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(54) **HEIGHT ADJUSTMENT DEVICE FOR A HANDLE OF A ROLLATOR**

HÖHENVERSTELLUNGSVORRICHTUNG FÜR EINEN GRIFF EINES ROLLATORS

DISPOSITIF DE RÉGLAGE EN HAUTEUR POUR UNE POIGNÉE D'AMBULATEUR

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(73) Proprietor: **Invacare International Sàrl**

1196 Gland (CH)

(72) Inventors:

- **VAN HOUTEM, Jos**
S-34032 Grimslov (SE)

- **NILSSON, Tobias**
S-34133 Ljungby (SE)

(74) Representative: **Ganguillet, Cyril et al**

ABREMA

Agence Brevets & Marques Ganguillet

Avenue du Théâtre 16

P.O. Box 5027

1002 Lausanne (CH)

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EP 2 825 147 B9

Description

FIELD OF THE INVENTION

[0001] The present invention relates to a height adjustment device for a handle of a rollator.

[0002] The present invention relates also to a rollator comprising height adjustable handles wherein each handle is adjusted through a height adjustment device.

[0003] Finally, the present invention relates to a method for adjusting and memorizing a desired height of a handle of a rollator using a height adjustment device.

BACKGROUND OF THE INVENTION

[0004] Certain health conditions hinder vertical balance, and movement in the upright position or other mechanics of walking. The health care industry has developed aids for those who suffer from such conditions, including crutches, walkers, rollators, and wheelchairs. Rollators are wheeled supports which aid individuals who have function in their lower limbs, but lack the muscular control, strength or balance to enable them to walk unassisted. It is advantageous for such supports to include two pairs of wheels in order to avoid the need to lift the device, and to facilitate its use as an ambulatory aid. Further, these devices may include a seat so that a user may use the device to sit and rest.

[0005] Conventional rollators may also comprise height adjustable handles. These height adjustable handles permit to adapt the rollator to the needs of the user.

[0006] In the document US 2005/0211285, the handles are mounted on the ends of uprights telescopically adjustable in the main frame of the rollator. The adjustment of the handle height consists in removing and repositioning screws inside corresponding holes provided in the uprights and the main frame. This procedure is generally long and boring, and involves appropriate tools for removing the screws. Another disadvantage of this known rollator is the impossibility for a user to memorize a desired handle height corresponding to its needs. Thus, one user has no choice but to repeat the same handle height adjusting procedure every time he uses the rollator after a storage period, during which the handles of the rollator are generally positioned in their lowest position.

[0007] Another height adjustment device for a handle of a rollator is disclosed in EP 2 343 035 A1.

[0008] One aim of the present invention is therefore to provide a height adjustment device for a handle of a rollator, wherein the drawbacks mentioned above is avoided.

SUMMARY OF THE INVENTION

[0009] In this view, the present invention is concerned with a height adjustment device as claimed in claim 1 and a method for adjusting and memorizing a desired height of claim 15.

[0010] Important features of the device are defined in the dependent claims.

[0011] Thanks to the features of the invention, the height of the handles may be easily and quickly adjusted.

[0012] Furthermore, the user has the possibility to memorize a desired height so as to avoid repeating the same handle height adjusting procedure every time he uses the rollator.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Other features and advantages of the present invention will appear more clearly from the detailed description of one embodiment of the invention which is presented solely by way of a non-restricted example and illustrated by the attached drawings in which:

Figure 1 is a perspective view of a handle of a rollator provided with a height adjustment device according to the present invention;

Figures 2a and 2b are vertical section views of the handle of Figure 1, respectively in locked and unlocked positions;

Figure 3 is a similar view to Figure 1 showing by transparency an abutment means lodged inside the outer tube;

Figure 4a, 4b and 4c are vertical section views of the handle of Figure 3, respectively in rest, adjusting and locked positions of the abutment means;

Figure 4d is a cross section view of the handle of Figure 3.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0014] In reference to Figure 1, a height adjustment device conform to the present invention is shown.

[0015] The height adjustment device 1 comprises an inner tube 2 telescopically received in an outer tube 3, the handle 4 of the rollator being connected at the upper end of said inner tube 2. The outer tube 3 may be connected to the main frame of the rollator or, preferably, may define one upright of said main frame. This illustration does not reveal the locking and unlocking assemblies permitting, respectively, to lock the inner tube 2 in a fixed position with regard to the outer tube 3 and to unlock said inner tube 2 from said fixed position because they are partially lodged inside the outer tube 3. As better explained in the following paragraphs, such assemblies may not be limited to the embodiment shown on Figures 2a, 2b.

[0016] In reference to Figures 2a and 2b, a first embodiment of the height adjustment device of Figure 1 is shown.

[0017] In this embodiment, the external surface of the inner tube 2 is provided with a plurality of semispherical recesses 5, said recesses being spaced-apart along the periphery of the inner tube and being aligned in the axial

direction of said inner tube. A locking assembly 10 comprises a housing 11 fixedly connected to the outer tube 3 through a screw 12 and disposed in a gap between the inner tube 2 and the outer tube 3, a locking ball 13 at least partially received in a through hole 11a formed through a longitudinal flange 11b of the housing 11 between the external surface of the housing 11 and an central opening 11c formed inside the housing 11, and a sliding piece 14 slidably received inside said opening 11b, said sliding piece 14 being urged outside of the opening 11c by means of a spring 15 disposed inside the opening 11c, one end of said spring 15 abutting against the bottom of the opening 11c and the other end abutting against the upper face of the sliding piece 14. In the embodiment shown, the opening 11c and the sliding piece 14 define approximately a cylindrical shape, the sliding piece 14 being slidably movable inside the opening 11c along a direction approximately parallel to the axis of the inner tube 2. The expressions "axial direction" or "axially" will be used thereafter so as to characterize all directions approximately parallel to the axis of the inner tube 2. In addition, the sliding piece 14 comprises a cavity 16 formed at its periphery, said cavity 16 being adapted to receive at least partially the locking ball 13.

