

(19)



(11)

EP 2 389 915 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

30.11.2011 Bulletin 2011/48

(51) Int Cl.:

A61G 5/12 (2006.01)

(21) Application number: **11004247.0**

(22) Date of filing: **24.05.2011**

(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

(71) Applicant: **Vassilli s.r.l.**

35020 Saonara (PD) (IT)

(72) Inventor: **Vassilli, Berto**

35020 Saonara PD (IT)

(30) Priority: **25.05.2010 IT PD20100161**

(54) **Dynamic head support**

(57) It's a head support that that follows the movements of the head, restricting them and limiting them so

that they do not become excessive and too sudden, and that it anthropometrically follows the movements of the head. (fig. 8)

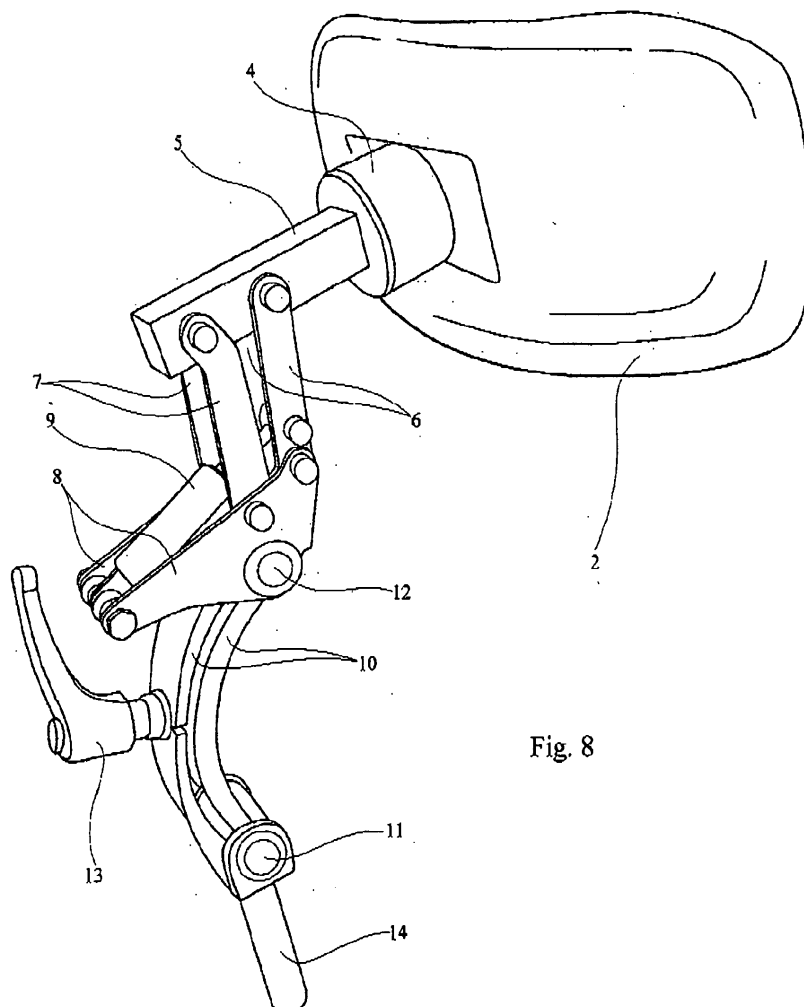


Fig. 8

EP 2 389 915 A1

Description

[0001] The object of this patent application is a new head support device, called dynamic because it remains in contact with the head of the disabled person during any movements.

[0002] In particular this head support is particularly suitable for use in the wheelchairs of disabled people.

[0003] The manufacturers of accessories for the disabled have always been intent on creating devices that are comfortable and effective in meeting the specific needs of the disabled.

[0004] The head support, especially when used together with wheelchairs, is particularly important in certain types of disabilities.

[0005] Indeed, the head support is essential for that type of disability that requires, because of the impossibility of maintaining the correct posture of the head, or because of sudden spasms, the use of braces to contain uncontrolled movements of the head.

[0006] These days the head support looks quite similar to the well-known one used in cars, but with greater ease in regulation.

[0007] In fact the shape is slightly concave in order to restrain the head at the rear in the occipital region and in a partly lateral manner in the parietal region.

[0008] The traditional structure of the head support is appropriately padded at the front where it comes into contact with the head and is supported, behind the padding, in a fixed manner, with the possibility of adjustment, with respect to the backrest of the wheelchair (see fig. 1) along the Z and Y axes.

[0009] This adjustment generally includes the possibility of setting the height Z and the horizontal depth Y.

[0010] With these two movements the head support nears the head of the disabled person in the occipital region and the height and the depth are fixed in a stable manner.

[0011] Nevertheless, this arrangement is often very restrictive and greatly limits the natural movements that also the disabled person, with problems moving the head, should and could carry out.

[0012] And it does not help the disabled person afflicted with dystonia and/or twitches, since it has a rigid contraposition that stimulates this pathology.

[0013] Until now there has not been any support that overcomes the main drawbacks of a normal head support in a simple, inexpensive and reliable way and at the same time respecting the needs of disabled persons.

