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(54) SYSTEM FOR DONNING A COMPRESSIVE GARMENT

(57) System (1) for donning a compressive garment (2), comprising: a ring assembly (3) forming a ring structure (5) comprising a circumferential wall for receiving a stretched compressive garment thereon; a support assembly (8) for supporting the ring structure (5) at an initial donning position defined by the support assembly; and at least one handle assembly (9) connected or at least connectable to at least one of the ring assembly and

the support assembly, the at least one handle assembly comprising one or more respective handles (10) which, when connected, are at least selectively arranged at a predetermined axial distance from the ring structure at an opposite axial side of the ring structure from a garment receiving end, at least when the ring structure is supported by the support assembly.

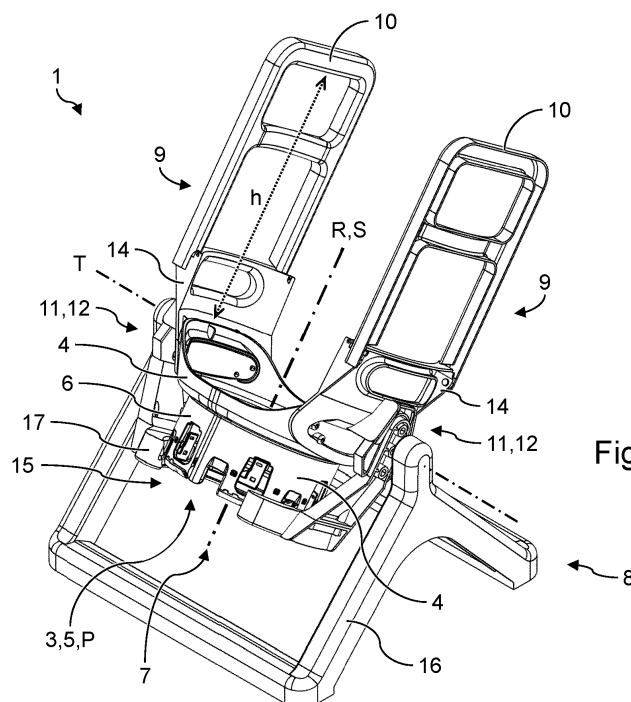


Fig. 1

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Description

FIELD

[0001] The invention relates to a system for donning a compressive garment as well as to a combination of such a system and the compressive garment.

BACKGROUND

[0002] Compressive garments, also known as compression garments, are known from practice. When worn, compressive garments fit tightly and compress underlying tissue. Such compression can be beneficial in various ways and in various situations. For example, compressive hosiery, in particular compressive stockings, are known for use in the treatment of venous or lymphatic diseases such as deep vein thrombosis.

[0003] Due to their tight, compressive fit, the donning of compressive garments is generally difficult, requiring forceful stretching of the garment prior to and during the donning, in order to be able to position the garment appropriately with respect to the relevant body part. In a traditional method, a user of the garment or an assistant stretches and positions the garment manually. This process is physically demanding, cumbersome, uncomfortable and potentially unsafe.

[0004] To provide improved donning of a compressive garment, WO2021/221494A1 discloses an assembly, device, system and method for donning a compressive garment. Although this provides substantial improvements over traditional methods, there is still a need for further improvements, in particular to better support wearers of various physical ability compressive garments to don the compressive garment by themselves, i.e. with less or no aid from other people such as caregivers.

SUMMARY

[0005] An object of the present invention is to provide improved donning of a compressive garment, in particular a compressive stocking. An object is to better support wearers of such compressive garments to don the compressive garment by themselves. This concerns in particular wearers with relatively limited ranges of motion in their back, arms and/or legs, as may be the case for example in some elderly or disabled wearers.

[0006] Thereto, an aspect of the invention provides a system for donning a compressive garment.

[0007] The system comprises a ring assembly comprising a set of ring sections together forming an openable closed ring structure which extends around a main ring axis. Said ring structure comprises a circumferential wall for receiving a stretched compressive garment thereon from a garment receiving axial end. The ring structure is configured for resisting radial compression of the circumferential wall by the received garment, wherein at least two of the ring sections are moveable

with respect to each other for opening the ring structure. Such a ring assembly is known as such from WO2021/221494A1.

[0008] The system further comprises a support assembly for supporting the ring structure with the received compressive garment at an initial donning position. The support assembly is at least selectively configured to clamp at least part of the compressive garment onto the circumferential wall of the supported ring structure for resisting, at least initially, axial relative movement between said at least part of the compressive garment and the circumferential wall. The initial donning position is defined by the support assembly, which is preferably mobile to thereby allow the initial donning position to be at a convenient position relative to the wearer.

[0009] Although not strictly necessary, the system preferably comprises a system for donning a compressive garment as taught in WO2021/221494A1, of which the respective teachings are therefore incorporated herein by reference.

[0010] The system further comprises at least one handle assembly connected or at least connectable to at least one of the ring assembly and the support assembly, the at least one handle assembly comprising one or more respective handles which, when connected, are at least selectively arranged at a predetermined axial distance from the ring structure at an opposite axial side of the ring structure from the garment receiving end, at least when the ring structure is supported by the support assembly.

[0011] Although the ring structure may itself comprise one or more handles, such a handle assembly advantageously enables a user such as a wearer to handle the ring assembly at a distance from their hands, which is particularly advantageous if the user's hands cannot reach all the way to the initial donning position. The initial donning position may for example be at ground level for a compressive stocking, and may thus be relatively difficult to reach by hand. Meanwhile, the ring assembly itself can remain relatively compact, which can be particularly advantageous when the ring assembly is handled by another user such as a caregiver, as well as having advantages for storage and transport purposes.

[0012] A further aspect provides a combination of the system described herein and the compressive garment, wherein the compressive garment is stretchable from a less stretched circumference which is small compared to a respective circumference of the circumferential wall of the ring structure, to a more stretched circumference which is at least equal to said circumference of the circumferential wall. The compressive garment may in particular be a compressive stocking.

[0013] A further aspect provides a support assembly evidently configured for use as the support assembly as described herein.

[0014] Such a combination of the system and compressive garment as well as said support assembly provide advantages corresponding to those set out above regarding the system.

[0015] Optional advantageous elaborations are provided by the features of the dependent claims, as will be explained further in the detailed description below.

DETAILED DESCRIPTION

[0016] In the following, the invention will be explained further using examples of embodiments and drawings. The drawings are schematic and merely show examples. In the drawings, corresponding elements are provided with corresponding reference signs. Although reference will be made to the drawings, it shall be appreciated that embodiments described herein may also be understood independent from the drawings and need not necessarily be mutually combined in the same way as in the examples shown in the drawings. In the drawings:

Fig. 1 shows a perspective view of an embodiment of a system for donning a compressive garment, with a ring structure in an initial donning position;

Fig. 2 shows a perspective view of a ring assembly with a compressive garment received thereon;

Fig. 3 shows an exploded perspective view of a ring assembly and two handle assemblies of the system of Fig. 1;

Fig. 4 shows a perspective view of the ring assembly and handle assemblies of the system of Fig. 1;

Fig. 5 shows a perspective view of the ring assembly with handle assemblies of Fig. 4, wherein the ring assembly is received on a device of the system, wherein the handle assemblies are in an adjusted state;

Fig. 6 shows a perspective view of a support assembly of the system of Fig. 1;

Fig. 7 shows a perspective view of an alternative example corresponding to the system of Fig. 1;

Fig. 8 shows a perspective view of a vertical cross section through a detail of the system of Fig. 1;

Fig. 9 shows a perspective view of a further embodiment of the system for donning a compressive garment, with a ring structure in an initial donning position;

Fig. 10 shows a front perspective view of the system of Fig. 9;

Fig. 11 shows a perspective view of the system of Fig. 9, with the ring assembly positioned away from a support assembly and a handle assembly;

Fig. 12 shows an exploded perspective view of the system of Fig. 9;

Fig. 13 shows a bottom perspective view of a base part of a support assembly of the system of Fig. 9;

Fig. 14 shows a bottom perspective view of a ring structure receiving part of a support assembly of the system of Fig. 9;

Fig. 15 shows a perspective view of the system of Fig. 9 in use, wherein the user holds the handle assembly and the ring structure has a received compressive garment in an initial donning position;

Fig. 16 shows a perspective view of the system of Fig. 9 in use, wherein the user has moved his foot into the compressive garment such that the compressive garment is donned along his foot;