[0018] Thus configured, the locking assembly 10 permits, respectively, to lock and unlock the inner tube 2 in and from its fixed position with regard to the outer tube 3 depending on the position of the sliding piece 14 inside the opening 11c.

[0019] In particular, in a first position of the sliding piece 14, thereafter defined as the "locking" position, illustrated in Figure 2a, the sliding piece 14 is positioned downwards under the action of the spring 15 so that the cylindrical periphery of the sliding piece exerts a radially inward force on the locking ball 13 such that said locking ball 13 is pushed outside of the through hole 11a. The expression "radially inward" or "radially outward" refers to a direction oriented from the periphery of the outer tube 3 to the center of said outer tube 3, or inversely. Thus, when the through hole 11a is aligned with a semispherical recess 5 of the inner tube 2, the locking ball 13 is pushed inside said semispherical recess 5 when the sliding piece 14 is in its locking position. In this configuration, the locking ball 14 extends both in the through hole 11a and the semispherical recess 5 and prevents the axial displacement of the inner tube 2 along the outer tube 3.

[0020] In a second position of the sliding piece 14, thereafter defined as the "unlocking" position, illustrated in Figure 2b, the sliding piece 14 is positioned upwards against the action of the spring 15 so that the cavity 16 is aligned with the through hole 11a. Thus, the locking ball 14 may at least partially be received in the cavity 16 such that the locking ball 14 does not protrude from the periphery of the housing 11. In this configuration, the locking ball 14 does not prevent the axial displacement of the inner tube 2 along the outer tube 3. In a preferred embodiment, the cavity 16 is formed with an upper portion inclining towards the outer surface of the sliding piece 14

so as to permit a progressive displacement of the locking ball 13.

[0021] The displacement of the sliding piece 14 from its locking position to its unlocking position is done by the unlocking assembly 20.

[0022] In the embodiment shown, the unlocking assembly 20 comprises a driving piece 21 fixedly connected to the sliding piece 14 through a screw 22, said driving piece 21 extending through a slit 23 formed in the outer tube 3 such that said driving piece 21 protrudes from the periphery of said outer tube 3. In particular, a grip 21a integral with said driving piece 21 may be actuated by the hand of a user so as to axially move the driving piece 21 from a lower position in which said driving piece 21 abuts against a lower end of the slit 23, said lower position corresponding to the locking position of the sliding piece 14, to an upper position in which said driving piece 21 abuts against an upper end of the slit 23, said upper position corresponding to the unlocking position of the sliding piece 14.

[0023] The height adjustment device 1 comprises also an upper sleeve 6 partially disposed in the gap between the inner tube 2 and the outer tube 3, said upper sleeve 6 being fixedly connected at the upper part of the outer tube 3 through the screw 12. The upper sleeve 6 is configured so as to keep constant the distance between the inner tube 2 and the outer tube 3. In particular, as shown on Figures 1 and 4d, the upper sleeve 6 comprises a cut-out 6a formed in its upper face, said cut-out 6a being adapted to slidably receive the inner tube 2. In the preferred embodiment shown, this cut-out 6a has sensitively the same shape as the cross section of the inner tube 2. To prevent the inner tube 2 from rotating around its axis, which could lead to a bad alignment between the through hole 11a and the semispherical recesses 5, in particular when the sliding piece 14 is in its unlocking position, the cut-out 6a may have a shape chosen among a polygon, an ellipse and any other closed curve except a circle.

[0024] The height adjustment device according to the invention may also comprise an abutment means so as to enable the user to find automatically a desired handle height after the handle has been lowered in its storage position. This abutment means could be used in the embodiment of Figures 1, 2a and 2b, but could also be adapted to other embodiments revealing only the features of independent claim 1 and dependent claim 5.

[0025] In a first embodiment (not shown), the abutment means consists in a pin integral with the inner tube 2, said pin extending radially outward from the periphery of said inner tube 2 such that said pin abuts against a lower face 6b of the upper sleeve 6 when the handle 4 and the inner tube 2 are positioned in their highest position corresponding to the desired handle height. In this embodiment, the abutment means can not be easily adapted to the needs of the user.

[0026] In the embodiment shown in Figures 3, 4a to 4d, the abutment means 30 comprises an elongated element 31 slidably received in an axial groove 7 provided

at the periphery of the inner tube 2, said elongated element 31 having a lower part to which is fixedly connected a pin 32, said pin extending radially outward from the periphery of the inner tube 2, and an upper part inside which is formed a threaded through hole 33, said through hole extending in a direction approximately orthogonal to an axial direction and being adapted to receive a screw 34, said screw removably connecting the elongated element 31 to the inner tube 2 when it is tightened.

[0027] The method for adjusting and memorizing a desired height for the handle of a rollator is explained in the following paragraph in relation with Figures 4a to 4c.

[0028] In Figure 4a, the handle 4 has been moved from its storage position, in which, for instance, the lower end of the handle 4 abuts against the upper face 6c of the upper sleeve 6, to an intermediate position in which the elongated element 31 has been moved toward the upper part of the outer tube 3. This displacement is possible on the condition that the inner tube 2 is unlocked and the screw 34 does not protrude radially outward from the periphery of the inner tube 2. When no desired handle height has been memorized, the elongated element 31 is disconnected from the inner tube 2 and abuts against an upper face 8a of a lower sleeve 8 connected at the lower end of the inner tube 2 and slidably received inside the outer tube 3. Such a configuration may occur for example when the length of the screw 34 is less than or approximately equal to the length of the through hole 33.