[0014] The purpose of this patent application is to have a head support that follows the movements of the head, restricting them and limiting them so that they do not become excessive and too sudden, and which can be easily adjusted to the correct position.

[0015] Another purpose of the above-mentioned head support consists of the fact that it anthropometrically follows the movements of the head.

[0016] The invention consists of a head support that

includes padding that rests against the head of the disabled person in the occipital region, this padding being joined to a support structure that is fixed (or the padding directly) in a protruding manner on a moveable rod of an articulated quadrangle that allows the movements of the head to be followed.

[0017] Preferably the support structure is fixed in a protruding manner to the moveable rod, providing a simple and compact configuration.

[0018] The suitable sizing of the levers, hinged to the moveable rod on the one side and hinged to a base on the other side, allows you to obtain an extremely useful movement of the rod that is configured for anthropometric movement with respect to the articulation of the head.

[0019] In particular the above-mentioned movement allows the movement of the head to be followed towards the rear part.

[0020] Advantageously these movements are limited by an elastic element that resists these movements, dampening them, in part dissipating the energy.

[0021] Preferably this elastic element is a gas pump that is fixed between the base of the articulated quadrilateral and a lever.

[0022] Preferably these elastic elements exert a counter force proportional to the intensity of the movement, and have differentiated elastic constant between the movement following stress and its return or release, i.e. they have an elastic constant of return that is lower than that direct one so as to provide a repositioning of the head support to its resting state in a slow manner.

[0023] This has the quality of softening the impact and fostering neuro-dystonic relaxation, in that we do not have the rigid contraposition of a traditional fixed head support.

[0024] To avoid troublesome oscillations, said elastic elements can be pre-loaded, providing the disabled person with the feeling of a solid support.

[0025] The base of this articulated quadrilateral is positioned and held in place by devices for adjusting the height and depth.

[0026] The height can be adjusted by a moveable rod fixed at the rear of the wheelchair.

[0027] At the top end of this rod the device for adjusting the depth is hinged, composed of a semi-circular element that allows both the depth and the height of the support point of the head support to be adjusted.

[0028] This head support also has the added improvement of the interposition of an elastic component, preferably a rubber element, fixed between the padding and the protruding part of the moveable rod of the articulated quadrilateral.

[0029] This rubber element, preferably solid rubber, carries out the function of absorbing any parietal dystonia of the disabled person.

[0030] This rubber is effective if it is sufficiently flexible to be able to absorb contractions and dystonia, both lateral as well as antero-posterior.

[0031] The form of the head support, when properly

padding, is of the anatomical semi-wraparound variety, allowing the head to be held and controlled also in a lateral position and therefore preventing the decentralisation of the head.

[0032] From the following description the above-mentioned benefits and further improvements and refinements will be evident, with reference to a preferred realisation, by way of example and in no way restrictive.

Fig. 1 shows an example of a head support of the previous art, where the height and depth adjustments are independent and carried out through adjustable rods.

Fig. 2 shows the object of this patent application supported in the rear by a backrest of a stylised wheelchair on which the outline of a person has been drawn whose head is resting on the head support. Fig. 3 shows the device of Fig. 2, where the head support is pushed behind the head of the above-mentioned person.

Figs. 4 and 5 show in greater detail a part respectively of drawings 2 and 3.

Fig. 6 shows a partial side view of the device that is the object of this patent application.

Fig. 7 shows figs. 2 and 3 overlying, with the regulation and movement possibilities highlighted.

Fig. 8 shows a perspective view of the head support that is the object of this patent application in a rest position.

Fig. 9 shows the head support of fig. 8 reclined and pushed back.

[0033] The head support 1 includes shaped padding, preferably an anatomical semi-wraparound of the head of the disabled person.

[0034] This padding 2 of the support protrudes at the back from a moveable rod 5, preferably tubular, of an articulated quadrilateral, with an elastic component 4 inserted, advantageously a rubber element.

[0035] This moveable rod 5 is hinged onto at least a pair of levers 6 and 7, in their turn hinged to the opposite end on a base 8.

[0036] Between the base 8 and a lever 6 an elastic element 9 has been fixed, in particular a small gas pump, preferably pre-loaded in order to avoid troublesome oscillations and to provide the sensation of a solid support for the disabled person.

[0037] Conveniently the points where the above-mentioned gas pump 9 is fixed revolve with respect to the base and with respect to the lever 6.

[0038] The above-mentioned base 8 has hinged support 12, in order to be brought to the correct position and inclination, on a device for regulating the depth containing a semi-circular element 10 that makes it possible to have a simultaneous movement for varying the height and the inclination of the head support.

[0039] On the outer part of said semi-circular element 10 there is a single restraining control 13 for fixing and

releasing.

[0040] In its turn the semi-circular element 10 is hinged 11 along its horizontal axis to the upper end of the rod for adjusting the height 14 needed for attaining the desired height where the head support 1 should be positioned.

[0041] The use and the operation of this head support 1 is extremely simple.

[0042] After regulating the rod for adjusting the height 14 in order to bring the head support to the required height (using the movement indicated as A in fig. 7), using the restraining control 13 you make a bigger distance between the two arched elements that make up the curved element 10; these two arched elements are joined at their ends forming two housings for hinging 11, 12, the former 11 for the rod for adjusting the height 14, and the latter housing 12, at the opposite end, for the base 8 of the articulated quadrilateral.