Fig. 17 shows a perspective view of the system of Fig. 9 in use, wherein the user has moved the system such that the compressive garment is donned along his foot and part of his leg;

Fig. 18 shows a perspective view of the system of Fig. 9 in use, wherein the user placed the support assembly and handle assembly on the floor and holds the ring assembly with the compressive garment;

Fig. 19 shows a perspective view of the system of Fig. 9 in use, wherein the support assembly and handle assembly are positioned on the floor and the user has moved the ring assembly further along his leg;

Fig. 20 shows a perspective view of the system of Fig. 9 in use, wherein the support assembly and handle assembly are positioned on the floor and the user has moved the ring assembly away from the compressive garment;

Fig. 21 shows a highly schematic representation of a side view of a vertical cross section through a detail of the system of Fig. 9 and a compressive garment, wherein an axial distance between a resilient element and a received ring structure is a first distance;

Fig. 22 shows a highly schematic representation of a side view of a vertical cross section through a detail of the system of Fig. 9 and a compressive garment, wherein compared to Fig. 21 the axial distance between the resilient element and the received ring structure is a larger second distance;

Fig. 23 shows a perspective view of a ring structure receiving part configured to be connected to a handle assembly formed by two rigid structures;

Fig. 24 shows a side view of a detail of the system of Fig. 9, wherein an axial distance between a ring structure receiving part and a base part is a third distance; and

Fig. 25 shows a side view of a detail of the system of Fig. 9, wherein the axial distance between a ring structure receiving part and a base part is a larger fourth distance.

Fig. 1 shows an example of an embodiment of a system 1 for donning a compressive garment 2. Fig. 7 shows a further example of such a system 1, largely corresponding to the example of Fig. 1. Fig. 9 shows an example of a further embodiment of the system 1 for donning a compressive garment 2.

[0017] The system 1 may be combined with the compressive garment 2. In Fig. 1 and Fig. 9, for example, the system 1 is shown without a compressive garment; in Fig. 7 and Figs. 15-20 the system is shown with a compressive garment 2. In Figs. 21 and 22 a detail of the system 1 is shown with a detail of the compressive garment 2.

Preferably, the compressive garment 2 is stretchable from a less stretched circumference which is small compared to a respective circumference of the circumferential wall 6 of the ring structure 5, to a more stretched circumference which is at least equal to said circumference of the circumferential wall 6. The compressive garment 2 may be a compressive stocking.

[0018] The system 1 comprises a ring assembly 3. The ring assembly 3 of the system 1 of Fig. 1 is also shown in Figs. 3-5, 7-11 and 15-22, wherein in Fig. 7 and Figs. 15-22 a compressive garment 2 is received on the ring assembly 3. A further example of such a ring assembly 3 is shown in Fig. 2, also with a compressive garment 2 received thereon.

[0019] The ring assembly 3 comprises a set of ring sections 4 together forming an openable closed ring structure 5 which extends around a main ring axis R. The ring structure 5 comprises a circumferential wall 6 for receiving a stretched compressive garment 2 thereon from a garment receiving axial end 7. The ring structure 5 is configured for resisting radial compression of the circumferential wall 6 by the received garment 2. At least two of the ring sections 4 are moveable with respect to each other for opening the ring structure 5. Therefore, a user can open the ring structure 5 for removing the ring structure 5 from their limb after the compressive garment 2 has been donned, as can be seen for example in Fig. 20.

[0020] The ring assembly 3 preferably corresponds to a ring assembly known as such from WO2021/221494A1 and described in more detail therein.

[0021] With reference to Fig. 5, preferably, the system 1 further comprises a device 19 for stretching and positioning the compressive garment 2 onto the circumferential wall 6 of the ring structure 5, preferably a device for donning a compressive garment as known as such from WO2021/221494A1 and described in more detail therein.

[0022] The device 19 is configured for receiving the ring structure 5 thereon, and for releasing the ring structure 5 therefrom in an axial direction with respect to the main ring axis R. The device 19 comprises at least one engaging member 20 which is configured for engaging at least part of the compressive garment 2 and for moving at least the engaged part of the garment 2 with respect to the circumferential wall 6. The at least one engaging member 20 is moveable between a radially retracted position and a radially extended position, wherein in the radially extended position the engaging member 20 at least partly extends radially outwardly through at least one passage 21 in the circumferential wall 6, wherein in the retracted position the engaging member 20 extends less or not through said passage 21.

[0023] With reference to for example Figs. 1, 7, 9 and 15-20, the system 1 further comprises a support assembly 8. An embodiment of the support assembly 8 is also shown separately in Fig. 6. A further embodiment of the support assembly 8 is shown together with an embodi-

ment of the handle assembly 9 in the exploded view of Fig. 12. The support assembly 8 is configured for supporting the ring structure 5 with the received compressive garment 2 at an initial donning position P defined by the support assembly 8.

[0024] The support assembly 8 is at least selectively configured to clamp at least part of the compressive garment 2 onto the circumferential wall 6 of the supported ring structure 5 for resisting, at least initially, axial relative movement between said at least part of the compressive garment 2 and the circumferential wall 6. Thereby, a user can more easily fully insert their foot into the garment 2 without the garment 2 slipping off the wall prematurely, i.e. before the foot has been fully inserted. Once the foot has been fully inserted, the ring assembly 3 may for example be lifted from the support assembly 8 to thereby allow the garment 2 to at least selectively be released from the wall 6 onto the leg of the user. Alternatively or additionally, as explained further elsewhere herein, the support assembly 8 may be adjustable by a user to end or reduce the resisting, allowing the user to let the garment 2 be released from the wall onto their leg without the user having to grasp the ring assembly 3.

[0025] The system 1 comprises at least one handle assembly 9 connected or at least connectable to at least one of the ring assembly 3 and the support assembly 8. The at least one handle assembly 9 comprises one or more respective handles 10 which, when connected, are at least selectively arranged at a predetermined axial distance h (see e.g. Fig. 1, Fig. 9) from the ring structure 5 at an opposite axial side of the ring structure 5 from the garment receiving end 7, at least when the ring structure 5 is supported by the support assembly 8. The one or more handles 10 being located at an axial distance h from the ring structure 5 ensures that a user's hands don't have to reach all the way to the initial donning position P. The initial donning position P may for example be at ground level for a compressive garment 2, and may thus be relatively difficult to reach by hand. This is especially the case for wearers with relatively limited ranges of motion in their back, arms and/or legs.

[0026] The following parts of the detailed description can be particularly well understood with reference to Figures 1-7, as non-limiting examples of possible embodiments.

[0027] In embodiments, the number of handle assemblies 9 of the at least one handle assembly 9 is two. Thereby, the handle assemblies 9 enable a user to handle the ring assembly 3 and/or the support assembly 8 at a distance from their hands using both hands, in particular with one handle assembly 9 each comprising one handle 10 per hand. This allows a user to grab each handle 10 comfortably with one hand. Further, a lower force per hand is required by the user since the total force needed to, in use, operate the system 1 and thereby don the compressive garment 2 can be divided over two handles 10, i.e. over two hands.

[0028] Fig. 3 shows an example of an embodiment

wherein the two handle assemblies 9 are disconnected from the ring assembly 3 and the support assembly 8. In this example, the two handle assemblies 9 are connectable to the ring assembly 3. It will be appreciated that the two handle assemblies 9 may instead be connectable to the support assembly 8 or to both the ring assembly 3 and the support assembly 8. It shall be appreciated that the at least one connection between the handle assemblies 9 and at least one of the ring assembly 3 and the support assembly 8 may be realized in various ways, for example as a snap fit connection, a screw connection, a bolt connection, an adhesive connection, a hook-and-loop connection, etc. The at least one connection is preferably a releasable connection for purposes of modularity, adjustability and ease of storage and transport. This allows for the system 1 to become relatively compact when the different parts of the system 1 are disconnected by the user and not in use. However, the at least one connection may alternatively be a fixed connection.

[0029] In embodiments, the predetermined axial distance h is at least as large as the axial size of the ring structure 5 itself, for example about twice as large. The axial size of the ring structure 5 may for example be about 12.5 cm. In embodiments, the predetermined axial distance h is at least 15 cm, preferably at least 20 cm, for example about 26 cm. A particularly ergonomic design can be provided in this way, in particular with a sufficiently extended reach for users having difficulty to reach their feet with their hands.