[0029] In Figure 4b, the handle 4 has been moved from the intermediate position of Figure 4a to its highest position, in which the pin 32 abuts against a lower face 6b of the upper sleeve 6. Thereafter, the inner tube 2 has been locked in said highest position through the locking assembly 20. In this position, the through hole 33 is positioned just above the upper face 6c of said upper sleeve 6. Such a configuration may occur for example when the distance separating the pin 32 and the through hole 33 is slightly higher than the distance separating said lower and upper faces 6b, 6c of the upper sleeve 6. Thus, in this position, the user may tighten the screw 34 so as to connect the elongated element 31 to the inner tube 2. However, before tightening said screw 34, the user must adjust the handle height to the desired height. Accordingly, he untightens the screw 34 until said screw protrudes radially outward from the periphery of the inner tube 2. Thus, the screw 34 abuts against the upper face 6c of the upper sleeve 6, preventing the elongated element 31 to move downwards.

[0030] In Figure 4c, the handle 4 has been moved from its highest position to a final position, in which the desired height is reached. This displacement is possible on the condition that the inner tube 2 has been unlocked beforehand through the unlocking assembly 30. When the desired height is reached, the inner tube 2 is locked through the locking assembly 20 and the screw 34 is tightened so as to connect the elongated element 31 to the inner tube 2. Thus, the user has memorized this final position and can automatically adjust the handle height to the

desired height each time he moves the inner tube 2 to its highest position, the elongated element 31 being connected to the inner tube 2.

Claims

1. Height adjustment device (1) for a handle (4) of a rollator, comprising:

- an inner tube (2) telescopically received in an outer tube (3), the handle (4) of the rollator being connected at the upper end of said inner tube (2),
- a locking assembly (10) adapted to lock the inner tube (2) in a fixed position with regard to the outer tube (3),
- an unlocking assembly (20) adapted to unlock the inner tube (2) from said fixed position,

characterized in that an upper part of the outer tube (3) is connected to an upper sleeve (6), said upper sleeve (6) being configured so as to keep constant the distance between the inner tube (2) and the outer tube (3), wherein the inner tube (2) is movable inside the outer tube (3) between a lowest position, in which, for instance, a lower end of the handle (4) of the rollator abuts against the upper face (6c) of the upper sleeve (6), and a highest position, in which an abutment means (30) at least temporarily integral with the inner tube (2) abuts against a lower face (6b) of the upper sleeve (6).

2. Height adjustment device (1) according to claim 1, wherein the external surface of the inner tube (2) is provided with a plurality of semispherical recesses (5) and the locking assembly (10) comprises:

- an housing (11) fixedly connected to the outer tube (3) and disposed in a gap formed between the inner tube (2) and the outer tube (3), said housing (11) comprising a longitudinal flange (11b) adjacent to the inner tube (2), said longitudinal flange (11b) comprising a through hole (11a) adapted to receive at least partially a locking ball (13), and
- a sliding piece (14) slidably movable inside an opening (11c) of the housing (11) between a locking position, in which the sliding piece (14) exerts a radially inward locking force on the locking ball (13) so as to push said locking ball (13) inside one of the semispherical recesses (5) of the inner tube (2), and an unlocking position, in which a cavity (16) formed in the external surface of the sliding piece (14) is adapted to receive at least partially the locking ball (13).

3. Height adjustment device (1) according to claim 2,

wherein the unlocking assembly (20) comprises a driving piece (21) fixedly connected to the sliding piece (14), said driving piece (21) extending through a slit (23) formed in the outer tube (3) so as to be actuated by the hand of a user, said slit (23) being configured so as to permit the sliding displacement of said driving piece (21) between a first position corresponding to the locking position of the sliding piece (14) and a second position corresponding to the unlocking position of the sliding piece (14).

4. Height adjustment device (1) according to any one of claim 2 or 3, wherein the locking assembly (10) comprises a spring (15) disposed inside the opening (11c) of the housing (11), one end of said spring (15) abutting against the housing (11) and the other end of said spring (15) abutting against the sliding piece (14) such that the sliding piece (14) moves from its unlocking position to its locking position under the action of the spring (15).
5. Height adjustment device (1) according to any one of claims 1 to 4, wherein the upper sleeve (6) comprises a cut-out (6a) formed inside its upper face (6c), said cut-out (6a) being adapted to receive the inner tube (2).
6. Height adjustment device (1) according to claim 5, wherein the cut-out (6a) has sensitively the same shape as the cross section of the inner tube (2).
7. Height adjustment device (1) according to claim 6, wherein the cut-out (6a) is configured so as to prevent the inner tube (2) from rotating around its axis.
8. Height adjustment device (1) according to claim 7, wherein the cut-out (6a) has a shape chosen among a polygon, an ellipse and any other closed curve except a circle.
9. Height adjustment device (1) according to any one of claims 1 to 8, wherein the abutment means consists in a pin integral with the inner tube (2), said pin extending radially outward from the periphery of the inner tube (2).
10. Height adjustment device (1) according to any one of claims 1 to 8, wherein the abutment means (30) includes an elongated element (31) adapted to be slidably received in an axial groove (7) provided at the periphery of the inner tube (2), said elongated element (31) having a lower part to which is fixedly connected a pin (32), said pin (32) extending radially outward from the periphery of the inner tube (2), and an upper part inside which is formed a threaded through hole (33), said through hole (33) extending in a direction approximately orthogonal to an axial direction and being adapted to receive a screw (34)

so as to removably connect the elongated element (31) to the inner tube (2).