[0043] The spacing of the two arched elements widens the housings 11 and 12 releasing the hinging, providing the free rotation (in line with the movement indicated as B in Fig. 7) of both the hinges in housings 11 and 12.

[0044] The head support 1, free to rotate around the axes of hinges 11 and 12, is easily brought to rest in the occipital region of the head 3 of the disabled person who is seated in the wheelchair 15.

[0045] The disabled person, because of dystonia or twitching, moves his head 3 backwards (according to the movement C in Fig. 7) without finding any rigid hindrance.

[0046] But the padding 2 moves, yielding to the pressure exercised by the head 3 of the disabled person, according to the degree of looseness of the moveable rod 5 of the articulated quadrilateral which is configured as a Grashof quadrilateral.

[0047] Using a pair of levers 6 and 9 with lengths that allow the padding 2 to have an anthropometric movement (see lowering D corresponding to the going back of the padding) corresponding to the movement of the head 3 of the disabled person, you obtain the absence of the relative sliding between the head 3 and the padding 2.

[0048] This anthropometric movement of the padding 2 is very important and valued since it prevents the continual and bothersome rubbing of the head 3 against the padding 2.

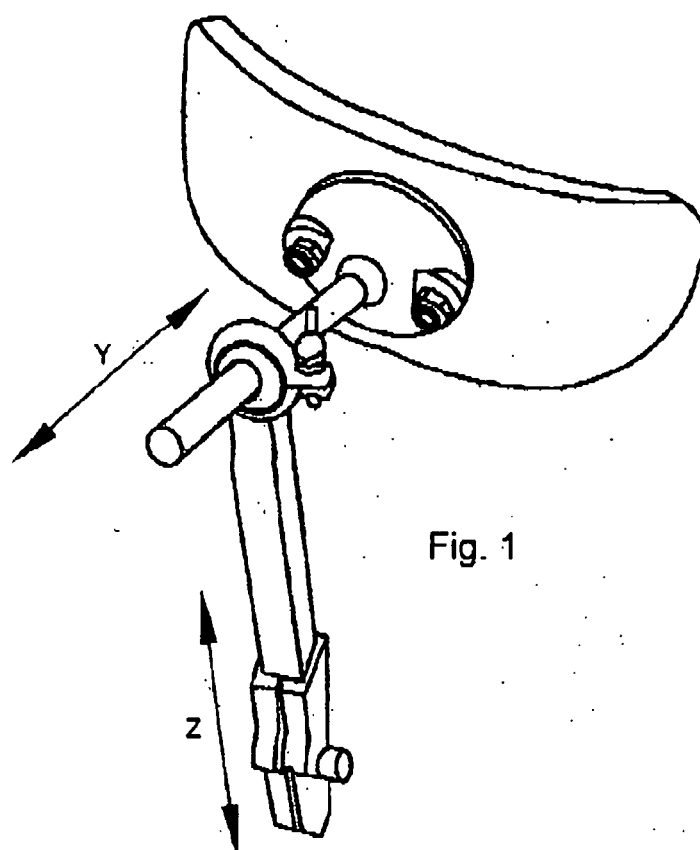
[0049] Since sudden and impulsive movements are not only antero-posterior but also include lateral dystonia and jerks, the padding 2 of the head support has a configuration that can contain them and reduce them, thanks to the anatomical semi-wraparound shape, because of the presence of an elastic component 4, like a flexible rubber element, inserted between the protruding end of the upper free rod 5 of the articulated quadrilateral and the structure supporting the padding 2 of the head support 1.

