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(54) **AID FOR PULLING ELASTIC STOCKINGS ON AND OFF**

HILFE ZUM AN- UND AUSZIEHEN ELASTISCHER STRÜMPFE

AIDE POUR METTRE ET ENLEVER DES BAS ÉLASTIQUES

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Description

[0001] The invention relates to an aid for pulling on and off elastic stockings, in particular therapeutic elastic stockings. The invention likewise relates to a method for pulling elastic stockings on and off while making use of the device.

A therapeutic elastic stocking is frequently applied as medical aid for users with varicose veins and other vascular problems. For a good therapeutic effect the elastic stocking must exert pressure on the leg with a determined tensioning force. Owing to the desired tensioning force the user encounters problems when pulling on and pulling off the elastic stocking, this requiring sufficient strength and mobility of the user. It is however precisely in this respect that the user group is often limited, for instance due to advanced age, illness or disorders of the support and locomotion system.

The invention has for its object to provide an aid for pulling on and off elastic stockings, in particular therapeutic elastic stockings, more easily.

According to the invention this object is achieved by an aid as according to claim 1. The aid comprises two mutually coupled elongate supports, each with a proximal gripping end and a distal tensioning end, wherein the coupling comprises a pivoting connection which is placed between the two outer ends and with which the supports can be moved in the manner of scissors in a frontal plane, and wherein the supports each comprise a first tensioning element between the tensioning end and the pivoting connection, which elements form an adjacently placed pair over which a stocking can be arranged. The pivoting connection is placed a transverse distance from the supports by means of spacers which preferably run in a frontal plane, and the spacers comprise or form a handle.

The aid is particularly suitable for users with reduced mobility, possibly in combination with decreased strength. Only a limited degree of mobility is expected of the user, for instance in that he/she is able to reach his/her ankle when bending at the hip and knee.

[0002] According to the invention, the coupling between the two supports has a compound function, wherein the coupling not only serves for pivotal coupling of the supports but also functions as a handle for grasping of the aid.

In an embodiment of the invention the aid has the feature that the spacers together define a distance between the supports which amounts to at least a hand's width. In this embodiment at least part of the spacers form the handle with which the aid can be gripped with at least one hand. The handle preferably extends in a frontal plane.

The aid according to the invention is suitable for pulling an elastic stocking on and off to the knee, wherein the elastic stocking can have an open as well as a closed toe piece. In the context of the present application the terms proximal, distal, frontal and sagittal are defined in relation to a user who is standing upright (or sitting upright during use) and holding the aid in upright position at the

gripping ends of the supports of the aid. This position of the aid is referred to in the context of this application as the tensioning position of the aid. In the tensioning position the tensioning end of the supports is located on a substrate such as the ground. It may be necessary to turn the aid upside down during use. The definitions remain the same in such an upside down position, in other words the proximal gripping ends will be (temporarily) located distally relative to the user. A frontal plane is defined in the usual manner as a plane extending transversely (from left to right) of the body of the user or of the aid. A sagittal plane is defined in the usual manner as a plane extending in the direction of view of a user (from the back to the front). A sagittal plane of the aid lies perpendicularly of a frontal plane of the aid.

By spacing apart the gripping ends of the supports relative to each other the pivoting connection ensures that the first tensioning elements are moved toward each other on the other side. An elastic stocking can then be arranged over the tensioning elements in substantially tension-free state. Once the elastic stocking has been arranged over the tensioning elements, the elastic stocking can be opened out and tensioned with little force by moving the gripping ends in the opposite direction. The aid has the feature that the pivoting connection is placed at a distance from the supports in a frontal plane by means of spacers.

Although the distance from the pivoting connection to the tensioning end can be chosen within broad limits, an aid with a pivoting connection situated at a distance of 20 to 35 cm from the tensioning end provides an optimal convenience of use, wherein the forces and movements required to pull the stocking on and off are small.

It has further been found that an optimal balance between the force to be exerted and the degree of widening (opening out) of the elastic stocking is achieved in an embodiment of the aid wherein the distance from the pivoting connection to the tensioning end amounts to between 1/8 and 3/5 of the total length of the supports, and more preferably to between 1/5 and 1/2 of the total length of the supports.

An embodiment according to the invention relates to an aid, wherein the spacers extend substantially perpendicularly of the supports and their combined length more preferably amounts to at least 10 cm. In an embodiment wherein the distance from the pivoting connection to the tensioning end moreover amounts to between 1/8 and 3/5 of the total length of the supports and the spacers form the pivoting handle, the pivoting handle is located at a favourable distance from the tensioning end. When an elastic stocking is for instance being pulled off, the second tensioning elements can be placed with one hand under an upper edge of an elastic stocking arranged around the leg, wherein the aid is held fast by the pivoting handle with the other hand.

Another embodiment of the invention provides an aid, the supports of which each comprise a second tensioning element at the tensioning end, which elements form an

adjacently placed pair over which a stocking can be arranged.

An embodiment of an aid wherein the tensioning elements are placed at a distance from the supports in a sagittal plane of the aid by means of spacers has the advantage that neither the supports nor the pivoting connection are at risk of coming into contact with the shin-bone during use of the aid.

[0003] Another embodiment relates to an aid wherein in the tensioning position of the aid the spacers of the first tensioning elements run in the proximal direction and the spacers of the second tensioning elements in the distal direction. In this embodiment the first tensioning elements are more proximally situated than the second tensioning elements, this facilitating the use as both pull-off aid and pull-on aid.

[0004] A further embodiment according to the invention relates to an aid wherein the first tensioning elements are directed toward the proximal outer end and the second tensioning elements toward the distal tensioning end, thus forming S-shaped spoon elements.

[0005] The tensioning elements of the aid can in principle take any form. It is thus possible for instance that they are embodied in the form of ball-like elements, for instance made of rubber, arranged on a spacer. A practical embodiment provides an aid with supports which each comprise at the distal outer end a spoon element, the outer ends (or spoons) of which form the tensioning elements and the middle part of which forms the spacer. The spoons preferably take a flat and to some extent curved form here, thereby creating a slightly concave inner surface which fits onto the shape of the lower leg. The contours of the spoons are preferably round and blunt so that an elastic stocking can be tensioned thereover without appreciable risk of damage, for instance due to excessive local stretching.

[0006] In yet another embodiment the aid has the feature that the supports comprise telescopically extendable parts which can be fixed by means of a locking member. The dimensions of the aid can hereby be adapted to (the abilities of) the user. The locking member is preferably situated in the spacers of the pivoting connection, wherein two functions (scissor movement and telescopic adjustment) are integrated into one component.

[0007] It is advantageous here according to an embodiment of the aid for the support parts to comprise openings in their peripheral surface and for the locking member to comprise a locking pin which is held by means of a spring in a locked position in which the locking pin engages in an opening of a support part, and which can be carried by means of a catch into an unlocked position in which the locking pin leaves the relevant opening clear. Such an embodiment keeps the support parts locked under the influence of the spring force, and unlocking requires a conscious action on the part of the user - unlocking by operating the catch. This enhances the safety of the aid.

[0008] The convenience of use of the aid is further in-

creased in an embodiment in which the supports each comprise a handle, preferably extending in a sagittal plane, on the gripping ends. An embodiment which is further improved in this respect makes use of supports which each comprise an auxiliary handle, preferably also extending in a sagittal plane, between the pivoting connection and the gripping ends. The two auxiliary handles provide the user with an additional gripping option, wherein the supports can be gripped at a different distances from the gripping end.

[0009] The invention likewise relates to a method for pulling an elastic stocking on. The method comprises of

- a) providing an aid according to the invention;
- b) coupling the first tensioning elements and an elastic stocking by folding the elastic stocking back from an upper edge thereof over the first tensioning elements, wherein an opening for a foot is formed;
- c) widening the opening by moving the proximal outer ends of the supports toward each other and inserting the foot into the opening;
- d) moving the aid in the proximal direction, wherein the elastic stocking is moved together with the first tensioning elements along the lower leg to the knee and into the desired position; and
- e) uncoupling the first tensioning means and the elastic stocking.