[0030] With reference to Fig. 5, in embodiments, each handle assembly 9 is adjustable to adjust and/or cancel the predetermined axial distance h between the handle 10 and the ring structure 5, for example to an adjusted axial distance h^* , which may be smaller than the axial size of the ring assembly 3 itself.

[0031] Such adjustability can provide various advantages. For example, the axial distance between the handle 10 and the ring structure 5 may thus be adjusted to a specific user's needs. Moreover, as shown in Fig. 5, the ring structure 5 may thereby be positioned on the device 19 to receive the stretched garment using the device 19, while the device is positioned on an extended flat surface such as a table top or counter top.

[0032] In embodiments, as for example shown in Fig. 5 when compared to Fig. 4, for providing the adjustability, the handle 10 is rotatable with respect to a connecting part 14 of the handle assembly 9 which connecting part 14 is configured to connect to the ring assembly 3. Such rotatability may be about a rotation axis extending transverse to the main ring axis R , in particular substantially tangential with respect to the ring structure 5. Alternatively or additionally, the handle 10 could be translatable with respect to the connecting part 14, in particular along the main ring axis R .

[0033] In embodiments, the support assembly 8 comprises a ring structure receiving part 17. For the clamping of the at least part of the compressive garment 2 onto the circumferential wall 6, the ring structure receiving part 17

of the support assembly 8 comprises a resilient material 18 arranged to be engaged by the circumferential wall 6 with the garment 2 therebetween when the ring structure 5 with the compressive garment 2 is at the initial donning position P . Such a resilient material 18 is shown in Fig. 8 in the form of a section of a rubber O-ring extending along the ring structure receiving part 17 in a circumferential direction. Alternatively or additionally, a foam material could be used. The resilient material 18 can be compressed and decompressed upon respective clamping and releasing of at least part of the compressive garment 2 between the circumferential wall 6 and the ring structure receiving part 17.

[0034] In embodiments, the support assembly 8 has a radial opening 15 through which a leg of a user can be moved away from the support assembly 8 in a radially outward direction from a position in which the leg extends to coincide with a main axis S of the support assembly 8 corresponding to the main ring axis R . In this way, a user can more easily move their leg away from the support assembly 8, e.g. once their foot has been inserted into the garment 2.

[0035] In embodiments, a circumferential size of the radial opening 15 is in the range of 60 to 120 degrees, preferably in the range of 75 to 105 degrees, for example about 90 degrees. It has been found that such a size provides sufficient clearance for the leg while still enabling good engagement between the ring assembly 3 and the support assembly 8 upon receiving the ring structure 5 in the initial donning position P . In view of the radial opening 15, the support assembly 8 may thus comprise a substantially horseshoe shaped part or section, as can be seen in Fig. 6 in the form of a ring structure receiving part 17.

[0036] In embodiments, the support assembly 8 comprises a base part 16 and a ring structure receiving part 17, wherein at least one of a position and an orientation of the ring structure receiving part 17 with respect to the base part 16 is adjustable. Thereby, the support assembly 8 and the corresponding position of the ring assembly 3 can be adjusted e.g. to a specific user's needs. The adjusting could even occur during donning of the garment to thereby allow a user to more easily maneuver their foot through the ring structure 5.

[0037] As shown in e.g. Figs. 1 and 6, the base part 16 may be a frame-like base, i.e. mainly consisting of interconnected frame parts. Alternatively, as shown in Fig. 7, the base part 16 may be a box-like base, i.e. mainly consisting of interconnected plate parts. The base part 16 can alternatively have a more organic shape, as shown in for example Figs. 9-14. The base part 16 can be shaped such that a main axis S of the support assembly 8 corresponding to the main ring axis R extends, in use, in a direction coinciding a path of insertion of the user's foot into the ring structure 5. This allows for a more stable placement of the base part 16 and the ring assembly 3 with respect to a flat surface such as a floor during maneuvering of the user's foot through the ring structure

5. It shall be appreciated that further variations are possible, e.g. a combination of one or more plate parts and/or one or more frame parts and/or one or more organically shaped parts.

[0038] In embodiments as for example shown in Figs. 1, 3-5 and 7, the adjustability comprises a rotatability about a rotation axis T parallel to a normally horizontal plane as defined by the base part 16, said rotation axis T being transverse to an axis S of the support assembly 8 corresponding to the main ring axis R. The adjustment may thus be a substantially swinging type of adjustment, which has been found to be advantageous in facilitating a maneuvering of the user's foot through the ring structure 5. Alternatively or additionally, the adjustability may comprise a translatability, e.g. a vertical adjustment of the rotation axis T with respect to the base part 16.

[0039] In embodiments, as for example shown in Figs. 1 and 3-7, the support assembly 8 on the one hand and at least one of the ring assembly 3 and the at least one handle assembly 9 on the other hand are provided with one or more respective guiding structures 11, 12 which are configured to mutually cooperate so as to guide the ring structure 5 towards the initial donning position P. Thereby, a user such as a wearer can relatively easily and precisely position the ring structure 5 with the compressive garment 2 in the initial donning position P, in particular also with limited dexterity while handling the ring structure 5 at a distance from their hands using the at least one handle assembly 9. A relatively precise positioning of the ring structure 5 with respect to the support assembly 8 may be required, in particular to facilitate the aforementioned clamping function of the support assembly 8.

[0040] In embodiments, each handle assembly 9, in particular each connecting part 14 thereof, comprises a respective one 12 of the guiding structures 11, 12. Alternatively or additionally, one or more guiding structures could be comprised by a ring section 4 of the ring assembly 3.

[0041] In embodiments, as for example shown in Figs. 1-7, the guiding structures 11, 12 are configured to align the main ring axis R with a corresponding main axis S of the support assembly 8 when the ring structure 5 approaches the initial donning position P in an at least partially axial direction. An advantageous centering action can thus be provided, enabling a relatively stable and well balanced engagement between the ring structure 5 and the support assembly 8, in particular the ring structure receiving part 17 thereof.

[0042] In embodiments as for example shown in Figs. 1, 3-5 and 7, the guiding structures 11, 12 are circumferentially distributed about the main ring axis R, respectively about a corresponding main axis S of the support assembly 8. The centering action may thereby be particularly effective. For example, the guiding structures 11, 12 may be arranged at opposite lateral sides, e.g. corresponding to sides where the handle assemblies 9 may be arranged and/or connected.

[0043] In embodiments, the guiding structures 11, 12 have mutually mating tapered shapes. In this way, a relatively precise centering action can be provided without requiring a very precise handling by the user.

[0044] In embodiments, the guiding structures 11, 12 are provided with a resilient material 13 at a mutual interface to stabilize the ring structure 5 at the initial donning position P. Such resilient material 13 may serve to compensate for any play among mutually mating guiding structures 11, 12. Moreover, a light clamping action may be provided by such resilient material 13, so that the ring structure 5 may also be stabilized along its axial direction R (although still being manually releasable along said direction).

[0045] The following parts of the detailed description can be particularly well understood with reference to Figures 9-22, as non-limiting examples of possible embodiments.

[0046] In embodiments, the at least one handle assembly 9 is connected to the support assembly 8, wherein the support assembly 8 is configured to end, or at least reduce, the clamping when the support assembly 8 with the supported ring structure 5 is suspended via the at least one handle assembly 9. This allows the clamping force on the compressive garment 2 to decrease when the ring assembly 3 is lifted away from the initial donning position P together with the support assembly 8 via the at least one handle assembly 9, i.e. in a situation such as shown in Fig. 17.

[0047] In embodiments, the support assembly 8 comprises a base part 16 and a ring structure receiving part 17. The base part 16 may be configured to be supported on a supporting surface such as a floor. The base part 16 may be provided with a resilient element 22. The ring structure receiving part 17 is configured to receive the ring structure 5 therein, wherein the at least one handle assembly 9 may be connected to the ring structure receiving part 17. An axial passage in the support assembly 8 for the received garment 2 to extend through extends through both the ring structure receiving part 17 and the base part 16. The ring structure receiving part 17 may be movable with respect to the base part 16 to vary an axial distance between the resilient element 22 and the garment receiving axial end 7 of the received ring structure 5 between a first distance D1 and a larger second distance D2, in particular by varying an axial distance between the ring structure receiving part 17 and the base part 16 between a third distance D3 and a larger fourth distance D4. Such distances have been indicated in Figs. 21 and 22 as illustrative examples.

