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(54) DEVICE AND METHOD FOR ADJUSTING A WHEELCHAIR LEG REST

VORRICHTUNG UND VERFAHREN ZUR EINSTELLUNG EINER BEINAUFLAGE FÜR EINEN
ROLLSTUHL

DISPOSITIF ET PROCÉDÉ POUR AJUSTER UN REPOSE-JAMBE DE CHAISE ROULANTE

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Description

[0001] The present invention relates to a device and method for adjusting a wheelchair leg rest. More, specifically, the invention relates to a device and a method as disclosed respectively in the preambles of claims 1 and 7.

[0002] The device according to the invention is an improvement of an existing known solution, and can far more easily be adjusted to the needs of different users as regards adjustment of the leg angle of the leg rest. Traditionally, this is often solved by offering different leg rests mounted at fixed angles. This means that the whole leg rest must be changed in order to change the desired angle. Legs rests that give fixed angles of 70°, 80° or 90°, measured from the horizontal plane down to the leg rest (see Fig. 1), are often used.

[0003] As examples of prior art in the field, mention may also be made of US 3,282,605 and US 3,337,261, which describe almost identical solutions for changing the angle of the foot/leg rest, both of which are far more complex than the solution according to the invention. The upper end of the rest is hinge-attached to the other parts of the wheelchair, and at a distance below the hinge point, there is mounted on the rest a toothed rack-like device having a circular arc form. The toothed rack is intended to cooperate with a locking device that is fixed to the other parts of the wheelchair, and the locking device comprises a mechanism in the form of teeth or the like for engagement with the teeth on the toothed rack, and also a mechanism for side shifting the toothed rack so that it disengages from the teeth in the locking device. In this position, the desired angle for the rest can be adjusted in steps, and once the desired angle has been found, the locking mechanism effects side shifting of the toothed rack so that it re-engages with the teeth in the locking device.

[0004] The prior art also includes US 4 893 827 A, which describes a wheelchair having an adjustable leg rest. The wheelchair includes a foot rest member with a body having a bracket which slideably accommodates one leg of a two-legged support, the opposite leg of which is slidably accommodated in a tube secured to the bottom of the wheelchair seat. Legs are joined to one another by a pivot to enable the included angle between the legs to be adjusted. This angle is maintained by means of a tubular bracket pivoted to a link fixed on the wheelchair seat and a rod pivoted at one end to a link secured to the leg and having its other end slideably accommodated in the bracket. A set screw reacts between the members and to maintain them in selected positions of adjustment.

[0005] The prior art also includes US 153 478 A which discloses a chair having an adjustable back, seat and leg rest. One arcuate part is attached to the leg rest and another is attached to the seat, which is also pivotal. The leg rest may be adjusted by locking encircling clasps or keepers.

[0006] The device and the method according to the invention are characterised by the features disclosed in the characterising clauses of claims 1 and 7 respectively.

[0007] Advantageous embodiments of the invention are set forth in the dependent claims. The device according to the invention is described in more detail below with reference to the attached drawings, wherein:

Fig. 1 shows different leg rests with fixed angles according to the prior art;

Fig. 2 shows an angle-adjustable leg rest according to the invention set at different angles;

Fig. 3 shows the leg rest in Fig. 2 mounted on a wheelchair and set at different angles; and

Fig. 4 is a perspective detailed view of the leg rest and the wheelchair shown in Fig. 3.

[0008] With reference to Figs. 2-4, there is shown an adjustable wheelchair leg rest device 1 in accordance with the present invention.

