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(54) **Structure for disabled persons comprising a wheelchair, with a device connected to the rear side, for the lateral transfer of the patient**

(57) The invention has the object to offer a proper support to disabled persons affected by motor disabilities and obligate to live on a wheelchair.

This invention relates to a structure for disabled persons comprising a wheelchair with a device, connected to the rear side, for the lateral transfer of the patient, characterized in: a telescopic section (16, 17) that is installed with brackets on a rear side of the wheelchair (20, 21) and that is manhandled through a winch (12) by an assistant; a jib (13), placed at the end of the upper element (17) of the telescopic section, characterized by rotating motion, whose purpose is the lateral displacement of the patient; a stabilizing rod (15), placed on a rear side of the wheelchair, whose purpose is to support the structure during the lateral displacement of the patient; a safe-

ty device (7) (8) applied to the crank (5) of the winch (12) that does not allow to lift an exceeding weight; one more safety device (6), applied to the crank (5) of the which, that does not allow to turn the crank (5) if the stabilizing rod (15) is closed and the structure is not stable; two swivel and removable front wheels (1), positioned sideways of the footboard, increasing the stability of the structure.

The state of the art on the devices to lift disabled persons was congested to the devices used to lift engines in the machine shop and to strange and weighty devices similar to cranes, afterward adapted for lifting people. However, in view of the excessive size and the high financial cost, such devices in practice are not used.

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Description

[0001] The present invention relates to a structure for disabled persons comprising a wheelchair with a device able to displace the patient laterally.

[0002] In particular, the present invention has the object to offer a proper support to disabled persons affected by motor disabilities and obligate to live on a wheelchair.

[0003] This result has been achieved, according to the present invention, by adopting the concept of making a structure which can reduce, with reasonably costs, the restrictions caused by the exigency of lifting and displacing a patient.

[0004] The architectural barriers constraining the disabled persons are not caused only by architectural elements but also by psychological factors. For example, let's think about the exigency to lift a heavy and inert body every day: it is an ordinary act for those people used to assist a disabled person daily, but it becomes complicated for those people not used to do it and for those who are not able to lift a person in a proper and safe way.

[0005] The main attempt was to develop the idea in a simple and functional way and sustaining reasonably costs, in order to offer a health support that could improve the quality of life of anyone would use it. The state of the art on the devices to lift disabled persons was congested to the devices used to lift engines in the machine shop and to strange and weighty devices similar to cranes, afterward adapted for lifting people. However, in view of the excessive size and the high financial cost, such devices in practice are not used.

[0006] Thanks to the present invention, a wheelchair and a lifting device are always easily and rapidly available for use, so that it can be used wherever you want. It has the same reliability of a mechanical device but is not bound to electricity. Besides, a structure according to the present invention is easy to make, cost-effective and reliable even after a prolonged service life.

[0007] The structure can be divided into two distinct parts, Fig. 1: the first is represented by a folding wheelchair properly arranged for its purpose, and the second part is represented by a device for lateral displacement of the patient.

[0008] The feature that makes this invention innovative is the fact of combine the special function of two basic aids for mobility of disabled persons. In fact, the device for the displacement of the patient can be removed by pulling some pins out (22, 23) and it is suitable to all common configurations of use of the wheelchair, as it can stay always connected to it: it can stay applied to the wheelchair when it is open, when it is fan closed and when it is in motion. This means that the structure can also be used as a traditional wheelchair. Fig.4 and Fig. 7, Fig. 1.

[0009] Reduced to its basic construction and reference being made to the figures of the attached drawings, a structure of few components that characterize its simplicity and ease of use. The displacing mechanism is based

on a manual winch (12) started by an assistant who twists the crank (5) which pulls the rope (30) and activates the rise of the upper element of the telescopic section (17) Fig.3, Fig. 5. At the top of the upper element of the telescopic section, there is a jib (13) characterized by rotation within a range of 180 ° which allows the assistant, after having raised up the folding armrest of the wheelchair (31), to displace the patient wrapped in a body harness (32) connected to the jib (13) by a hook (14). The displacement takes place easily and with minimum effort. Fig. 2 e 3.