11. Height adjustment device (1) according to the claim 10, wherein the length of the screw (34) is less than or approximately equal to the length of the through hole (33) such that the screw (34) does not protrude radially outward from the periphery of the inner tube (2) when the elongated element (31) is connected to the inner tube (2) and may protrude radially outward from the periphery of the inner tube (2) when the elongated element (31) is disconnected from the inner tube (2).
12. Height adjustment device (1) according to claim 11, wherein the distance separating the pin (32) and the through hole (33) of the elongated element (31) in the axial direction is slightly higher than the distance separating the lower (6b) and upper face (6c) of the upper sleeve (6) such that said through hole (33) is positioned just above the upper face (6c) of the upper sleeve (6) when said pin (32) abuts against the lower face (6b) of the upper sleeve (6).
13. Height adjustment device (1) according to claim 12, wherein a lower sleeve (8) is connected at the lower end of the inner tube (2), said lower sleeve (8) being slidably received inside the outer tube (3) and comprising an upper face (8a) against which abuts the elongated element (31) when it is disconnected from the inner tube (2) and when the screw (34) does not protrude radially outward from the periphery of the inner tube (2).
14. Rollator comprising height adjustable handles wherein each handle (4) is adjusted through a height adjustment device (1) according to any one of the claims 1 to 13.
15. Method for adjusting and memorizing a desired height of a handle (4) of a rollator using a height adjustment device (1) according to claim 13, said method comprising the steps of:
 - displacement of the handle (4) so as to move the inner tube (2) in its highest position, the elongated element (31) being disconnected from the inner tube (2) and resting on the upper face (8a) of the lower sleeve (8),
 - locking of the inner tube (2) in its highest position through the locking assembly (10),
 - unscrewing of the screw (34) lodged inside the through hole (33) of the elongated element (31) until said screw (34) protrudes radially outward from the periphery of the inner tube (2),
 - unlocking of the inner tube (2) through the unlocking assembly (20),
 - displacement of the handle (4) until the desired

height is reached, said screw (34) abutting against the upper face (6c) of the upper sleeve (6),

- locking of the inner tube (2) through the locking assembly (10),

- screwing of said screw (34) so as to connect the elongated element (31) to the inner tube (2).

Patentansprüche

1. Höhenverstellsvorrichtung (1) für einen Griff (4) eines Rollators, umfassend:

- ein Innenrohr (2), das ineinanderschiebbar in einem Außenrohr (3) aufgenommen ist, wobei der Griff (4) des Rollators an dem oberen Ende des Innenrohrs (2) angeschlossen ist,

- eine Verriegelungseinrichtung (10), die geeignet ist, das Innenrohr (2) in einer festen Stellung in Bezug auf das Außenrohr (3) zu verriegeln,

- eine Entriegelungseinrichtung (20), die geeignet ist, das Innenrohr (2) aus der festen Stellung zu entriegeln,

dadurch gekennzeichnet, dass

ein oberer Teil des Außenrohrs (3) mit einer oberen Hülse (6) verbunden ist, wobei die obere Hülse (6) so ausgelegt ist, dass sie den Abstand zwischen dem Innenrohr (2) und dem Außenrohr (3) konstant hält,

wobei das Innenrohr (2) in dem Außenrohr (3) zwischen einer untersten Stellung, in der zum Beispiel ein unteres Ende des Griffs (4) des Rollators an der Oberseite (6c) der oberen Hülse (6) anliegt, und einer obersten Stellung, in der ein Widerlagermittel (30), das wenigstens vorübergehend mit dem Innenrohr (2) eine Einheit bildet, an einer Unterseite (6b) der oberen Hülse (6) anliegt, bewegbar ist.

2. Höhenverstellsvorrichtung (1) nach Anspruch 1, wobei die Außenfläche des Innenrohrs (2) mit einer Vielzahl von halbkugelförmigen Vertiefungen (5) versehen ist und die Verriegelungseinrichtung (10) Folgendes umfasst:

- ein Gehäuse (11), das fest mit dem Außenrohr (3) verbunden und in einem zwischen dem Innenrohr (2) und dem Außenrohr (3) ausgebildeten Spalt angeordnet ist, wobei das Gehäuse (11) einen benachbart zu dem Innenrohr (2) gelegenen Längsflansch (11b) umfasst, wobei der Längsflansch (11b) eine Durchgangsbohrung (11a) umfasst, die geeignet ist, wenigstens zum Teil eine Verriegelungskugel (13) aufzunehmen, und

- ein Gleitstück (14), das in einer Öffnung (11c) des Gehäuses (11) zwischen einer Verriegelungs-

stellungsstellung, in der das Gleitstück (14) eine radial nach innen gerichtete Zuhaltkraft auf die Verriegelungskugel (13) ausübt, um die Verriegelungskugel (13) in einer der halbkugelförmigen Vertiefungen (5) des Innenrohrs (2) zu verschieben, und einer Entriegelungsstellung, in der ein in der Außenfläche des Gleitstücks (14) ausgebildeter Hohlraum (16) geeignet ist, die Verriegelungskugel (13) wenigstens zum Teil aufzunehmen, auf gleitbare Weise bewegbar ist.

3. Höhenverstellsvorrichtung (1) nach Anspruch 2, wobei die Entriegelungseinrichtung (20) ein Antriebsstück (21) umfasst, das fest mit dem Gleitstück (14) verbunden ist, wobei sich das Antriebsstück (21) durch einen in dem Außenrohr (3) ausgebildeten Schlitz (23) erstreckt, um von einem Benutzer von Hand betätigt zu werden, wobei der Schlitz (23) so ausgelegt ist, dass er die gleitende Verschiebung des Antriebsstücks (21) zwischen einer ersten Stellung, die der Verriegelungsstellung des Gleitstücks (14) entspricht, und einer zweiten Stellung, die der Entriegelungsstellung des Gleitstücks (14) entspricht, ermöglicht.

4. Höhenverstellsvorrichtung (1) nach einem der Ansprüche 2 oder 3, wobei die Verriegelungseinrichtung (10) eine Feder (15) umfasst, die in der Öffnung (11c) des Gehäuses (11) angeordnet ist, wobei ein Ende der Feder (15) an dem Gehäuse (11) anliegt und das andere Ende der Feder (15) an dem Gleitstück (14) auf eine solche Weise anliegt, dass sich das Gleitstück (14) unter der Einwirkung der Feder (15) aus seiner Entriegelungsstellung in seine Verriegelungsstellung bewegt.