[0009] Referring in particular to Fig. 4, the device 1 comprises a supporting column 2 to the upper end 3 of which is attachable a forward, upper part 4 of a wheelchair and to the lower end 5 of which is attachable a footrest 6. The supporting column 2 further comprises an upper 2' and a lower 2" part which are hinge-connectable to the wheelchair via a pivot joint 7, or the supporting column comprises an upper part (2') and a lower part (2") which are hinge-connected at a pivot joint (7). To the lower part 2" of the supporting column 2, at a distance from the pivot joint 7, there is attached a first, preferably circular-arc-shaped part 8 having a plurality of adjustment holes 9 arranged along a circular arc with center at the pivot joint 7. The device 1 further comprises a second arc-shaped part (11). To a forward, lower part 10 of the wheelchair there is attachable a second, preferably circular-arc-shaped part 11 for locking cooperation with the first part 8, a plurality of adjustment holes 9 also being provided in the second part 11 along a similar circular arc as for the first part 8, both arc-shaped parts (8, 9) having the same centre when attached to the wheelchair, where the locking advantageously is effected by a bolt 12 passed through two adjustment holes 9 on their respective parts 8, 11 aligned with each other by turning the lower part 2" of the supporting column 2 about the pivot joint 7, and where the bolt is locked with a nut 13.

[0010] The angle adjustment of the device 1, as can be seen, is not stepless, but has predetermined angles of, for example, 70°, 80° or 90°, measured from a horizontal plane through the link 7 and down to the second part 2" of the supporting column 2. This can be seen in particular from Figure 2. Thus, fixed, predefined angles for a user's leg are obtained.

[0011] In a non-illustrated alternative embodiment, the locking bolt 12 is locked in threads provided in the adjustment holes 9 instead of using a locking nut 13.

[0012] In another non-illustrated alternative embodiment, the link 7 is arranged at the junction between the

forward, upper part of the wheelchair 4 and the supporting column 2.

[0013] The aforementioned directional indications "upper", "lower", "forward" etc. are merely intended for descriptive purposes, and should by no means be regarded as limiting for the invention.

Claims

1. An adjustable wheelchair leg rest device (1), comprising

- a supporting column (2) to the upper end (3) of which is attachable a forward, upper part (4) of a wheelchair and to the lower end (5) of which is attachable a footrest (6),

wherein the supporting column (2) is hinge-connectable to the wheelchair via a pivot joint (7), or the supporting column (2) comprises an upper part (2') and a lower part (2'') which are hinge-connected at a pivot joint (7),

characterised in that

- to a lower portion of the supporting column (2), at a distance from the pivot joint (7), there is attached a first, circular-arc-shaped part (8) having a plurality of adjustment holes (9) arranged along a circular arc with centre at the pivot joint (7), and the device (1) further comprises a second, circular arc-shaped part (11),
- where to a forward, lower part (10) of the wheelchair there is attachable said second, circular-arc-shaped part (11) for locking cooperation with the first, circular-arc-shaped part (8), a plurality of adjustment holes (9) also being provided in the second, circular-arc-shaped part (11) along a similar circular arc as for the first, circular-arc-shaped part (8), both circular arc-shaped parts (8, 11) having the same centre when attached to the wheelchair, and
- where the locking is effected by a locking bolt (12) passed through two adjustment holes (9) in the respective circular-arc-shaped parts (8, 11) aligned with each other by turning the lower part (2'') of the supporting column (2) or the supporting column (2) about the pivot joint (7).

2. A device according to claim 1, **characterised in that** the locking bolt (12) is lockable with a nut (13).
3. A device according to claim 1, **characterised in that** the locking bolt (12) is lockable in threads provided in the adjustment holes (9).
4. A device according to any one of the preceding claims, **characterised in that** the link (7) is arranged

at the junction between the forward, upper part of the wheelchair (4) and the supporting column (2).

5. A device according to any one of the preceding claims, **characterised in that** three adjustment holes (9) are arranged on each of the respective parts (8, 11).
6. A device according to claim 5, **characterised in that** the angle adjustment of the device (1) is carried out at predetermined angles of 70°, 80° and 90°.
7. A method for angle adjustment using a device (1) according to any one of the preceding claims, **characterised by** bringing two selected adjustment holes (9) on respective circular arc-shaped parts (8, 11) into alignment with each other by turning the lower part (2'') of the supporting column (2) or the supporting column (2) about the pivot joint (7); and passing a locking bolt (12) through the two aligned adjustment holes (9) for locking the respective parts (8, 11) together.
8. A method according to claim 7, **characterised by** locking the locking bolt (12) with a nut (13).
9. A method according to claim 7, **characterised by** locking the locking bolt (12) in threads provided in the adjustment holes (9).