[0048] At the first distance D1, shown in Fig. 21, the resilient element 22 is arranged to provide the clamping of the at least part of the compressive garment 2 onto the circumferential wall 6, i.e. at the garment receiving axial end 7, of the supported ring structure 5. At the larger second distance D2, shown in Fig. 22, compared to the first distance D1, the resilient element 22 is arranged to provide less or none of said clamping of the at least part of

the compressive garment 2 onto the circumferential wall 6, i.e. at the garment receiving axial end 7, of the supported ring structure 5. Therefore, when there is a first axial distance D1 between the resilient element 22 and the garment receiving axial end 7, the compressive garment 2 may be clamped on the circumferential wall 6 of the supported ring structure 5. The compressive garment 2 may be released from the wall 6 onto the leg of the user when there is a larger second axial distance D2 between the resilient element 22 and the garment receiving axial end 7 of the received ring structure 5. The first distance D1 may be at or near zero, in particular being about the same as a thickness of the garment 2. The second distance D2 is preferably considerably larger than the thickness of the garment 2, for example at least five times said thickness. Advantageously, a selectivity between clamping and non-clamping of the garment 2 onto the wall 6 of the ring structure 5 may thus be provided by the configuration of the system 1, in particular the support assembly 8.

[0049] In embodiments, the ring structure receiving part 17 is movably connected to the base part 16 to inhibit one or more mutual movements of the ring structure receiving part 17 and the base part 16 not corresponding to the variation of the axial distance between the first distance D1 and the larger second distance D2, in particular to inhibit axial movement beyond the larger second distance D2 from the first distance D1 and/or to inhibit non-axial movement. This allows for the ring structure receiving part 17 to remain connected to the base part 16 in conveniently close proximity thereof, while still allowing for marginal axial movement between said parts. Therefore, the axial distance between the ring structure receiving part 17 and the base part 16 can be varied between a third distance D3 and a larger fourth distance D4. Such distances have been indicated in Figs. 21 and 22 as illustrative examples, as well as being indicated in Figs. 24 and 25.

[0050] In embodiments, the support assembly 8 comprises at least one biasing element 23. The biasing element 23 can for example comprise one or more springs, wherein the springs are each configured to mutually bias the ring structure receiving part 17 and the base part 16 towards the first distance D1 from the larger second distance D2. Hence, a biasing force can be applied to pull the ring structure receiving part 17 towards the base part 16. The one or more springs, e.g. such as shown in Fig. 12, can e.g. be arranged on a bottom side of the base part 16 in the first recesses 25 shown in Fig. 13. Each of the springs 23 can be connected to the base part 16 with a screw being inserted through the base part 16 into second recesses 26 of the ring structure receiving part 17 shown in Fig. 14. As may be understood from Fig. 12, the screw 27 may extend through the spring 23, wherein a washer 28 may be used to retain the spring 23 between the head of the screw 27 and the deep end of the first recess 25. For clarity of the drawing, only a single set of such a spring 23, screw 27 and washer 28 are shown in

Fig. 12, whereas preferably multiple, in particular about four, such sets are used, as may be understood from the four second recesses 26 visible in Fig. 14, where it can also be seen that such sets and recesses are preferably relatively evenly distributed along the circumferential direction.

[0051] In embodiments, with particular reference to Fig. 22, at the larger second distance D2, the resilient element 22 is arranged to engage at least part of the compressive garment 2 at an axial distance from the ring structure 5 axially beyond the garment receiving axial end 7. Such engaging of at least part of the compressive garment 2 by the resilient element 22 may promote a relatively well controlled release of the garment 2, in particular by providing a suitable resistance that can contribute to the garment 2 being released onto the limb without wrinkles or folds, yet also without excessive axial stretching of the garment 2.

[0052] At the larger second distance D2, the compressive garment 2 applies a force F to the resilient element 22 in axial direction, i.e. the direction of main ring axis R of the ring structure 5, the force F being directed distally with respect to the garment receiving axial end 7. The force F applied by the compressive garment 2 to the resilient element 22, in distal direction from the ring structure 5, is transmitted via the resilient element 22 to the base part 16. The transmission of the force F from the compressive garment 2 to the base part 16 moves the base part 16 further away from the ring structure receiving part 17, thereby increasing the axial distance between the base part 16 and the ring structure receiving part 17 from D3 to D4. The force F is created by the user when maneuvering their foot through the ring structure 5, thereby applying tension so as to urge the compressive garment 2 to stretch in the axial direction of main ring axis R. At the same time when the user maneuvers their foot through the ring structure 5, the user pulls the handle assembly 9 proximally towards the user's torso, thereby increasing the axial distance between the ring structure receiving part 17 and the base part 16 to the larger fourth distance D4 from the third distance D3. Figures 24 and 25 show further illustrative examples of the third and fourth axial distances D3 and D4 between the ring structure receiving part 17 and the base part 16. Correspondingly, it can be seen that in Fig. 17 the axial distance between ring structure receiving part 17 and base part 16 is increased compared to Fig. 16, wherein in particular an axial width of a circumferential gap between respective outer wall sections of both parts has increased, similar to what is seen in Fig. 25 compared to Fig. 24.

[0053] In embodiments, the resilient element 22 presents a tapering garment engaging surface 24 that gradually narrows the axial passage for the received garment 2 from a wider passage at a side of the ring receiving part 17 to a narrower passage at a side of the base part 16. Hence, when the axial distance between the resilient element 22 and the garment receiving axial end 7 comprises a first distance D1, the clamping force between the

compressive garment 2, the resilient element 22 and the circumferential wall 6 comprises both a friction force and a normal force.

[0054] In embodiments, the narrower passage at the side of the base part 16 is narrow compared to a width of the ring structure 5 at the garment receiving axial end 7 of the ring structure 5. In this way, the resilient element 22 can advantageously continue to be engaged with the garment 2, with associated advantages as explained above, in particular using a relatively simple and robust construction.

[0055] Figs. 21 and 22 show a side view of a vertical cross section through a detail of the system of Fig. 9. In Fig. 21, an axial distance between the resilient element 22 and the garment receiving axial end 7 of the received ring structure 5 is a first distance D1. Here, the compressive garment 2 is clamped between the circumferential wall 6 of the ring structure 5 and the resilient element 22. The resilient element 22 is in this example slightly compressed by the clamping force.

[0056] In Fig. 22, an axial distance between a resilient element 22 and the garment receiving axial end 7 of the received ring structure 5 is a second distance D2. Here, the compressive garment 2 is released from between the circumferential wall 6 of the ring structure 5 and the resilient element 22. The resilient element 22 in Fig. 22 is shown having its uncompressed shape due to the absence of the clamping force.

[0057] In Figs. 21 and 22 the resilient element 22 comprises a tapering garment engaging surface 24 that gradually narrows the axial passage for the received garment 2 from a wider passage at a side of the ring receiving part 17 to a narrower passage at a side of the base part 16.

[0058] Thus, in embodiments, for the clamping of the at least part of the compressive garment 2 onto the circumferential wall 6, the support assembly 8 comprises a resilient element 22 arranged to be engaged by the circumferential wall 6 with the garment 2 therebetween when the ring structure 5 with the compressive garment 2 is at the initial donning position P. This allows for the compressive garment 2 to stay clamped on the circumferential wall 6 while the user maneuvers their foot through the ring structure 5. Hence, the compressive garment 2 can be pulled up along the user's foot without being released from the circumferential wall 6 too early, such that the compressive garment 2 is donned tightly around the wearer's foot and/or leg. A first garment part 2A of the compressive garment 2 is in this example retained along the circumferential wall 6 of the ring structure 5. Here, a second garment part 2B is the part of the compressive garment 2 that is released from the circumferential wall 6 and positioned axially distal from the garment receiving axial end 7. At the larger second distance D2 shown in Fig. 22, the second garment part 2B still engages the resilient element 22 and applies the force F via the resilient element 22 to the base part 16. Also, the first garment part 2A is still engaged with cir-

cumferential wall 6. Both of these engagements, individually as well as together, are believed to contribute to a relatively well controlled release of the garment 2. As can be seen in Fig. 22, in this example, during the release of the garment 2 in a downward direction, the garment 2 is constrained by the engagement with the wall 6 and the resilient element 22 to essentially follow a zigzag or meandering path, resulting in a resistance that balances the aim of easy release without excessive stretching with the aim of gradual release without wrinkling of the garment after release. Thus, the second garment part 2B may be more stretched than the first garment part 2A, which may be wrinkled, as schematically shown in Figs. 21 and 22. It shall be appreciated that the mentioned zigzag or meandering path for the garment 2 is here enabled by the above-described option wherein the resilient element 22 presents a tapering garment engaging surface that gradually narrows the axial passage for the received garment from a wider passage at a side of the ring receiving part 17 to a narrower passage at a side of the base part 16, wherein the narrower passage at the side of the base part 16 is narrow compared to a width of the ring structure 5 at the garment receiving axial end 7 of the ring structure 5.

