



(11) **EP 1 702 600 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
17.12.2008 Bulletin 2008/51

(51) Int Cl.:
A61G 1/02^(2006.01) A61G 7/08^(2006.01)

(21) Application number: **06250692.8**

(22) Date of filing: **09.02.2006**

(54) **Stretcher**

Krankentrage

Brancard

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

(30) Priority: **17.03.2005 GB 0505447**

(43) Date of publication of application:
20.09.2006 Bulletin 2006/38

(73) Proprietor: **Ferno (UK) Limited
Cleckheaton,
West Yorkshire BD19 4TZ (GB)**

(72) Inventors:
• **Williamson, Robert, c/o Ferno (UK) Limited
Cleckheaton
West Yorkshire BD19 4TZ (GB)**
• **Whyman, David, c/o Ferno (UK) Limited
Cleckheaton
West Yorkshire BD19 4TZ (GB)**

(74) Representative: **Sherrard-Smith, Hugh et al
Appleyard Lees & Co.
15 Clare Road
Halifax, HX1 2HY,
West Yorkshire (GB)**

(56) References cited:
EP-A- 0 769 286 US-A1- 2003 159 861

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 702 600 B1

Description

[0001] The present invention relates to a stretcher and a method of operating a stretcher. Herein any reference to a stretcher includes a stretcher trolley.

[0002] Stretchers are presently manoeuvred manually by an operator who exerts the forces required to direct and move the stretcher about hospital ward, between wards, between ambulances and between ambulances and incidents. During the course of manoeuvring the stretcher the operator has to exert a considerable force in order to control the stretcher. The effect can be bad for the back of the operator. The force is increased when manoeuvring the stretcher up steep inclines or ramps, such as an ambulance ramp or hospital ramp. Furthermore, the wheels of the stretcher are mounted on swivels, which, particularly if the ramp tilts to one side (such as may occur when the vehicle is not parked on level ground), as the operator pushes the stretcher up it can run off the stretcher. In addition the stretcher can run off course when going up or down hill or on a slope. Alternatively, the stretcher can run away down hill if on a steep hill or if the operator slips and loses grip. All of these problems are accentuated when the patient on the stretcher is particularly heavy.

[0003] US-A-2003/0159861 discloses a wheeled carriage for supporting a patient in a substantially horizontal position. A control apparatus controls the wheel support structure to move the auxiliary wheels between a first deployed position whereat castered wheels one end of the carriage are elevated from a floor surface, and a second stored position with the auxiliary wheels out of engagement with the floor surface. This document provides basis for the pre-characterising portion of independent claim 1 and claim 13 appended hereto.

[0004] EP-A-0769286 discloses a further patient transfer apparatus having casters disposed at four locations on a frame, and a drive mechanism which is elevatable with respect to the frame.

[0005] It is an object of the present invention to attempt to overcome at least some of the above or other disadvantages.

[0006] According to one aspect of the present invention a stretcher includes at least three non-driven wheels and at least one driven wheel, the driven wheel being moveable relative to at least one of the non-driven wheels between a driven position in which the driven wheel is in contact with the ground and a non-driven position in which the driven wheel is spaced from the ground, characterised by: the stretcher being adapted such that the height of a patient support above the ground, in the region of the driven wheel first decreases and then increases as movement occurs between the two positions.

[0007] At least one of the driven wheels or a non-driven wheel may be moveably mounted on the stretcher in order to effect the movement between the two positions.

[0008] In the travelling position at least one of the non-driven wheels may be spaced on the ground. The driven

wheel may be pivotally mounted on the stretcher about an axis offset from that wheels rotational axis to effect the movement between the driven and non-driven positions.

[0009] The movement in at least one direction between the positions may be effected by driving means.

[0010] The drive means may be arranged to hold the stretcher in at least one of the positions with the hold being exerted in at least one of the positions being releasable.

[0011] The movement from at least one position to another may be effected by manual movement of a telescopic arm.

[0012] The movement in at least one direction between the positions may be effected by driving means which may include an extendable and contractible member pivotably connected to the stretcher and a link at a location spaced from the pivotal mounting of the link to the stretcher.

[0013] The movement from the driving position to the non-driving position may be at least initially pivotal movement about the point of contact of the driven wheel with the ground.

[0014] The driven wheel may be larger than the non-driven wheel such as being more than twice the diameter of the non-driven wheel.

[0015] When the wheel is in the driving position the drive may be arranged to be able to act as a brake should the stretcher be going down an incline.

[0016] The arrangement may include a battery arranged to power the drive wheel. A battery may be arranged to drive the movement between at least one of the positions.

[0017] The angle of the axis of the driven wheel may be fixed with respect to the longitudinal extent of the stretcher.

[0018] The axis of at least one non-driven wheel may be able to move about an upwardly extending axis and may be selectively lockable in at least one position of the upwardly extending axis.

[0019] The driven wheel may be located between non-driven wheels in the direction of longitudinal extent of the stretcher.

[0020] The non-driven wheel may be located towards one end of the stretcher in the region of a support extending up from a lower region of the trolley to a patient support for a body. The driven wheel may be pivotally connected to the support. The driven wheel and the non-driven wheel may be located in the region of the support with each being either side of the support in the longitudinal extent of the trolley.

[0021] According to a further aspect of the present invention there is provided a method of operating a stretcher that includes at least three non-driven wheels and at least one driven wheel comprising moving at least one of the wheels between a driven position in which the driven wheel is in contact with the ground and a non-driven position in which the driven wheel is spaced from the

ground; characterised by: causing a support for a patient located above the region of the driven wheel to move first downwardly and then upwardly when moving from the driven position to the non-driven position.

[0022] The method may comprise causing at least one non-driven wheel to be clear of the ground in the driven position. The method may comprise causing the non-driven wheel to be clear of the ground in the driven position at a location spaced from the longitudinal extent of the remaining wheels in contact with the ground.

[0023] Further features of the present invention are defined in the claims.

[0024] The drive means may include, although by no means be limited to, linear lead-screw actuators, hydraulic actuators, or electro-hydraulic actuators.

[0025] The present invention includes any combination as claimed.