5. Höhenverstellsvorrichtung (1) nach einem der Ansprüche 1 bis 4, wobei die obere Hülse (6) eine Aussparung (6a) umfasst, die in der Oberseite (6c) derselben ausgebildet ist, wobei die Aussparung (6a) geeignet ist, das Innenrohr (2) aufzunehmen.

6. Höhenverstellsvorrichtung (1) nach Anspruch 5, wobei die Aussparung (6a) auf empfindliche Weise die gleiche Form wie der Querschnitt des Innenrohrs (2) aufweist.

7. Höhenverstellsvorrichtung (1) nach Anspruch 6, wobei die Aussparung (6a) so ausgelegt ist, dass sie das Innenrohr (2) daran hindert, sich um seine Achse zu drehen.

8. Höhenverstellsvorrichtung (1) nach Anspruch 7, wobei die Aussparung (6a) eine Form hat, die aus einem Polygon, einer Ellipse oder jedweder anderen geschlossenen Kurve außer einem Kreis ausgewählt ist.

9. Höhenverstellvorrichtung (1) nach einem der Ansprüche 1 bis 8, wobei das Widerlagermittel aus einem mit dem Innenrohr (2) eine Einheit bildenden Stift besteht, der sich von dem Umfang des Innenrohrs (2) radial nach außen erstreckt. 5
10. Höhenverstellvorrichtung (1) nach einem der Ansprüche 1 bis 8, wobei das Widerlagermittel (30) ein längliches Element (31) umfasst, das geeignet ist, in einer axialen Nut (7), die an dem Umfang des Innenrohrs (2) vorgesehen ist, auf gleitbare Weise aufgenommen zu werden, wobei das längliche Element (31) einen unteren Teil, mit dem ein Stift (32) fest verbunden ist, der sich von dem Umfang des Innenrohrs (2) radial nach außen erstreckt, und einen oberen Teil aufweist, in dem eine mit einem Gewinde versehene Durchgangsbohrung (33) ausgebildet ist, wobei sich die Durchgangsbohrung (33) in einer Richtung erstreckt, die in etwa rechtwinklig zu einer axialen Richtung verläuft und geeignet ist, eine Schraube (34) aufzunehmen, um das längliche Element (31) auf lösbare Weise mit dem Innenrohr (2) zu verbinden. 10
11. Höhenverstellvorrichtung (1) nach Anspruch 10, wobei die Länge der Schraube (34) kleiner oder in etwa gleich der Länge der Durchgangsbohrung (33) auf eine solche Weise ist, dass die Schraube (34) von dem Umfang des Innenrohrs (2) nicht radial nach außen vorsteht, wenn das längliche Element (31) mit dem Innenrohr (2) verbunden ist, und von dem Umfang des Innenrohrs (2) radial nach außen vorstehen kann, wenn das längliche Element (31) nicht mit dem Innenrohr (2) verbunden ist. 15 20 25 30
12. Höhenverstellvorrichtung (1) nach Anspruch 11, wobei der den Stift (32) und die Durchgangsbohrung (33) des länglichen Elements (31) in axialer Richtung trennende Abstand etwas größer als der die Unterseite (6b) und die Oberseite (6c) der oberen Hülse (6) trennende Abstand ist, und zwar derart, dass die Durchgangsbohrung (33) soeben über der Oberseite (6c) der oberen Hülse (6) positioniert ist, wenn der Stift (32) an der Unterseite (6b) der oberen Hülse (6) anliegt. 35 40 45
13. Höhenverstellvorrichtung (1) nach Anspruch 12, wobei eine untere Hülse (8) an dem unteren Ende des Innenrohrs (2) angeschlossen ist, wobei die untere Hülse (8) auf gleitbare Weise in dem Außenrohr (3) aufgenommen ist und eine Oberseite (8a) umfasst, an der das längliche Element (31) anliegt, wenn es nicht mit dem Innenrohr (2) verbunden ist und wenn die Schraube (34) von dem Umfang des Innenrohrs (2) nicht radial nach außen vorsteht. 50 55
14. Rollator, umfassend höhenverstellbare Griffe, wobei jeder Griff (4) durch eine Höhenverstellvorrichtung (1) nach einem der Ansprüche 1 bis 13 verstellbar wird.

tung (1) nach einem der Ansprüche 1 bis 13 verstellbar wird.

15. Verfahren zum Verstellen und Speichern einer gewünschten Höhe eines Griffs (4) eines Rollators unter Verwendung einer Höhenverstellvorrichtung (1) nach Anspruch 13, wobei das Verfahren folgende Schritte umfasst:

- Verschieben des Griffs (4), um das Innenrohr (2) in seine oberste Stellung zu bewegen, wobei das längliche Element (31) nicht mit dem Innenrohr (2) verbunden ist und auf der Oberseite (8a) der unteren Hülse (8) ruht,
- Verriegeln des Innenrohrs (2) in seiner obersten Stellung mit Hilfe der Verriegelungseinrichtung (10),
- Lösen der in der Durchgangsbohrung (33) des länglichen Elements (31) sitzenden Schraube (34), bis die Schraube (34) von dem Umfang des Innenrohrs (2) radial nach außen vorsteht,
- Entriegeln des Innenrohrs (2) mit Hilfe der Entriegelungseinrichtung (20),
- Verschieben des Griffs (4), bis die gewünschte Höhe erreicht ist, wobei die Schraube (34) an der Oberseite (6c) der oberen Hülse (6) anliegt,
- Verriegeln des Innenrohrs (2) mit Hilfe der Verriegelungseinrichtung (10),
- Einschrauben der Schraube (34), um das längliche Element (31) mit dem Innenrohr (2) zu verbinden.