[0059] In embodiments, the at least one handle assembly 9 is formed from a single rigid structure, for example a rigid tube structure, that is rigidly connectable or connected to the at least one of the ring assembly 3 and the support assembly 8. This single rigid structure allows for more efficient force transfer from the user to the system 1 during operating thereof. Further, the single rigid structure provides a robust handle assembly 9 that is less likely to be damaged, broken or used in an unintended manner in combination with the system 1.

[0060] Alternatively, the at least one handle assembly 9 may be formed from two rigid structures, for example two rigid tube structures, that are rigidly connectable or connected to the at least one of the ring assembly 3 and the support assembly 8. Fig. 23 shows an example of a ring structure receiving part 17 that is configured for connecting two rigid structures forming the handle assembly 9 thereto. The ring structure receiving part 17 is in this example substantially horseshoe shaped, and comprises two elongate curved recesses 29 for connecting the handle assembly 9 thereto. At an end of each elongate curved recess 29, the ring structure receiving part 17 comprises a, e.g. cylindrical, handle connection protrusion 30. The two rigid structures of the handle assembly 9 can each comprise one or more handles 10. The handle connection protrusions 30 are each configured to engage an end of a rigid structure of handle assembly 9. Compared to a handle assembly formed from a single rigid structure, the handle assembly formed from two rigid structures may be more easily stored and/or transported, e.g. when not assembled to the ring structure receiving part 17.

[0061] In embodiments, different sizes of handle assemblies 9, such as handle assemblies 9 with different

distances h between handle 10 and ring assembly 3 and/or with varying handle 10 widths, can be combined with the system 1. The user can choose the required handle assembly 9 size, i.e. corresponding to the user's body dimensions, capabilities and/or preferences, and connect the chosen handle assembly 9 to the support assembly 8. The handle assemblies 9 are easily connected to the ring structure receiving part 17 of the support assembly 8. Optionally, handle add-ons (not shown) can be provided for connection thereof to each of the handles 10. The handle add-ons can each be connected to one of the handles 10 for providing increased grip resistance and/or more comfort in grabbing of the handles 10 by the user. Figs. 15-20 show perspective views of the system of Fig. 9 in a possible use, wherein the user operates the system 1 for donning the compressive garment 2 on his own foot and leg. The steps for donning the compressive garment 2 by a user may be performed with the system 1 in the following order. In Fig. 15, the user holds the handle assembly 9 that is connected to the support assembly 8, in particular holding handles 10 thereof. The ring structure 5 is here positioned in the support assembly 8. The ring structure 5 here has a received compressive garment 2 in an initial donning position P. Here, the support assembly 8 is positioned on a floor as a flat surface in front on the user. The user is sitting on a chair, as this position allows the user to operate the system 1 more easily and comfortably. It will be appreciated that the system 1 can also be operated by a different person than the wearer of the compressive garment 2, such as a caregiver or helper. Hence, the person operating the system 1 can be positioned differently in order to ensure a more comfortable posture.

[0062] In Fig. 16, the user has inserted his foot into the compressive garment 2, without the garment 2 slipping off the wall prematurely, i.e. before the foot has been fully inserted. The user here holds the handle assembly 9 while the support assembly 8 is still resting on the flat surface. The compressive garment 2 is here donned along a substantial part of the user's foot. During this donning along the foot, to avoid premature release of the garment 2, the garment 2 preferably remains clamped essentially as illustrated in Fig. 21 and explained elsewhere herein.

[0063] Thereafter, the user has lifted the system 1 from the floor by pulling the handle assembly 9 in a substantially upward direction along his leg in Fig. 17. At least a part of the compressive garment 2 is released from the circumferential wall 6 and donned along the user's leg. As can be seen from Fig. 17, there is a nonzero distance between the ring receiving part 17 and the base part 16, while the parts are still in close proximity of one another. In particular, it can be seen that the axial distance between the ring receiving part 17 and the base part 16 is larger in Fig. 17 than in Figs. 15 and 16, the larger distance in particular corresponding to the larger distance D2 compared to the smaller distance D1 as illustrated in Figs. 22 and 21, respectively. As explained elsewhere herein, the

larger distance D2, as well as the further arrangement illustrated in Fig. 22, can advantageously enable a well-balanced release of the garment at this time.

[0064] In Fig. 18, the user placed the support assembly 8 and handle assembly 9 back on the floor, separating the support assembly 8 from the ring assembly 3. The support assembly 8 can be positioned on the floor by lowering the handle assembly 9 with the user's hands. The user thereafter holds the ring assembly 3 with part of the compressive garment 2 thereon with his hands. Meanwhile, the radial opening 15 has allowed the user to move his leg radially away from the support assembly 8.

[0065] Fig. 19 shows that the support assembly 8 and handle assembly 9 are still positioned on the floor. The user has moved the ring assembly 3 and the compressive garment 2 further along his leg in the direction of his knee. The compressive garment 2 is now fully donned along the user's leg, and the ring assembly 3 can be removed from underneath the compressive garment 2.

[0066] In Fig. 20, the support assembly 8 and handle assembly 9 are still positioned on the floor. The user has now moved the ring assembly 3 away from the compressive garment 2 by opening the closed ring structure 5 and removing the ring structure 5 from underneath the compressive garment 2. The ring structure 5 is opened by the user by moving two ring sections 4 away from each other in an radially outward direction of the ring assembly 3. The donning process of the compressive garment 2 is now complete. The user can similarly don another compressive garment on their other leg. Thereto, the ring structure 5 may be closed again so as to position a further compressive garment thereon using the device 19, and subsequently placing the ring structure 5 with the further compressive garment in the support assembly 8, which may thereto be lifted by a user to avoid having to reach to the initial donning position.

[0067] Although the invention has been explained herein using examples of embodiments and drawings, these do not limit the scope of the invention as defined by the claims. Many variations, extensions and combinations are possible, as will be appreciated by the skilled person having the benefit of the present disclosure. Examples thereof have been provided throughout the description.

LIST OF REFERENCE SIGNS

[0068]

1. System
2. Compressive garment
- 2A. First garment part of compressive garment
- 2B. Second garment part of compressive garment
3. Ring assembly
4. Ring section
5. Ring structure
6. Circumferential wall
7. Garment receiving axial end

- 8. Support assembly
- 9. Handle assembly
- 10. Handle
- 11. Female guiding structure
- 12. Male guiding structure 5
- 13. Resilient material of guiding structures
- 14. Connecting part of handle assembly
- 15. Radial opening
- 16. Base
- 17. Ring structure receiving part 10
- 18. Resilient material of ring structure receiving part
- 19. Device
- 20. Engaging member
- 21. Passage in circumferential wall
- 22. Resilient element 15
- 23. Biasing element
- 24. Garment engaging surface
- 25. First recess
- 26. Second recess
- 27. Screw 20
- 28. Washer
- 29. Elongate curved recess
- 30. Handle connection protrusion
- D1. First distance between resilient element and garment receiving axial end of received ring structure 25
- D2. Second distance between resilient element and garment receiving axial end of received ring structure
- D3. Third distance between ring structure receiving part and base part 30
- D4. Fourth distance between ring structure receiving part and base part
- h. Distance between handle and ring assembly
- P. Initial donning position 35
- R. Main ring axis
- S. Corresponding main axis of support assembly
- T. Rotation axis

Claims 40

1. System (1) for donning a compressive garment (2), comprising:
 - a ring assembly (3) comprising a set of ring sections (4) together forming an openable closed ring structure (5) which extends around a main ring axis (R), said ring structure (5) comprising a circumferential wall (6) for receiving a stretched compressive garment (2) thereon from a garment receiving axial end (7), wherein the ring structure (5) is configured for resisting radial compression of the circumferential wall (6) by the received garment (2), wherein at least two of the ring sections (4) are moveable with respect to each other for opening the ring structure (5); 45
 - a support assembly (8) for supporting the ring structure (5); 50

structure (5) with the received compressive garment (2) at an initial donning position (P) defined by the support assembly (8), wherein the support assembly (8) is at least selectively configured to clamp at least part of the compressive garment (2) onto the circumferential wall (6) of the supported ring structure (5) for resisting, at least initially, axial relative movement between said at least part of the compressive garment (2) and the circumferential wall (6); and

- at least one handle assembly (9) connected or at least connectable to at least one of the ring assembly (3) and the support assembly (8), the at least one handle assembly comprising one or more respective handles (10) which, when connected, are at least selectively arranged at a predetermined axial distance (h) from the ring structure (5) at an opposite axial side of the ring structure (5) from the garment receiving end (7), at least when the ring structure (5) is supported by the support assembly (8).

