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(71) Applicant: **Focal Meditech B.V.**
5026 SP Tilburg (NL)

(72) Inventors:
- **DE JONG, Ralf**
  5106 NZ Dongen-Vaart (NL)
- **VAN OENE, Ericus Martinus Petrus**
  5071 GW Udenhout (NL)
- **GROENLAND, Paulus Christianus Maria**
  5056 AD Berkel-Enschot (NL)
- **VERSTEGEN, Paulus Petrus Hendricus**
  5406 AT Uden (NL)
- **VAN BUSSEL, Gijs Anthonius Marinus Johannes**
  5721 LG Asten (NL)

(74) Representative: **Patentwerk B.V.**
P.O. Box 1514
5200 BN 's-Hertogenbosch (NL)

(54) HOLDER FOR MOUNTING AN ARM SUPPORT ON A MOVABLE CARRIER, CARRIER PROVIDED WITH SUCH A HOLDER, AND ARMREST PROVIDED WITH SUCH A HOLDER

(57) The present invention relates to a holder for mounting an arm support on a movable carrier, particularly a wheelchair having a first position for transporting persons in a sitting position and a second position for transporting persons in a standing position, comprising a first holder part mountable on the carrier, a second holder part, connected to the first holder part for rotating at least about a rotation axis extending horizontally at least in a position of use, for mounting the arm support thereon, a sensor for generating a measurement signal which represents the rotational orientation of the second holder part relative to the gravitational force, a controllable drive for rotating the second holder part about the rotation axis relative to the first holder part, and a control for controlling the drive on the basis of the measurement signal.

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Description

[0001] The present invention relates to a holder for mounting an arm support on a movable carrier, carrier provided with such a holder, and to an armrest provided with such a holder.

[0002] The invention relates particularly to a holder for carrying an arm support of a wheelchair having a first position for transporting persons in a sitting position and a second position for transporting persons in a standing position.

[0003] Such wheelchairs are increasingly popular and can be moved from one position into another position by means of a collapsing and extending mechanism. Electrical provisions such as electric motors are usually present here for the collapsing and extending.

[0004] The relative orientation of parts of the wheelchair, particularly that of the seat of the chair relative to the backrest thereof, changes during collapsing. As a result, the orientation of an armrest which is optionally (in)directly connected to the seat also changes here.

[0005] For users it is however desirable for the armrest to remain in their preferred orientation. This orientation may be very precisely determined, and in some cases this desire is present not only in the collapsed and extended position, but also during the transition between these positions.

[0006] In the case of armrests which were supplied along with a wheelchair it is known for this purpose to connect the armrest via a mechanical transmission to the seat or another part of the wheelchair. Such a transmission then ensures that the armrest is for instance held at a fixed angle relative to the backrest, or in each case substantially horizontally. The known types of mechanical transmission usually comprise for this purpose rod assemblies and parallelograms.

[0007] Drawbacks of these constructions are that they are relatively expansive and heavy, they greatly limit the freedom of design of the wheelchair, they are susceptible to mechanical disruption and adjustments, and above all they are suitable only for an armrest associated with the specific wheelchair on which they are mounted.

[0008] In the case of more advanced, particularly dynamic armrests, which make higher demands of their mounting, the mechanical balancing devices supplied as standard as a rule do not suffice, which necessitates a lot of custom work. It is therefore an object of the present invention to at least partially obviate the above stated drawbacks, or to provide a usable alternative to the prior art.

[0009] The present invention provides for this purpose a holder for mounting an arm support on a movable carrier, comprising a first holder part mountable on the carrier, a second holder part, connected to the first holder part for rotating at least about a rotation axis extending horizontally at least in a position of use, for mounting the arm support thereon, a sensor for generating a measurement signal which represents the rotational orientation of the second holder part relative to the gravitational force, a controllable drive for rotating the second holder part about the rotation axis relative to the first holder part, and a control for controlling the drive on the basis of the measurement signal.