[0010] Folding of the elastic stocking from the upper edge thereof back over the first tensioning elements preferably takes place over a distance covering between $\frac{1}{4}$ and $\frac{1}{2}$ of the total length of the elastic stocking, preferably to about $\frac{1}{3}$ of the total length of the elastic stocking.

[0011] In an embodiment of the method the aid is placed upside down at the tensioning position in step b) with the gripping ends on the ground surface, the tensioning ends are moved toward each other and the elastic stocking is clamped between the second tensioning means, preferably at the position of the heel. The stocking is hereby fixed, whereby coupling of the first tensioning elements and the elastic stocking is considerably simplified.

[0012] Another embodiment comprises a method wherein in step d) the aid is gripped in the tensioning position by the auxiliary handles and the proximal part of the supports rests on the front part of the shoulders. In this embodiment the upper body can if desired assist in pulling the elastic stocking up along the leg by leaning backwards.

[0013] Yet another embodiment of the method has the feature that in step c) a flexible body made of a smooth material with low frictional resistance is introduced into the opening prior to insertion of the foot. Such a flexible body is for instance known from NL 8902619 and preferably comprises a flexible tube-like peripheral body of a smooth material with an insertion end for a foot, the peripheral body being provided with a lining of a smooth material. The lining is attached to the peripheral body at

the position of the insertion end and can otherwise be moved freely relative to the peripheral body from an inward folded position, in which the lining is situated in the peripheral body, to an outward folded position in which the lining is situated outside the peripheral body. Such a flexible and smooth body makes the sliding of an elastic stocking along a surface considerably easier in that the body arranged between stocking and surface perceptibly reduces the friction forces. It is noted that the flexible body need in no way be tube-like. A single strip of flexible smooth material can also suffice, for instance a strip which is slightly longer than the elastic stocking and has a width of about 15 cm.

[0014] The invention likewise relates to a method for pulling an elastic stocking off, comprising of

- a) providing an aid according to the invention;
- b) coupling the second tensioning elements and an elastic stocking arranged round the leg by placing the second tensioning elements under an upper edge of the elastic stocking, wherein a peripheral opening is formed between stocking and leg;
- c) moving the aid in the distal direction, wherein the elastic stocking is moved together with the second tensioning elements along the lower leg to the foot and into the desired position;
- d) widening the peripheral opening by moving the proximal gripping ends of the supports toward each other;
- e) peeling the elastic stocking off the foot; and
- f) uncoupling the second tensioning means and the elastic stocking.

[0015] The widening of the peripheral opening in step d) can take place at any moment, such as prior to step c). The widening is however preferably carried out when the elastic stocking is situated at the position of the ankle.

[0016] The aid according to the invention need not be adjusted at all for the purpose of pulling off elastic stockings as according to the above stated method. The dual functionality of the aid, among other reasons because of the presence of the co-acting first and second tensioning means, provides a great advantage for the user.

[0017] The invention will now be further elucidated on the basis of the exemplary embodiments shown in the figures, without otherwise being limited thereto. Herein:

Fig. 1 is a schematic perspective view of an embodiment of the aid according to the invention in ready-to-use position;

Fig. 2 is a schematic perspective view of the embodiment shown in figure 1 in partially uncoupled position;

Fig. 3A is a schematic cross-sectional view of a coupling between telescopic support parts;

Fig. 3B is a schematic perspective view of the coupling shown in figure 3A in coupled position;

Fig. 3C is a schematic perspective view of the cou-

pling shown in figure 3A in uncoupled position;

Fig. 4A is a schematic perspective view of a pivoting connection according to the invention; and finally

Fig. 4B is a schematic perspective sectional view of a detail of the pivoting connection.

[0018] Figure 1 shows an aid 1 for pulling on and off an elastic stocking in ready-to-use position. Aid 1 is shown in upright position. For the relative positioning of the aid components reference is made in the context of this description to a sagittal plane 2 and a frontal plane 3 running at a right angle thereto in accordance with the planes defined in a user. Aid 1 comprises two elongate supports (5a, 5b) running in a longitudinal direction 4 and having a length of about 80 cm. The supports (5a, 5b) preferably have a low specific weight and are for instance made of aluminium, which is optionally anodized in the desired colour. The anodizing helps to prevent the aluminium giving off black residue onto body and clothing. The supports (5a, 5b) are mutually coupled by an intermediate pivoting connection 6. Each support (5a, 5b) has a proximal gripping end (7a, 7b) and a distal support end (8a, 8b). In the shown embodiment pivoting connection 6 is situated a distance of about 27 cm from the distal outer ends (8a, 8b). Pivoting connection 6 comprises spacers in the form of transverse profiles (9a, 9b) connected substantially rigidly at an outer end to the associated support (5a, 5b). The transverse profiles (9a, 9b) are mutually connected at their other outer end by means of a hinge, which is not visible because it is concealed from view by a rubber sleeve 10 arranged over the hinge. According to the invention, in the shown embodiment the rubber sleeve 10 forms a handle for the user. The hinge of pivoting connection 6 is held at a transverse distance from supports (5a, 5b) by the two transverse profiles (9a, 9b). For the purpose of stability and convenience of use the hinge is preferably a flat hinge only able to rotate around the rotation axis 4 lying perpendicularly of frontal plane 3. Figure 4A shows schematically an embodiment of pivoting connection 6 according to the invention, wherein rubber sleeve 10 is omitted. Pivoting connection 6 comprises transverse profiles (9a, 9b) rotatable around rotation axis 4. As shown in more detail in figure 4B, the hinge comprises a metal bearing bush 100 received in a cylindrical recess 101 of pivoting outer ends of profiles (9a, 9b). Bearing bush 100 imparts stability to the hinge construction and prevents wearing away of recesses 101 in the transverse profiles (9a and 9b). Bearing bush 100 is enclosed in recesses 101 by means of a bolt connection, this comprising in the shown embodiment a low socket-head bolt 102 with inner hexagon 103, and a low locking nut 104. Because the end surfaces of bearing bush 100 are in contact in the desired tightened state with the clamping surfaces of socket-head bolt 102 and locking nut 104, bearing bush 100 prevents excessive tightening of the bolt connection. Locking nut 104 moreover prevents pivoting connection 6 coming loose of its own accord due to the many pivoting movement made

during the lifespan of aid 1. By having the proximal outer ends (7a, 7b) perform symmetrical displacements in the frontal plane 3 as according to the arrows (11a, 11b) the distal outer ends (8a, 8b) are moved inward via pivoting connection 6 as according to the arrows (12a, 12b). Should the proximal outer ends (7a, 7b) be symmetrically displaced in frontal plane 3 in a direction opposite to that of arrows (11a, 11b), the distal outer ends (8a, 8b) then move outward in a direction opposite to that of arrows (12a, 12b). Supports (5a, 5b) move in the manner of scissors here in a transverse direction (in the frontal plane). Owing to the placing of pivoting connection 6 at a distance from the distal outer ends (8a, 8b) only a relatively small displacement (7a, 7b) is necessary to obtain a relatively large displacement of the distal outer ends (8a, 8b). The force required for this purpose is moreover small and can be easily exerted by users with physical limitations.

[0019] For the purpose of arranging the elastic stockings the supports (5a, 5b) are each provided at the distal tensioning end (8a, 8b) with a spoon element (13a, 13b), the outer ends (the spoons) of which form tensioning elements (14a, 14b, 15a, 15b). The middle portion of the two spoon elements (13a, 13b) holds the tensioning elements (14a, 14b, 15a, 15b) at a distance from supports (5a, 5b) in the sagittal plane 2 of aid 1, and therefore forms a spacer for tensioning elements (14a, 14b, 15a, 15b). Each spoon element (13a, 13b) comprises a first tensioning element (15a, 15b) situated between the distal outer end (8a, 8b) and pivoting connection 6. The two first tensioning elements (15a, 15b) form an adjacently placed pair over which an elastic stocking (not shown) can be arranged. Each spoon element (13a, 13b) is also provided with a second tensioning element (14a, 14b) situated at the distal outer end (8a, 8b) of each support (5a, 5b). The two second tensioning elements (14a, 14b) likewise form an adjacently placed pair over which an elastic stocking (not shown) can be arranged. Spoon elements (13a, 13b) can for instance be connected to supports (5a, 5b) by means of a pin-hole connection or by means of glueing. If desired, the spoons (14a, 15a, 14b, 15b) of spoon elements (13a, 13b) are provided on the inward facing side or all around with inserts (not shown) of a relatively frictional material such as for instance rubber.