Patentansprüche

1. Einstellbare Beinauflage (1) für einen Rollstuhl, umfassend
 - eine Tragsäule (2), an deren oberem Ende (3) ein vorderer, oberer Teil (4) eines Rollstuhls befestigbar ist, und an deren unterem Ende (5) eine Fussaufflage (6) befestigbar ist,

wobei die Tragsäule (2) über ein Drehgelenk (7) mit dem Rollstuhl durch Scharnier verbindbar ist, oder die Tragsäule (2) einen oberen Teil (2') und einen unteren Teil (2'') umfasst, welche an einem Drehgelenk (7) durch Scharnier verbunden sind,

dadurch gekennzeichnet, dass

 - an einem unteren Abschnitt der Tragsäule (2), in einem Abstand zum Drehgelenk (7), ein erster kreisbogenförmiger Teil (8) befestigt ist, welcher eine Mehrzahl von Einstelllöchern (9) aufweist, die um einen Kreisbogen mit Zentrum am Drehgelenk (7) angeordnet sind, und die Vorrichtung (1) ferner einen zweiten kreisbogenförmigen Teil (11) umfasst,
 - wobei an einem vorderen, unteren Teil (10)

- des Rollstuhls der zweite kreisbogenförmige Teil (11) befestigbar ist, um mit dem ersten kreisbogenförmigen Teil (8) verriegelnd zusammenzuwirken, wobei auch in dem zweiten kreisbogenförmigen Teil (11) an einem ähnlichen Kreisbogen entlang wie bei dem ersten kreisbogenförmigen Teil (8) eine Mehrzahl von Einstelllöchern (9) vorgesehen sind, wobei die beiden kreisbogenförmigen Teile (8, 11) das gleiche Zentrum aufweisen, wenn sie an dem Rollstuhl befestigt sind, und
- wobei das Verriegeln durch einen Verriegelungsbolzen (12) durchgeführt wird, welcher durch zwei Einstelllöcher (9) in den jeweiligen kreisbogenförmigen Teilen (8, 11) hindurch geführt sind, welche durch Drehen des unteren Teils (2'') der Tragsäule (2) oder der Tragsäule (2) um das Drehgelenk (7) zueinander ausgerichtet sind.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Verriegelungsbolzen (12) mit einer Mutter (13) verriegelbar ist.
 3. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** der Verriegelungsbolzen (12) in den Einstelllöchern (9) vorgesehenen Gewinden verriegelbar ist.
 4. Vorrichtung nach einem der vorgehenden Ansprüche, **dadurch gekennzeichnet, dass** das Gelenk (7) an dem Verbindungspunkt zwischen dem vorderen, oberen Teil des Rollstuhls (4) und der Tragsäule (2) angeordnet ist.
 5. Vorrichtung nach einem der vorgehenden Ansprüche, **dadurch gekennzeichnet, dass** drei Einstelllöcher (9) an jeweils einem der jeweiligen Teile (8, 11) angeordnet sind.
 6. Vorrichtung nach Anspruch 5, **dadurch gekennzeichnet, dass** die Winkelverstellung der Vorrichtung (1) bei vorgegebenen Winkeln von 70°, 80° and 90° durchgeführt ist.
 7. Verfahren zur Winkelverstellung unter Verwendung einer Vorrichtung (1) nach einem der vorgehenden Ansprüche, **gekennzeichnet durch**
 - Ausrichten zueinander von zwei ausgewählten Einstelllöchern (9) an jeweiligen kreisbogenförmigen Teilen (8, 11) **durch** Drehen des unteren Teils (2'') der Tragsäule (2) oder der Tragsäule (2) um das Drehgelenk (7); und
 - Führen eines Verriegelungsbolzens (12) **durch** die beiden ausgerichteten Einstelllöcher (9) hindurch, um die jeweiligen Teile (8, 11) miteinander zu verriegeln.
 8. Verfahren nach Anspruch 7, **gekennzeichnet durch** Verriegeln des Verriegelungsbolzens (12) mit einer Mutter (13).
 9. Verfahren nach Anspruch 7, **gekennzeichnet durch** Verriegeln des Verriegelungsbolzens (12) in den Einstelllöchern (9) vorgesehenen Gewinden.
- ## 10 Revendications
1. Dispositif (1) pour régler un repose-jambe pour un fauteuil roulant, comprenant