[0010] A stabilizing rod (15), to be opened before the lateral displacement of the patient, Fig.2 and 3. provides stability to the structure; previously, it has to be scrolled from one tip to the other, passing in a cylindrical guide (24); this allows to open the rod also in tight spaces.

[0011] The device can be closed without obstructing the movement of the wheelchair. Fig.4. Moreover, the jib (13) includes an external padding that confers it the dual function of height adjustable headrest, adjustable by moving the crank (5). Immediately after the use, the device for displacement can be closed and made portable with the wheelchair itself, Fig.7., or else, it can be easily removed by pulling some pins out (22) (23) Tab Fig. 1, to get a traditional wheelchair.

[0012] The structure, that appears as a common wheelchair, is characterized by meticulous precautions that permit it to withstand to the operation of displacement of the patient and at the same time allows to use it as a conventional wheelchair; in effect, it is characterized in that the front swivel wheels (1) are placed sideways of the footrests (26) Fig.6. and this gives it a good stability to displace the patient safely, Fig.2 and 3, and without altering the maximum size of a common wheelchair; in effect, the increasing of size would preclude a major difficulty in restricted spaces.

[0013] At the same time, as a normal wheelchair including removable platforms, you can remove the footrests (26) together with the front wheels (1) through the extraction of interconnected tubes (2) by unlocking pins (3) Fig1.; the wheelchair, in such conditions, will lean on two further smaller wheels (4), fixed to the frame of the wheelchair, getting the capability to entry in extremely restricted spaces such as, for example, an elevator, Fig. 1.

[0014] Moreover, the wheelchair has supports on the rear (20, 21) to contain the device's props (18) (19), blocked by simple pivots (22, 23) Fig.1. This allows to use the wheelchair in traditional mode.

[0015] The entire structure, during the lateral displacement of the patient, Fig. 2 and 3, is supported by a stabilizing rod (15), which can scroll from one tip to the other, throughout a cylindrical guide (24) and stabilized by a lever pedal (29) and an adjustable foot of support (28); everything is blocked by a locking system (25, 11).

[0016] This mechanism ensures that the displacing device can also be used in restricted spaces because the rod, equipped with a side-scrolling, can be placed even

in tight spaces, for example, you can displace the person sitting on a bed and put on the wheelchair and on the contrary too, as the rod can slide under the bed, allowing the wheelchair to approach perfectly alongside.

[0017] The crank (5) was fitted with an easy but functional safety system that does not allow to lift an exceeding weight and comprising at least one or more pistons (7) located in apposite caves hollowed out on the coupling of the crank's cylinder (5) with the prismatic transmission shaft (9) of the winch (12) and elastically embodied by the ring (8) made in elastic material such as plastic or analogous (8) Fig1;

[0018] The procedure is very simple, the pistons (7) are in contact with the facets of the transmission shaft, (9) and during rotation of the crank (5) they are contained in a ring made in elastic material. When the elastic containment strength of the ring (8) loss, the piston (7) tend to leave its cavity, bypassing the shaft facet (9) and causing an unsuccessful turn of the crank (5). Everything is controlled by the thickness of the elastic ring (8), that is selected on the base of the capacity established for the device lifting.

[0019] The crank (5) is characterized in a further safety device, consisting of a simple metal stick (6), which does not allow to rotate the crank (5) if the stabilizing rod (15) is closed, Fig.6; this is to prevent to displace the patient without stabilizing the structure by opening the rod (15). In conclusion, the device can stay always connected to the wheelchair, when it is open, when it is in motion and also when it is fan closed, just by rotating the jib (13) and closing the stabilizing rod (15) blocked by a special support (27), Fig7.

[0020] These and other advantages and characteristics of the invention will be best understood by anyone skilled in the art by reading above description in conjunction with the attached drawings given as a practical exemplification of the invention, as follows:

Fig.1: Exploded perspective view with enlargement of two particular parts of the invention.

Fig.2: Front perspective view of the structure during the lateral displacement of the patient.

Fig.3: Rear perspective view of the structure during the lateral displacement of the patient

Fig.4: Front perspective view of the structure when the wheelchair is in motion.