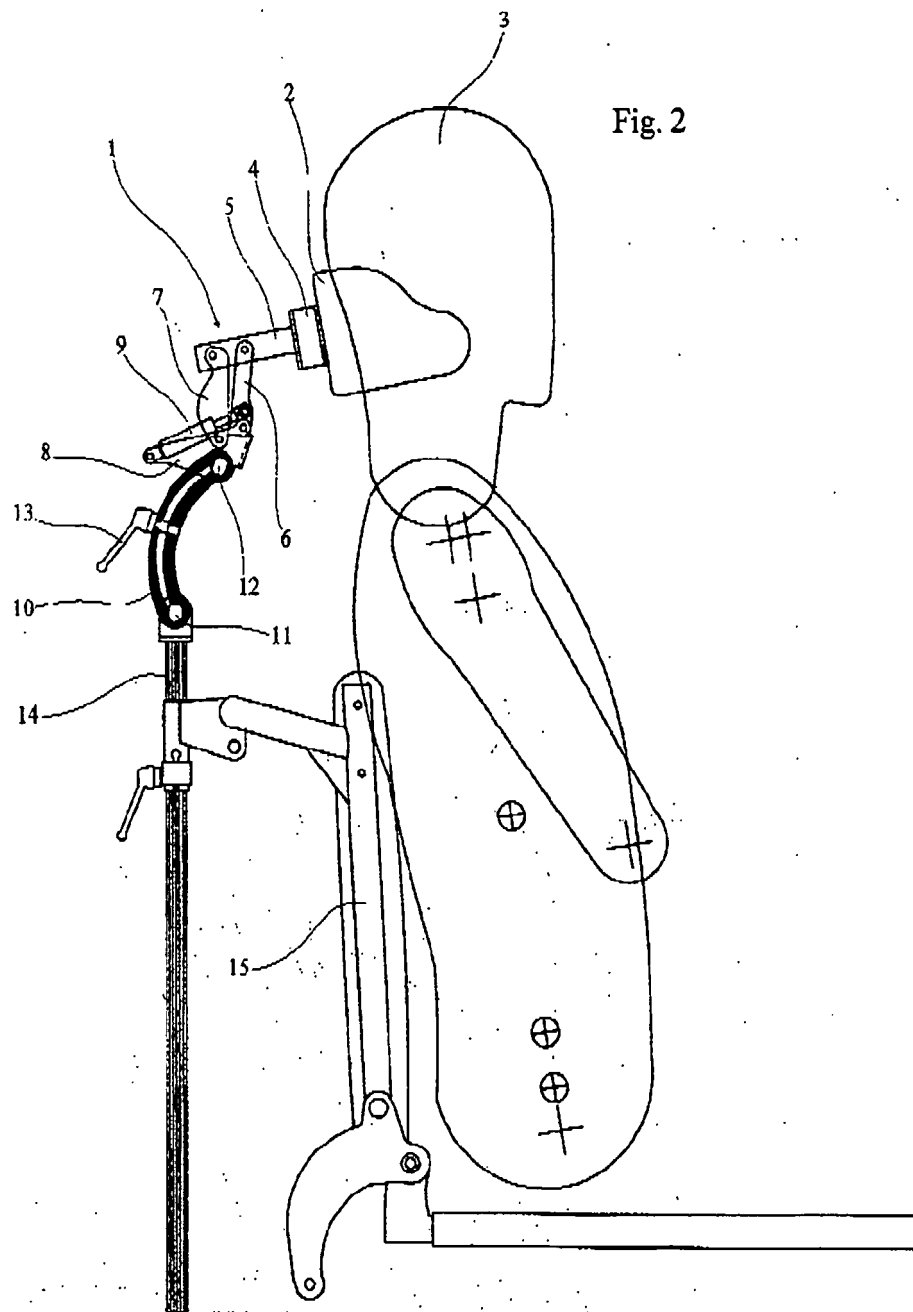
[0050] This elastic component 4 provides every small rotation with absorption and softening of the stresses bring back in a soft elastic manner the head support to the configuration it has when at rest.

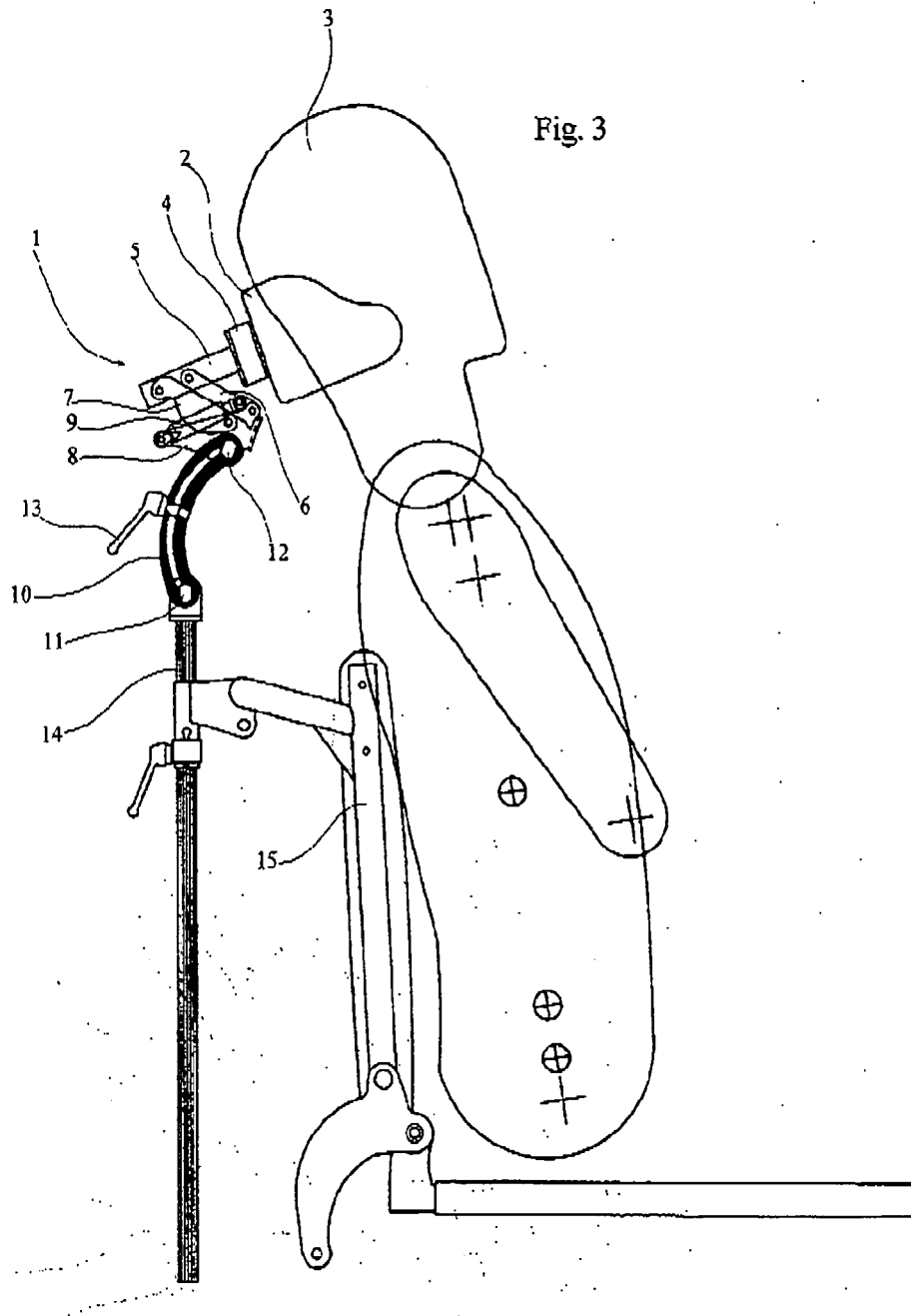
[0051] It is very important that the elastic devices 4 and 9 that are used can absorb and deaden the stresses to which they are subjected, providing the disabled person with the sensation of not having any rigid impediment, while at the same time containing and controlling his dystonia and/or jerks, fostering a neuro-dystonic relaxation.