 - une colonne de support (2) à l'extrémité supérieure (3) de laquelle peut être fixée une partie supérieure avant (4) d'un fauteuil roulant et à l'extrémité inférieure (5) de laquelle peut être fixé un repose-pied (6),
 la colonne de support (2) pouvant être reliée à charnière au fauteuil roulant par l'intermédiaire d'une bielle (7), ou la colonne de support (2) comprenant une partie supérieure (2') et une partie inférieure (2'') qui sont reliées à charnière à une bielle (7),
 caractérisé en ce que
 - à une partie inférieure de la colonne de support (2), à une distance de la bielle (7), on a attaché une première partie en forme d'arc de cercle (8) ayant une pluralité de trous de réglage (9) disposée le long d'un arc de cercle avec le centre à la bielle (7), et
 - le dispositif (1) comprenant en outre une deuxième partie en forme d'arc de cercle (11),
 - à une partie inférieure avant (10) du fauteuil roulant pouvant être fixée ladite deuxième partie en forme d'arc de cercle (11) pour coopération de verrouillage avec la première partie en forme d'arc de cercle (8), une pluralité de trous de réglage (9) étant également pourvue dans la deuxième partie en forme d'arc de cercle (11) le long d'un arc de cercle similaire comme pour la première partie en forme d'arc de cercle (8), les deux parties en forme d'arc de cercle (8, 11) ayant le même centre lorsqu'elles sont fixées au fauteuil roulant, et
 - le verrouillage étant avantageusement effectué par un boulon de verrouillage (12) passé à travers deux trous de réglage (9) dans leurs parties respectives en forme d'arc de cercle (8, 11) alignées l'une avec l'autre en faisant tourner la partie inférieure (2'') de la colonne de support (2) ou la colonne de support (2) autour de la bielle (7).
 2. Dispositif selon la revendication 1, **caractérisé en ce que** le boulon de verrouillage (12) est verrouillé

par un écrou (13).

3. Dispositif selon la revendication 1, **caractérisé en ce que** le boulon de verrouillage (12) est verrouillé dans des filetages prévus dans les trous de réglage (9). 5
4. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** la liaison (7) est disposée à la jonction entre la partie supérieure avant du fauteuil roulant (4) et la colonne de support (2). 10
5. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** trois trous de réglage (9) sont disposés sur chacune des parties respectives (8, 11). 15
6. Dispositif selon la revendication 5, **caractérisé en ce que** le réglage de l'angle du dispositif (1) est effectué à des angles prédéterminés de 70°, de 80° et de 90°. 20
7. Procédé de réglage d'un angle au moyen d'un dispositif (1) selon l'une quelconque des revendications précédentes, **caractérisé par** 25
 - la mise de deux trous de réglage (9) sélectionnés sur les parties respectives en forme d'arc de cercle (8, 11) en alignement l'un avec l'autre en faisant tourner la partie inférieure (2") de la colonne de support (2) ou la colonne de support (2) autour de la bielle (7); et 30
 - le passage d'un boulon de verrouillage (12) à travers les deux trous de réglage alignés (9) pour verrouiller les parties respectives (8, 11) l'une à l'autre. 35
8. Procédé selon la revendication 7, **caractérisé par** le verrouillage du boulon de verrouillage (12) avec un écrou (13). 40
9. Procédé selon la revendication 7, **caractérisé par** le verrouillage du boulon de verrouillage (12) dans des filetages prévus dans les trous de réglage (9). 45