[0020] The supports (5a, 5b) of aid 1 are further each provided at the proximal outer ends (7a, 7b) with a handle (18a, 18b). For an increased convenience of use handles (18a, 18b) extend in the sagittal plane 2 on either side of the associated support (5a, 5b). Each of the supports (5a, 5b) is further also provided between pivoting connection 6 and the proximal outer ends (7a, 7b) with an auxiliary handle (19a, 19b), likewise extending in the sagittal plane 2 on either side of the associated support (5a, 5b). The (auxiliary) handles (18a, 18b, 19a, 19b) can likewise be connected to supports (5a, 5b) by means of for instance a pin-hole connection or by means of glueing. If desired, the (auxiliary) handles (18a, 18b, 19a, 19b) can be provided with rubber gripping sleeves which are

to some extent stretchable and are arranged tightly over the handles. A glue connection can optionally provide for a good fixation. The rubber gripping sleeves are optionally provided with soft ribs which ensure a firm and comfortable grip. This is particularly convenient for older users with possibly rheumatic joints.

[0021] As can be seen in figure 1, the first tensioning elements (15a, 15b) are directed toward the proximal outer end (7a, 7b), while the second tensioning elements (14a, 14b) are directed toward the distal outer end (8a, 8b). Because the first and second tensioning elements point in opposite directions, spoon elements (13a, 13b) take a substantially S-like form. The tensioning elements (14a, 14b, 15a, 15b) have a form which is substantially flat and to some extent curved, whereby a more or less concave surface fitting onto the shape of the lower leg is created on the inner side of tensioning elements (14a, 14b, 15a, 15b). Tensioning elements (14a, 14b, 15a, 15b) are rounded and made somewhat blunt at the corners so that an elastic stocking can be tensioned thereover without much risk of damage due to excessive local stretching. Because the first tensioning elements (15a, 15b) in the sagittal plane 2 form an angle of 120 degrees with the longitudinal axis of the associated support (5a, 5b) and the second tensioning elements (14a, 14b) in the sagittal plane 2 form an angle of 90 degrees with the longitudinal axis of the associated support (5a, 5b), and are held a distance of 6 to 7 centimetres from the supports (5a, 5b), supports (5a, 5b) or pivoting connection 6 are prevented from coming into contact with the shinbone during use of the aid.

[0022] Figure 2 shows that supports (5a, 5b) of aid 1 can comprise telescopically extendable parts. This is shown in the figure for support 5a, which consists of a tube part 50a with a diameter of 18 mm which extends from the proximal outer end 7a to beyond pivoting connection 6, and a tube part 50b with a diameter of 15 mm which is telescopically slidable in tube part 50a and is mounted on the distal spoon element 13a. For the purpose of length adjustment the tube part 50b is provided with three holes 16 at a mutual spacing of 5 cm, and tube part 50a with one opening 17. The total adjustment range is hereby 10 cm. If desired, this range can be increased in simple manner by lengthening tube part 50b and adding holes. In the shown embodiment tube part 50b slides into hinge part 6 and the tube part 50a already inserted therein. The two tube parts (50a, 50b) are fixed into position by a locking member formed by a resilient locking pin 20 which is shown in more detail in figures 3A-3C. Due to the method of length adjustment tube part 50b with spoon element 13a can be mounted in only one way. This is also the case for the tube parts of the other support (5b). The orientation of spoon elements (13a, 13b) relative to each other is hereby always correct, and a user need not take account of left or right.

[0023] Locking pin 20 is situated in transverse profiles (9a, 9b) of pivoting connection 6 and is held by means of a spring 21 in a locked position, wherein locking pin

20 engages through opening 17 of support part 50a and an opening 16 of support part 50b. Locking pin 20 can be moved in the direction 22 and fixed in an unlocked position by a catch 23 which is connected to locking pin 20 by means of fixing pin 24. Locking catch 23 lies inside profile 9a and does not therefore protrude, thereby limiting the risk of undesired unlocking. Locking catch 23 can be gripped with thumb and index finger and displaced counter to the spring pressure produced by spring 21. The biased spring pressure typically amounts to about 0.5 kg in locked position. For unlocking purposes a total spring pressure of about 1 kg has to be overcome. By moving catch 23 in the direction 22 a user can unlock the support parts (50a, 50b), wherein the locking pin leaves the relevant openings (16, 17) clear and the tube parts (50a, 50b) are uncoupled. Figure 3B shows the locked position and figure 3C shows the unlocked position.

[0024] That described above for support 5a also applies to support 5b.

[0025] The above described components of aid 1 can be manufactured from any material suitable for the purpose. Components such as the spoon elements (13a, 13b), hinge part 6 and (auxiliary) handles (18a, 18b, 19a, 19b) are thus preferably made by injection moulding of glass fibre-reinforced plastic. Other components such as the fixing pins, the locking catch and the spring are preferably made of steel, while supports (5a, 5b) are typically made of anodized aluminium.

[0026] Because aid 1 consists of pre-assembled components, it can be easily assembled or disassembled by a user. The division into components further ensures that aid 1 can be packaged, shipped and stored in compact form. This moreover provides the option of length adjustment in accordance with build, height and reach, and adjustment of the opening range of an elastic stocking arranged on the aid.

[0027] An elastic stocking can be pulled on as follows using aid 1. Aid 1 is closed at the distal outer end (8a, 8b) and then placed upside down, with the handles (18a, 18b) downward (where supports (5a, 5b) are thus spaced apart) transversely on a ground surface between the legs of the user. If desired, the user can place one foot on a handle (18a, 18b) in order to stabilize aid 1. The elastic stocking is then clamped with the seam (or rear side) directed upward at the heel between the second tensioning elements (14a, 14b), which point upward in the upside down position. The upper edge of the elastic stocking is then folded back over the other (first) tensioning elements (15a, 15b). This does not involve any appreciable tension. An elongate sliding strip of a flexible, smooth material, for instance spinnaker cloth, can then also be placed with a relatively short outer end in the elastic stocking, wherein the remaining, relatively long part is likewise clamped between the second tensioning elements (14a, 14b) together with the heel part of the elastic stocking. Aid 1 is then turned over again and placed in the position as shown in figure 1. The most proximal handles (18a, 18b) of aid 1 are then gripped by the user and

moved toward each other (opposite to the directions (11a, 11b)). This movement places the elastic stocking under tension and widens the opening for a foot of the user. The first tensioning elements (15a, 15b) over which the elastic stocking is tensioned are set down on the ground close to the foot, in front of the toes, after which the foot is pushed into the opening of the elastic stocking. The opening can be enlarged here by moving the handles (18a, 18b) further apart. Aid 1 is optionally tilted just slightly about its longitudinal axis at the moment that the narrow portion of the elastic stocking, which is situated just above the ankles, has to be pulled over the heel/instep part of the user. This manoeuvre makes the opening easier to adjust in the width to the heel/instep part. In a subsequent step the elastic stocking is pulled further upward, wherein supports (5a, 5b) are then gripped on the intermediate auxiliary handles (19a, 19b). The proximal handles (18a, 18b) rest here on the front part of the shoulders. The upper body can hereby optionally also assist in pulling up the elastic stocking along the leg by leaning backwards a little. The elastic stocking is pulled further until it is in place. Tensioning elements (15a, 15b) are then removed from the elastic stocking, and the optionally present sliding strip is pulled from between the leg and the stocking via the top side. If desired, the elastic stocking can be pulled slightly further using manual force.

