



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
08.01.2014 Bulletin 2014/02

(51) Int Cl.:
A61G 7/002 (2006.01)

(21) Application number: **12461533.7**

(22) Date of filing: **30.07.2012**

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**
Designated Extension States:
BA ME

- **Bajek, Bogdan**
35-330 Rzeszów (PL)
- **Gil, Krzysztof**
35-601 Rzeszów (PL)
- **Koczan, Marek**
35-328 Rzeszów (PL)

(30) Priority: **04.07.2012 PL 39979812**

(71) Applicant: **Akces-MED Sp. z o.o.**
35-615 Rzeszów (PL)

(74) Representative: **Klar, Mirosław**
Kancelaria Patentowa
Ul. Biernackiego 1/29
39-300 Mielec (PL)

(72) Inventors:
• **Wronski, Sławomir**
35-321 Rzeszów (PL)

(54) **Rotary mechanism of vertical positioning device**

(57) Subject of invention is rotary mechanism, equipped with horizontal, driveable frame with wheels, on which construction is placed, having form of four-bars linkage, characterized in that the horizontal driveable frame (1) consists of frame (2) rotationally fastened on one edge, rotationally fixed to support beam (3) of platform (4), where beneficially at distance (X) rotary bolt (5)

is placed, connected to arm of spring (6), beneficially gas spring, rotationally fixed at the bottom of cross-bar (7), which is located in central part of frame (1), at the same moment on support beam (3) of platform (4), beneficially at distance (Y), rotary extension arm (8) is fixed, beneficially U-shaped, ends of which are rotary fixed to ends of frame (1).

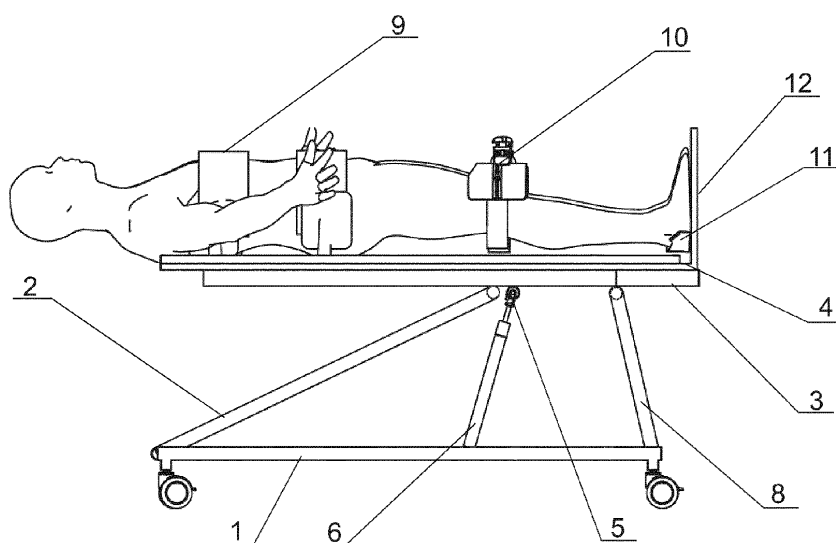


Fig. 1

Description

[0001] Subject of the invention is a rotary mechanism of device for keeping vertical position, used especially in devices for vertical positioning of sick persons during treatment and rehabilitation.

[0002] There is known, from the Polish patent No PL 173975 description, a table for vertical positioning and lifting, consisting of supporting structure, lifting mechanism and a bed, **characterized in that** it creates compact structure comprising three rectangular frames, a lower one with wheels, a middle one and an upper one being a bed covered with lining, where a protractile foot-pace is fixed. Lifting mechanism consists of electromechanical servo-motor, fixed to coupler and frame, whereas a mechanism for vertical positioning is created by servo-motor connected to middle frame and a lever, which is connected to frame by articulated joint.

[0003] There is known, from the other Polish patent description No PL 174281, vertical bed for rehabilitation, consisting of base frame located on wheels, and of frame rotation mechanism with upholstery plate, **characterized in that** in U-shaped segment of lower frame two posts with axis of shaft are fixed, to which two parallel supporting tubes fixed, connected with two supporting tubular stringers. Between the tubes, there are two arms of a lever, fixed at appropriate angle, connected by a bolt with extension arm.