[0026] The present invention can be carried into practice in various ways but several embodiments will now be described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a side perspective view of a stretcher trolley 2 showing the patient support 4, castor wheels 6a, 6b, 6c and 6d, a driven wheel 8 and a main frame 10;

Figures 2 and 3 are a side perspective and rear perspective view of the rear trolley end region 12 showing the rear castor wheels 6b and 6c and the driven wheels 8 connected to a sub frame 16. The sub frame 16 is assembled to the main frame 10 at a fixed pivot point 20 to enable it to rotate about a first axis;

Figure 4 is a side view of a first transition position 22 showing the rear castor wheels 6c and 6d in contact with the surface 24 and the driven wheels 8 free from the surface 24 such that the stretcher trolley 2 is solely supported by castor wheels.

Figure 5 is a side perspective view of a mid transition position 28 showing the driven wheels 8 and all castor wheels in contact with the surface 24;

Figure 6 is a side perspective view of a second transition position 30 showing the driven wheels 8 in contact with the surface 24 with the rear castor wheels clear from the surface 24 such that the trolley is solely supported by the front castor wheels 6a and 6b and the driven wheels 8; and

Figures 7 and 8 show side views in the two transition positions effected by pulling a lever 31 down.

[0027] As shown in Figures 1 and 2, the patient support 4 is mounted on a first support 32, which extends upwardly from the front of the main frame 10, and a second support 34, which extends upwardly from the rear of the

main frame 10 so that the patient support 4 is held mainly flat or horizontal.

[0028] The lower end of the second, rear support 34 is fixed to an upwardly extending arm 10a of the main frame 10. The upper end region of the second, rear support 34 is connected by a first group of co-operating parts 36 to the patient support 4.

[0029] The lower end region of the first, front support 32 is attached to a piston of a first linear actuator 38 by a second group of co-operating parts 40. The upper end region of the first support 32 is connected by a third group of co-operating parts 42 to the patient support 4. The lower end of the actuator 38 is fixed to an upwardly extending arm 10b of the main frame 10. The configuration of the patient support 4, the first support 32, the second support 34, the first linear actuator 38, and the three groups of co-operating parts 36, 40 and 42 is such that the first linear actuator may be driven to extend or contract a piston 38a of the linear actuator in order to incline or decline the angle of the patient support 4. When inclined, the patient support 4 may, for instance, be raised up to 15° to drain fluid from the legs of a patient on the support 4 with pivot occurring about the parts 36.

[0030] The first linear actuator 38 may be controlled by an operator controlling a two-position or multi-position switch, such as a rocker switch, which may be positioned at the rear of the trolley. A battery 56 mounted on the main frame 10 is able to power the actuator 38 in order to extend or contract the piston 38a using any well known method.

[0031] The main frame 10 provides the housing for the two front castor wheels 6a and 6b. The castor wheels 6a and 6b are aligned substantially in the same plane and at the first trolley end region and are spaced apart laterally across the stretcher, generally being positioned on the widest portion of the main frame 10. The front castor wheels are able to rotate about a horizontal axis and can swivel about a vertical axis on a stub shaft 47, offset from the horizontal axis.

[0032] The rear castor wheels 6c and 6d are able to rotate in the same way as the front castor wheels.

[0033] As shown in relation to figures 2 and 3, a sub frame comprising two side rails 50 and two cross rails 52 is pivotally mounted at points 20 on the main frame 10 at the rear end such that the sub frame 16 is able to pivot about a horizontal axis.

[0034] Rear castor wheels 6c and 6d are located on the rearward projecting end region of the sub frame 16. The castor wheel stub axles 48 of the rear castor wheels pivot with the sub frame about the pivot points 20.

[0035] The driven wheels 8 are mounted on axles 54 that project from a forward region of the sub frame, spaced from the pivot points 20 of the sub frame. The battery 56 powers a motor 58 mounted on the axle 54 or the sub frame 16 in order to drive the axle 54 and subsequently the wheels 8 in any well known manner. For instance, the motor may impart a drive via an induction force being applied to a magnet fast with the axles 54.

[0036] A second actuator 60 controls the movement of the sub frame 16 about the pivot points 20. The second actuator 60 is rotatably fixed at the upper end to the upwardly extending arm 10a just forward of that arm. The lower end of the actuator 60 is pivotally connected to the axle 54 of the sub frame 6 such that when the piston 66 of the second actuator 60 is extended or contracted the point at which the actuator 60 is located on the sub frame 16 moves up or down through a circumferential path by rotating about the pivot points 20.

[0037] The battery 56 powers the actuator 60 to extend or contract a piston 66 of the actuator. A two-position switch, such as a rocker switch, which may be positioned at the rear end of the trolley and controlled by an operator, may control the extension or contraction of the actuator 60.

[0038] It should be clear from Figure 4, 5 and 6 that extending the piston 66 of the actuator 60 effects a movement between the first, mid and second transition positions. In the second transition position the co-operating parts of the actuator 60 resist any rotational movement of the sub frame 16. During the transition between the first position 22 and the second position 30 the inclination of the patient support 4 changes only marginally. It can be seen that as the rear of the trolley is being moved between the position showing in Figures 7 and 8 the castor wheels are moved down, initially, to cause a slight lowering of the pivot points 20 about the contact of the driven wheels with the ground until the castors contact the ground. Then the pivot points 20 are raised slightly about the contact point of the castors with the ground. Accordingly the inclination change of the patient support 4 is minimal and the support is at substantially the same inclination regardless of the positions between those shown in Figure 7 and 8.

[0039] It is possible to lock the castors in a fixed rotational position about the stub axles 48. Thus, if the stub axles are locked in the position shown in Figure 8 when, or after the driven wheels only at the rear contact the ground, as in Figure 7, there is significant clearance for the trolley to negotiate small steps or ledges without the rear castor wheels contacting the step or ledge. In the locked position the tangent between the raised castor wheels and the driven wheels and the included angle to the horizontal may be more than 8° or more than 10° or in the region of 12° - 15°.

