it is attached to the chassis.

Figure 10 is a right side view to the wheelchair chassis of Figure 2 in a vertical position of storage, with the support arms of the anti-tip wheels being pivoted into the position shown in Figure 7.

Figure 11 is a rear perspective view of the wheelchair chassis as shown in Figure 10.

Detailed Description of the Preferred Embodiments

[0025] **Figure 1** shows an embodiment of the wheel-

chair chassis 1 of the present invention. If compared to a completely assembled wheelchair, the chassis shown in Figures 1 differs in that the seat, arm and legrests of the complete wheelchair are removed. The perspective rear view of Figure 1 shows a pair of right and left motor wheels 6, 6', right and left rear anti-tip wheels 8, 8' and a right front castor wheel 7 (the left front castor wheel 7' not being visible in this view). The anti-tip wheels are connected at the end of right and left curved support arms 9, 9', respectively. A right motor 10 is visible, and together with a left motor (not visible), the motors are provided in order to propel the left and right motorized wheels 6, 6', respectively. The castor wheels 7, 7' and the motorized wheels 6, 6' are fixed to the chassis. The anti-tip wheels 8, 8' are provided at the rear end of the left and right curved support arms 9, 9', said support arms being attached to swing arms being part of the chassis. The chassis 1 comprises a main, U-shaped frame element 11, the open end of the U being oriented towards the front. A horizontal frame element 12 is provided in a front area of the chassis. A pair of battery boxes 13, 14 is loaded on the chassis 1 at the rear of the wheelchair.

[0026] The present invention concerns more specifically the arrangement of wheels other than the main drive or motorized wheels. For example, the present invention is applicable to wheels such as idler wheels or anti-tip wheels of a wheelchair. Anti-tip wheels are typically provided as pairs of smaller wheels if compared to motorized or drive wheels. These pairs of smaller wheels are typically arranged towards the front or the rear end of a wheelchair and have, as a main purpose, the maintenance of the stability and/or maneuverability of a wheelchair. These smaller wheels are thus often provided at the rear-to-front extremities of a wheelchair and therefore determine the overall length and encumbrance of a wheelchair chassis. The present invention provides a possibility of change the orientation and/or position of such smaller wheels in order to allow a less encumbering, space-saving position of storage and transport for the wheelchair.

[0027] For the purpose of the present specification, situations and directions of elements of the wheelchair chassis of the present invention are determined by the perspective of a user seated in the completely assembled wheelchair. Accordingly, the left side of the wheelchair chassis 1 corresponds to the left side of Figure 1. The situations or directions "up" or "top" and "down" or "bottom", "rear" or "back" and "front", "behind" and "in front", "distal" and "proximal", "lateral" and "central" follow the same rule.

[0028] In the embodiment shown in the figures, the principle of the present invention is illustrated at the example of the anti-tip wheels 8, 8' of the wheelchair chassis 1 shown in Figures 1 and 2. Anti-tip wheels generally are not in touch with the ground on which a complete wheelchair moves, but may come in contact when a wheelchair is tipping over or runs on an obstacle. In these situations, the anti-tip wheels are provided to prevent falling over of

the wheelchair. In the wheelchair chassis shown in Figures 1 and 2, as mentioned above, the left and right anti-tip wheels 8, 8' are mounted at the rear distal end of dedicated, left and right support arms 9, 9', which in turn are mounted at their front end to the chassis.

[0029] Figure 2 is the same wheelchair chassis as shown in Figure 1, with the battery boxes 13, 14 being removed, normally loaded on the rear end of the chassis 1 (Figure 1). The embodiment of the wheelchair chassis shown in the figures of this specification is intended for storage or transport with the battery boxes being removed beforehand. However, the present invention also encompasses the possibility that the battery boxes stay on the wheelchair chassis when the wheelchair chassis is prepared or placed in a position for storage, as detailed further below.

[0030] In the lateral views of Figures 3a and 3b, the right side of the wheelchair chassis of the same embodiment is shown. The description of the right side also applies, as the skilled person will understand, also to the left side of the wheelchair chassis, where analogous structures are provided. It can be seen that each anti-tip wheel support arm 9, 9' comprises a nearly horizontal, front profile section 20, a bent section 22 and a rear, nearly vertical anti-tip wheel carrying section 21. As will be discussed further below, the angle α that the front profile section 20 deviates from horizontal is actually important for enabling storage of the wheelchair chassis in a space-saving manner.

[0031] In particular in Figures 3b and in the perspective, closer view of Figure 4, of the right anti-tip wheel, it can be seen that the rear portion 20 of the support arm 9 is guided in a tubular element 25, which thus functions as a holding structure having a hollow cylindrical configuration. The holding structure 25 is rigidly connected to the chassis 1, for example by welding or screwing, and more particularly to a lateral frame bar 30, which carries, on its lower side, the motor of the motorized wheel. The right motorized wheel is removed in Figures 3b and 4 for the reason of clarity. The support arm 9 carries, at its lower, rear end, a fork 23, in which the anti-tip wheel 8 is turnably mounted.

[0032] Figure 5 shows the support arm 9 of the right anti-tip wheel 8 being removed from the tubular element 25 and therefore also from the wheelchair chassis 1. A sleeve 28 provided on the front, substantially horizontal portion 20 of the support arm 9 can well be seen in Figure 5. This sleeve abuts against the rear end of the tubular element 25 when the support arm 9 is inserted, as can be seen in Figures 3a, 3b and 4. Figure 5 further shows a clasp 32 comprising two pins 31. In the position of use of the wheelchair, as exemplified in Figures 3a, 3b and 4 showing the wheelchair chassis (and also in the position of storage, as will be described below) the clasp 32 is situated inside the front profile section 20 of the support arm 9. Thereby, the pins 31 pass through holes 33 in the front profile section 20 and also through similar holes 29 in the tubular element 25 (Figures 3a, 3b, 4). By way of

the pins 31, said clasp 32 thus achieves a rigid but detachable connection between the support arm 9 and the tubular element 25 and thus links the support arm 9 to the chassis 1. As the skilled person will note, this mechanism functions as a lock mechanism and is capable of blocking any rotational movement of the support arm 9 in said tubular element 25 and also any transversal movement of the front profile section 20 of the support arm 9 in the tubular holding element.