2. System according to claim 1, wherein the support assembly (8) comprises:

- a base part configured to be supported on a supporting surface such as a floor, the base part being provided with a resilient element; and
- a ring structure receiving part configured to receive the ring structure (5) therein, wherein the at least one handle assembly (9) is connected to the ring structure receiving part,

wherein an axial passage for the received garment to extend through extends through both the ring structure receiving part and the base part,

wherein the ring structure receiving part is movable with respect to the base part to vary an axial distance between the resilient element and the garment receiving axial end (7) of the received ring structure (5) between a first distance and a larger second distance,

wherein at the first distance the resilient element is arranged to provide the clamping of the at least part of the compressive garment (2) onto the circumferential wall (6) of the supported ring structure (5),

wherein at the larger second distance, compared to the first distance, the resilient element is arranged to provide less or none of said clamping.

3. System according to claim 2, wherein the ring structure receiving part is movably connected to the base part to inhibit one or more mutual movements of the ring structure receiving part and the base part not

corresponding to the variation of the axial distance between the first distance and the larger second distance, in particular to inhibit axial movement beyond the larger second distance from the first distance and/or to inhibit non-axial movement.

4. System according to claim 2 or 3, wherein the support assembly comprises at least one biasing element, for example one or more springs, configured to mutually bias the ring structure receiving part and the base part towards the first distance from the larger second distance. 10
5. System according to any of claims 2-4, wherein the at the larger second distance, the resilient element is arranged to engage at least part of the compressive garment (2) at an axial distance from the ring structure (5) axially beyond the garment receiving axial end (7). 15
6. System according to any of claims 2-5, wherein the resilient element presents a tapering garment engaging surface that gradually narrows the axial passage for the received garment from a wider passage at a side of the ring receiving part to a narrower passage at a side of the base part. 20
7. System according to claim 6, wherein the narrower passage at the side of the base part is narrow compared to a width of the ring structure (5) at the garment receiving axial end (7) of the ring structure (5). 25
8. System according to any of the preceding claims, wherein the support assembly (8) has a radial opening (15) through which a leg of a user can be moved away from the support assembly (8) in a radially outward direction from a position in which the leg extends to coincide with a main axis (S) of the support assembly (8) corresponding to the main ring axis (R), preferably wherein a circumferential size of the radial opening (15) is in the range of 60 to 120 degrees, preferably in the range of 75 to 105 degrees, for example about 90 degrees. 30
9. System according to any of the preceding claims, wherein the support assembly (8) comprises a base part (16) and a ring structure receiving part (17), wherein at least one of a position and an orientation of the ring structure receiving part (17) with respect to the base part (16) is adjustable. 35
10. System according to any of the preceding claims, wherein the at least one handle assembly (9) is formed from a single rigid structure or two rigid structures, for example a single or two rigid tube structure(s), that is/are rigidly connectable or con- 40

nected to the at least one of the ring assembly (3) and the support assembly (8).

11. System according to any of the preceding claims, wherein, for the clamping of the at least part of the compressive garment (2) onto the circumferential wall (6), the support assembly (8) comprises a resilient element (18) arranged to be engaged by the circumferential wall (6) with the garment (2) therebetween when the ring structure (5) with the compressive garment (2) is at the initial donning position (P). 45

12. System according to any of the preceding claims, further comprising a device (19) for stretching and positioning the compressive garment (2) onto the circumferential wall (6) of the ring structure (5), 50

wherein the device (19) is configured for receiving the ring structure (5) thereon, and for releasing the ring structure (5) therefrom in an axial direction with respect to the main ring axis (R), wherein the device (19) comprises at least one engaging member (20) which is configured for engaging at least part of the compressive garment (2) and for moving at least the engaged part of the garment (2) with respect to the circumferential wall (6),

wherein the at least one engaging member (20) is moveable between a radially retracted position and a radially extended position, wherein in the radially extended position the engaging member (20) at least partly extends radially outwardly through at least one passage (21) in the circumferential wall (6), wherein in the retracted position the engaging member (20) extends less or not through said passage (21). 55

13. Combination of a system (1) according to any of the preceding claims and the compressive garment (2), wherein the compressive garment (2) is stretchable from a less stretched circumference which is small compared to a respective circumference of the circumferential wall (6) of the ring structure (5), to a more stretched circumference which is at least equal to said circumference of the circumferential wall (6). 60

14. Support assembly evidently configured for use as the support assembly in the system according to any of claims 1- 12. 65