[0040] When the second trolley end region 12 is orientated in the second transition position, the stretcher can be moved by an operator at the rear of the trolley using a lever, which initiates and varies the speed of rotation of the drive shaft from the motor and the speed of travel of the trolley. Similarly, the lever can be moved in an opposite direction to initiate and vary the speed of reverse rotation of the axle 54. The motor may include a positive drive that prevents the axle 54 from being able to rotate faster than that set by the lever to prevent the runaway of the stretcher down inclines.

[0041] Furthermore, it will be appreciated that not all

of the power to move the stretcher need be applied by the motor and an operator could assist in providing the necessary power.

[0042] Should the motor fail or should it be desired to manoeuvre the stretcher in a traditional manner using both sets of castor wheels 26 and 14 or the front castor wheels and the driven wheels. The actuator piston 66 may contract to initiate the transition to the first position 22. Alternatively the actuator may relax such that all driven and non driven wheels contact the ground.

[0043] Should the battery fail the transition means may be effected manually as depicted by figures 7 and 8. A telescopic lever 31 held fast to the sub frame is extended from the sub frame 16 by any well-known means. The actuator piston 66 is unloaded such that the co-operating parts of the actuator 60 do not resist rotational movement of the sub frame 16. A downwards force exerted on the lever 31 by the hand or foot of an operator acts to rotate the sub frame 16 in to the first transition position. The actuator piston 66 may be re-locked in order to impart the necessary rotational movement of the sub frame 16 or the lever may be moved sideways to engage with a locking part of the main frame. Return movement and locking is a reverse of this operation.

[0044] The pistons may comprise linear actuators whereby a nut is axially fixed but rotated to drive the piston axially with regard to the rotation of the nut.

Claims

1. A stretcher (2) including at least three non-driven wheels (6a,6b,6c,6d) and at least one driven wheel (8), the driven wheel (8) being movable relative to at least one of the non-driven wheels (6a,6b,6c,6d) between a driven position in which the driven wheel (8) is in contact with the ground and a non-driven position in which the driven wheel is spaced from the ground;

characterised by:

the stretcher (2) being adapted such that the height of a patient support (4) above the ground, in the region of the driven wheel, first decreases and then increases as movement occurs between the two positions.

2. The stretcher as claimed in claim 1 in which the height of a patient support (4) above the region of the driven wheel (8) is substantially the same in both positions.
3. The stretcher as claimed in any preceding claim in which, in the driving position at least one of the non-driven wheels (6c,6d) is spaced from the ground and is spaced from the extent between the non-driven wheels (6c,6d) in contact with the ground and the driven wheels (8).

4. The stretcher as claimed in claim 3 in which a non-driven wheel (6c,6d) that is spaced from the ground is rotatable about its own wheel axis and a further axis spaced from that axis whereby the non-driven wheel (6c,6d) can be moved about that further axis and locked in position about that further axis to move that non-driven wheel (6c,6d) further from the ground.
5. The stretcher as claimed in claim 4 in which that further axis is an upwardly extending axis.
6. The stretcher as claimed in any preceding claim in which at least one non-driven wheel (6c, 6d) is pivotally mounted on the stretcher (2) about an axis offset from the rotational axis of the non-driven wheel (6c, 6d) to effect the movement between the positions.
7. The stretcher as claimed in claim 6 in which the driven wheel (8) is pivotally mounted on the stretcher (2) about an axis offset from the rotational axis of the driven wheel (8) to effect the movement between the driven and non-driven positions and in which the driven wheel (8) and the non-driven wheel (6c, 6d) are connected to a link (50) that is pivotally mounted on the stretcher (2) with, in the longitudinal extent of the stretcher (2), the pivot axis of the driven wheel (8) being on one side of the pivotal mounting of the link (50) on the stretcher (2) and the pivot axis of the non-driven wheel (6c, 6d) being on the other side.
8. The stretcher as claimed in any preceding claim in which the movement in at least one direction between the positions is effected by drive means (60) and in which the drive means (60) are arranged to hold the stretcher in at least one of the positions.
9. The stretcher as claimed in any preceding claim in which the movement from at least one position to another is effect manually.
10. The stretcher as claimed in claim 9 in which the movement is effected by means of a lever (31).
11. The stretcher as claimed in claim 10 when dependent on claim 8 in which the link (50) is constrained to move with the lever (31) about the pivot axis of the link (50).
12. The stretcher as claimed in claim 11 in which the lever (31) is movable to a locking condition to restrain pivotal movement of the link (50) in at least one position.
13. The stretcher as claimed in claim 12 when dependent on claim 8 in which the pivotal connection of the drive means (60) to the link (50) is coincident with the pivot axis of at least one of the driven wheel or a non-driven wheel.
14. The stretcher as claimed in any preceding claim in which the stretcher (2) is adapted such that the movement from the driving to the non-driving position is at least initially pivotal movement about the point of contact of the driven wheel (8) with the ground and is, at least towards the end of that movement, pivotal movement about the contact of the at least one non-driven wheel (6c,6d).
15. A method of operating a stretcher that includes at least three non-driven wheels (6a,6d) and at least one driven wheel (8) comprising moving at least one of the wheels (6a,6d,8) between a driven position in which the driven wheel (8) is in contact with the ground and non-driven position in which the driven wheel (8) is spaced from the ground;
characterised by:
causing a support (4) for a patient located above the region of the driven wheel (8) to move first downwardly and then upwardly when moving from the driving position to the non-driving position.
16. The method as claimed in Claim 15 comprising moving the driven wheel (8) and at least said one non-driven wheel (6c,6d) when moving between the positions.
17. The method as claimed in claim 15 or 16 comprising at least one said non-driven wheel (6c,6d) and at least one said driven wheel (8) being connected and pivoting about a common axis to cause the movement from the driving to the non-driving position.