[0028] The same aid 1 can likewise be used for the purpose of pulling off an elastic stocking. The distal (second) tensioning elements (14a, 14b) point downward here, and supports (5a, 5b) rest along the body with the proximal handles (18a, 18b) on or above the shoulders. The second tensioning elements (14a, 14b) are pushed into the elastic stocking on either side of the lower leg via the top side of the elastic stocking. The elastic stocking is then pushed downward using handles (18a, 18b, 19a, 19b) of supports (5a, 5b). By performing a scissor movement of supports (5a, 5b), i.e. by moving handles (18a, 18b) toward each other, the opening of the elastic stocking is enlarged, whereby it can be slid easily over the lower leg, and particularly the heel. Once the elastic stocking has in this way been peeled off the lower leg, tensioning elements (14a, 14b) are removed from the elastic stocking. If desired, use can also be made of a sliding strip when the stocking is being pulled off.

A (therapeutic) elastic stocking can be pulled on and off as described in simple manner using little force and small movements. The aid is easy to handle, light in weight and, owing to the modular structure, saves storage space. The opening of an elastic stocking can be made larger or smaller by the scissor action of the supports. Arranging an elastic stocking over the tensioning elements is also simple, in contrast to known aids where the elastic stocking has to be tensioned over a bracket or pushed into a ring, or wherein the elastic stocking has to be slid over stationary rubber balls. Because the spoon elements take an ergonomic form and are covered with relatively smooth rubber, these elements cause less friction and do not press painfully into the skin of a user. The

aid is further adjustable in the length, which increases the convenience of use and the flexibility thereof.

[0029] The invention is not limited to the above described exemplary embodiments. It will be apparent that within the scope of the invention, as defined by the claims, different modifications can be made which will be self-evident to the skilled person.

Claims

1. Aid for pulling an elastic stocking on and off a leg, the aid comprising two mutually coupled elongate supports, each with a proximal gripping end and a distal tensioning end, wherein the coupling comprises a pivoting connection which is placed between the two outer ends and with which the supports can be moved in the manner of scissors in a transverse direction, and wherein the supports each comprise a first tensioning element between the tensioning end and the pivoting connection, which elements form an adjacently placed pair over which a stocking can be arranged, wherein the pivoting connection is placed a transverse distance from the supports by means of spacers, **characterized in that** the spacers comprise a handle, wherein the pivoting connection is covered with a flexible sleeve which forms the handle.
2. Aid as claimed in claim 1, wherein the spacers extend substantially perpendicularly of the supports and their combined length amounts to at least 10 cm.
3. Aid as claimed in claim 1 or 2, wherein the distance from the pivoting connection to the distal tensioning end amounts to between $1/5$ and $1/2$ of the total length of the supports.
4. Aid as claimed in any of the foregoing claims, wherein the pivoting connection is situated at a distance of 20 to 35 cm from the distal tensioning end.
5. Aid as claimed in any of the foregoing claims, wherein the supports each comprise a second tensioning element at the distal tensioning end, which elements form an adjacently placed pair over which a stocking can be arranged.
6. Aid as claimed in any of the foregoing claims, wherein the tensioning elements are placed at a distance from the supports in a sagittal plane of the aid by means of spacers.
7. Aid as claimed in claim 6, wherein the spacers of the first tensioning elements run in the proximal direction and the spacers of the second tensioning elements in the distal direction.
8. Aid as claimed in any one of the claims 5-7, wherein the first tensioning elements are directed toward the proximal outer end and the second tensioning elements toward the distal tensioning end, thus forming S-shaped spoon elements.
9. Aid as claimed in claim 6 or 7, wherein the supports each comprise at the distal tensioning end a spoon element, the outer ends of which form the tensioning elements and the middle part of which forms the spacer.
10. Aid as claimed in any of the foregoing claims, wherein the supports comprise telescopically extendable parts which can be fixed by means of a locking member.
11. Aid as claimed in claim 10, wherein the support parts comprise openings in their peripheral surface and the locking member comprises a locking pin which is held by means of a spring in a locked position in which the locking pin engages in an opening of a support part, and which can be carried by means of a catch into an unlocked position in which the locking pin leaves the relevant opening clear.
12. Aid as claimed in any of the foregoing claims, wherein the supports each comprise a handle extending in a sagittal plane on the proximal gripping ends.
13. Aid as claimed in any of the foregoing claims, wherein the supports each comprise an auxiliary handle extending in a sagittal plane between the pivoting connection and the proximal gripping ends.
14. Method for pulling an elastic stocking on, comprising of
 - a) providing an aid as claimed in any of the foregoing claims;
 - b) coupling the first tensioning elements and an elastic stocking by folding the elastic stocking back from an upper edge thereof over the first tensioning elements, wherein an opening for a foot is formed;
 - c) moving the aid into tensioning position, wherein the gripping ends are situated proximally relative to the user and the tensioning elements distally;
 - d) widening the opening by moving the proximal outer ends of the supports toward each other and inserting the foot into the opening;
 - e) moving the aid in the proximal direction, wherein the elastic stocking is moved together with the first tensioning elements along the lower leg to the knee and into the desired position; and
 - f) uncoupling the first tensioning means and the elastic stocking.

15. Method for pulling an elastic stocking off, comprising of

- a) providing an aid as claimed in any of the claims 1-13;
- b) coupling the second tensioning elements and an elastic stocking arranged round the leg by placing the second tensioning elements under an upper edge of the elastic stocking, wherein a peripheral opening is formed between stocking and leg;
- c) moving the aid in the distal direction, wherein the elastic stocking is moved together with the second tensioning elements along the lower leg to the foot and into the desired position;
- d) widening the peripheral opening by moving the proximal outer ends of the supports toward each other;
- e) further peeling off the elastic stocking over the foot until it has been removed; and
- f) uncoupling the second tensioning means and the elastic stocking.

Patentansprüche

- 1. Hilfsmittel zum An- und Ausziehen eines elastischen Strumpfes von einem Bein, wobei das Hilfsmittel zwei gegenseitig gekoppelte längliche Träger aufweist, jeder mit einem proximalen Griffende und einem distalen Spannende, wobei die Kopplung eine Schwenkverbindung umfasst, die zwischen den beiden Außenenden angeordnet ist und mit der die Träger in der Art von Scheren in einer Querrichtung bewegt werden können, und wobei die Träger jeweils ein erstes Spannelement zwischen dem Spannende und der Schwenkverbindung aufweisen, wobei die Elemente ein benachbart angeordnetes Paar bilden, über das ein Strumpf angeordnet werden kann, wobei die Schwenkverbindung in einem Querabstand von den Trägern mittels Abstandshaltern angeordnet sind, **dadurch gekennzeichnet, dass** die Abstandshalter einen Handgriff aufweisen, wobei die Schwenkverbindung mit einer flexiblen Hülse abgedeckt ist, die den Handgriff bildet.
- 2. Hilfsmittel nach Anspruch 1, wobei sich die Abstandshalter im Wesentlichen rechtwinklig zu den Trägern erstrecken und ihre kombinierte Länge mindestens 10 cm beträgt.
- 3. Hilfsmittel nach Anspruch 1 oder 2, wobei der Abstand von der Schwenkverbindung zu dem distalen Spannende zwischen $1/5$ und $1/2$ der Gesamtlänge der Träger beträgt.
- 4. Hilfsmittel nach einem der vorstehenden Ansprüche, wobei die Schwenkverbindung in einem Abstand

von 20 bis 35 cm von dem distalen Spannende angeordnet ist.