[0033] In the following, we describe the unblocking of the lock mechanism provided by said clasp 32, and the rotation of the anti-tip wheels for the purpose of achieving a space-saving position of storage and transport of the wheelchair chassis of the present invention.

[0034] As appears from the previously discussed figures, the pins 31 (Figure 5) are accessible from the outside in a position of use of the wheelchair chassis, and even of the completely assembled wheelchair, as they pass through the hole 33 in the support arm 9 and also through hole 29 in the holding structure 25. A wheelchair user or any other person can push said pins back when grasping the holding structure 25, thereby disengaging the pins from the hole 29 of the holding structure 25. In so doing, the support arm 9 becomes unblocked from the holding structure and is free to move transversally within said holding structure 25 towards the rear.

[0035] The arrow in Figure 6 illustrates how the support arm 9 is transversally drawn in the rear direction while being guided in the tubular holding structure 25. The extent of movement can be recognized at the position of the retainer sleeve 28, which, in the positions of use shown in Figures 3a, 3b and 4, abuts against the holding structure 25. In Figure 6, in contrast, the retainer sleeve 28 is situated at a distance of several centimeters away from the rear end of the tube of the holding structure 25.

[0036] In the position shown in Figure 6, the holes 33 (Figure 5) of the support arm 9 and the holes 29 provided in the holding structure 25 are no longer aligned, and the pins 31 (Figure 5), thus do no longer block the movement of the support arm 9 with respect to the chassis 1. Thanks to the tubular or cylindrical configuration of the front section 20 of the support arm 9, which is housed in a hollow cylindrical bearing provided by the tubular holding structure 25, also a rotational movement of the support arm is now possible.

[0037] In Figures 7 and 8, the rotation of the support arm by about 180° is shown. In this position, the anti-tip wheel 8 is directed to the top, and the rear section 21 of the support arm 9 is oriented in a close to vertical position. Also in the upwardly rotated position shown in Figures 7 and 8, the support arm is not blocked and still free to further move and/or rotate. In particular, it can be seen that the position of the sleeve 28 still is removed from the rear end of the holding structure 25.

[0038] The support arm can, however, be blocked in the upward position of the anti-tip wheels by pushing the support arm transversally back into the holding structure

25, as is illustrated by the arrow in **Figures 9a and 9b**. As can be better seen in the enlarged Figure 9b, the support arm 9 is pushed until the sleeve 28 on said support arm abuts again on the rear end of the tube of the holding structure 25. If, in this position, the support arm is rotated until an exact vertical position of the rear section 21 is obtained, the pins 31 (Figure 5) in the support arm 9 will again pass through the holes 29 in the holding structure 25 and thereby block further rotational and transversal movement of the support arm 9.

[0039] As the skilled person will understand, the clasp 32 shown in Figure 5 is such that two pins 31 are diametrically opposed with respect to each other (180°). Accordingly, the rear section 20 of the support arm 9 actually comprises two holes 33, a second hole being provided diametrically opposed (not visible in Figure 5). Similarly, the holding structure 25 comprises two holes 29, of which the second one is diametrically opposed and cannot be seen in the figures. This arrangement is such that when the support arm is rotated by exactly 180°, the pins 31 can again be moved into the holes 33 and 29. Then the pins block the support arm in a position that is rotated by 180° with respect to the previously blocked position.

[0040] **Figures 10 and 11** show a space-saving position of the wheelchair chassis shown in the previous figures. This position is useful for storage of the wheelchair chassis when not needed, for example in a maintenance workshop, or for transport. This position is obtained by tilting the front of the wheelchair chassis up-wards and rotating the wheelchair chassis around the main motorized wheels, until the longitudinal rear-to-front dimension of the wheelchair chassis is oriented vertically. The wheelchair chassis is then stabilized and supported on the main wheels 6, 6' and on the anti-tip wheels 8, 8'. As was mentioned above, the anti-tip wheels usually do not touch the ground when the assembled wheelchair is in a horizontal position of use. However, in the vertical position of storage of the wheelchair chassis shown in Figures 10 and 11, the anti-tip wheels touch the ground and support the wheelchair chassis in this position.

[0041] With reference to Figure 3b it is noted that the front section 20 of the support arm 9 has a close to horizontal position, but is slightly skewed upwards towards the rear, thereby enclosing an angle α with respect to horizontal. The careful adjustment of this angle is important not only in order to assure the proper functioning of the anti-tip function of the anti-tip wheels in the assembled wheelchair, but also for assuring that the rear section 21 of the anti-tip wheels assumes a substantially vertical or close to vertical configuration following the up-ward pivoting of the support arm as shown in Figures 7, 8, 9a, 9b. The angle α is thus related to the angle between the front and rear sections 20 and 21 of the curved support arm 9. More specifically, angle α corresponds to the angle enclosed between said front and rear sections 20 and 21 of the curved support arm 9 minus 90°.

[0042] As the skilled person will understand, also the length of the various elements of the support arm 9 is

relevant as well as the position of attachment of the arm on the chassis with respect to the ground. The skilled person will be able to vary these elements when necessary or desirable for other reasons.