Revendications

1. Dispositif d'ajustement en hauteur (1) pour une poignée (4) d'un ambulateur, comprenant :
- un tube interne (2) reçu de manière télescopique dans un tube externe (3), la poignée (4) de l'ambulateur étant raccordée à l'extrémité supérieure dudit tube interne (2),
 - un ensemble de verrouillage (10) prévu pour verrouiller le tube interne (2) dans une position fixe par rapport au tube externe (3),
 - un ensemble de déverrouillage (20) prévu pour déverrouiller le tube interne (2) de ladite position fixe,

caractérisé en ce qu'une partie supérieure du tube externe (3) est connectée à un manchon supérieur (6), ledit manchon supérieur (6) étant configuré de manière à maintenir constante la distance entre le tube interne (2) et le tube externe (3), le tube interne (2) pouvant se déplacer à l'intérieur du tube externe (3) entre une position inférieure dans laquelle, par exemple, une extrémité inférieure de la poignée (4) de l'ambulateur bute contre la face su-

périeure (6c) du manchon supérieur (6), et une position supérieure dans laquelle un moyen de butée (30) au moins temporairement intégré au tube interne (2) bute contre une face inférieure (6b) du manchon supérieur (6).

2. Dispositif d'ajustement en hauteur (1) selon la revendication 1, dans lequel la surface extérieure du tube interne (2) est pourvue d'une pluralité de renforcements hémisphériques (5) et l'ensemble de verrouillage (10) comprend :

- un boîtier (11) connecté fixement au tube externe (3) et disposé dans un espace formé entre le tube interne (2) et le tube externe (3), ledit boîtier (11) comprenant une bride longitudinale (11b) adjacente au tube interne (2), ladite bride longitudinale (11b) comprenant un trou traversant (11a) prévu pour recevoir au moins en partie une bille de verrouillage (13), et

- un élément coulissant (14) pouvant être déplacé de manière coulissante à l'intérieur d'une ouverture (11c) du boîtier (11) entre une position de verrouillage dans laquelle l'élément coulissant (14) exerce une force de verrouillage radialement vers l'intérieur sur la bille de verrouillage (13) de manière à pousser ladite bille de verrouillage (13) à l'intérieur de l'un des renforcements hémisphériques (5) du tube interne (2) et une position de déverrouillage dans laquelle une cavité (16) formée dans la surface extérieure de l'élément coulissant (14) est prévue pour recevoir au moins en partie la bille de verrouillage (13).

3. Dispositif d'ajustement en hauteur (1) selon la revendication 2, dans lequel l'ensemble de déverrouillage (20) comprend un élément d'entraînement (21) connecté fixement à l'élément coulissant (14), ledit élément d'entraînement (21) s'étendant à travers une fente (23) formée dans le tube externe (3) de manière à être actionnée par la main d'un utilisateur, ladite fente (23) étant configurée de manière à permettre le déplacement par coulisement dudit élément d'entraînement (21) entre une première position correspondant à la position de verrouillage de l'élément coulissant (14) et une deuxième position correspondant à la position de déverrouillage de l'élément coulissant (14).

4. Dispositif d'ajustement en hauteur (1) selon l'une quelconque des revendications 2 ou 3, dans lequel l'ensemble de verrouillage (10) comprend un ressort (15) disposé à l'intérieur de l'ouverture (11c) du boîtier (11), une extrémité dudit ressort (15) butant contre le boîtier (11) et l'autre extrémité dudit ressort (15) butant contre l'élément coulissant (14) de telle sorte que l'élément coulissant (14) se déplace de sa

position de déverrouillage dans sa position de verrouillage sous l'effet du ressort (15).

5. Dispositif d'ajustement en hauteur (1) selon l'une quelconque des revendications 1 à 4, dans lequel le manchon supérieur (6) comprend une découpe (6a) formée à l'intérieur de sa face supérieure (6c), ladite découpe (6a) étant prévue pour recevoir le tube interne (2).

6. Dispositif d'ajustement en hauteur (1) selon la revendication 5, dans lequel la découpe (6a) a sensiblement la même forme que la section transversale du tube interne (2).

7. Dispositif d'ajustement en hauteur (1) selon la revendication 6, dans lequel la découpe (6a) est configurée de manière à empêcher que le tube interne (2) ne tourne autour de son axe.

8. Dispositif d'ajustement en hauteur (1) selon la revendication 7, dans lequel la découpe (6a) présente une forme choisie parmi un polygone, une ellipse et toute autre courbe fermée sauf un cercle.

9. Dispositif d'ajustement en hauteur (1) selon l'une quelconque des revendications 1 à 8, dans lequel le moyen de butée est constitué d'une goupille intégrée au tube interne (2), ladite goupille s'étendant radialement vers l'extérieur depuis la périphérie du tube interne (2).

10. Dispositif d'ajustement en hauteur (1) selon l'une quelconque des revendications 1 à 8, dans lequel le moyen de butée (30) comporte un élément allongé (31) prévu pour être reçu de manière coulissante dans une gorge axiale (7) prévue au niveau de la périphérie du tube interne (2), ledit élément allongé (31) ayant une partie inférieure à laquelle est connectée de manière fixe une goupille (32), ladite goupille (32) s'étendant radialement vers l'extérieur depuis la périphérie du tube interne (2), et une partie supérieure à l'intérieur de laquelle est formé un trou traversant fileté (33), ledit trou traversant (33) s'étendant dans une direction approximativement perpendiculaire à une direction axiale et étant prévu pour recevoir une vis (34) de manière à raccorder de façon amovible l'élément allongé (31) au tube interne (2).

11. Dispositif d'ajustement en hauteur (1) selon la revendication 10, dans lequel la longueur de la vis (34) est inférieure ou approximativement égale à la longueur du trou traversant (33) de telle sorte que la vis (34) ne fasse pas saillie radialement vers l'extérieur depuis la périphérie du tube interne (2) lorsque l'élément allongé (31) est connecté au tube interne (2) et puisse faire saillie radialement vers l'extérieur depuis la périphérie du tube interne (2) lorsque l'élé-

ment allongé (31) est déconnecté du tube interne (2).