[0010] The holder according to the invention has the advantage of being independent of the orientation of the carrier. This finds application in diverse carriers, but particularly in the case of a wheelchair, and very specifically in the case of a wheelchair having a first position for transporting persons in a sitting position and a second position for transporting persons in a standing position, since a support point for an arm support is in motion in such chairs, in any case during a transition between the two positions. The holder according to the invention can however be generally applied for mounting armrests requiring a determined orientation relative to a base which is susceptible to movement.

[0011] A sensor suitable for generating a measurement signal which represents the rotational orientation of the second holder part relative to the gravitational force is for instance an inclinometer or an equivalent thereof, such as an optionally integrated electrical circuit with such a function.

[0012] In an embodiment the control is configured to register a preferred orientation of the second holder part relative to the gravitational force. Registering is understood to mean recording as reference in mechanical, electronic or other sense, for instance in the memory of a microprocessor.

[0013] The holder can be provided here with an input mechanism, such as a button, to input the preferred orientation. The control can be configured here such that it registers a rotational orientation in which the first holder part is oriented during use of the input mechanism, for instance pressing of the button, as preferred orientation.

[0014] The control can be configured to control the drive such that it rotates the second holder part about the rotation axis to the preferred orientation when the sensor signal indicates that the rotational orientation of the second holder part differs from the preferred orientation.

[0015] In a further embodiment the control is configured to control the drive only after a predetermined delay time when the rotational orientation of the second holder part differs from the preferred orientation. This prevents the holder reacting to (very) brief unsteadiness or changes in orientation.

[0016] The invention also relates to a carrier, particularly a wheelchair having a first position for transporting persons in a sitting position and a second position for transporting persons in a standing position, comprising a holder according to any of the foregoing claims, and to such a carrier comprising an armrest, particularly a robot arm armrest. The invention further relates to a robot arm armrest comprising a holder as described in the foregoing.

[0017] The invention will now be elucidated with refer-

ence to the following figures. Herein:

- figure 1 shows a prior art wheelchair;
- figure 2 shows a holder according to the present invention; and
- figure 3 shows schematically a control according to the present invention.

[0018] Figure 1 shows prior art wheelchair 1, which has a first position a for transporting a person in a sitting position and a second position b for transporting persons in a standing position, since a support point 2 for an arm support is in motion in such chairs, in any case during a transition between the two positions. The holder according to the invention is however generally applicable for mounting of armrests 3 which require a determined orientation relative to a base which is susceptible to movement.

[0019] Figure 2 shows a holder 4 according to the present invention for mounting an arm support on a movable carrier, comprising a first holder part 6 mountable on the carrier and a second holder part 8, connected to first holder part 6 for rotating at least about a rotation axis 7 extending horizontally at least in a position of use, for mounting thereon the arm support (not shown). The second holder part 8 has for this purpose a mounting surface provided with mounting holes 9. Parts of a control system shown further in figure 3 are not visible.

[0020] Figure 3 shows schematically a control according to the present invention. The control comprises a sensor 10 for generating a measurement signal which represents the rotational orientation of second holder part 8 relative to the gravitational force. The control additionally comprises a controllable drive 11 for rotating second holder part 8 about the rotation axis relative to the first holder part (not shown). Also present is a control 12 for controlling the drive, which is configured to register a preferred orientation of the second holder part relative to the gravitational force or the first holder part, on the basis of the measurement signal.

[0021] The holder is provided with an input mechanism, such as a button, to input the preferred orientation, formed by a button 13. The control is configured to control the drive such that it rotates second holder part 8 about rotation axis 7 to the preferred orientation when the sensor signal indicates that the rotational orientation of the second holder part differs from the preferred orientation.

[0022] The shown embodiments serve solely for the purpose of illustrating and elucidating the present invention and are by no means limitative for the scope of protection thereof.

[0023] In addition to the shown embodiments many embodiments are possible, all of which are deemed to fall within the scope of protection of the following claims.