Claims

1. Dynamic head support including a pad (2) that comes into contact with the occipital zone of the head of the user, with said pad (2) being joined to a support structure **characterised by** the fact that said pad (2) or its support structure is fixed to a moveable rod (5) of an articulated quadrilateral that allows the movements of the head (3) to be followed. 5
2. Dynamic head support according to claim 1 **characterised by** the fact that the support structure of the pad or the pad itself is fixed on said moveable rod (5). 10 20
3. Dynamic head support according to claim 1 or 2 **characterised by** the fact that the connecting levers (6, 9) of the articulated quadrilateral are sized so as to provide a lowering (D) movement of the moveable rod (5) when the pad (2) is pushed backwards, which is an anthropometric movement with respect to the articulation of the head (3). 25 30
4. Dynamic head support according to claim 1, 2, or 3 **characterised by** the fact that it includes an elastic element (9) that counters the above-mentioned movement of the moveable rod (5). 35
5. Dynamic head support according to one or more of the previous claims **characterised by** the fact that said elastic element (9) dissipates the energy. 40
6. Dynamic head support according to one or more of the previous claims **characterised by** the fact that said elastic element (9) has a differentiated elastic constant between the straining movement and the release. 45
7. Dynamic head support according to one or more of the previous claims **characterised by** the fact that said elastic element (9) has a preload to prevent the pad (2) from freely oscillating. 50
8. Dynamic head support according to one or more of the previous claims **characterised by** the fact that said pad (2) or its support structure is fixed to the moveable rod (5) with the insertion of an elastic device (4) that is capable of absorbing parietal and/or anterior-posterior dystonia of the head (3) of the disabled person. 55
9. Dynamic head support according to one or more of the previous claims **characterised by** the fact that said pad (2) has an anatomical semi-wraparound configuration for the head (3).
10. Dynamic head support according to one or more of the previous claims **characterised by** the fact that the means of regulating the depth is made up of an element with a semi-circular shape (10) composed of two distinct elements joined at their ends forming two housings for hinging (11, 12), the first housing (11) for adjusting the height (14) and the second housing (12) for hinging the pad, with eventual insertion of the articulated quadrilateral, the locking of these hinges being possible by means of the said two curved elements coming closer to each other with a narrowing of the distance of the housings (11, 12).