[0004] Rotary mechanism of device according to invention, equipped with horizontal frame with wheels, on which the structure, having form rectangular with articulated joints is located, is **characterized in that** the vertical, driveable frame is created by a frame, rotationally fixed on one edge, connected in upper part, also rotationally, with supporting beam of platform. At supporting beam, beneficially at the distance X, a rotary bolt is located, connected with arm of a spring, beneficially gas spring, fixed rotationally at the bottom to cross-bar, located in central part of driveable frame. On supporting beam of platform, beneficially at the distance Y, rotary extension arm, beneficially U-shaped, is fixed, ends of which are rotationally fixed to ends of driveable frame. Beneficially, ratio of driveable frame length to distance X, between fixing point of upper frame to support beam and rotational bolt is within the range 22 to 27. Beneficially ratio of driveable frame length to distance between rotary bolt and fixing point of upper section of extension arm to supporting beam is within the range 3 to 6.

Beneficially, platform is equipped with stabilizing bands and passages, fastening trunk and legs of patient, and fasteners located on flat surface of foot-pacer.

[0005] Rotary mechanism of device, thanks to rotary fixing and articulated joints, allows for fluent rotation of platform with patient. Usage of four-bar linkage allows for introduction of gas spring to support bringing patient to vertical position, as well as in reverse direction, that means in putting patient on the back. At the same mo-

ment low height from the floor is maintained, what makes easy to move the patient, for example from a bed.

[0006] Subject of invention is presented in example on the drawing, where fig. 1 shows side view of the device, fig. 2 - 3D rear view, fig. 3 - side view of mechanism, fig. 4 - 3D view of mechanism, fig. 5 - scheme of device rotation.

[0007] Horizontal, driveable frame 1 consists of frame 2, rotationally fixed on one side, connected in upper part, also rotary, with supporting beam 3 of platform 4, at which, beneficially at distance X, rotary bolt 5 is located, connected with arm of shock absorber 6, fixed at bottom to rotational cross-beam 7, located in central part of driveable frame 1. On supporting beam 3 of platform 4, beneficially at distance Y, extension arm 8 is fixed, beneficially U-shaped, ends of which are rotationally fixed to ends of driveable frame 1.

Ratio of length L of driveable frame 1 to distance X between fixing point of upper part of frame 2 to supporting beam 3 and rotational bolt 5, is within range 22 to 27.

Ratio of length L of driveable frame 1 to distance Y between rotary bolt 5 and fixing point of upper section of extension arm 8 to supporting beam 3 is within range 3 to 6.

Platform is equipped with stabilizing bands 9 and passages 10, fixing the trunk and legs of patient, and fasteners 11 located on flat surface of foot-pacer 12.

Claims

1. Rotary mechanism of device for vertical positioning, equipped with horizontal, driveable frame with wheels, on which construction is placed, having form of four-bar linkage, **characterized in that** the horizontal, driveable frame (1) consists of rotationally fixed on one side frame (2), connected in upper part, also rotationally with supporting beam (3) of platform (4), at which, beneficially at distance (X), rotary bolt (5) is located, connected to arm of shock absorber (6), fixed at bottom to rotational cross-beam (7), located in central part of driveable frame (1), and at the same moment on the supporting beam (3) of platform (4), extension arm (8) is rotationally fixed, beneficially at distance (Y), beneficially U-shaped, and ends of which are rotationally fixed to ends of driveable frame (1).
2. Rotary mechanism of device for vertical positioning according to claim 1, **characterized in that** the proportion of length (L) of driveable frame (1) to distance (X) between fixing point of upper section of frame (2) to supporting beam (3) and rotary bolt (5), is within range 22 to 27.
3. Rotary mechanism of device for vertical positioning according to claim 1, **characterized in that** the proportion of length (L) of driveable frame (1) to distance

(Y) between rotational bolt (5) and fixing point of upper section of extension arm (8) to supporting beam (8), is within range 3 to 6.

4. Rotary mechanism of device for vertical positioning according to claim 1, **characterized in that** the platform (4) is equipped with stabilizing bands (9) and passages (10), fastening the trunk and legs of patient and fasteners (11) located on flat surface of foot-pacer (12).