Claims

1. Holder for mounting an arm support on a movable carrier, particularly a wheelchair having a first position for transporting persons in a sitting position and a second position for transporting persons in a standing position, comprising:

   - A first holder part mountable on the carrier;
   - A second holder part, connected to the first holder part for rotating at least about a rotation axis extending horizontally at least in a position of use, for mounting the arm support thereon;
   - A sensor for generating a measurement signal which represents the rotational orientation of the second holder part relative to the gravitational force;
   - A controllable drive for rotating the second holder part about the rotation axis relative to the first holder part;
   - A control for controlling the drive on the basis of the measurement signal.

2. Holder as claimed in claim 1, wherein the control is configured to register a preferred orientation of the second holder part relative to the gravitational force or the first holder part.

3. Holder as claimed in claim 2, wherein the holder is provided with an input mechanism, such as a button, to input the preferred orientation.

4. Holder as claimed in claim 2 or 3, wherein the control is configured to control the drive such that it rotates the second holder part about the rotation axis to the preferred orientation when the sensor signal indicates that the rotational orientation of the second holder part differs from the preferred orientation.

5. Holder as claimed in claim 3, wherein the control is configured to control the drive only after a predetermined delay time when the rotational orientation of the second holder part differs from the preferred orientation.

6. Wheelchair, particularly a wheelchair having a first position for transporting persons in a sitting position and a second position for transporting persons in a standing position, comprising a holder as claimed in any of the foregoing claims.