Patentansprüche

1. Trage (2) umfassend zumindest drei nicht angetriebene Räder (6a, 6b, 6c, 6d) und zumindest ein angetriebenes Rad (8), bei welcher das angetriebene Rad (8) relativ zu zumindest einer der nicht angetriebenen Räder (6a, 6b, 6c, 6d) zwischen einer angetriebenen Position, in welcher das angetriebene Rad (8) mit dem Boden in Kontakt steht, und einer nicht angetriebenen Position, in welcher das angetriebene Rad vom Boden beabstandet ist, beweglich ist;
dadurch gekennzeichnet,
dass die Trage (2) so ausgelegt ist, dass die Höhe einer Patientenauflage (4) über dem Boden im Bereich des angetriebenen Rades zuerst ab- und dann zunimmt, wenn eine Bewegung zwischen den zwei Positionen erfolgt,

2. Trage wie in Anspruch 1 beansprucht, bei welcher die Höhe einer Patientenauflage (4) über dem Bereich des angetriebenen Rades (8) im Wesentlichen die gleiche in beiden Positionen ist.
3. Trage wie in einem der vorangehenden Ansprüche beansprucht, bei welcher in der Fahrposition zumindest eines der nicht angetriebenen Räder (6c, 6d) vom Boden beabstandet ist und von der Erstreckung zwischen den nicht angetriebenen Rädern (6c und 6d), welche mit dem Boden in Kontakt stehen, und den angetriebenen Rädern (8) beabstandet ist.
4. Trage wie in Anspruch 3 beansprucht, bei welcher ein nicht angetriebenes Rad (6c, 6d), welches vom Boden beabstandet ist, um seine eigene Radachse und eine weitere Achse drehbar ist, die von dieser Achse beabstandet ist, wobei das nicht angetriebene Rad (6c, 6d) um diese weitere Achse bewegt und in der Position um diese weitere Achse gesperrt werden kann, um das nicht angetriebene Rad (6c, 6d) weiter vom Boden zu bewegen.
5. Trage wie in Anspruch 4 beansprucht, bei welcher diese weitere Achse eine sich nach oben erstreckende Achse ist.
6. Trage wie in einem vorhergehenden Anspruch beansprucht, bei welcher zumindest ein nicht angetriebenes Rad (6c, 6d) schwenkbar um eine Achse auf der Trage (2) montiert ist, welche von der Drehachse des nicht angetriebenen Rades (6c, 6d) beabstandet ist, um die Bewegung zwischen den Positionen zu bewerkstelligen.
7. Trage wie in Anspruch 6 beansprucht, bei welcher das angetriebene Rad (8) schwenkbar um eine Achse auf der Trage (2) montiert ist, welche von der Drehachse des angetriebenen Rades (8) beabstandet ist, um die Bewegung zwischen der angetriebenen und der nicht angetriebenen Position zu bewerkstelligen und bei welcher das angetriebene Rad (8) und das nicht angetriebene Rad (6c, 6d) mit einer Verbindung (50) verbunden sind, welche schwenkbar an der Trage (2) montiert ist, wobei die Drehachse des angetriebenen Rades (8) in der Längserstreckung der Trage (2) auf einer Seite der schwenkbaren Festlegung der Verbindung (50) auf der Trage (2) und die Drehachse des nicht angetriebenen Rades (6c, 6d) auf der anderen Seite ist.
8. Trage wie in einem vorhergehenden Anspruch beansprucht, bei welcher die Bewegung in zumindest einer Richtung zwischen den Positionen durch Antriebsmittel (60) bewerkstelligt wird und wobei die Antriebsmittel (60) angeordnet sind um die Trage in zumindest einer der Positionen zu halten.

5

10

15

20

25

30

35

40

45

50

55

9. Trage wie in einem der vorhergehenden Ansprüche beansprucht, bei welcher die Bewegung von zumindest einer Position in die andere manuell bewerkstelligt wird.
10. Trage wie in Anspruch 9 beansprucht, bei welcher die Bewegung mittels eines Hebels (31) bewerkstelligt wird.
11. Trage wie in Anspruch 10 beansprucht, wenn dieser von Anspruch 8 abhängig ist, bei welcher die Verbindung (50) mit dem Hebel (31) um die Drehachse der Verbindung (50) zwangsgeführt ist.
12. Trage wie in Anspruch 11 beansprucht, bei welcher der Hebel (31) in einen Sperrzustand bewegbar ist, um eine Drehbewegung der Verbindung (50) in zumindest einer Position zu verhindern.
13. Trage wie in Anspruch 12 beansprucht, wenn dieser von Anspruch 8 abhängig ist, bei welcher die schwenkbare Verbindung der Antriebsmittel (60) zu der Verbindung (50) mit der Drehachse des angetriebenen Rades und/oder eines nicht angetriebenen Rades zusammenfällt.
14. Trage wie in einem der vorhergehenden Ansprüche beansprucht, bei welcher die Trage (2) so ausgelegt ist, dass die Bewegung von der Fahrposition in die Nicht-Fahrposition zumindest anfänglich eine Drehbewegung um den Kontaktpunkt des angetriebenen Rades (8) mit dem Boden ist und zumindest gegen Ende dieser Bewegung eine Drehbewegung um den Kontakt des zumindest einen nicht angetriebenen Rades (6c, 6d) ist.
15. Verfahren zum Bedienen einer Trage, welche zumindest drei nicht angetriebene Räder (6a, 6d) und zumindest ein angetriebenes Rad (8) umfasst, umfassend das Bewegen zumindest eines der Räder (6a, 6d, 8) zwischen einer angetriebenen Position, in welcher das angetriebene Rad (8) mit dem Boden in Kontakt steht und einer nicht angetriebenen Position, in welcher das angetriebene Rad (8) vom Boden beabstandet ist;
gekennzeichnet durch:
 Veranlassen einer Auflage (4) für einen Patienten, welche oberhalb des Bereichs des angetriebenen Rades (8) angeordnet ist, sich zuerst nach unten und dann nach oben zu bewegen, wenn man aus der angetriebenen Position in die nicht angetriebene Position bewegt.
16. Verfahren wie in Anspruch 15 beansprucht, umfassend Bewegen des angetriebenen Rades (8) und zumindest des genannten einen nicht angetriebenen Rades 6c, 6d) , wenn man zwischen den Positionen

bewegt.