[0043] In the embodiment shown in the figures, the axis of pivoting of the support arm 9 in the holding structure 25 lies in a plane that is vertically extending in the longitudinal, rear to front direction of the wheelchair chassis. Deviations of this situation of the axis are possible. For example, the support arms could be oriented slightly outwards, in which case the axis of pivoting would be provided at an angle β (not shown) of about 0-70° from a vertical rear-to front longitudinal plane.

[0044] In the embodiment of the wheelchair chassis shown in the figures, the anti-tip wheels are provided in a rear position of the wheelchair chassis. There are many wheelchairs that are constructed with the anti-tip wheels provided in the front of the wheelchair. The present invention analogously also applies to wheelchairs with front anti-tip wheels.

[0045] According to another embodiment of the present invention, not represented on the drawings, the rear portion 20 of the support arms 9, 9' is not guided in a tubular element 25, but is mounted in articulation onto the chassis (or onto another element fixed to the chassis or to a swing arm being part of the chassis, such as for example the tube 25), for example through a universal or cardan joint, so as to be able to be pivoted to serve as support when the wheelchair chassis is in its vertical position of storage, so that the wheelchair chassis can be stabilised and supported on the main wheels 6, 6' and on the anti-tip wheels 8, 8'.

35 Claims

1. A wheelchair chassis (1) comprising a pair of anti-tip wheels (8, 8'), wherein said wheelchair chassis has an horizontal position of use and a vertical position of storage, wherein each anti-tip wheel is provided on a curved support arm (9, 9'), **characterized in that** said curved support arm is movably mounted with respect to said wheelchair chassis, and **in that**, in said position of storage said curved support arm is in a position that is moved with respect to the position of use, in order to allow the wheelchair chassis to be positioned in said vertical position.
2. The wheelchair chassis of claim 1, wherein in said position of storage said curved support arm (9, 9') is in a position that is rotated with respect to the position of use by an angle of about 90 to 270°.
3. The wheelchair chassis of claim 1, wherein in said position of storage, the wheelchair chassis lies on motorized drive wheels (6, 6') and on said anti-tip wheels (8, 8').

4. The wheelchair chassis of any one of the preceding claims, wherein said anti-tip wheels (8, 8') are provided on a rotatable support arm (9, 9'), and wherein in said position of storage the wheelchair chassis lies on motorized drive wheels (6, 6') and on said anti-tip wheels (8, 8').
5. The wheelchair chassis of any one of the preceding claims, wherein, in a position of use, the curved support arm (9, 9') is blocked against any rotation.
6. The wheelchair chassis of any one of the preceding claims, wherein said curved support arm (9, 9') is associated with a lock mechanism (29, 32, 31, 33) preventing rotation of said support arm in the position of use and/or in the position of storage.
7. The wheelchair chassis of claim 6, wherein said lock mechanism (29, 32, 31, 33) can be actuated and unlocked by hand.
8. The wheelchair chassis of any one of claims 6 and 7, wherein said lock mechanism (29, 32, 31, 33) comprises at least one pin (31), which, in a position of use and/or in a position of storage blocks any relative movement between said support arm and a holding structure (25) provided on the chassis (5) of the wheelchair.
9. The wheelchair chassis of claim 8, wherein said pin (31) engages said support arm (9, 9') and said holding structure (25) in a position of use and/or in a position of storage and can be disengaged from one or both of said support arm and/or said holding structure by hand and/or without the need of a special tool.
10. The wheelchair chassis of claim 9, wherein a disengagement of said pin (31) from the support arm (9, 9') and/or said holding structure (25) allows the rotation of the support arm.
11. The wheelchair chassis of any one of claims 8-10, wherein one selected from said holding structure (25) and the support arm (9, 9') comprises a hollow cylindrical section and the respective other of said holding structure and the support arm comprises a cylindrical or tubular section, wherein tubular section engages in said hollow cylindrical section.
12. The wheelchair chassis of claim 11, wherein a hand-actuatable lock mechanism (29, 32, 31, 33) prevents rotation of said tubular section in said hollow cylindrical section.
13. The wheelchair chassis of any one of claims 6-12, wherein said support arm (9, 9') or said holding structure (25) comprises a limiting structure (28) limiting transversal movement of the support arm with re-

spect to said holding structure in at least one direction when the said lock mechanism (29, 32, 31, 33) is unlocked.

- 5 14. The wheelchair chassis of any one of the preceding claims, wherein said support arm (9, 9') and said holding structure (25) both comprise an opening (29, 33), wherein, in a position of use and/or in a position of storage, when relative movement between said support arm and said holding structure is blocked, the openings are aligned and said pin (31) crosses said openings and thereby blocks said relative movement.
- 10 15. The wheelchair chassis of any one of the preceding claims, which is the wheelchair chassis of a motorized wheelchair, and wherein in said position of storage batteries (13, 14) are removed from the wheelchair chassis.
- 15 16. A wheelchair comprising a chassis according to anyone of the preceding claims.