Fig.5: Side view, where the connection of the rope (10) to the upper element of the telescopic section (17), according to the invention, is clearly noticeable.

Fig. 6 From on high view, where the safety device (6) according to the invention, is clearly noticeable.

Fig. 7 Perspective view of the whole structure when it is fan closed.

Claims

1. A structure for disabled persons comprising a wheel-

chair with a device, connected to the rear side, for the lateral transfer of the patient, **characterized in:**

a telescopic section (16, 17) that is installed with brackets on a rear side of the wheelchair (20, 21) and that is manhandled through a winch (12) by an assistant;

a jib (13), placed at the end of the upper element (17) of the telescopic section, **characterized by** rotating motion, whose purpose is the lateral displacement of the patient;

a stabilizing rod (15), placed on a rear side of the wheelchair, whose purpose is to support the structure during the lateral displacement of the patient;

a safety device (7) (8) applied to the crank (5) of the winch (12) that does not allow to lift an exceeding weight;

one more safety device (6), applied to the crank (5) of the which, that does not allow to turn the crank (5) if the stabilizing rod (15) is closed and the structure is not stable;

two swivel and removable front wheels (1), positioned sideways of the footboard, that increase the stability of the structure.

2. Structure for disabled persons, according to claim 1, comprising a wheelchair with a device, connected to the rear side, for the lateral displacement of the patient, **characterized in that** the device for the displacement of the patient can be removed by pulling some pins out (22, 23) and that it is suitable to all common configurations of use of the wheelchair, as it can stay always connected to it: this means that it can stay applied to the wheelchair when it is open, when it is fan closed and when it is in motion.

3. Structure according to claim 1 and 2 **characterized in that** the telescopic section (16, 17), consists of a tubular element (16) in which is contained a further upper element (17) to which is connected a cable (10) pulled by a winch (12) that is started up by a crank (5), which activates the rise of the upper section (17).

4. Structure according to one or more preceding claims, **characterized in that** the telescopic section (16, 17) installed on a side of the wheelchair, comprises a jib (13) placed at the top of the upper element (17) with the purpose to transfer the patient laterally and **characterized by** rotation within a range of 180 °, with a hook at its top (14) which hold up a body harness (32) that surrounds the patient during the displacement and also **characterized by** a padding in soft material that gives it the dual function of height adjustable headrest, adjustable by moving the crank (5) of the winch (12).

5. Structure according to one or more preceding claims, **characterized in that** the crank (5) of the winch (12) has a safety device (7, 8) that does not allow to lift an exceeding load; it comprises at least one or more pistons (7) seated in suitable caves hollowed out on the coupling of cylinder (5) with the prismatic transmission shaft (9) of the winch (12) and elastically embodied by a ring (8) made in elastic material such as plastic or analogous.
6. Structure according to one or more preceding claims, **characterized in** two front swivel wheels, removable (1) together with the footboard (26), located sideways of the footboard and connected to the wheelchair (2) by interconnected tubular props removable by an unblock system (3) if you want to reduce the length of the wheelchair to get into tight areas or make easy the transport; in view of this, there are two additional smaller wheels, fixed to the wheelchair's frame (4), on which the wheelchair can lean once the front wheels are disjointed.
7. Structure according to one or more preceding claims, **characterized in that** the displacing device includes a stabilizing rod (15), joined to the telescopic section (16) (17) through interconnected tubes (24), with a lever pedal (29) and an adjustable foot of support (28) at its tip: the rod, when the device is not in use, is positioned perpendicularly to the telescopic section and stopped by clasp (27); it is **characterized by** a cinematic opening in which previously the stabilizing rod runs from one tip to the other, passing in a cylindrical guide (24), after that it leans on the ground by using the pedal (29) and it is stopped by a clamping system (25) (11) in order to displace the patient safely.
8. Structure according to one or more preceding claims, **characterized in that** the crank (5) of the winch (12) has a safety device, represented by a small bar (6) applied on it (5), which does not allow to turn the crank (5) if the stabilizing rod is closed (15) and so the structure is not steady.