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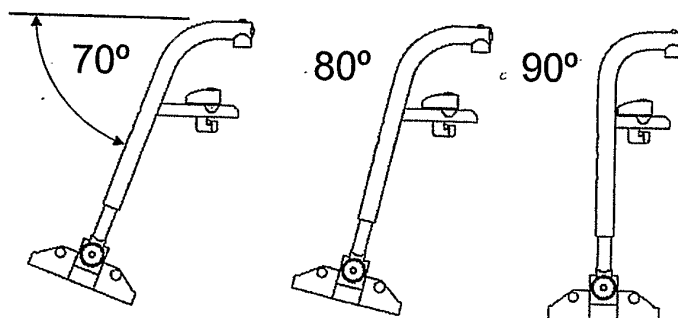


Fig. 1

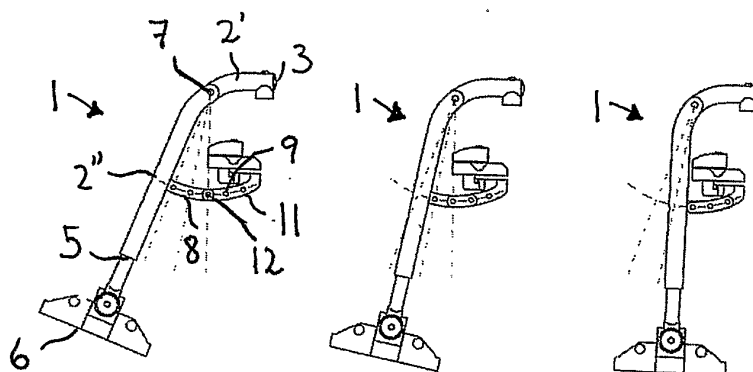


Fig. 2

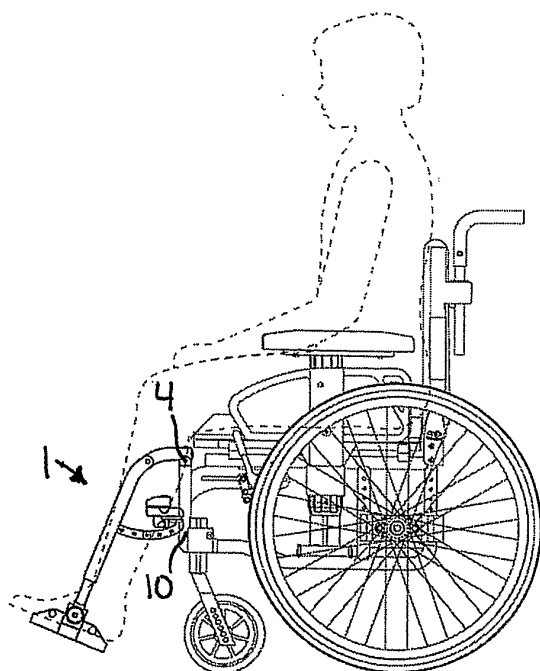


Fig. 3

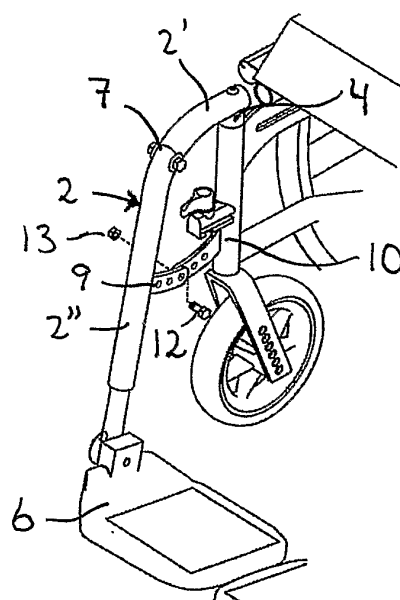


Fig 4

REFERENCES CITED IN THE DESCRIPTION

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