25 Patentansprüche

1. Rollstuhl-Fahrgestell (1), umfassend ein Paar Antikkippräder (8, 8'), wobei das Rollstuhl-Fahrgestell eine horizontale Verwendungsposition und eine vertikale Aufbewahrungsposition aufweist, wobei jedes Antikkipprad an einem gekrümmten Stützarm (9, 9') bereitgestellt ist, **dadurch gekennzeichnet, dass** der gekrümmte Stützarm beweglich in Bezug auf das Rollstuhl-Fahrgestell montiert ist, und dadurch, dass sich der gekrümmte Stützarm in der Aufbewahrungsposition in einer Position befindet, die in Bezug auf die Verwendungsposition bewegt wird, um zu ermöglichen, dass das Rollstuhl-Fahrgestell in der vertikalen Position angeordnet werden kann.
2. Rollstuhl-Fahrgestell nach Anspruch 1, wobei in der Aufbewahrungsposition der Stützarm (9, 9') in einer Position ist, die in Bezug auf die Verwendungsposition um einen Winkel von etwa 90 bis 270° gedreht ist.
3. Rollstuhl-Fahrgestell nach Anspruch 1, wobei in der Aufbewahrungsposition das Rollstuhl-Fahrgestell auf motorisierten Antriebsrädern (6, 6') und auf den Antikkipprädern (8, 8') liegt.
4. Rollstuhl-Fahrgestell nach einem der vorhergehenden Ansprüche, wobei die Antikkippräder (8, 8') an einem drehbaren Stützarm (9, 9') bereitgestellt sind und wobei in der Aufbewahrungsposition das Rollstuhl-Fahrgestell auf motorisierten Antriebsrädern (6, 6') und auf den Antikkipprädern (8, 8') liegt.

5. Rollstuhl-Fahrgestell nach einem der vorhergehenden Ansprüche, wobei in einer Verwendungsposition der gekrümmte Stützarm (9, 9') gegen jegliche Drehung blockiert ist.
6. Rollstuhl-Fahrgestell nach einem der vorhergehenden Ansprüche, wobei der gekrümmte Stützarm (9, 9') mit einem Verriegelungsmechanismus (29, 32, 31, 33) verbunden ist, der eine Drehung des Stützarms in der Verwendungsposition und/oder Aufbewahrungsposition verhindert.
7. Rollstuhl-Fahrgestell nach Anspruch 6, wobei der Verriegelungsmechanismus (29, 32, 31, 33) per Hand betätigt und entriegelt werden kann.
8. Rollstuhl-Fahrgestell nach einem der Ansprüche 6 und 7, wobei der Verriegelungsmechanismus (29, 32, 31, 33) mindestens einen Stift (31) umfasst, der in einer Verwendungsposition und/oder Aufbewahrungsposition jede relative Bewegung zwischen dem Stützarm und einer Haltestruktur (25), die an dem Fahrgestell (5) des Rollstuhls bereitgestellt ist, blockiert.
9. Rollstuhl-Fahrgestell nach Anspruch 8, wobei der Stift (31) in den Stützarm (9, 9') und die Haltestruktur (25) in einer Verwendungsposition und/oder Aufbewahrungsposition eingreift und von dem Stützarm und/oder der Haltestruktur per Hand und/oder ohne Verwendung eines speziellen Werkzeugs gelöst werden kann.
10. Rollstuhl-Fahrgestell nach Anspruch 9, wobei ein Lösen des Stiftes (31) aus dem Stützarm (9, 9') und/oder der Haltestruktur (25) die Drehung des Stützarms ermöglicht.
11. Rollstuhl-Fahrgestell nach einem der Ansprüche 8 bis 10, wobei entweder die Haltestruktur (25) oder der Stützarm (9, 9') einen hohlen zylindrischen Abschnitt umfassen und der jeweils andere von Haltestruktur und Stützarm einen zylindrischen oder röhrenförmigen Abschnitt umfassen, wobei der röhrenförmige Abschnitt in den hohlen zylindrischen Abschnitt eingreift.
12. Rollstuhl-Fahrgestell nach Anspruch 11, wobei ein per Hand betätigbarer Verriegelungsmechanismus (29, 32, 31, 33) eine Drehung des röhrenförmigen Abschnitts in dem hohlen zylindrischen Abschnitt verhindert.
13. Rollstuhl-Fahrgestell nach einem der Ansprüche 6 bis 12, wobei der Stützarm (9, 9') oder die Haltestruktur (25) eine Begrenzungsstruktur (28) umfassen, welche eine Querbewegung des Stützarms in Bezug auf die Haltestruktur in mindestens eine Rich-

tung einschränkt, wenn der Verriegelungsmechanismus (29, 32, 31, 33) entriegelt ist.

- 5 14. Rollstuhl-Fahrgestell nach einem der vorhergehenden Ansprüche, wobei der Stützarm (9, 9') und die Haltestruktur (25) beide eine Öffnung (29, 33) umfassen, wobei in einer Verwendungsposition und/oder in einer Aufbewahrungsposition, wenn die relative Bewegung zwischen dem Stützarm und der Haltestruktur blockiert ist, die Öffnungen miteinander ausgerichtet sind und der Stift (31) die Öffnungen durchläuft und dadurch die relative Bewegung blockiert.
- 10 15. Rollstuhl-Fahrgestell nach einem der vorhergehenden Ansprüche, wobei das Rollstuhl-Fahrgestell das eines motorisierten Rollstuhls ist und wobei in der Aufbewahrungsposition Batterien (13, 14) aus dem Rollstuhl-Fahrgestell entfernt werden.
- 20 16. Rollstuhl mit einem Fahrgestell nach einem der vorhergehenden Ansprüche.