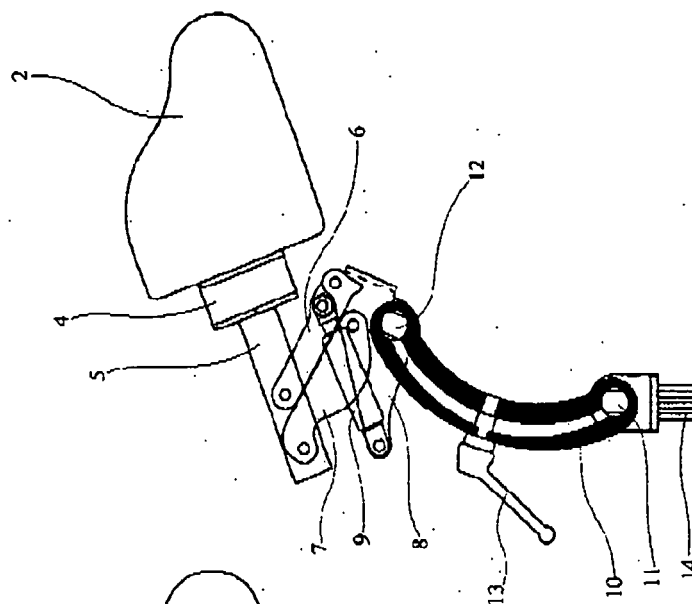


Fig. 5

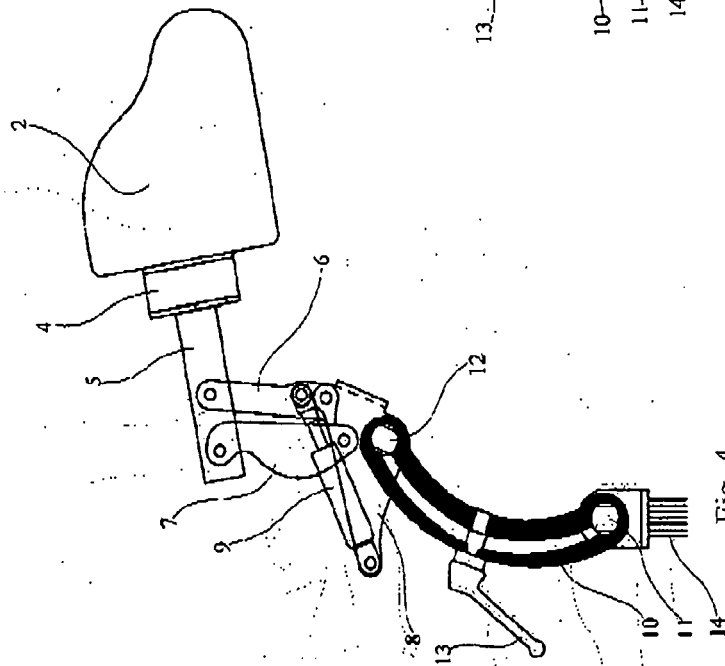


Fig. 4

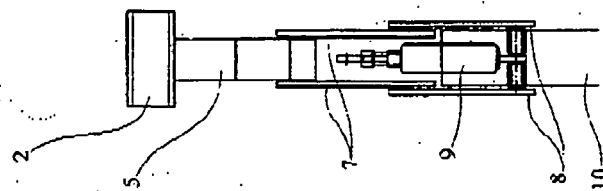
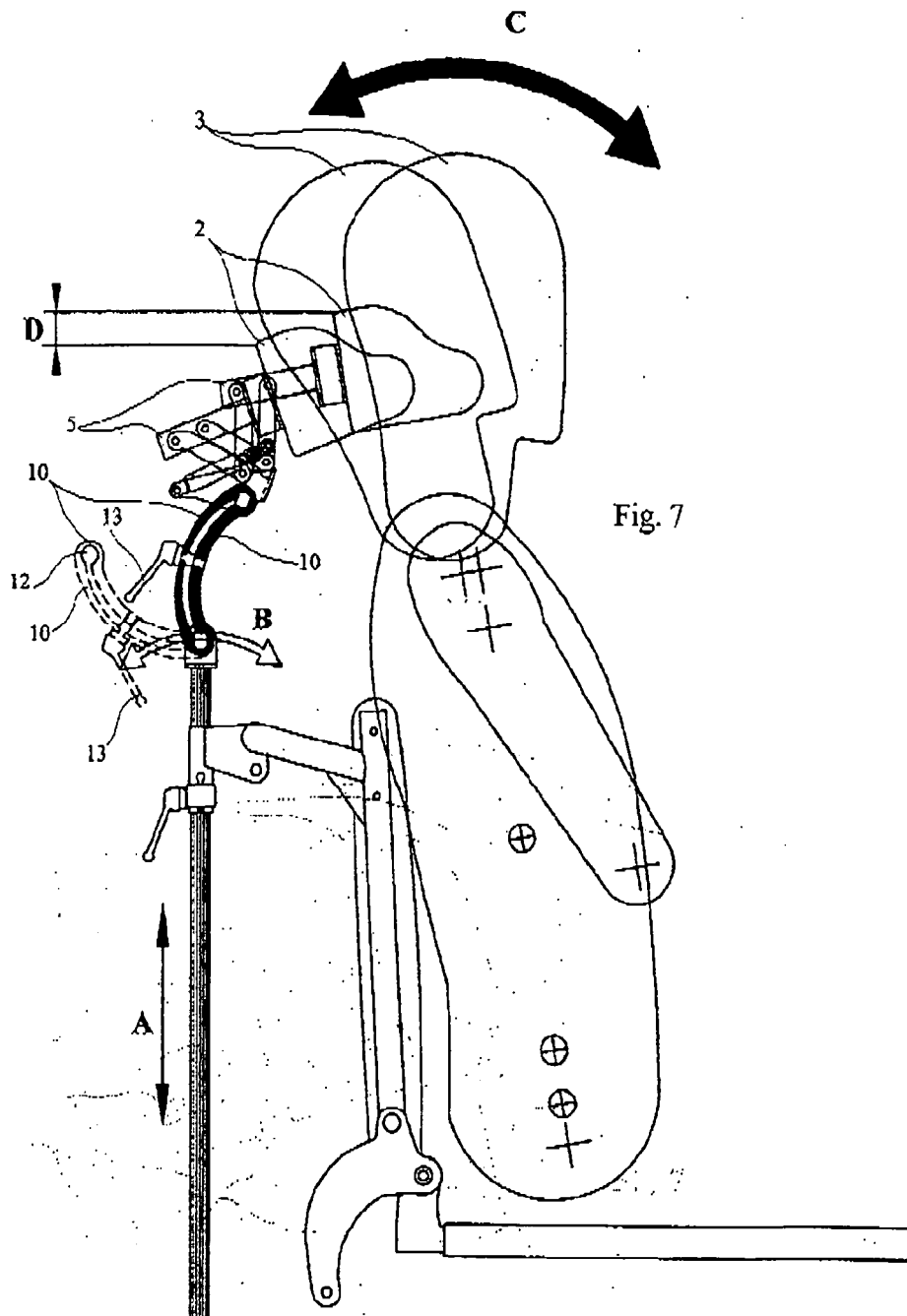