17. Verfahren wie in Anspruch 15 oder 16 beansprucht, umfassend zumindest ein genanntes nicht angetriebenes Rad (6c, 6d) und zumindest ein genanntes angetriebenes Rad (8), welche über eine gemeinsame Achse verbunden sind und um diese verschwenkbar sind, um die Bewegung aus der Fahrposition in die Nicht-FahrPosition zu bewerkstelligen.

Revendications

1. Civière (2) comprenant au moins trois roues non menées (6a, 6b, 6c, 6d) et au moins une roue menée (8), la roue menée (8) étant mobile par rapport à l'une au moins des roues non menées (6a, 6b, 6c, 6d) entre une position menée dans laquelle la roue menée (8) est en contact avec le sol et une position non menée dans laquelle la roue menée est écartée du sol ;

caractérisée en ce que

la civière (2) est adaptée de telle sorte que la hauteur du support (4) destiné à un patient au-dessus du sol dans la zone de la roue menée diminue tout d'abord puis augmente lorsque se produit le mouvement entre les deux positions.

2. Civière selon la revendication 1 dans laquelle la hauteur du support (4) pour un patient au-dessus de la zone de la roue menée (8) est essentiellement la même dans les deux positions.
3. Civière selon l'une quelconque des revendications précédentes, dans laquelle, dans la position d'entraînement d'au moins l'une des roues non menées (6c, 6d) est écartée du sol et est écartée de la distance entre les roues non menées (6c, 6d) en contact avec le sol et les roues menées (8).
4. Civière selon la revendication 3, dans laquelle une roue non menée (6c, 6d) qui est écartée du sol est rotative autour de son propre axe de roue et d'un axe supplémentaire écarté de cet axe, grâce à quoi la roue non menée (6c, 6d) peut être déplacée autour de cet axe supplémentaire, et verrouillée en position autour de cet axe supplémentaire pour écarter davantage la roue non menée (6c, 6d) du sol.
5. Civière selon la revendication 4, dans laquelle cet axe supplémentaire est un axe s'étendant vers le haut.
6. Civière selon l'une quelconque des revendications précédentes, dans laquelle au moins une roue non menée (6c, 6d) est montée pivotante sur la civière (2) autour d'un axe décalé de l'axe de rotation des roues non menées (6c, 6d) pour réaliser le mouve-

ment entre les positions.

7. Civière selon la revendication 6, dans laquelle la roue menée (8) est montée pivotante sur la civière (2) autour d'un axe décalé de l'axe de rotation de la roue menée (8) pour réaliser le mouvement entre les positions menées et non menées, et dans laquelle la roue menée (8) et la roue non menée (6c, 6d) sont raccordées à une liaison (50) qui est montée pivotante sur la civière (2) avec, dans l'étendue longitudinale de la civière (2), l'axe de pivot de la roue menée (8) qui est sur un premier côté du montage pivotant de la liaison (50) sur la civière (2) et l'axe de pivot de la roue non menée (6c, 6d) qui est sur l'autre côté.
8. Civière selon l'une quelconque des revendications précédentes, dans laquelle le mouvement dans au moins une direction entre les positions est effectué par des moyens d'entraînement (60), et dans laquelle les moyens d'entraînement (60) sont agencés pour maintenir la civière dans au moins l'une des positions.
9. Civière selon l'une quelconque des revendications précédentes, dans laquelle le mouvement d'au moins une position une autre est effectué manuellement.
10. Civière selon la revendication 9, dans laquelle le mouvement est effectué au moyen d'un levier (31).
11. Civière selon la revendication 10 lorsqu'elle est dépendante de la revendication 8, dans laquelle la liaison (50) est contrainte de se déplacer avec le levier (31) autour de l'axe de pivot de la liaison (50).
12. Civière selon la revendication 11, dans laquelle le levier (31) est déplaçable jusqu'à un état de verrouillage pour empêcher le mouvement pivotant de la liaison (50) dans au moins une position.
13. Civière selon la revendication 12 lorsqu'elle est dépendante de la revendication 8, dans laquelle la connexion pivotante des moyens d'entraînement (60) avec la liaison (50) est en coïncidence avec l'axe de pivot d'au moins l'une d'entre la roue menée et une roue non menée.
14. Civière selon l'une quelconque, des revendications précédentes, dans laquelle la civière (2) est adaptée pour que le mouvement de la position d'entraînement à celle de non entraînement soit, au moins initialement, un mouvement pivotant autour du point de contact de la roue menée (8) avec le sol et soit, au moins vers la fin de ce mouvement, un mouvement pivotant autour du contact de ladite au moins une roue non menée (6c, 6d),

15. Procédé d'utilisation d'une civière qui comprend au moins trois roues non menées (6a, 6b, 6c, 6d) et au moins une roue menée (8), comprenant le mouvement d'au moins l'une des roues (6a, 6d, 8) entre une position menée dans laquelle la roue menée (8) est en contact avec le sol et une position non menée dans laquelle la roue menée (8) est écartée du sol, *caractérisé par* 5
- le fait qu'un support (4) pour un patient situé au-dessus de la zone de la roue menée (8) est fait se déplacer en premier lieu vers le bas, puis vers le haut lorsqu'on passe de la position d'entraînement à la position de non entraînement.** 10
16. Procédé selon la revendication 15, comprenant le déplacement de la roue menée (8) et d'au moins l'une desdites roues non menées (6c, 6d) lors du déplacement entre les positions. 15
17. Procédé selon la revendication 15 ou 16, comprenant le fait qu'au moins une dite roue non menée (6c, 6d) et au moins une dite roue menée (8) est raccordée et pivote autour d'un axe commun pour provoquer le déplacement de la position d'entraînement à celle de non entraînement. 20 25