25 Revendications

- 30 1. Châssis de fauteuil roulant (1) comprenant une paire de roues anti-basculement (8, 8'), ledit châssis de fauteuil roulant ayant une position d'utilisation horizontale et une position de rangement verticale, chaque roue anti-basculement étant installée sur un bras de support coudé (9, 9'), **caractérisé en ce que** ledit bras de support coudé est monté de façon mobile par rapport audit châssis de fauteuil roulant, et
- 35 **en ce que**, dans ladite position de rangement, ledit bras de support coudé se trouve dans une position déplacée par rapport à la position d'utilisation, afin de permettre au châssis de fauteuil roulant d'être placé dans ladite position verticale.
- 40 2. Châssis de fauteuil roulant selon la revendication 1, dans lequel, dans ladite position de rangement, ledit bras de support coudé (9, 9') se trouve dans une position qui est pivotée par rapport à la position d'utilisation d'un angle d'environ 90 à 270°.
- 45 3. Châssis de fauteuil roulant selon la revendication 1, dans lequel, dans ladite position de rangement, le châssis de fauteuil roulant repose sur des roues motrices motorisées (6, 6') et sur lesdites roues anti-basculement (8, 8').
- 50 4. Châssis de fauteuil roulant selon l'une quelconque des revendications précédentes, dans lequel lesdites roues anti-basculement (8, 8') sont installées sur un bras de support pivotant (9, 9'), et dans lequel, dans ladite position de rangement, le châssis de fauteuil roulant repose sur des roues motrices motori-
- 55

- sées (6, 6') et sur lesdites roues anti-basculement (8, 8').
5. Châssis de fauteuil roulant selon l'une quelconque des revendications précédentes, dans lequel, dans une position d'utilisation, le bras de support coudé (9, 9') est bloqué de sorte qu'il ne peut effectuer aucun pivotement. 5
6. Châssis de fauteuil roulant selon l'une quelconque des revendications précédentes, dans lequel ledit bras de support courbé (9, 9') est associé à un mécanisme de verrouillage (29, 32, 31, 33) empêchant le pivotement dudit bras de support dans la position d'utilisation et/ou dans la position de rangement. 10
7. Châssis de fauteuil roulant selon la revendication 6, dans lequel ledit mécanisme de verrouillage (29, 32, 31, 33) peut être actionné et déverrouillé manuellement. 20
8. Châssis de fauteuil roulant selon l'une quelconque des revendications 6 et 7, dans lequel ledit mécanisme de verrouillage (29, 32, 31, 33) comprend au moins une goupille (31) qui, dans une position d'utilisation et/ou dans une position de rangement, bloque tout déplacement relatif entre ledit bras de support et une structure porteuse (25) installée sur le châssis (5) du fauteuil roulant. 25
9. Châssis de fauteuil roulant selon la revendication 8, dans lequel ladite goupille (31) s'accouple avec ledit bras de support (9, 9') et ladite structure porteuse (25) dans une position d'utilisation et/ou dans une position de rangement et peut être désaccouplée dudit bras de support et/ou de ladite structure porteuse manuellement et/ou sans qu'un outil spécial ne soit nécessaire. 30
10. Châssis de fauteuil roulant selon la revendication 9, dans lequel un désaccouplement de ladite goupille (31) vis-à-vis du bras de support (9, 9') et/ou de ladite structure porteuse (25) permet le pivotement du bras de support. 35
11. Châssis de fauteuil roulant selon l'une quelconque des revendications 8 à 10, dans lequel un élément sélectionné parmi ladite structure porteuse (25) et le bras de support (9, 9') comprend une section cylindrique creuse et l'autre élément, respectivement, parmi ladite structure porteuse et le bras de support comprend une section cylindrique ou tubulaire, la section tubulaire s'accouplant avec ladite section cylindrique creuse par insertion dans celle-ci. 40
12. Châssis de fauteuil roulant selon la revendication 11, dans lequel un mécanisme de verrouillage actionnable manuellement (29, 32, 31, 33) empêche tout pivotement de ladite section tubulaire dans ladite section cylindrique creuse. 45
13. Châssis de fauteuil roulant selon l'une quelconque des revendications 6 à 12, dans lequel ledit bras de support (9, 9') ou ladite structure porteuse (25) comprend une structure de limitation (28) limitant le déplacement transversal du bras de support par rapport à ladite structure porteuse dans au moins une direction lorsque ledit mécanisme de verrouillage (29, 32, 31, 33) est déverrouillé. 50
14. Châssis de fauteuil roulant selon l'une quelconque des revendications précédentes, dans lequel ledit bras de support (9, 9') et ladite structure porteuse (25) comprennent tous deux une ouverture (29, 33), dans lequel, dans une position d'utilisation et/ou dans une position de rangement, lorsque tout déplacement relatif entre ledit bras de support et ladite structure porteuse est bloqué, les ouvertures sont alignées et ladite goupille (31) traverse lesdites ouvertures, bloquant ainsi ledit déplacement relatif. 55
15. Châssis de fauteuil roulant selon l'une quelconque des revendications précédentes, constituant le châssis de fauteuil roulant d'un fauteuil roulant motorisé, et dans lequel, dans ladite position de rangement, des batteries (13, 14) sont retirées du châssis de fauteuil roulant.
16. Fauteuil roulant comprenant un châssis selon l'une quelconque des revendications précédentes.