Fig. 6



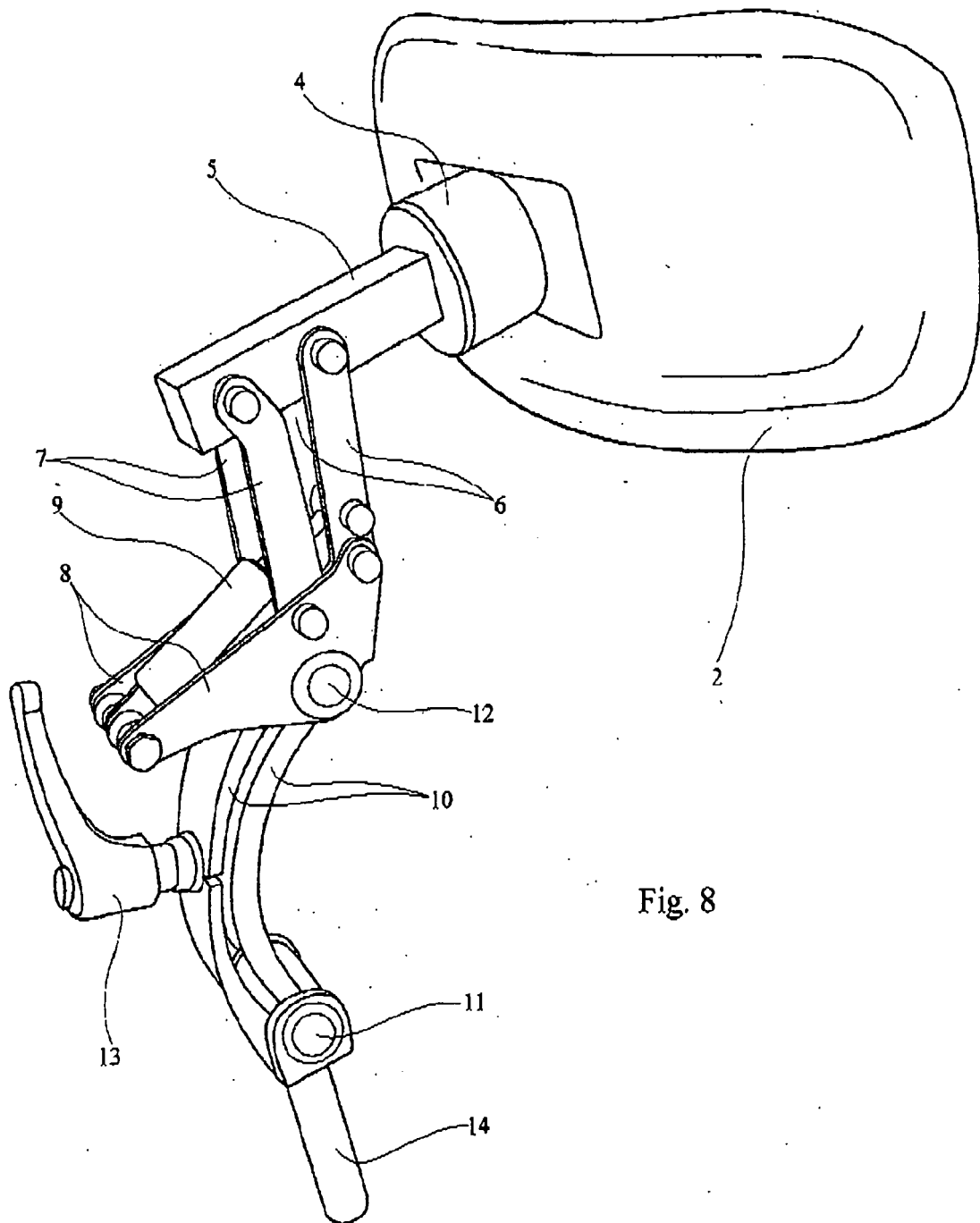


Fig. 8

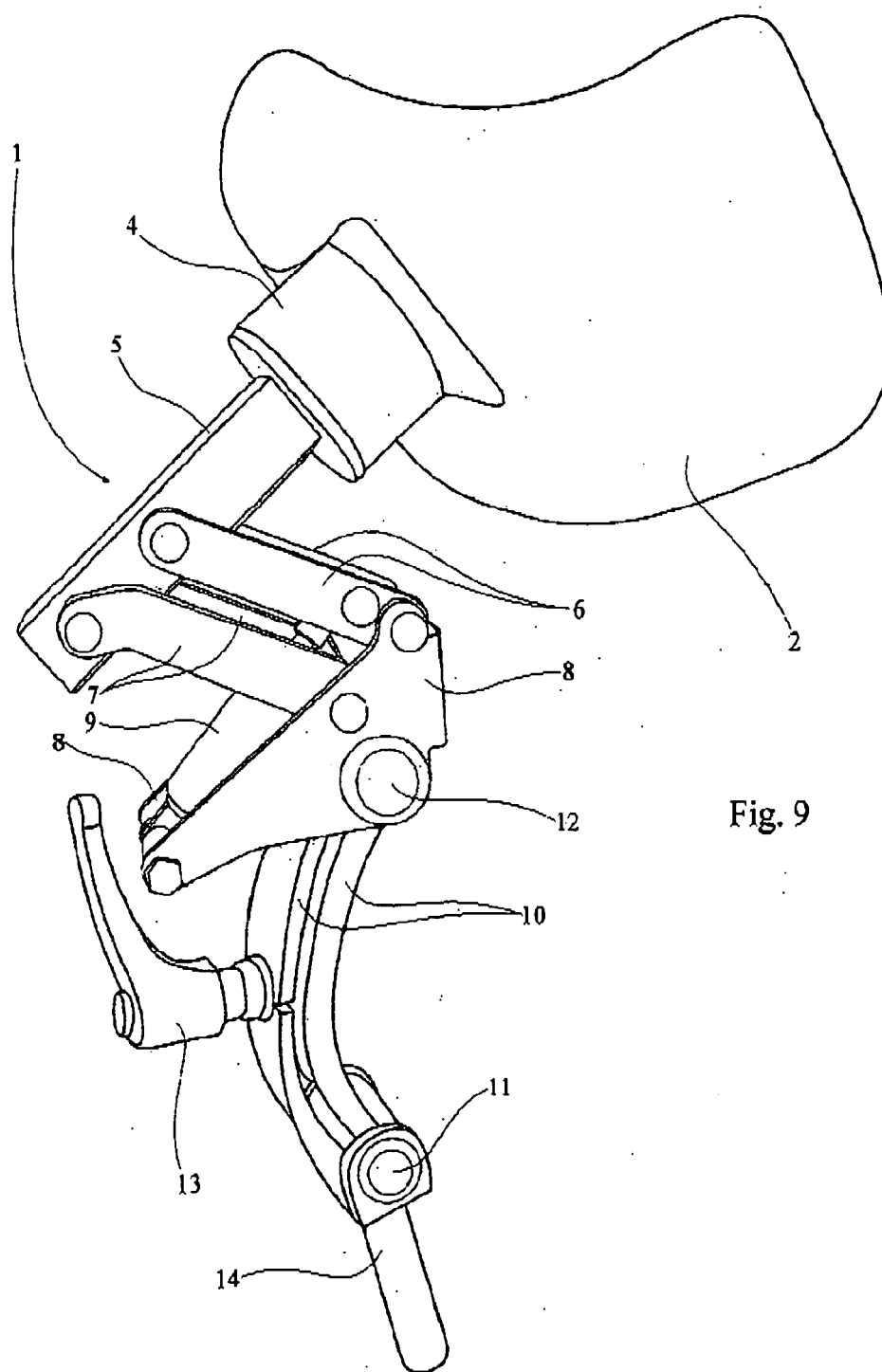


Fig. 9



EUROPEAN SEARCH REPORT

Application Number
EP 11 00 4247

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	US 5 791 735 A (HELMAN DONALD L [US]) 11 August 1998 (1998-08-11) * column 6, line 64 - column 10, line 37; figures 2,4,5 *	1,2,4-9	INV. A61G5/12
X	EP 1 772 130 A1 (DEGONDA REHAB SA [CH]) 11 April 2007 (2007-04-11) * paragraphs [0014] - [0018]; figures 1-2 *	1-8	
X	US 4 840 429 A (STOECKL KLAUS [DE]) 20 June 1989 (1989-06-20) * column 2, line 59 - column 4, line 25; figure 5 *	1-3,8	
X	DE 101 47 349 A1 (KALTENBACH & VOIGT [DE]) 2 October 2002 (2002-10-02) * paragraphs [0033] - [0073]; figures 3-7 *	1-3,8	
X	US 1 686 631 A (MAY ADAM J) 9 October 1928 (1928-10-09) * page 1, left-hand column, line 47 - page 3, left-hand column, line 59; figures 3-4 *	1,2,8,10	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 9 August 2011	Examiner Kroeders, Marleen
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 03.02 (P04C01)

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

EP 11 00 4247

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.

09-08-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5791735	A	11-08-1998	NONE
EP 1772130	A1	11-04-2007	AT 464871 T 15-05-2010 US 2007085401 A1 19-04-2007
US 4840429	A	20-06-1989	DE 8717434 U1 27-10-1988 EP 0303145 A1 15-02-1989 JP 5015301 Y2 22-04-1993 JP 64031732 U 27-02-1989
DE 10147349	A1	02-10-2002	NONE
US 1686631	A	09-10-1928	NONE