12. Dispositif d'ajustement en hauteur (1) selon la revendication 11, dans lequel la distance séparant la goupille (32) et le trou traversant (33) de l'élément allongé (31) dans la direction axiale est légèrement supérieure à la distance séparant la face inférieure (6b) et la face supérieure (6c) du manchon supérieur (6) de telle sorte que ledit trou traversant (33) soit positionné juste au-dessus de la face supérieure (6c) du manchon supérieur (6) lorsque ladite goupille (32) bute contre la face inférieure (6b) du manchon supérieur (6). 5

13. Dispositif d'ajustement en hauteur (1) selon la revendication 12, dans lequel un manchon inférieur (8) est connecté à l'extrémité inférieure du tube interne (2), ledit manchon inférieur (8) étant reçu par coulissement à l'intérieur du tube externe (3) et comprenant une face supérieure (8a) contre laquelle l'élément allongé (31) lorsqu'il est déconnecté du tube interne (2) et lorsque la vis (34) ne fait pas saillie radialement vers l'extérieur depuis la périphérie du tube interne (2). 10

14. Ambulateur comprenant des poignées ajustables en hauteur, chaque poignée (4) étant ajustée au moyen d'un dispositif d'ajustement en hauteur (1) selon l'une quelconque des revendications 1 à 13. 15

15. Procédé pour ajuster et mémoriser une hauteur souhaitée d'une poignée (4) d'un ambulateur utilisant un dispositif d'ajustement en hauteur (1) selon la revendication 13, ledit procédé comprenant les étapes suivantes : 20
 - déplacement de la poignée (4) de manière à déplacer le tube interne (2) dans sa position la plus haute, l'élément allongé (31) étant déconnecté du tube interne (2) et reposant sur la face supérieure (8a) du manchon inférieur (8), 25
 - verrouillage du tube interne (2) dans sa position la plus haute par l'ensemble de verrouillage (10),
 - dévissage de la vis (34) positionnée à l'intérieur du trou traversant (33) de l'élément allongé (31) jusqu'à ce que ladite vis (34) fasse saillie radialement vers l'extérieur depuis la périphérie du tube interne (2), 30
 - déverrouillage du tube interne (2) par le biais de l'ensemble de déverrouillage (20), 35
 - déplacement de la poignée (4) jusqu'à ce que la hauteur souhaitée soit atteinte, ladite vis (34) butant contre la face supérieure (6c) du manchon supérieur (6), 40
 - verrouillage du tube interne (2) par le biais de l'ensemble de verrouillage (10), 45
 - vissage de ladite vis (34) de manière à raccorder l'élément allongé (31) au tube interne (2). 50