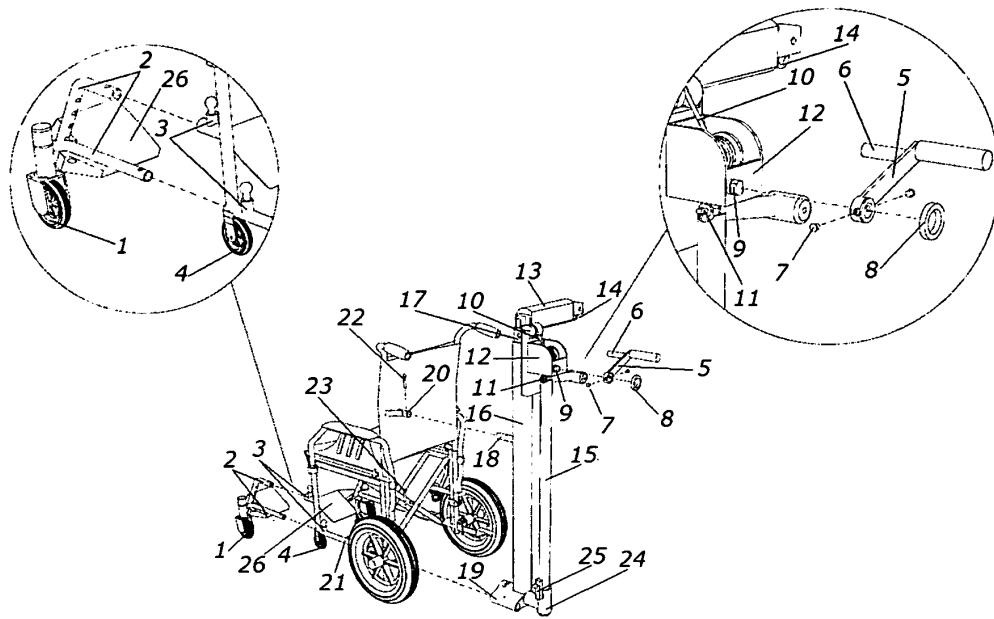


FIG. 1

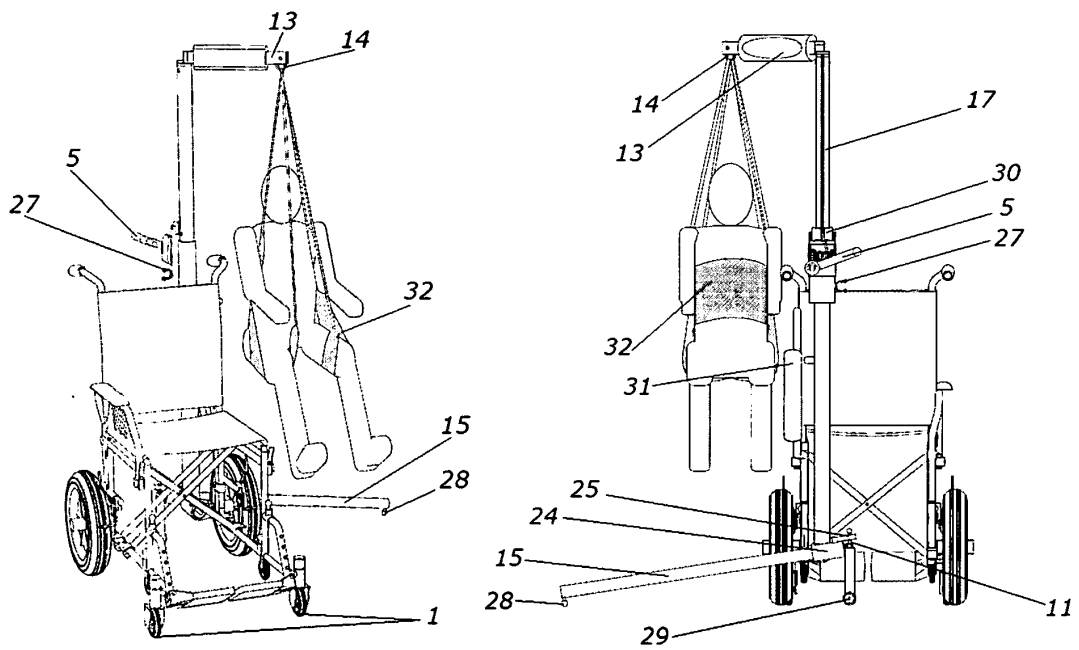


FIG. 2

FIG. 3

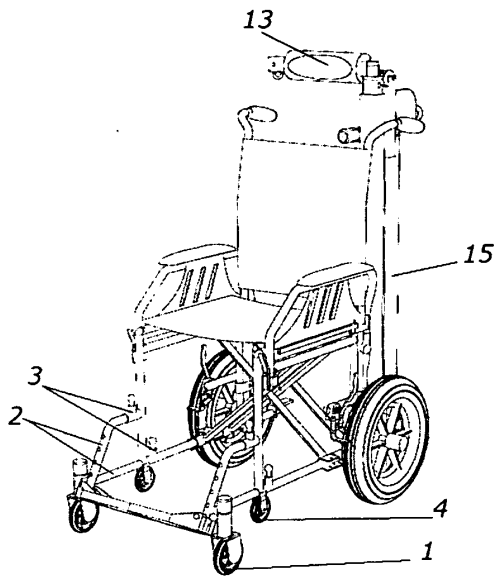


FIG. 4

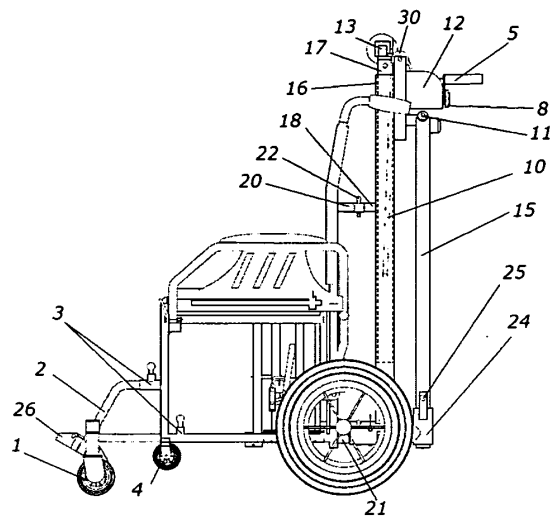


FIG. 5

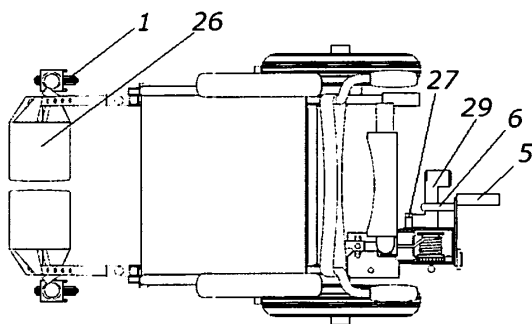


FIG. 6

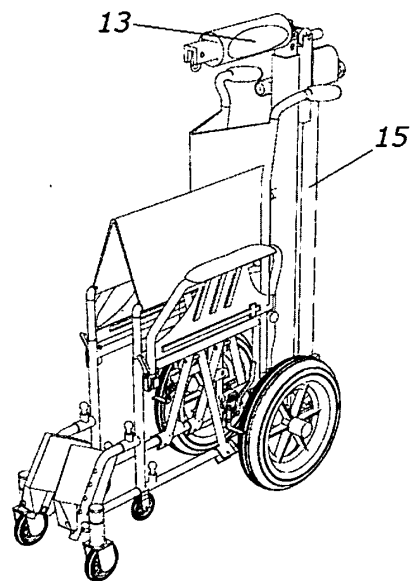


FIG. 7



EUROPEAN SEARCH REPORT

Application Number
EP 11 42 5092

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 5 379 468 A (CASSIDY JOSEPH P [US] ET AL) 10 January 1995 (1995-01-10) * column 3, line 28 - column 6, line 34; figures 1-6 *	1	INV. A61G5/10 A61G7/14
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			A61G
Place of search		Date of completion of the search	Examiner
The Hague		16 August 2011	Petzold, Jan
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503.03.82 (P04G01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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16-08-2011

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