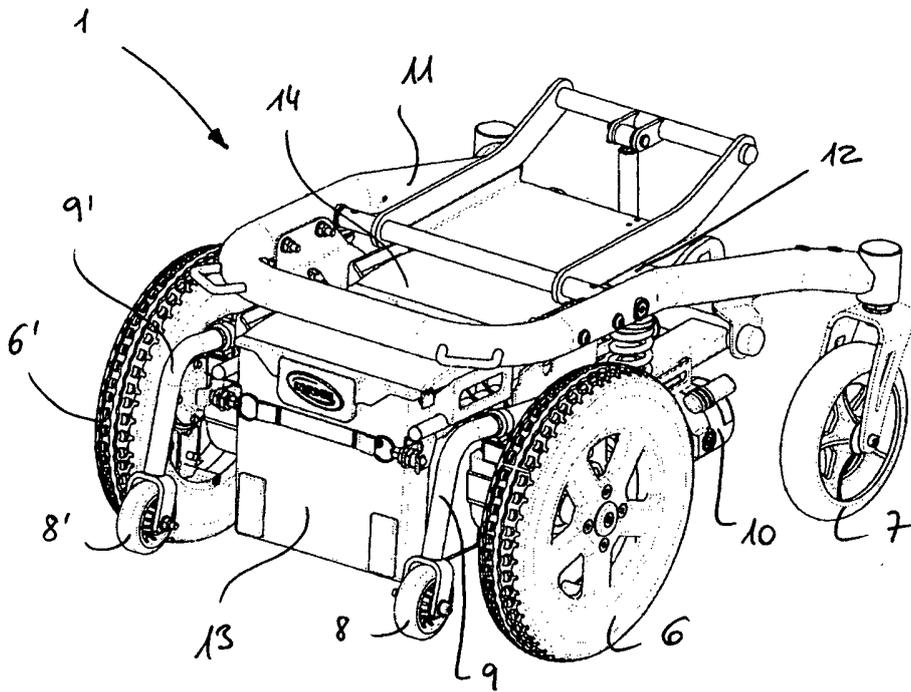


Figure 1

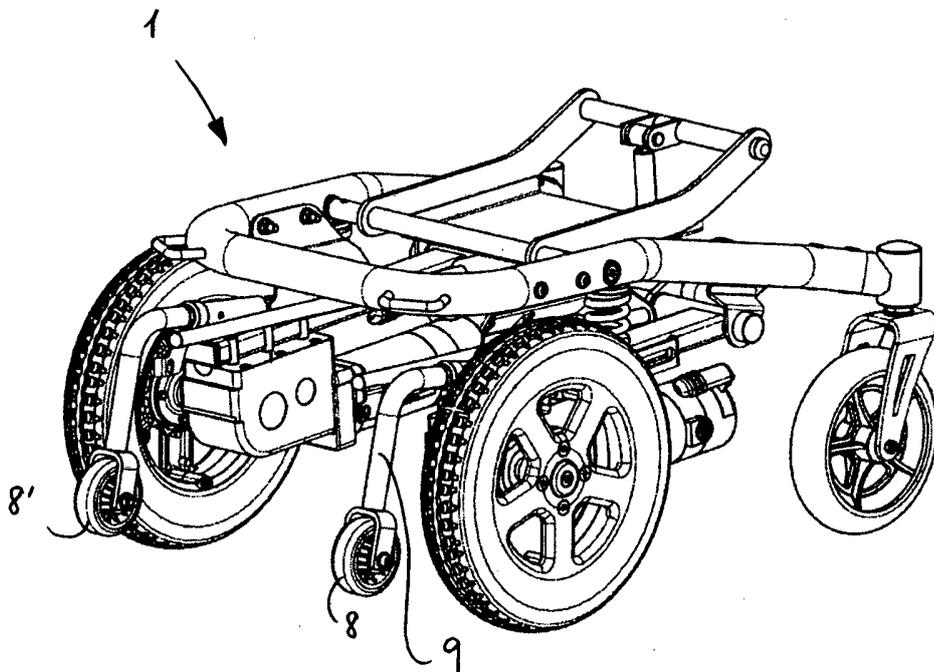


Figure 2

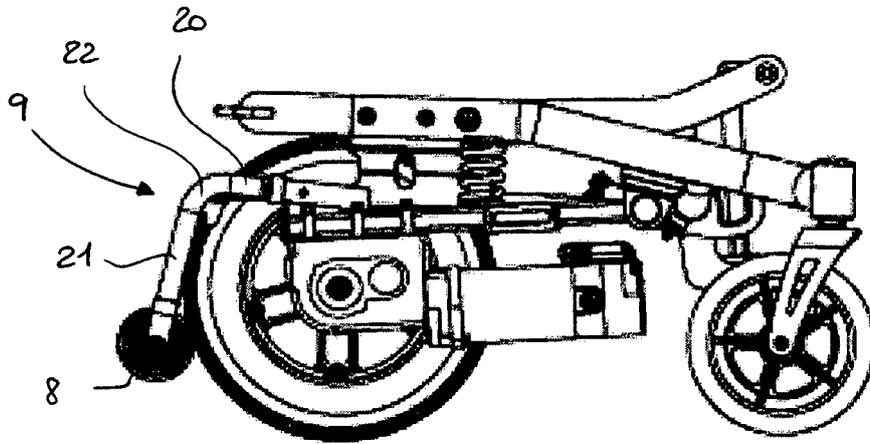


Figure 3a

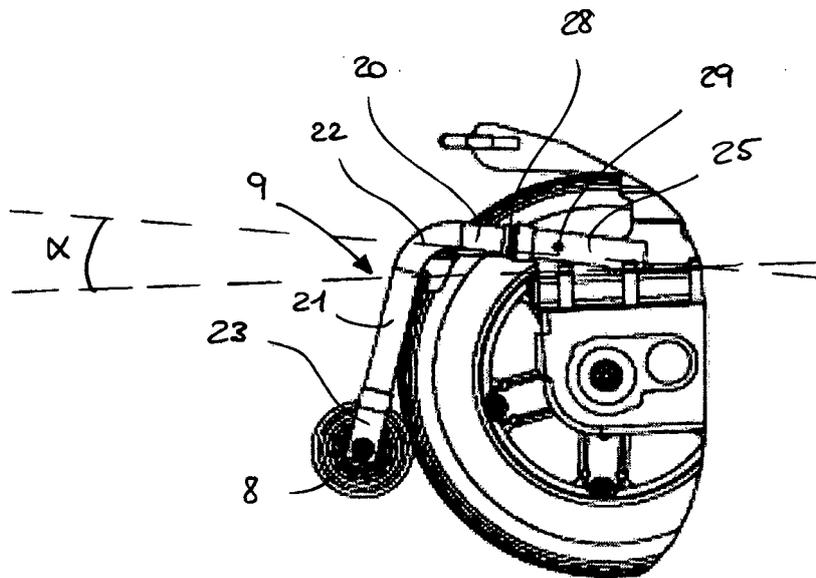


Figure 3b

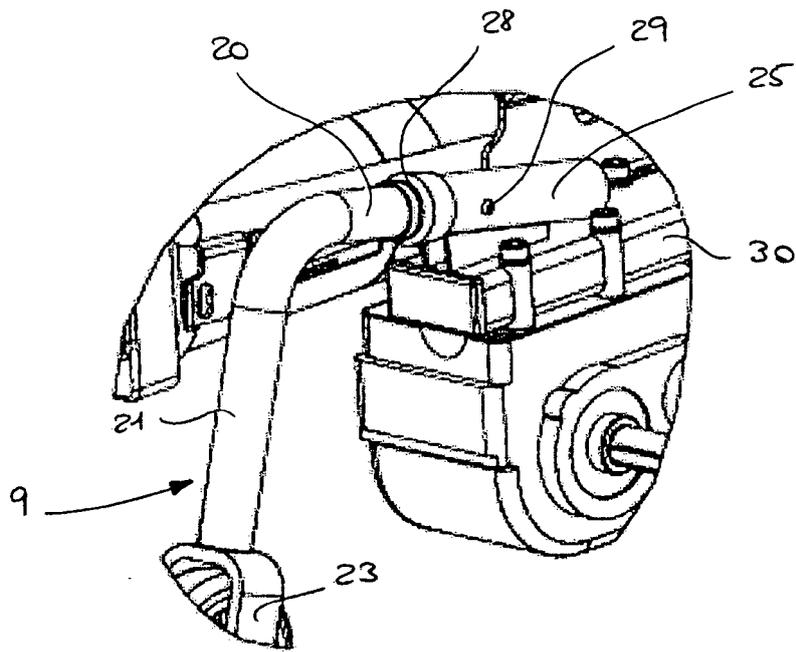


Figure 4