7. Wheelchair as claimed in claim 6, comprising an armrest, particularly a dynamic armrest.

8. Armrest, particularly a dynamic armrest comprising a holder as claimed in any of the claims 1-6.

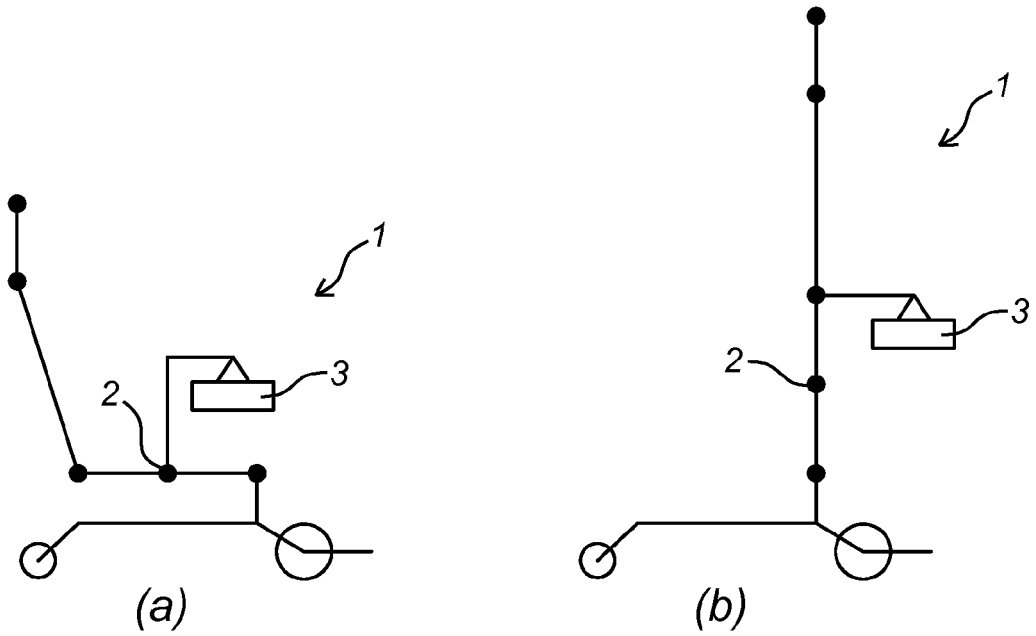

Fig. 1

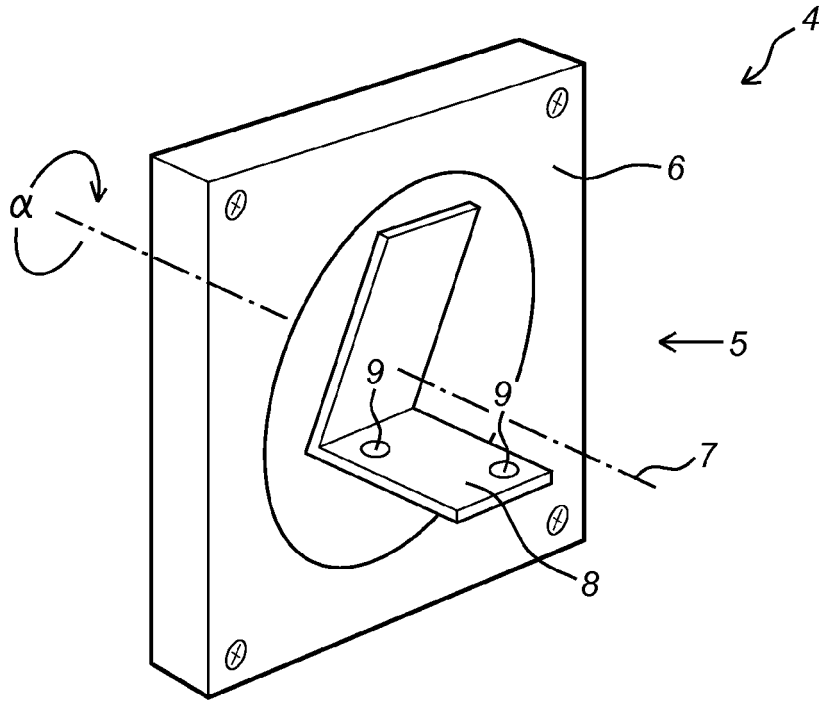

Fig. 2

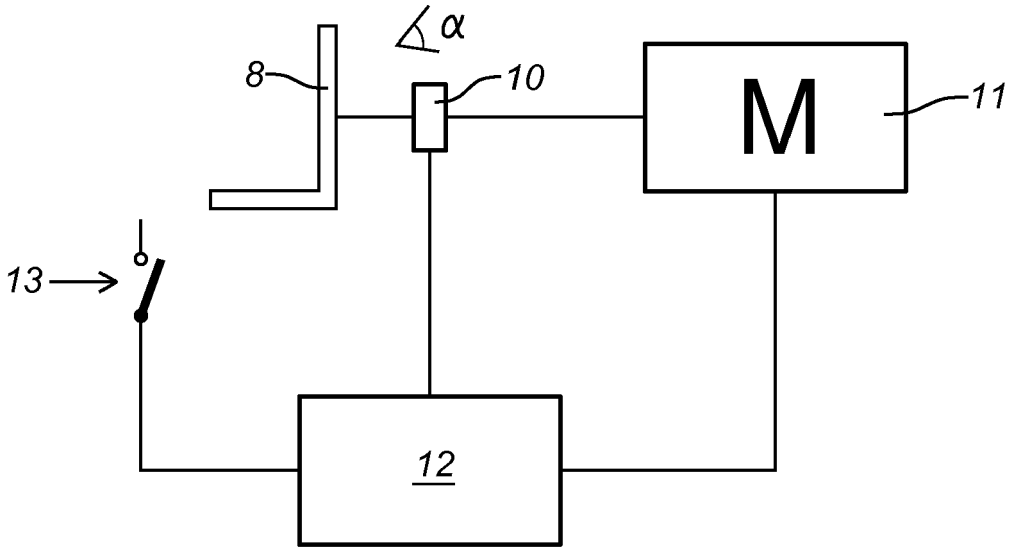

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 16 18 7325

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 2007/095582 A1 (STUIJT HENRICUS J A [NL] ET AL) 3 May 2007 (2007-05-03) * paragraphs [0054], [0075]; figures 1,4,6A,9 *	1-8	INV. A61G5/12 ADD. A61G5/14
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TECHNICAL FIELDS SEARCHED (IPC)
A61G

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	24 January 2017	Mammeri, Damya

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 16 18 7325

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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24-01-2017

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