- 5. Hilfsmittel nach einem der vorstehenden Ansprüche, wobei die Träger jeweils ein zweites Spannelement an dem distalen Spannende aufweisen, wobei die Elemente ein benachbart angeordnetes Paar bilden, über das ein Strumpf angeordnet werden kann.
- 6. Hilfsmittel nach einem der vorstehenden Ansprüche, wobei die Spannelemente in einem Abstand von den Trägern in einer Sagittalebene des Hilfsmittels mittels Abstandshaltern angeordnet sind.
- 7. Hilfsmittel nach Anspruch 6 wobei die Abstandshalter der ersten Spannelemente in der proximalen Richtung verlaufen und die Abstandshalter der zweiten Spannelemente in der distalen Richtung.
- 8. Hilfsmittel nach einem der Ansprüche 5-7, wobei die ersten Spannelemente in Richtung auf das proximale Außenende gerichtet sind und die zweiten Spannelemente zu dem distalen Spannende, sodass sie S-förmige Löffelelemente bilden.
- 9. Hilfsmittel nach Anspruch 6 oder 7, wobei jeder Träger an dem distalen Spannende ein Löffelelement aufweist, dessen Außenende die Spannelemente bilden und dessen Mittelteil den Abstandshalter bildet.
- 10. Hilfsmittel nach einem der vorstehenden Ansprüche, wobei die Träger teleskopisch ausfahrbare Teile aufweisen, die mittels eines Sperrelements fixiert werden können.
- 11. Hilfsmittel nach Anspruch 10, wobei die Trägerteile Öffnungen in ihrer Umfangsfläche aufweisen und das Sperrelement einen Sperrstift aufweist, der mittels einer Feder in einer gesperrten Position gehalten wird, in der der Sperrstift in eine Öffnung eines Trägerteils eingreift und der mittels eines Hakens in eine entspernte Position gebracht werden kann, in der der Sperrstift die relevante Öffnungen frei macht.
- 12. Hilfsmittel nach einem der vorstehenden Ansprüche, wobei die Träger jeweils einen Handgriff aufweisen, der sich in einer Sagittalebene an den proximalen Griffenden erstreckt.
- 13. Hilfsmittel nach einem der vorstehenden Ansprüche, wobei die Träger jeweils einen Hilfsgriff aufweisen, der sich in einer Sagittalebene zwischen der Schwenkverbindung und den proximalen Griffenden erstreckt.
- 14. Verfahren zum Anziehen eines elastischen Strumpfs mit

- a) Vorsehen eines Hilfsmittels nach einem der vorstehenden Ansprüche,
- b) Koppeln der ersten Spannelemente und eines elastischen Strumpfs durch Falten des elastischen Strumpfs zurück von seiner oberen Kante über die ersten Spannelemente, wodurch eine Öffnung für einen Fuß gebildet wird,
- c) Bewegen des Hilfsmittels in eine Spannposition, in der die Griffenden proximal relativ zu dem Benutzer sind und die Spannelemente distal,
- d) Aufweiten der Öffnung durch Bewegen der proximalen Außenenden des Trägers zueinander und Einbringen des Fußes in die Öffnung,
- g) Bewegen des Hilfsmittels in der proximalen Richtung, wodurch der elastische Strumpf zusammen mit den ersten Spannelementen des Unterschenkels zum Knie und in die gewünschte Position bewegt wird, und
- e) Entkoppeln der ersten Spanneinrichtung und des elastischen Strumpfs.

15. Verfahren zum Ausziehen eines elastischen Strumpfs mit

- a) Vorsehen eines Hilfsmittels nach einem der Ansprüche 1-13,
- b) Koppeln der zweiten Spannelemente und eines elastischen Strumpfs, der um ein Bein angeordnet ist, durch Platzieren der zweiten Spannelemente unter einer Oberkante des elastischen Strumpfs, wodurch eine Umfangsöffnung zwischen dem Strumpf und dem Bein gebildet wird,
- c) Bewegen des Hilfsmittels in der distalen Richtung, wodurch der elastische Strumpf zusammen mit den zweiten Spannelementen entlang des Unterschenkels zum Fuß und in die gewünschte Position bewegt wird,
- d) Aufweiten der Umfangsöffnung durch Bewegen der proximalen Außenenden der Träger zueinander,
- e) Weiteres Abschälen des elastischen Strumpfs über den Fuß, bis er entfernt ist, und
- f) Entkoppeln der zweiten Spanneinrichtungen und des elastischen Strumpfs.

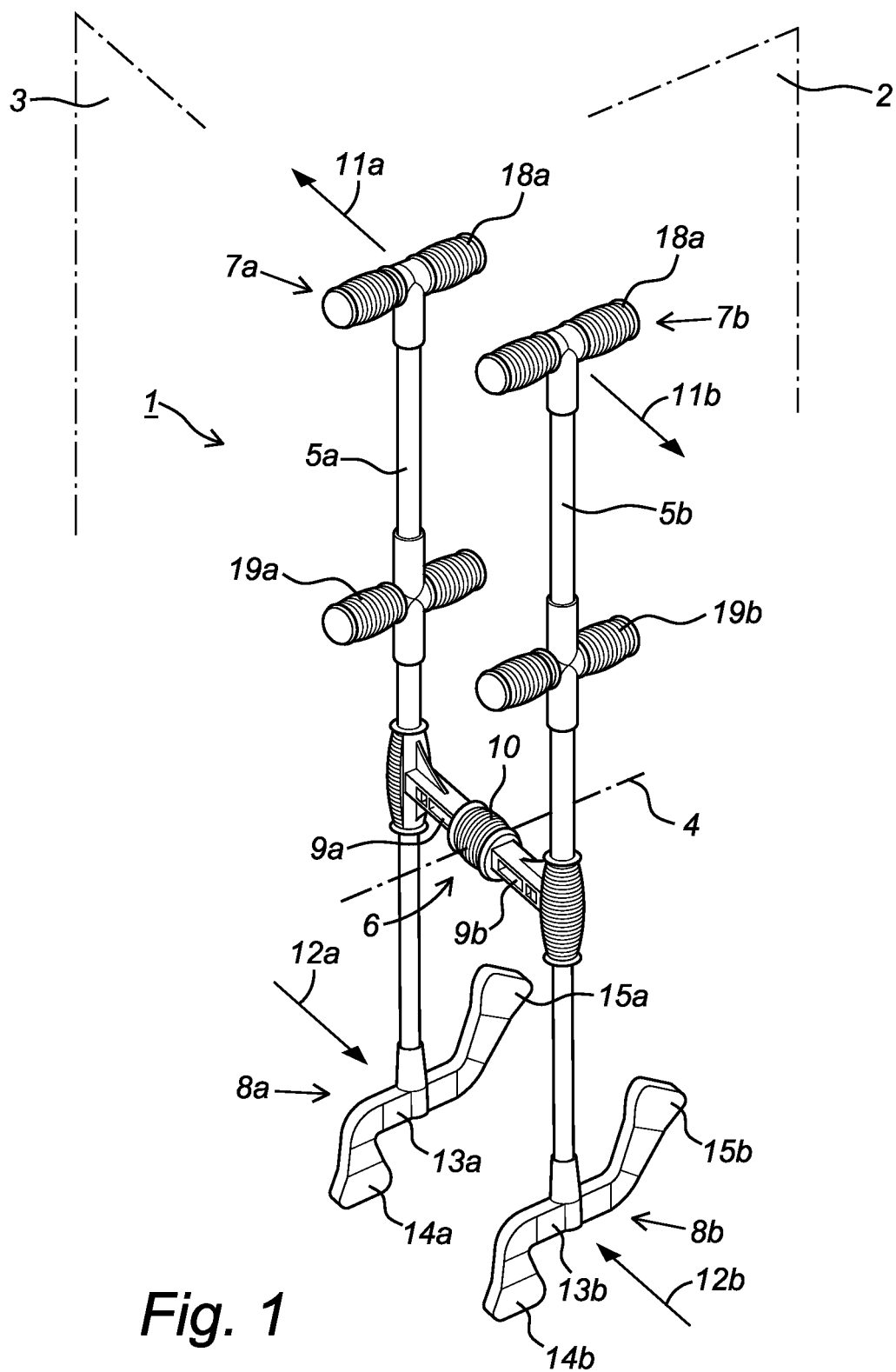
Revendications

1. Dispositif d'assistance destiné à enfiler un bas élastique sur une jambe et à le retirer, le dispositif d'assistance comprenant deux supports allongés couplés mutuellement, chacun comportant une extrémité de saisie proximale et une extrémité de mise en tension distale, dans lequel le couplage comprend une liaison pivotante qui est placée entre les deux extrémités externes et avec laquelle les supports

peuvent être déplacés à la manière de ciseaux dans une direction transversale, et dans lequel les supports comprennent chacun un premier élément de mise en tension entre l'extrémité de mise en tension et la liaison pivotante, lesquels éléments disposés de manière adjacente forment une paire sur laquelle un bas peut être agencé, dans lequel la liaison pivotante est placée à une certaine distance transversale par rapport aux supports au moyen d'entretoises, **caractérisé en ce que** les entretoises comprennent une poignée, dans lequel la liaison pivotante est recouverte par un manchon flexible qui forme la poignée.