15. Use of a system according to any of claims 1-12 for donning a compressive garment. 70

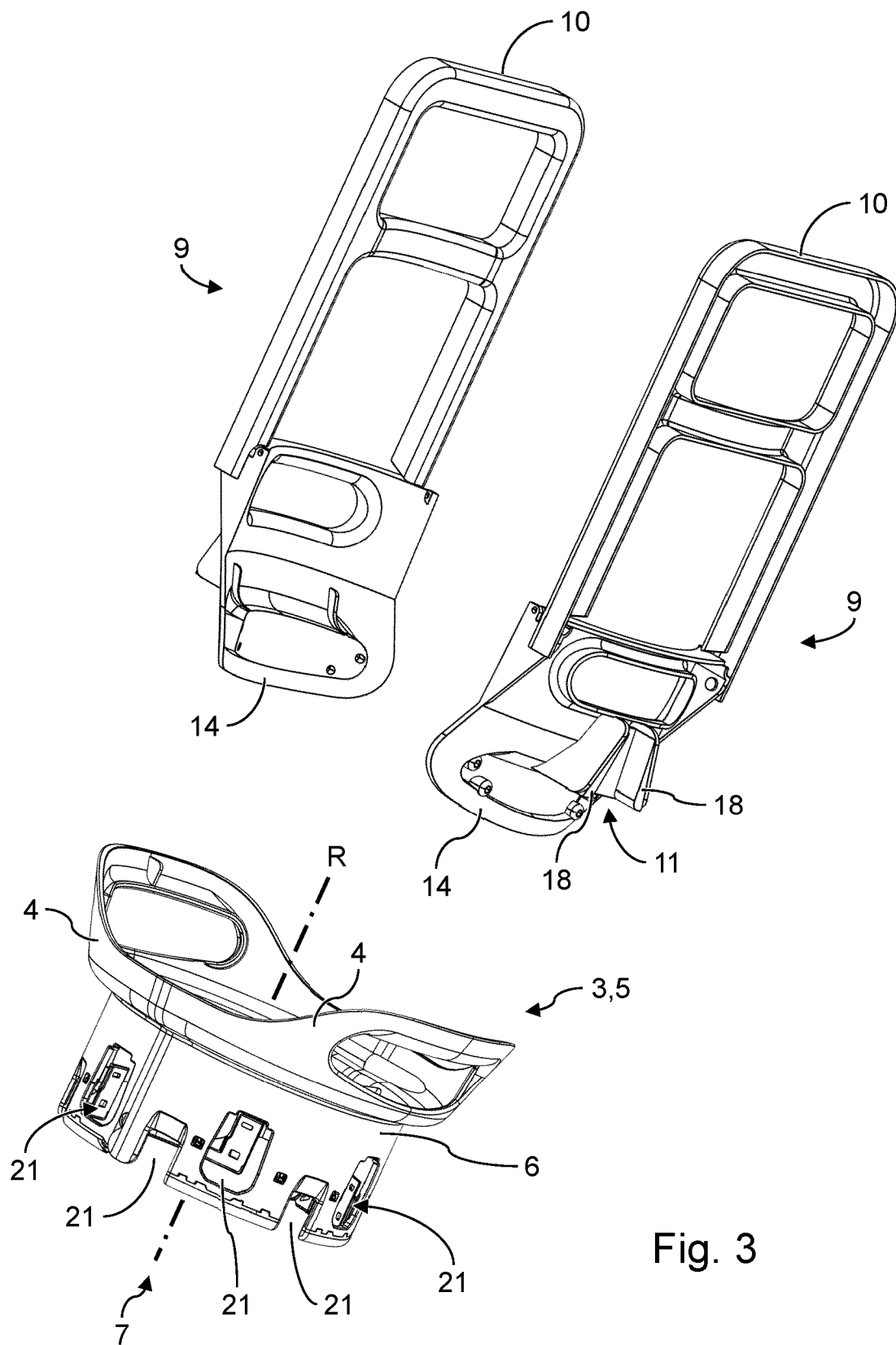
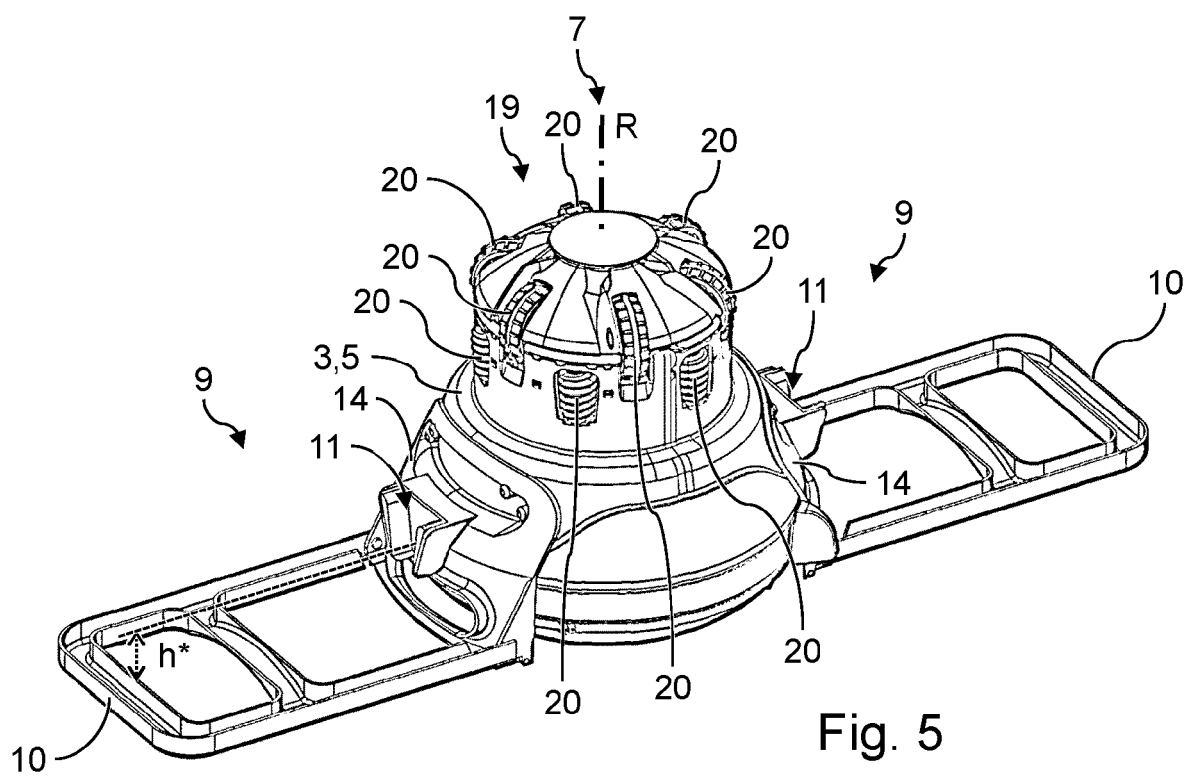
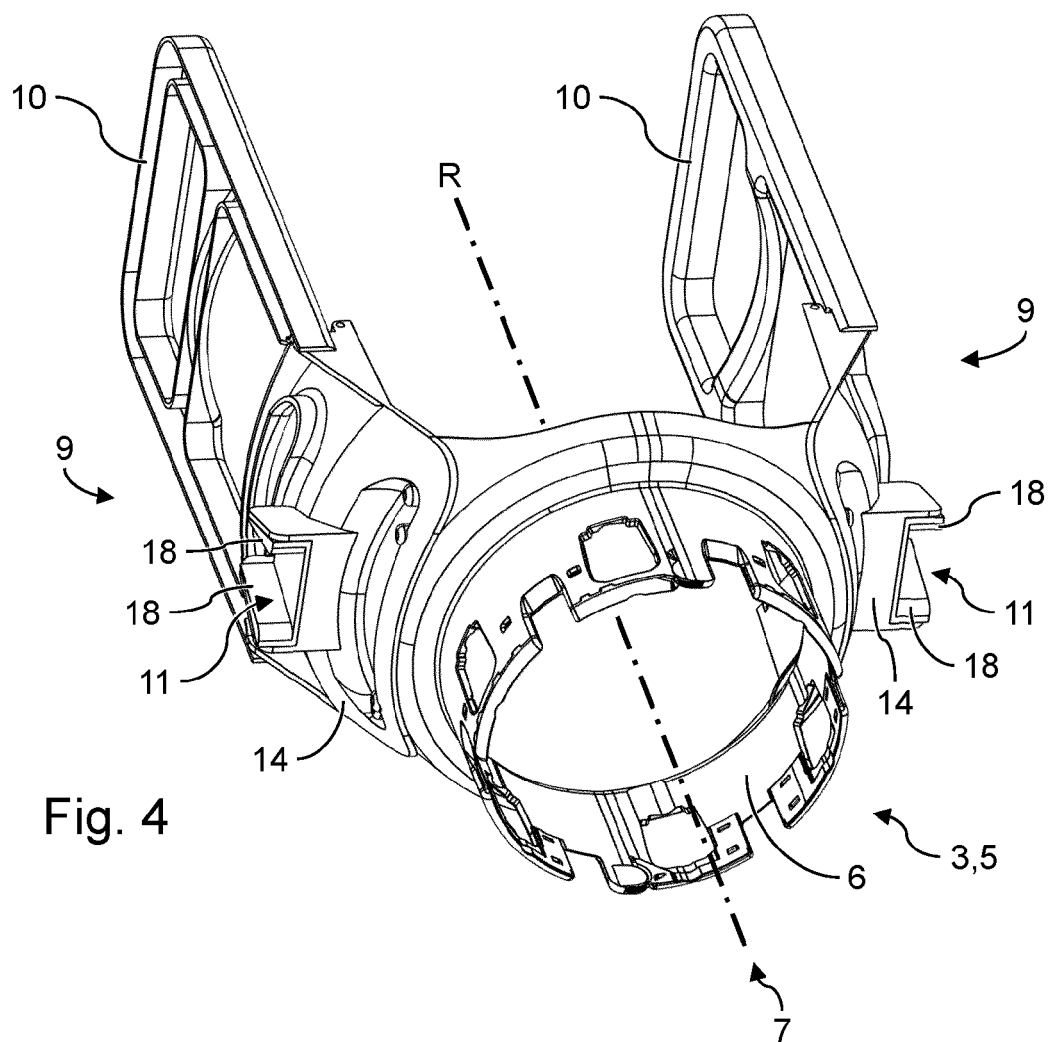
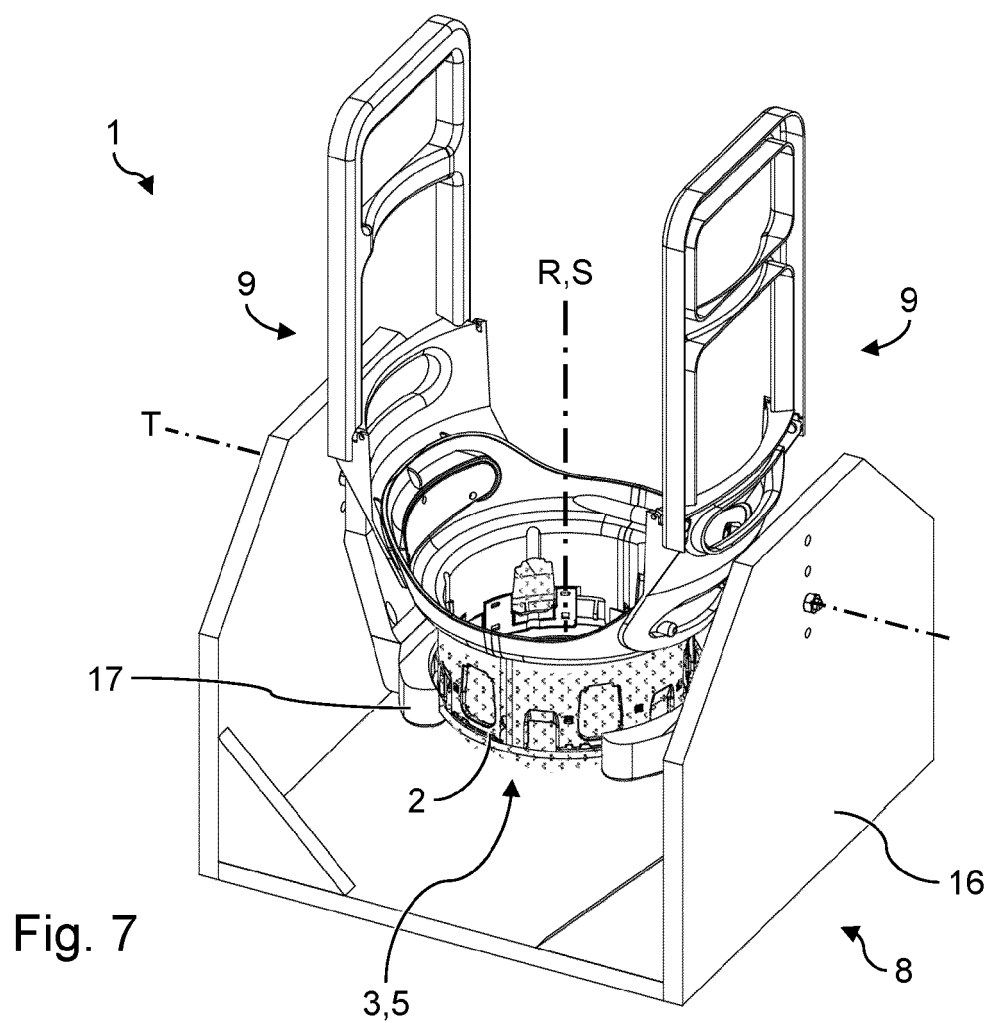
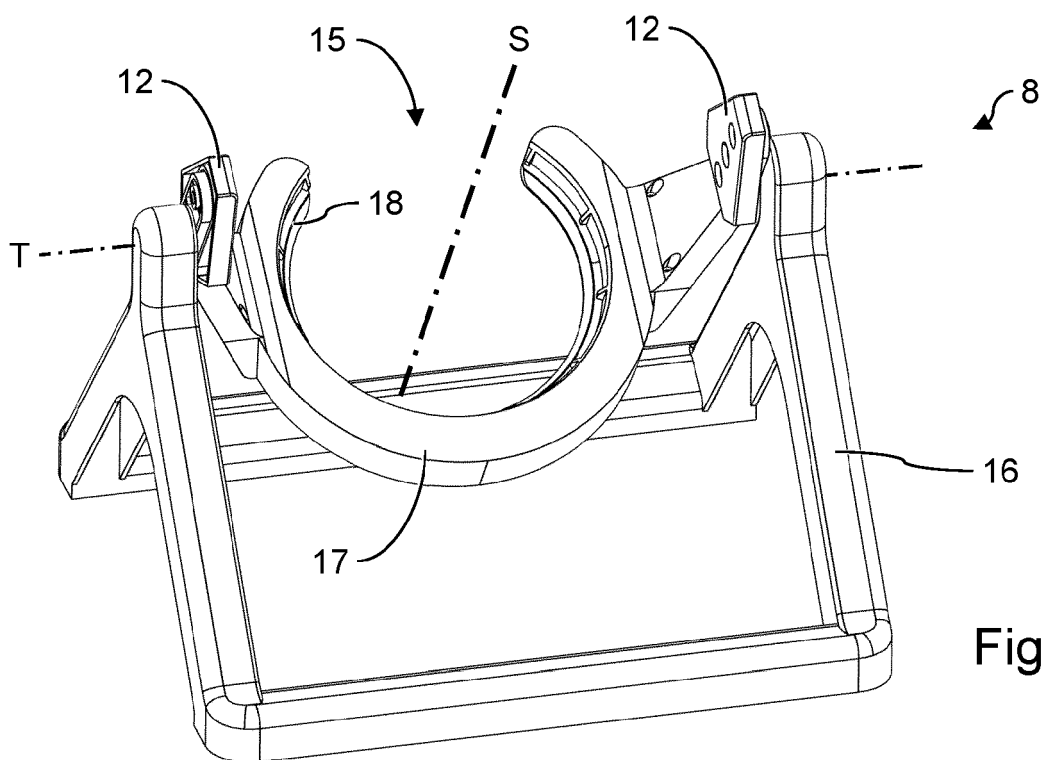