30

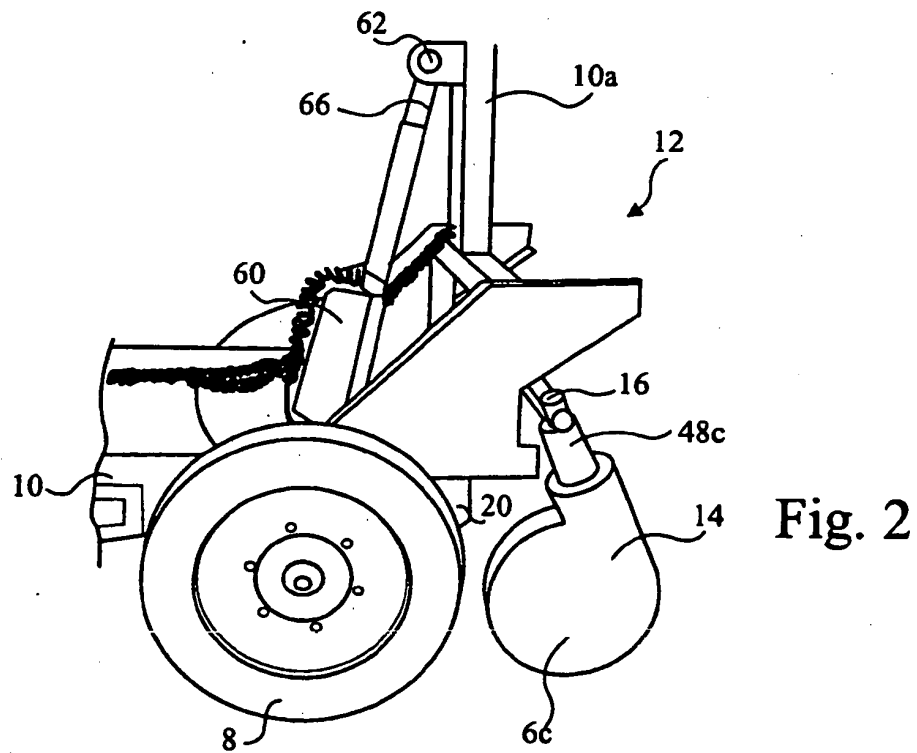
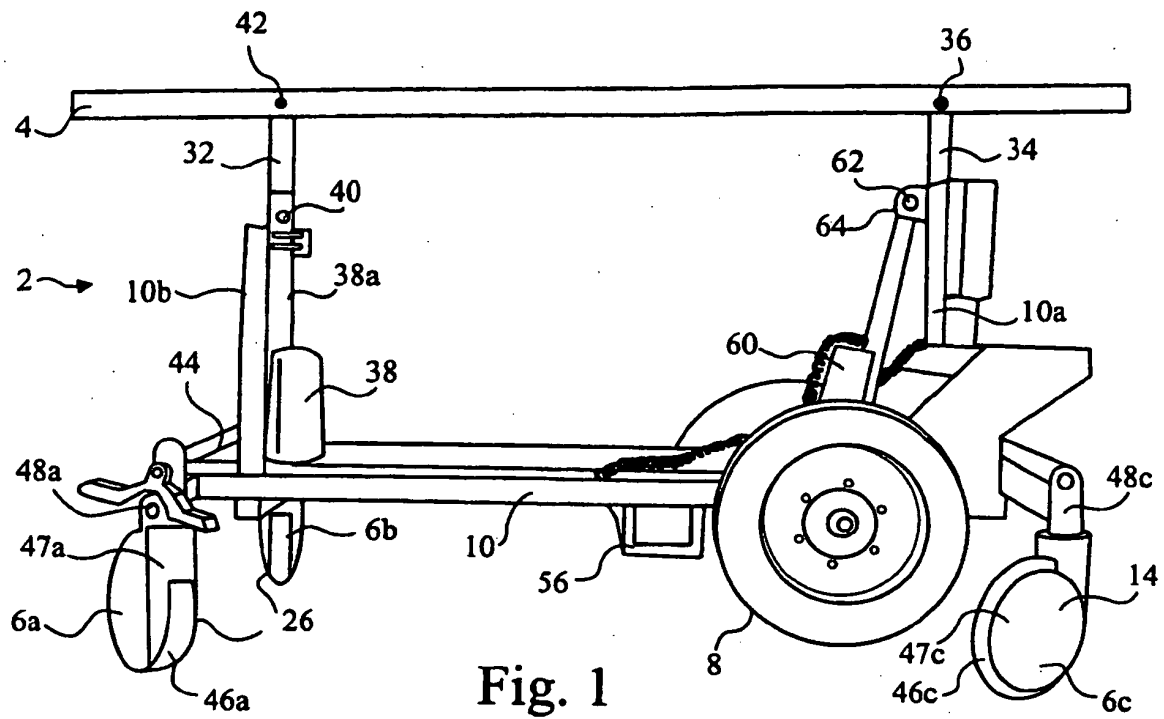
35