2. Dispositif d'assistance selon la revendication 1, dans lequel les entretoises s'étendent sensiblement perpendiculairement par rapport aux supports et leur longueur cumulée est supérieure ou égale à 10 cm.
3. Dispositif d'assistance selon la revendication 1 ou 2, dans lequel la distance de la liaison pivotante à l'extrémité de mise en tension distale est comprise entre 1/5 et 1/2 de la longueur totale des supports.
4. Dispositif d'assistance selon l'une quelconque des revendications précédentes, dans lequel la liaison pivotante est située à une distance de 20 à 35 cm de l'extrémité de mise en tension distale.
5. Dispositif d'assistance selon l'une quelconque des revendications précédentes, dans lequel les supports comprennent chacun un second élément de mise en tension au niveau de l'extrémité de mise en tension distale, lesquels éléments disposés de manière adjacente forment une paire sur laquelle un bas peut être agencé.
6. Dispositif d'assistance selon l'une quelconque des revendications précédentes, dans lequel les éléments de mise en tension sont placés à une certaine distance des supports dans un plan sagittal du dispositif d'assistance au moyen d'entretoises.
7. Dispositif d'assistance selon la revendication 6, dans lequel les entretoises des premiers éléments de mise en tension s'étendent dans la direction proximale et les entretoises des seconds éléments de mise en tension dans la direction distale.
8. Dispositif d'assistance selon l'une quelconque des revendications 5 à 7, dans lequel les premiers éléments de mise en tension sont dirigés vers l'extrémité externe proximale et les seconds éléments de mise en tension vers l'extrémité de mise en tension distale, formant ainsi des éléments ayant la forme en S d'une cuillère.
9. Dispositif d'assistance selon la revendication 6 ou

- 7, dans lequel les supports comprennent chacun, au niveau de l'extrémité de mise en tension distale un élément en cuillère, dont les extrémités externes forment les éléments de mise en tension et dont la partie centrale forme l'entretoise. 5
10. Dispositif d'assistance selon l'une quelconque des revendications précédentes, dans lequel les supports comprennent des parties extensibles de manière télescopique qui peuvent être fixées au moyen d'un élément de verrouillage. 10
11. Dispositif d'assistance selon la revendication 10, dans lequel les parties de support comprennent des ouvertures sur leur surface périphérique et l'élément de verrouillage comprend une broche de verrouillage qui est maintenue au moyen d'un ressort dans une position verrouillée dans laquelle la broche de verrouillage s'assemble dans une ouverture d'une partie de support, et qui peut être réalisée au moyen d'un élément de saisie dans une position déverrouillée dans laquelle la broche de verrouillage laisse l'ouverture concernée libre. 20
12. Dispositif d'assistance selon l'une quelconque des revendications précédentes, dans lequel les supports comprennent chacun une poignée s'étendant dans un plan sagittal sur les extrémités de saisie proximales. 25
13. Dispositif d'assistance selon l'une quelconque des revendications précédentes, dans lequel les supports comprennent chacun une poignée auxiliaire s'étendant dans un plan sagittal entre la liaison pivotante et les extrémités de saisie proximales. 30
14. Procédé destiné à enfiler un bas élastique, comprenant :
- a) la préparation d'un dispositif d'assistance selon l'une quelconque des revendications précédentes ; 40
- b) le couplage des premiers éléments de mise en tension et d'un bas élastique en repliant le bas élastique à partir de son bord supérieur sur les premiers éléments de mise en tension, dans lequel une ouverture pour un pied est formée ; 45
- c) le déplacement du dispositif d'assistance dans la position de mise en tension, dans lequel les extrémités de saisie sont situées de manière proximale par rapport à l'utilisateur et les éléments de mise en tension d'une manière distale ; 50
- d) l'élargissement de l'ouverture en déplaçant les extrémités externes proximales des supports l'une vers l'autre et en insérant le pied dans l'ouverture ; 55
- e) le déplacement du dispositif d'assistance dans la direction proximale, dans lequel le bas élastique est déplacé avec les premiers éléments de mise en tension le long de la jambe inférieure vers la cheville et dans la position désirée ; et
- e) la séparation des premiers éléments de mise en tension et du bas élastique.
15. Procédé destiné à retirer un bas élastique, comprenant :
- a) la préparation d'un dispositif d'assistance selon l'une quelconque des revendications 1 à 13;
- b) le couplage des seconds éléments de mise en tension et d'un bas élastique agencé autour de la jambe en mettant en place les seconds éléments de mise en tension au-dessous d'un bord supérieur du bas élastique, dans lequel une ouverture périphérique est formée entre le bas et la jambe ;
- c) le déplacement du dispositif d'assistance dans la direction distale, dans lequel le bas élastique est déplacé avec les seconds éléments de mise en tension le long de la jambe inférieure vers le pied et dans la position désirée ;
- d) l'élargissement de l'ouverture périphérique en déplaçant les extrémités externes proximales des supports l'une vers l'autre ;
- e) le complément de séparation du bas élastique sur le pied jusqu'à son retrait ; et
- f) le découplage des seconds éléments de mise en tension et du bas élastique.