10

15

20

25

30

35

40

45

50

55

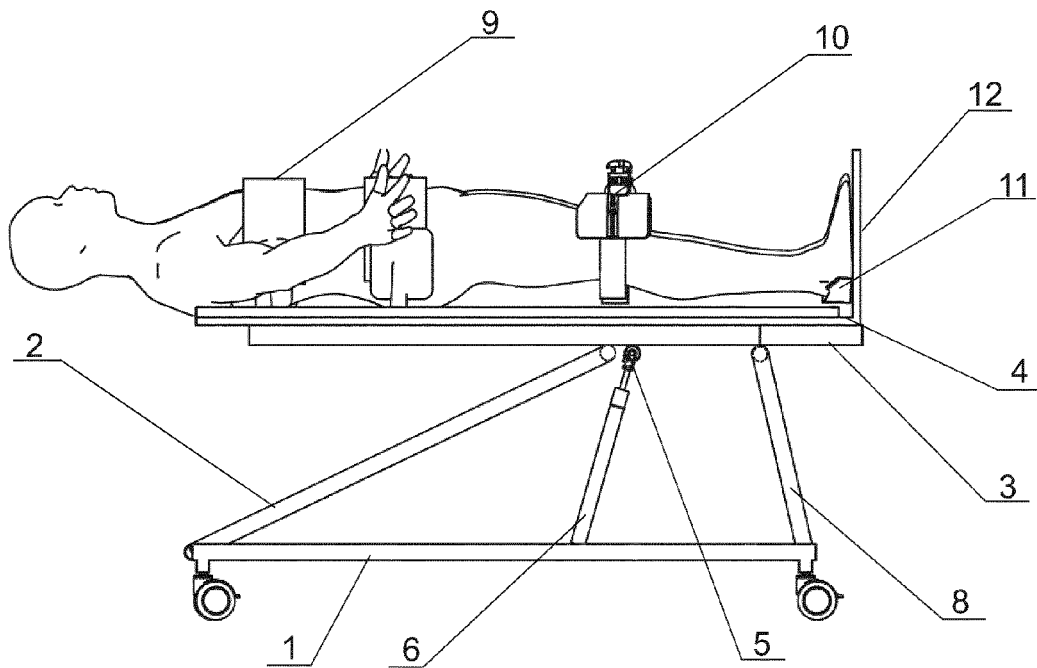


Fig. 1

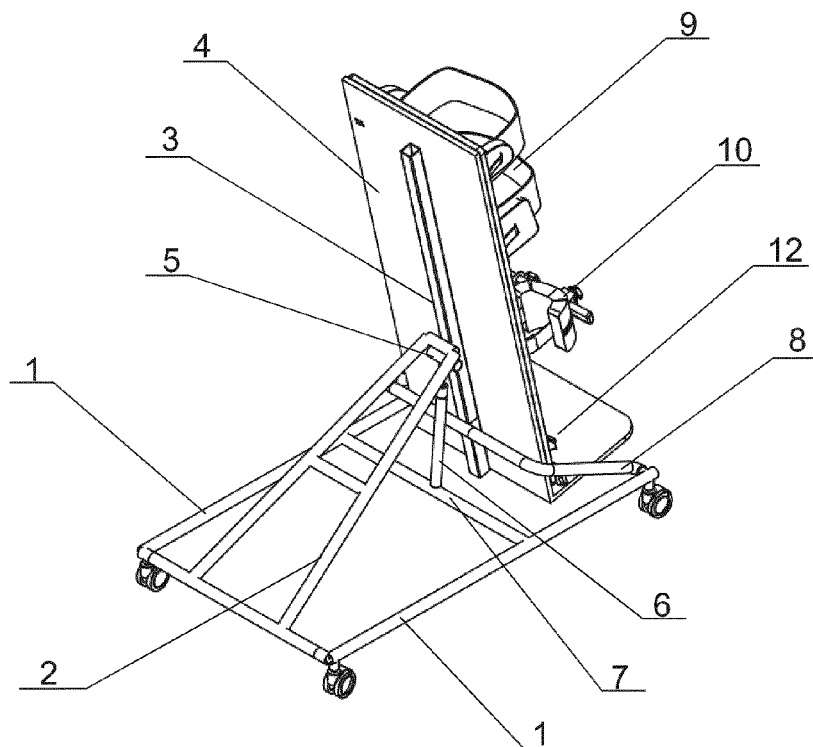


Fig. 2

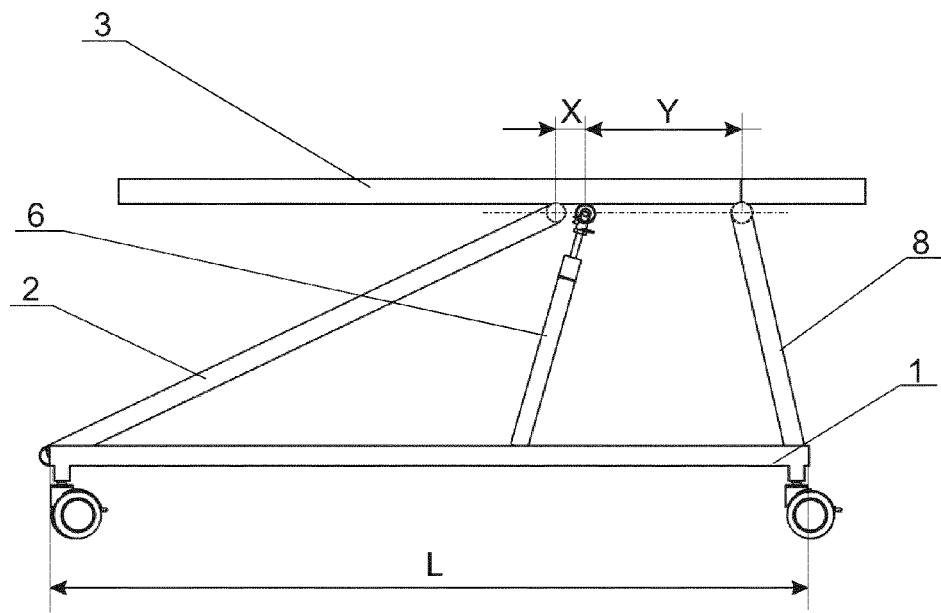


Fig. 3

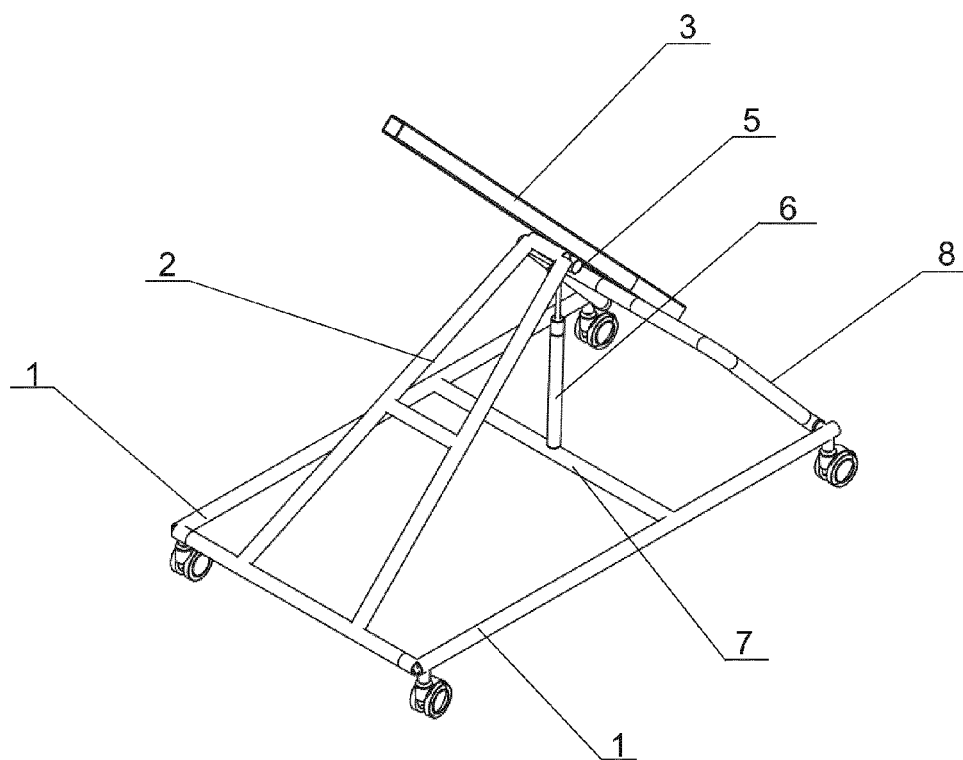


Fig. 4

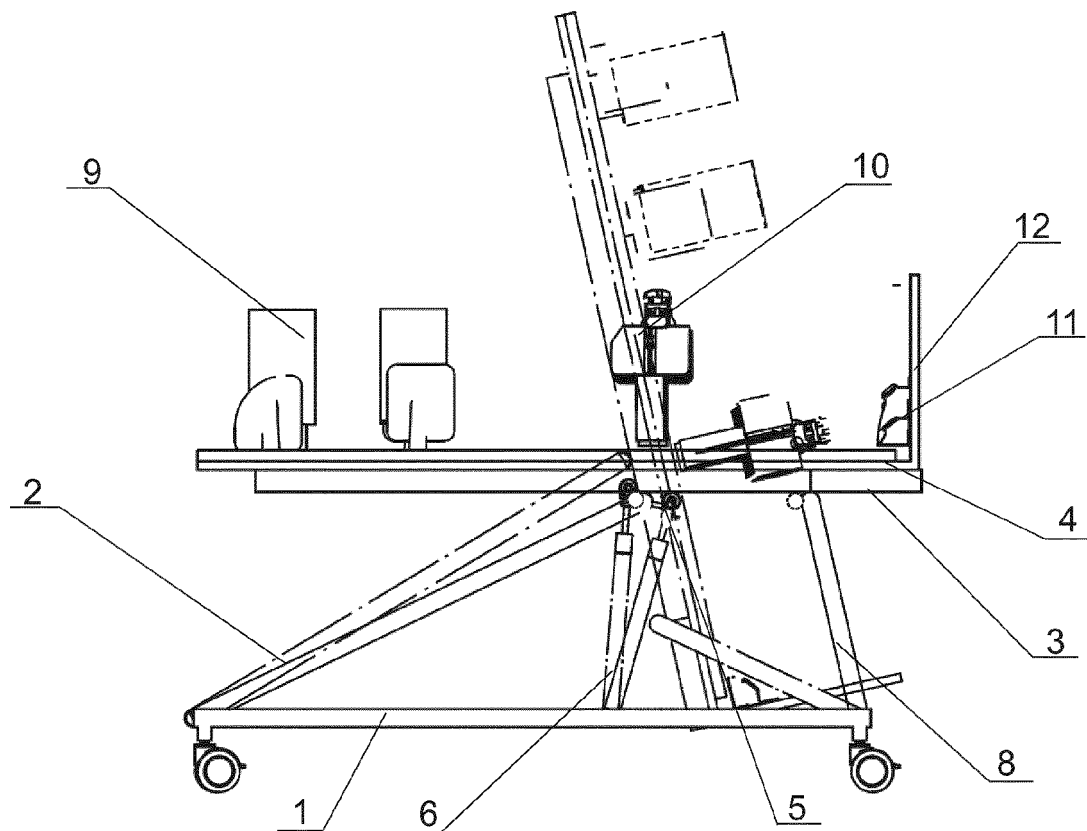


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 12 46 1533

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	FR 2 751 210 A1 (BATIFOUYE JEAN ROGER [FR]) 23 January 1998 (1998-01-23) * the whole document *	1-4	INV. A61G7/002
X	DE 43 40 358 A1 (VOLKSWAGEN AG [DE] WERKER JOACHIM [DE]) 9 June 1994 (1994-06-09) * the whole document *	1-4	
A	US 2006/225212 A1 (PARSON TROY D [US] ET AL) 12 October 2006 (2006-10-12) * figures *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A61G
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 22 October 2013	Examiner Knoflachner, Nikolaus
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			

1
EPO FORM 1503 03.82 (P04C01)

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

EP 12 46 1533

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

22-10-2013

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2751210	A1	23-01-1998	NONE	

DE 4340358	A1	09-06-1994	NONE	

US 2006225212	A1	12-10-2006	US 2006225212 A1	12-10-2006
			US 2010095456 A1	22-04-2010
			US 2013111669 A1	09-05-2013

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

- PL 173975 [0002]
- PL 174281 [0003]