40

45

50

55



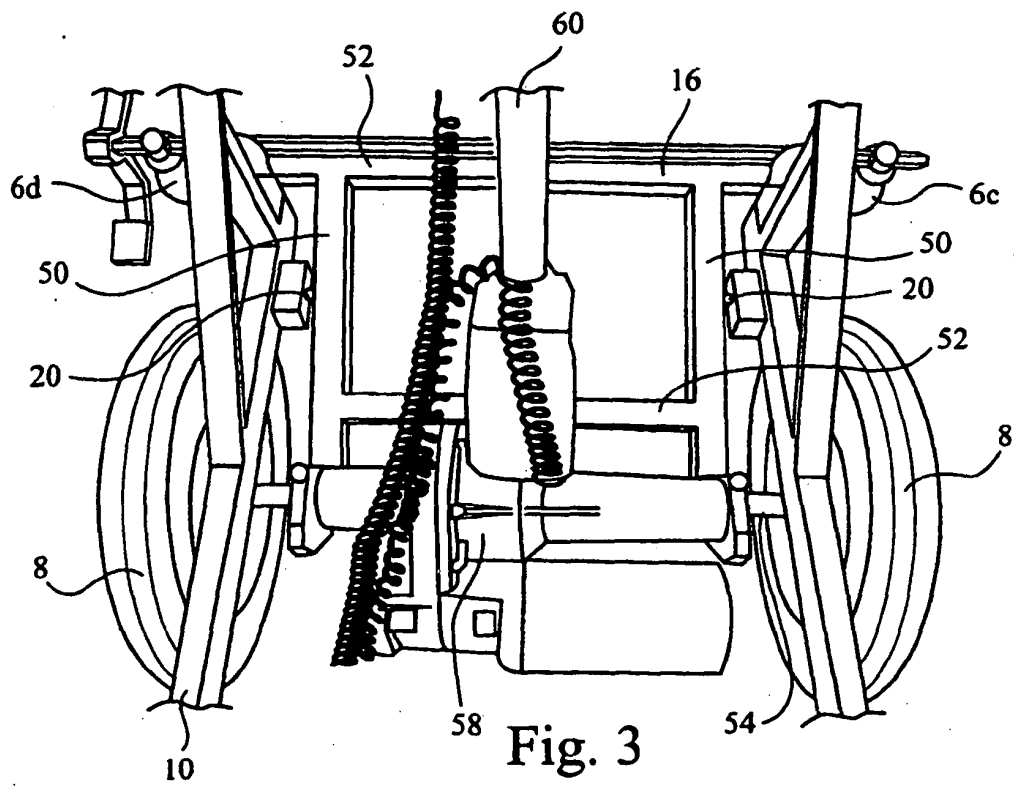


Fig. 3

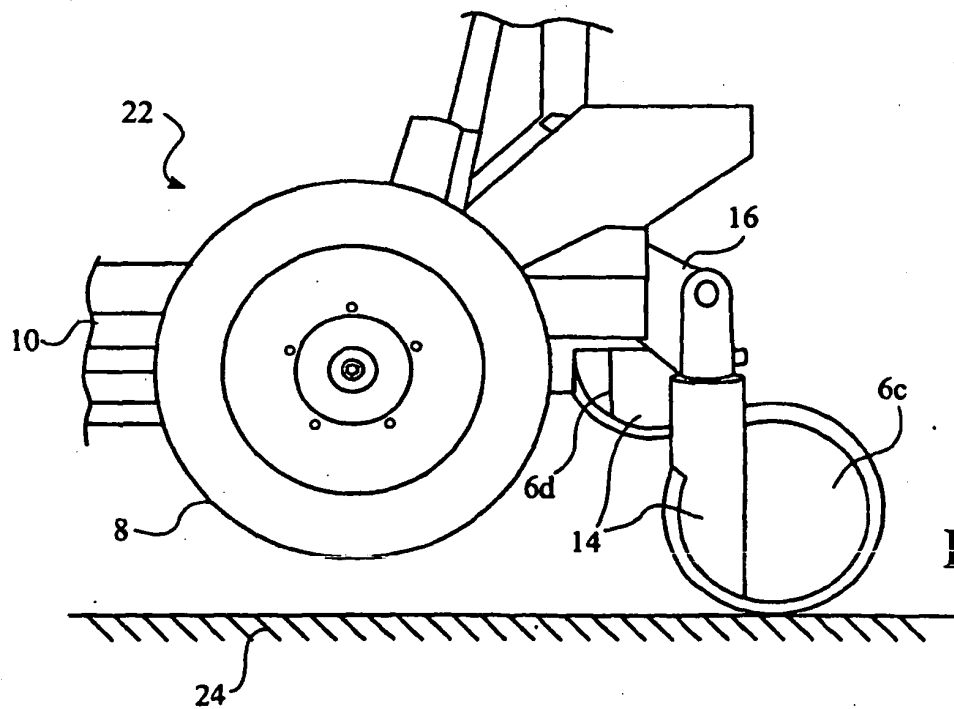


Fig. 4

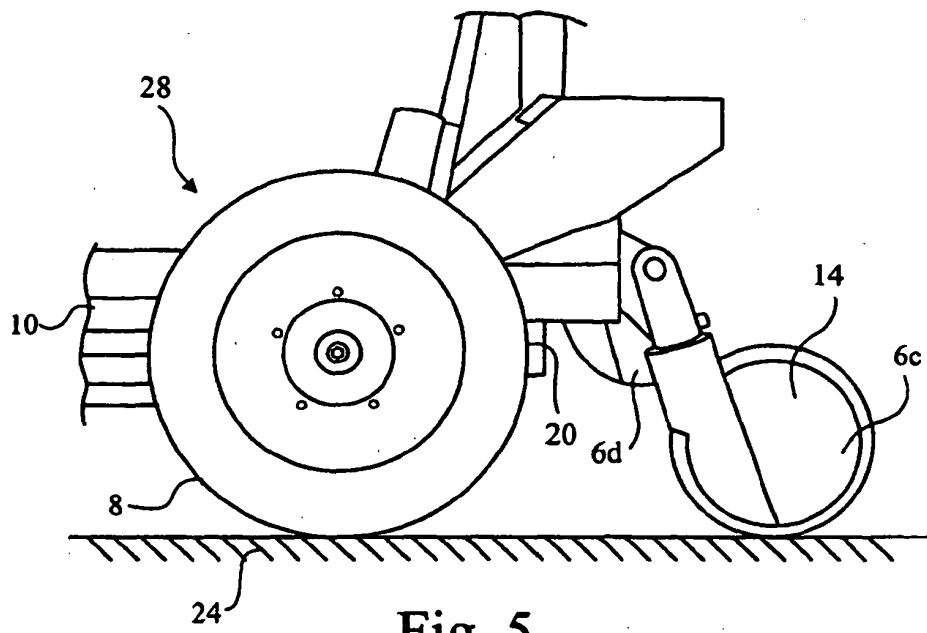


Fig. 5

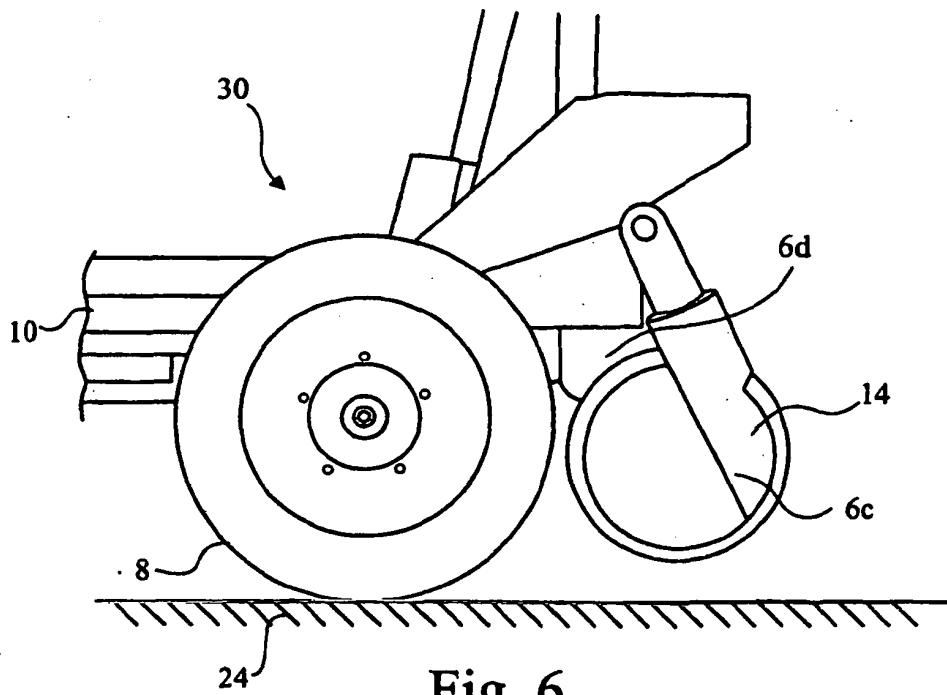