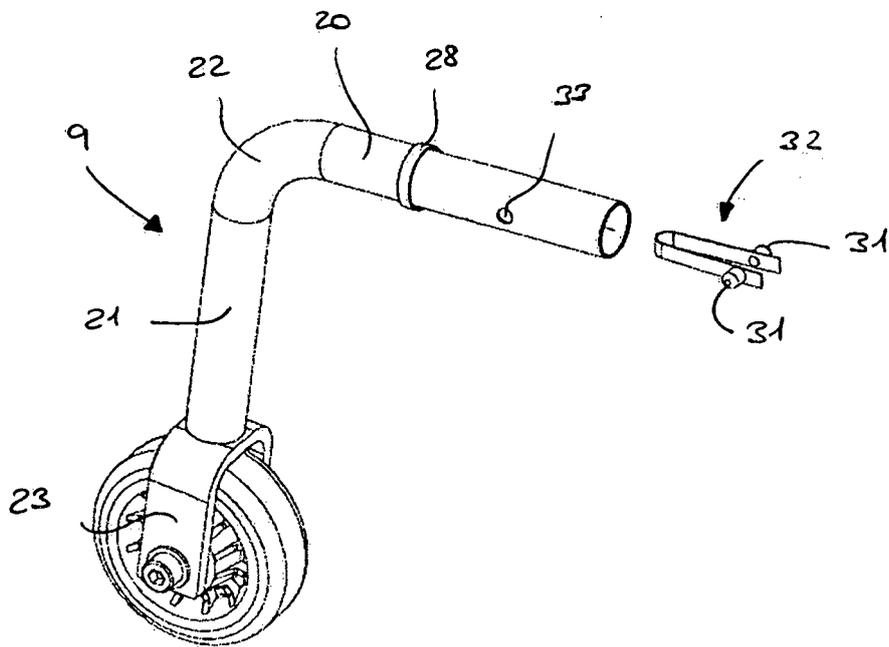


Figure 5

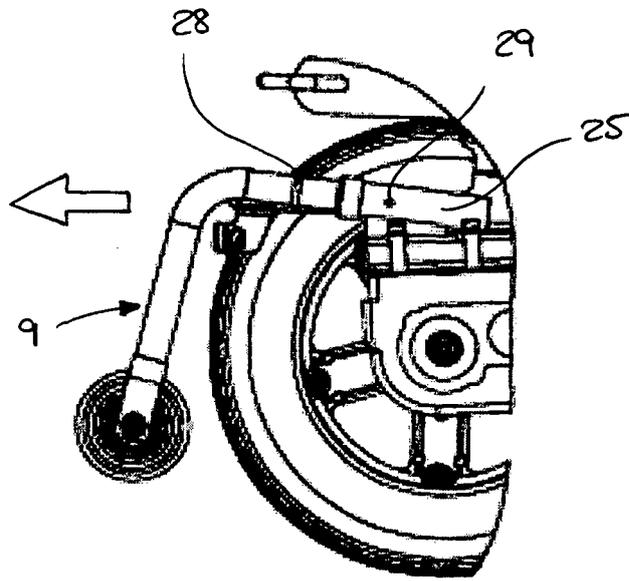


Figure 6

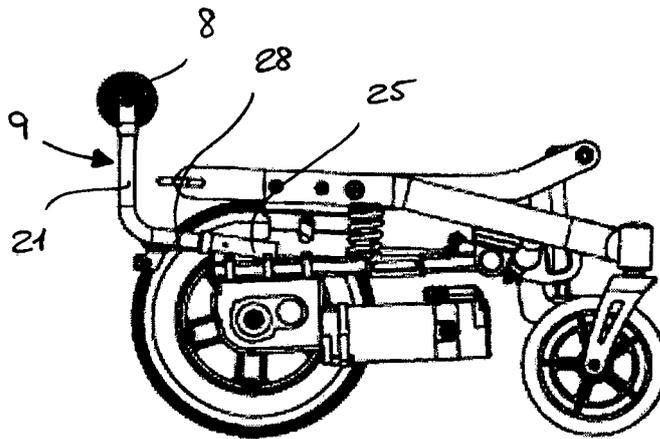


Figure 7

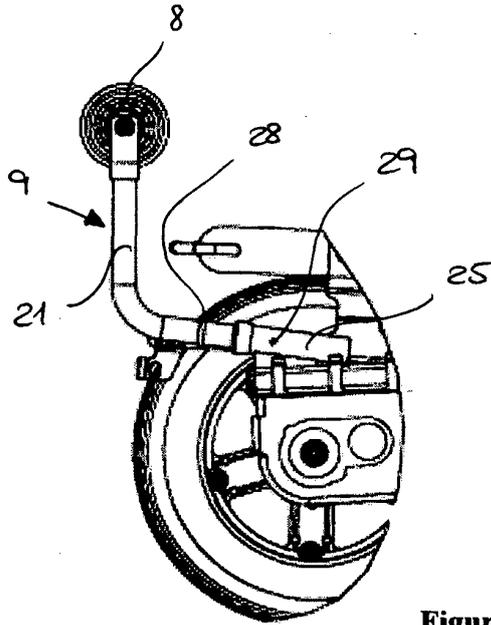


Figure 8

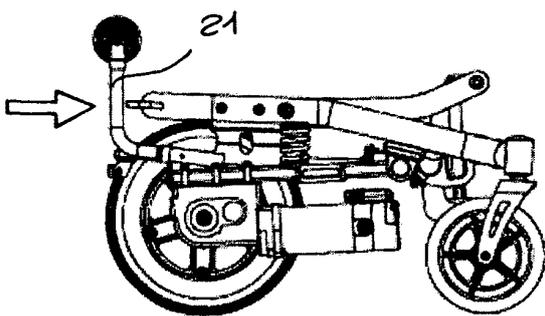


Figure 9a