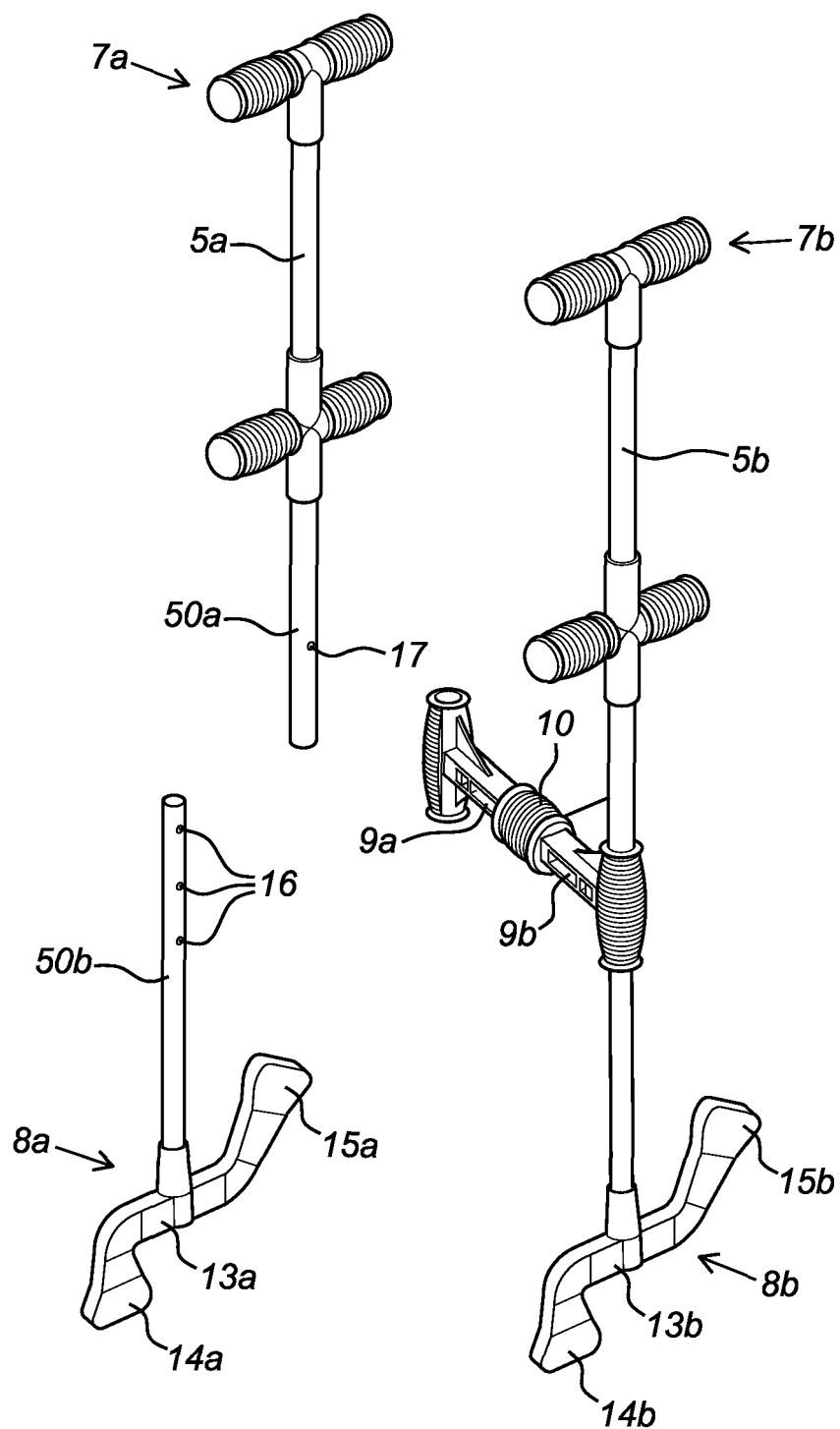


Fig. 2

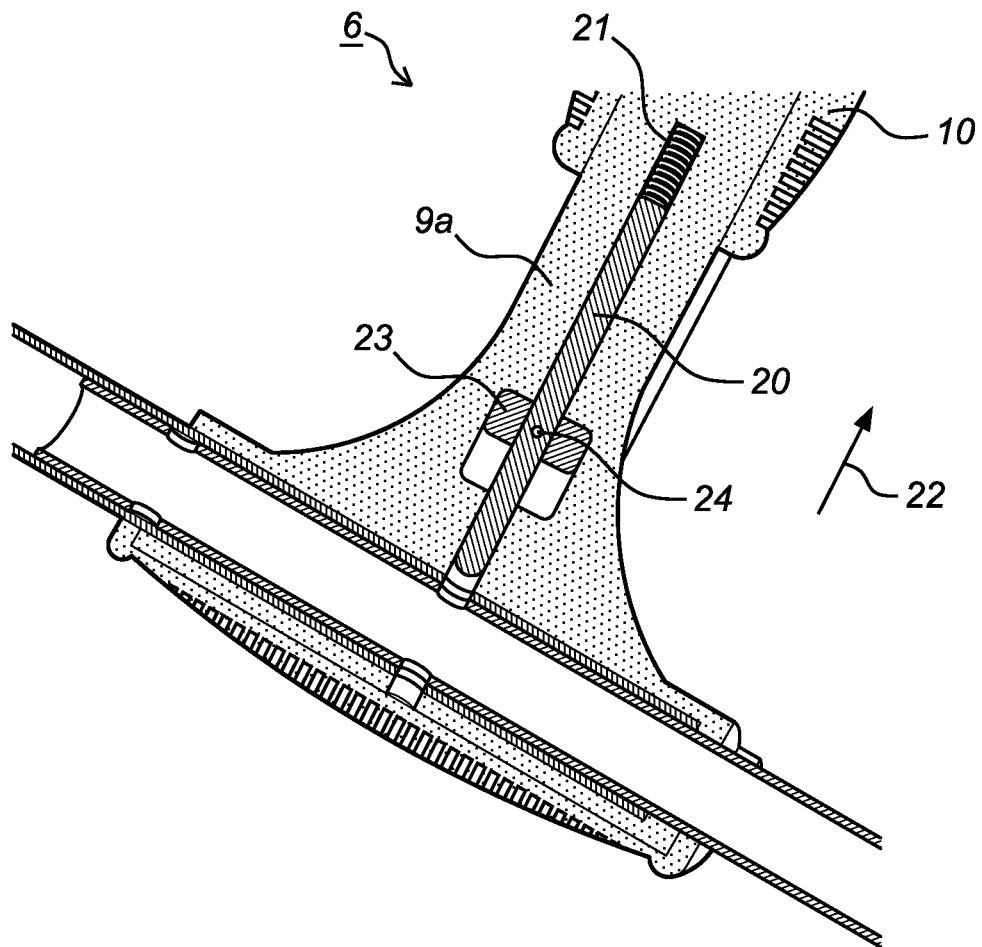
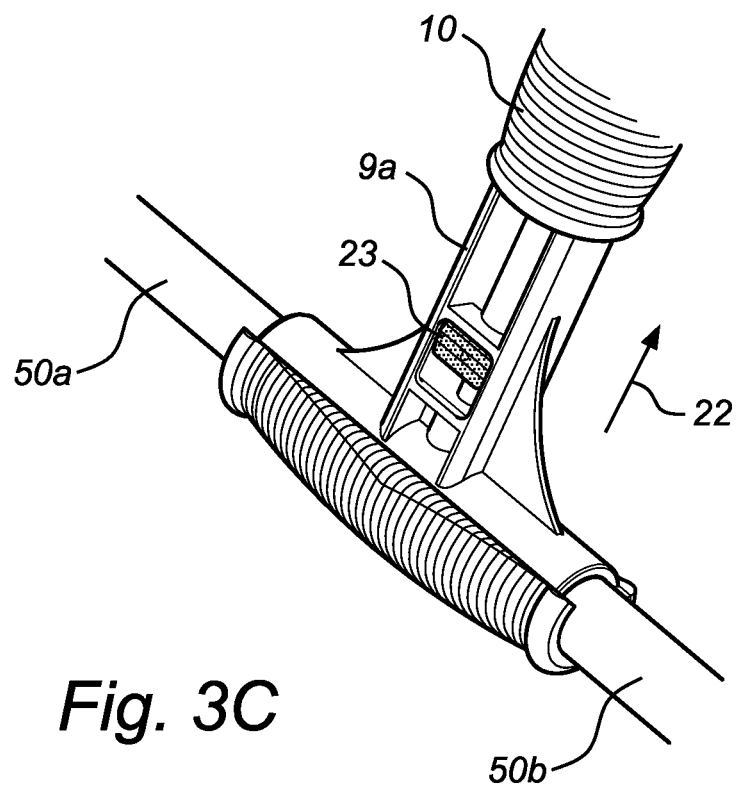
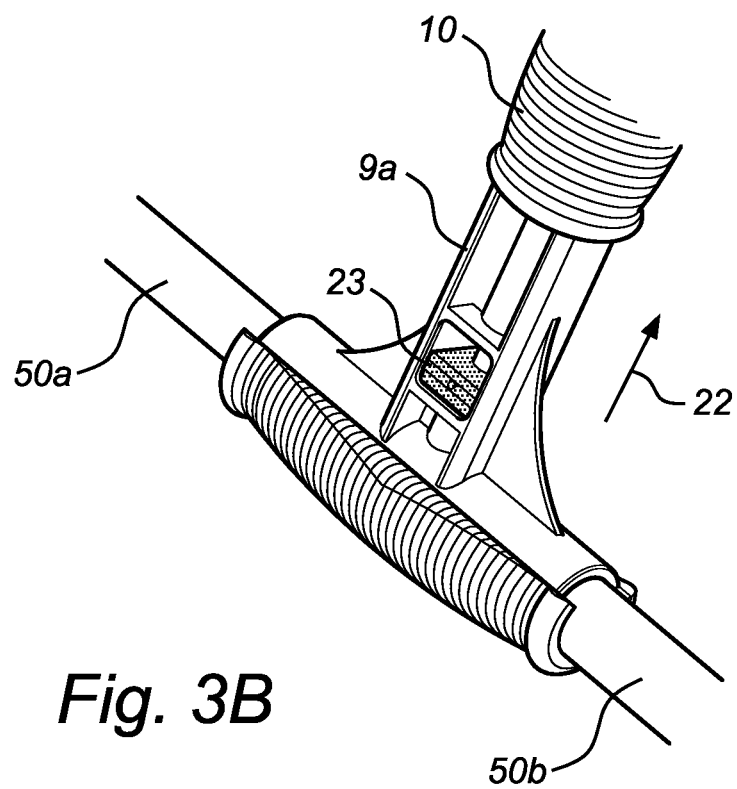