Fig. 6

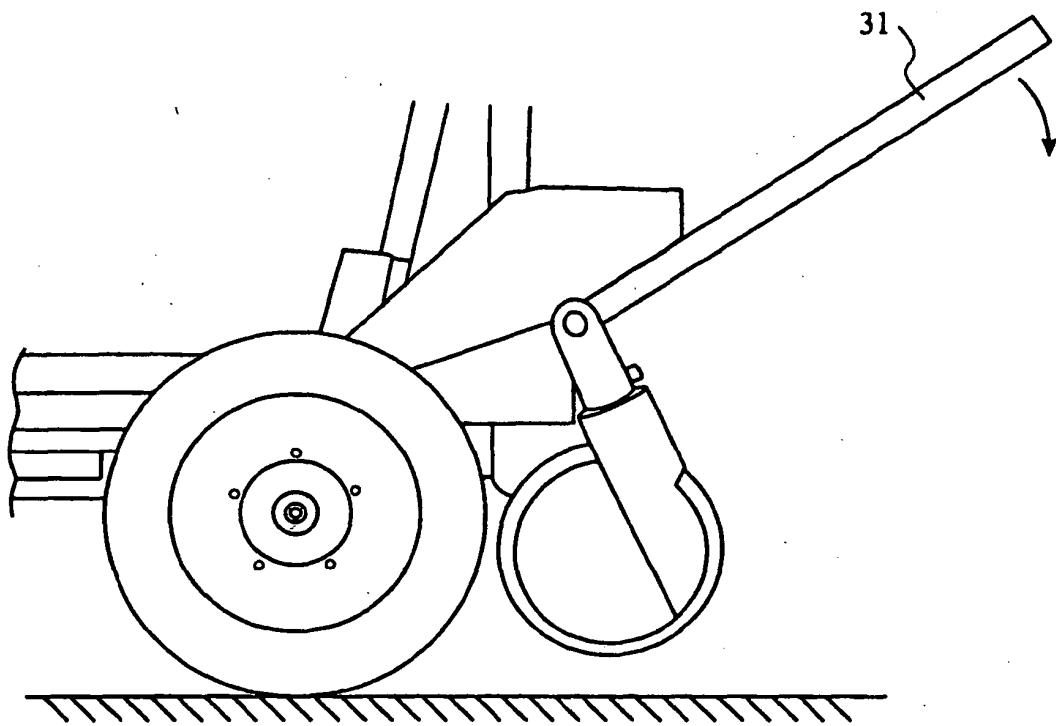


Fig. 7

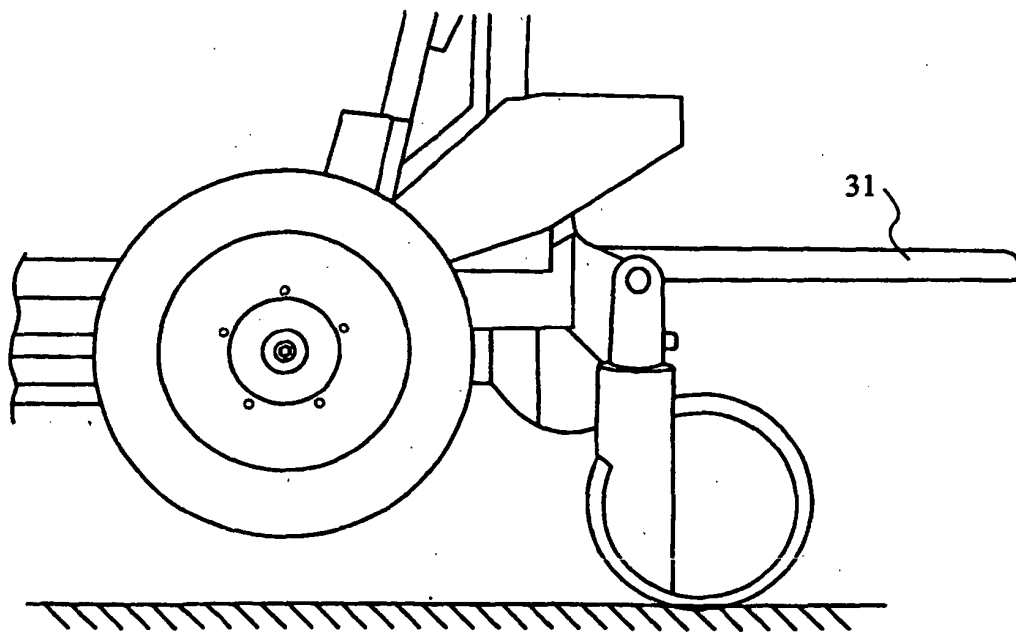


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 20030159861 A [0003]
- EP 0769286 A [0004]