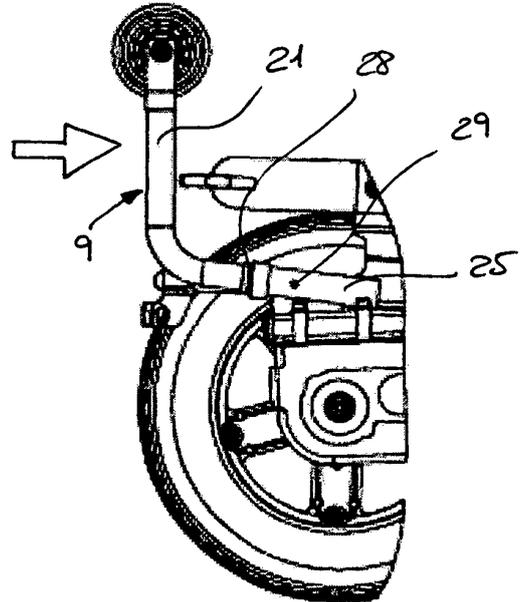


Figure 9b

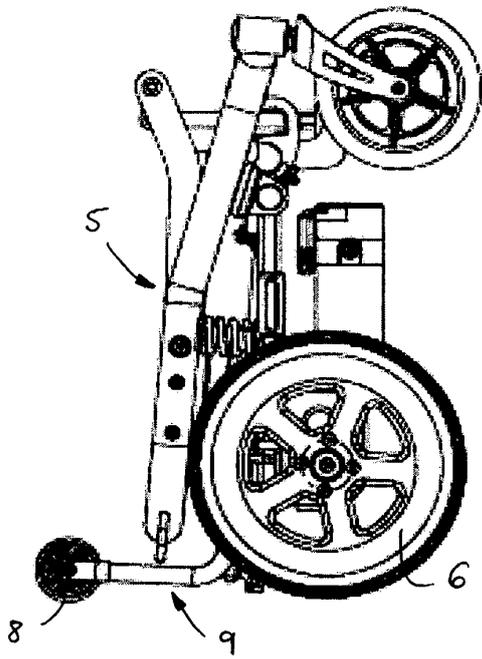


Figure 10

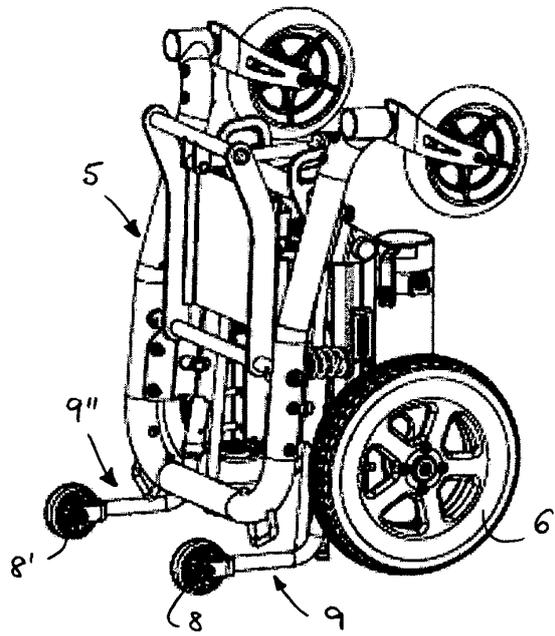


Figure 11

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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