Fig. 3A



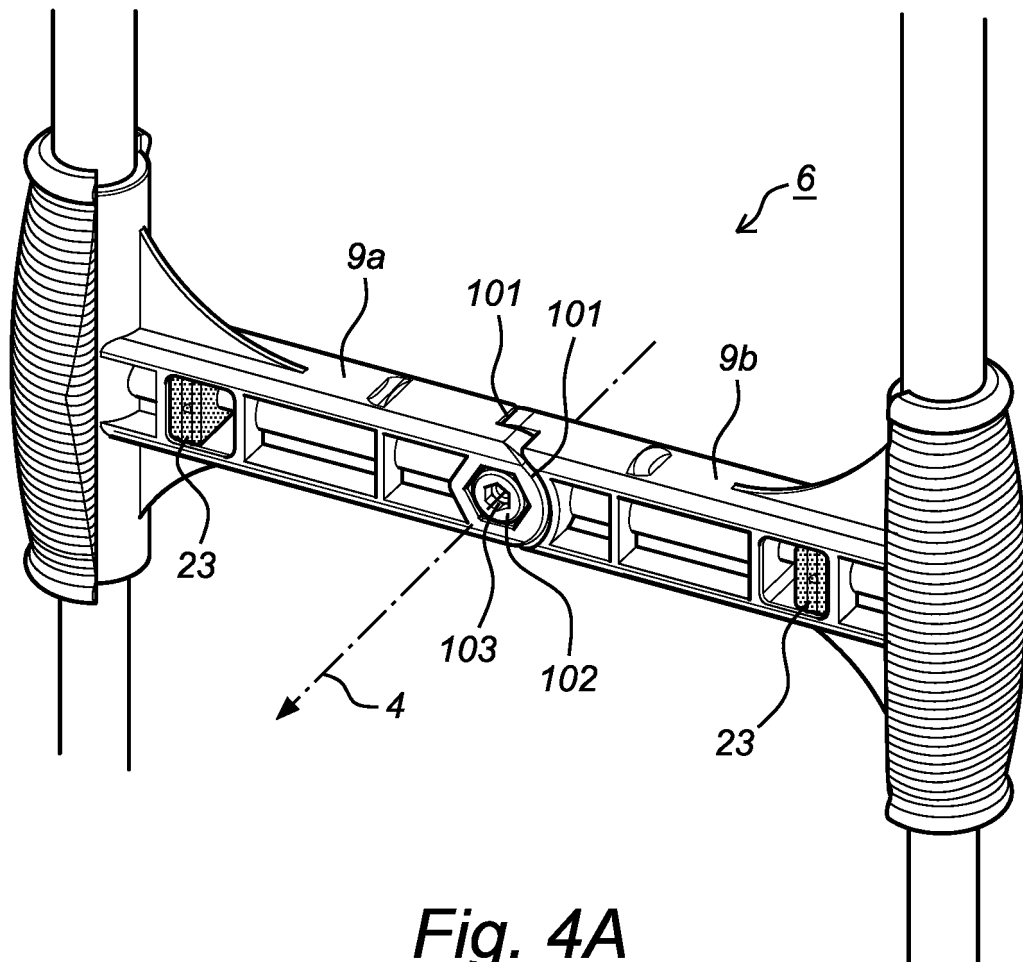


Fig. 4A

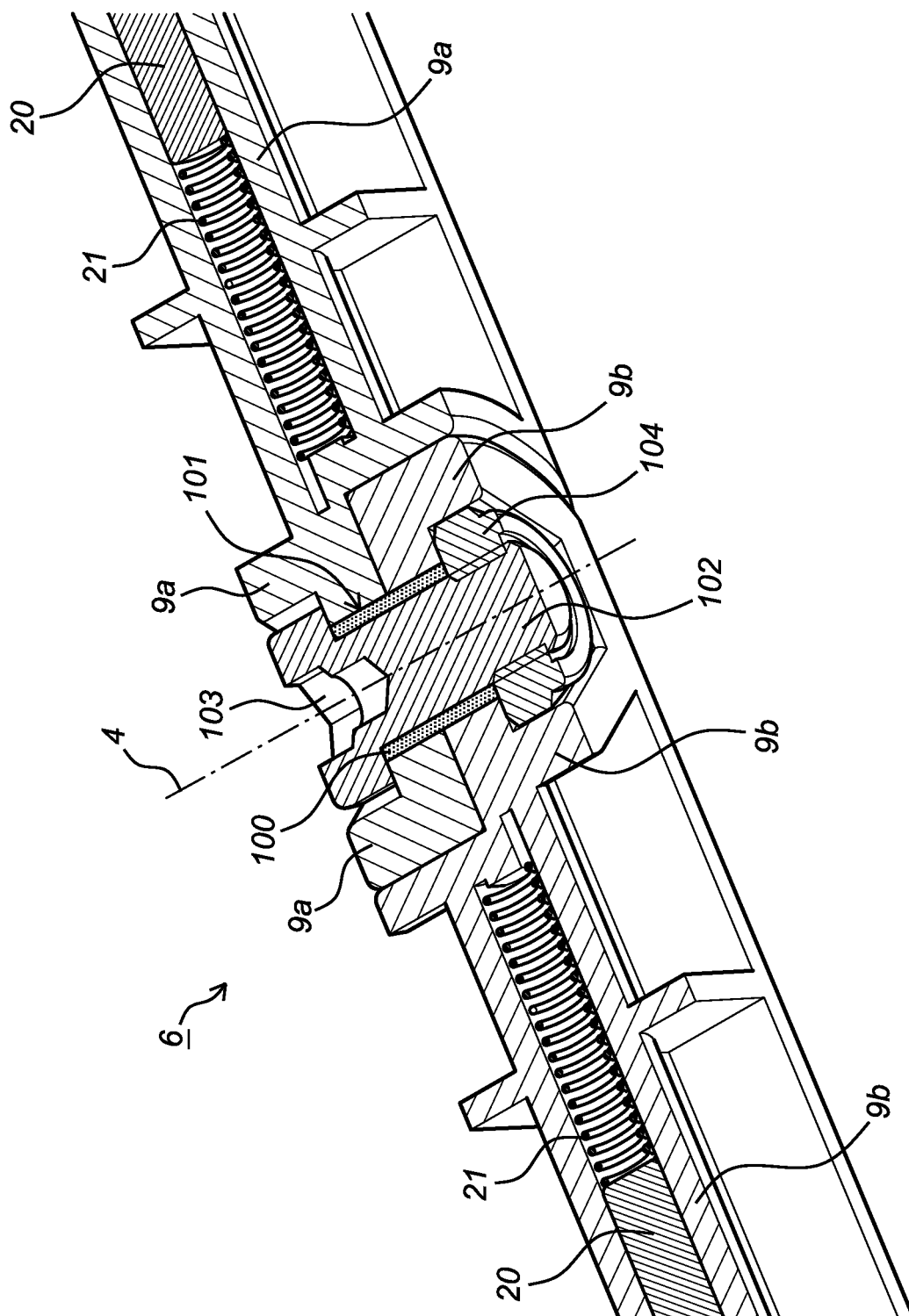


Fig. 4B

REFERENCES CITED IN THE DESCRIPTION

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