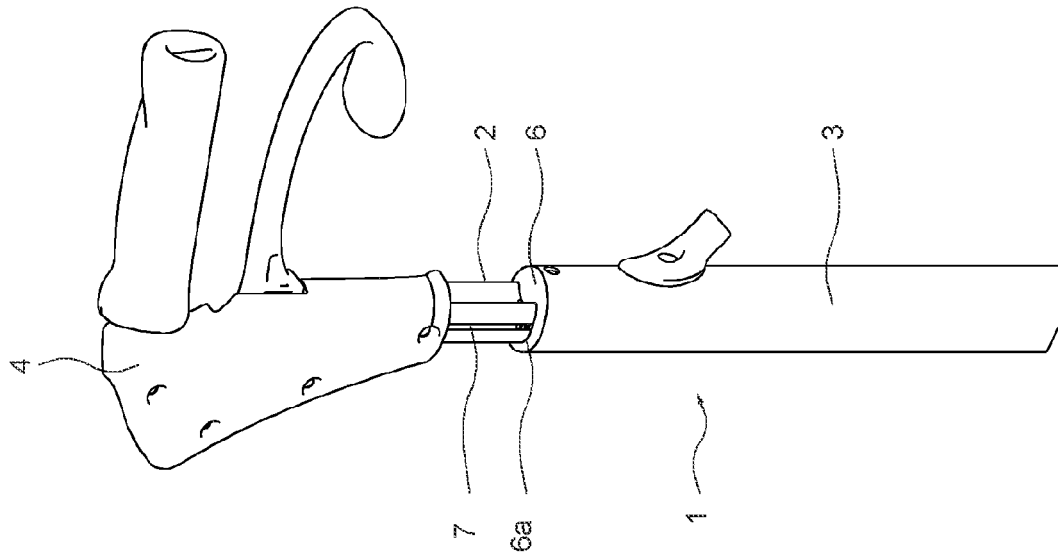


Fig. 1

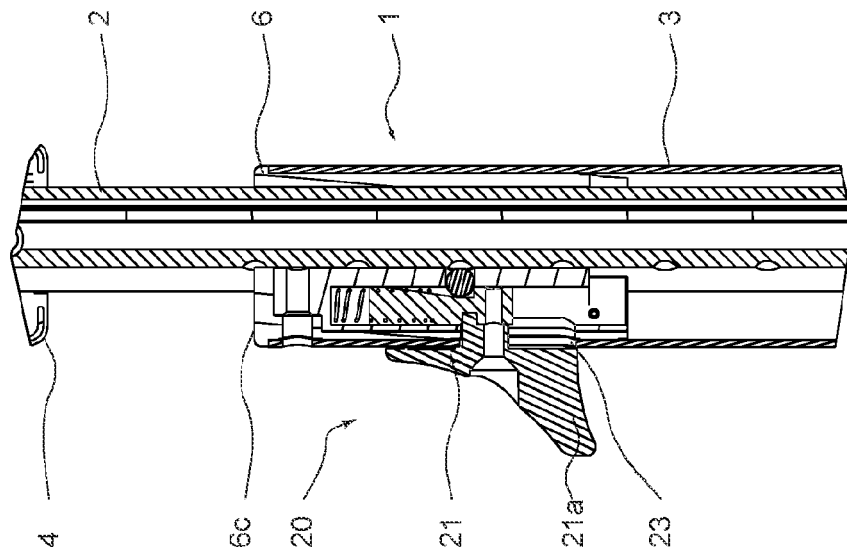


Fig. 2b

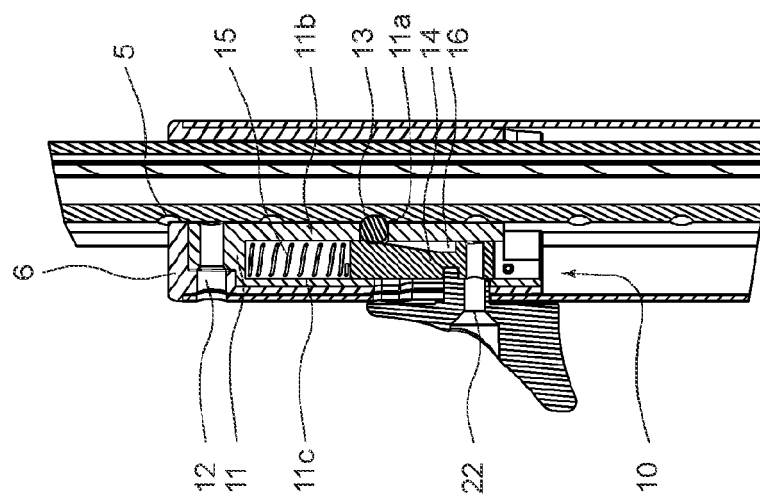


Fig. 2a

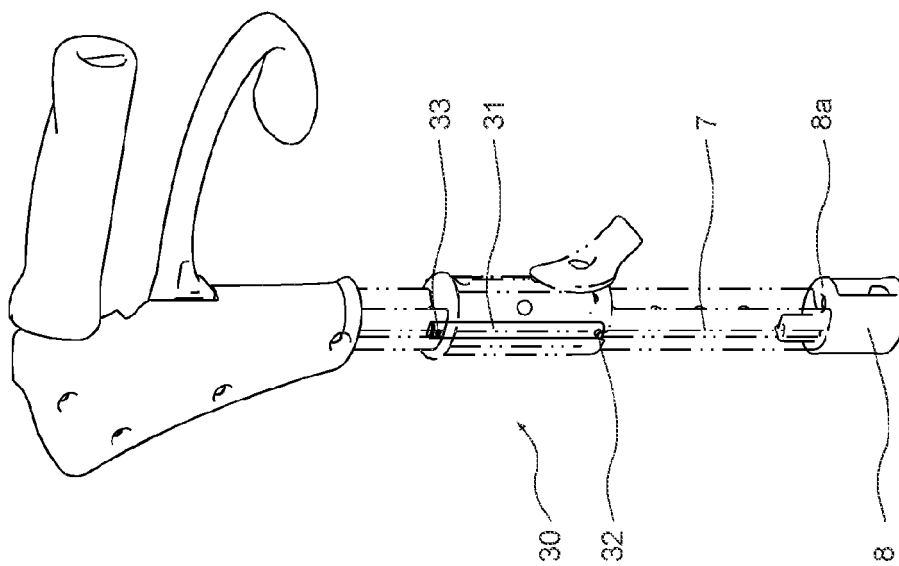


Fig. 3

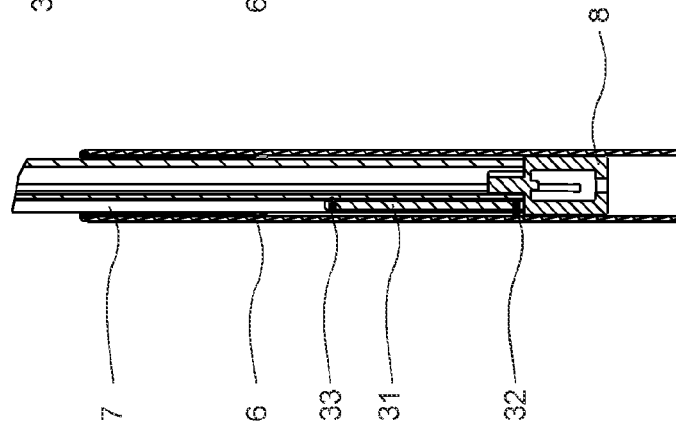


Fig. 4a

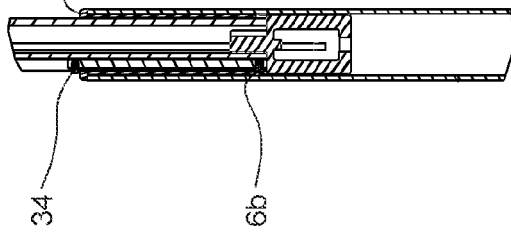


Fig. 4b

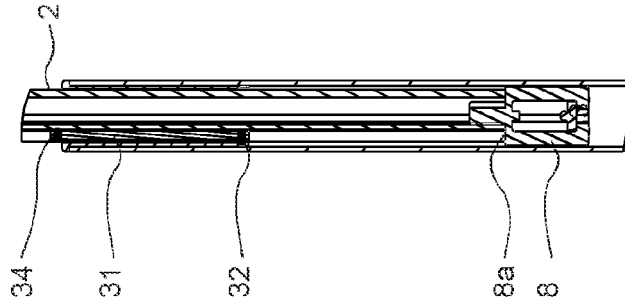


Fig. 4c

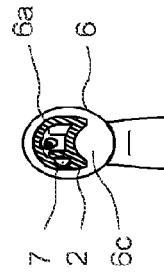


Fig. 4d

REFERENCES CITED IN THE DESCRIPTION

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