Fig. 3





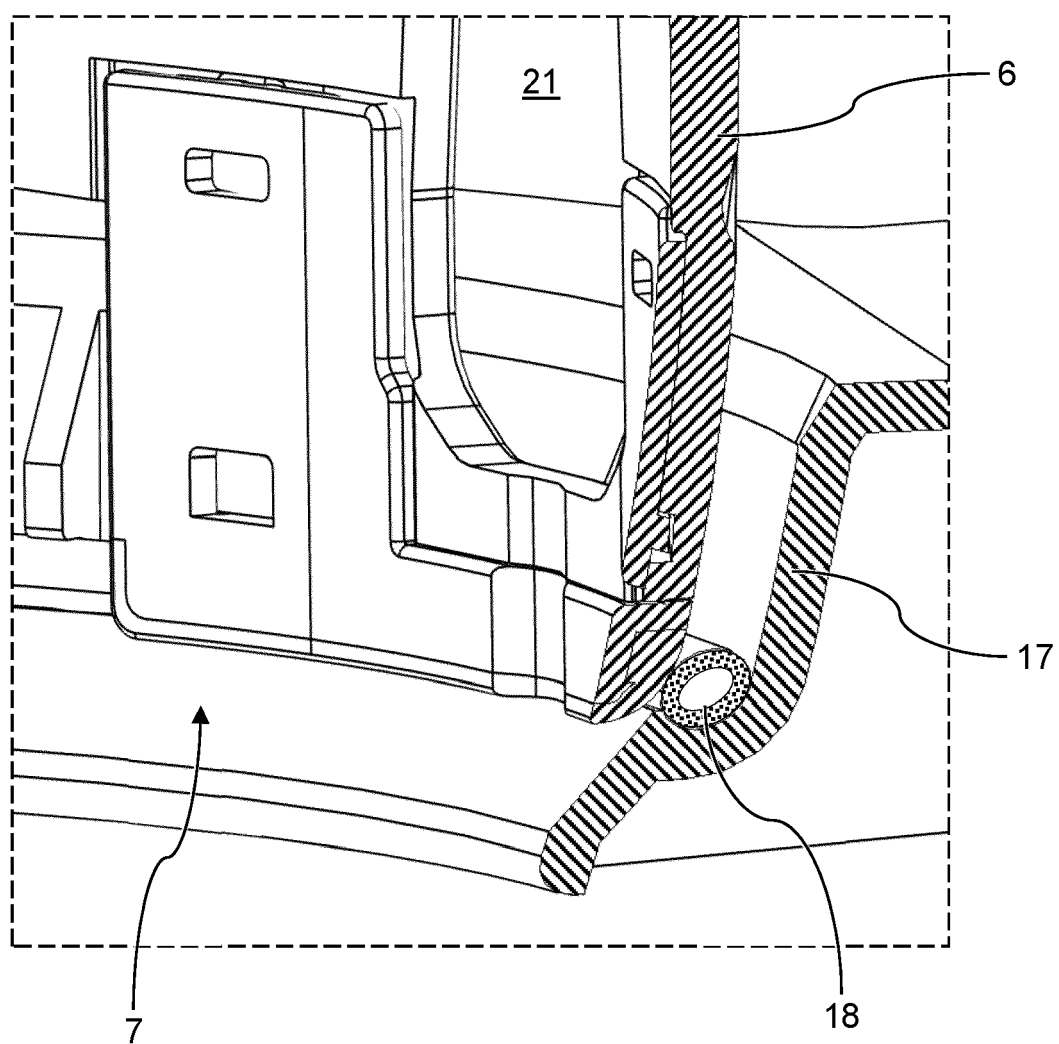


Fig. 8

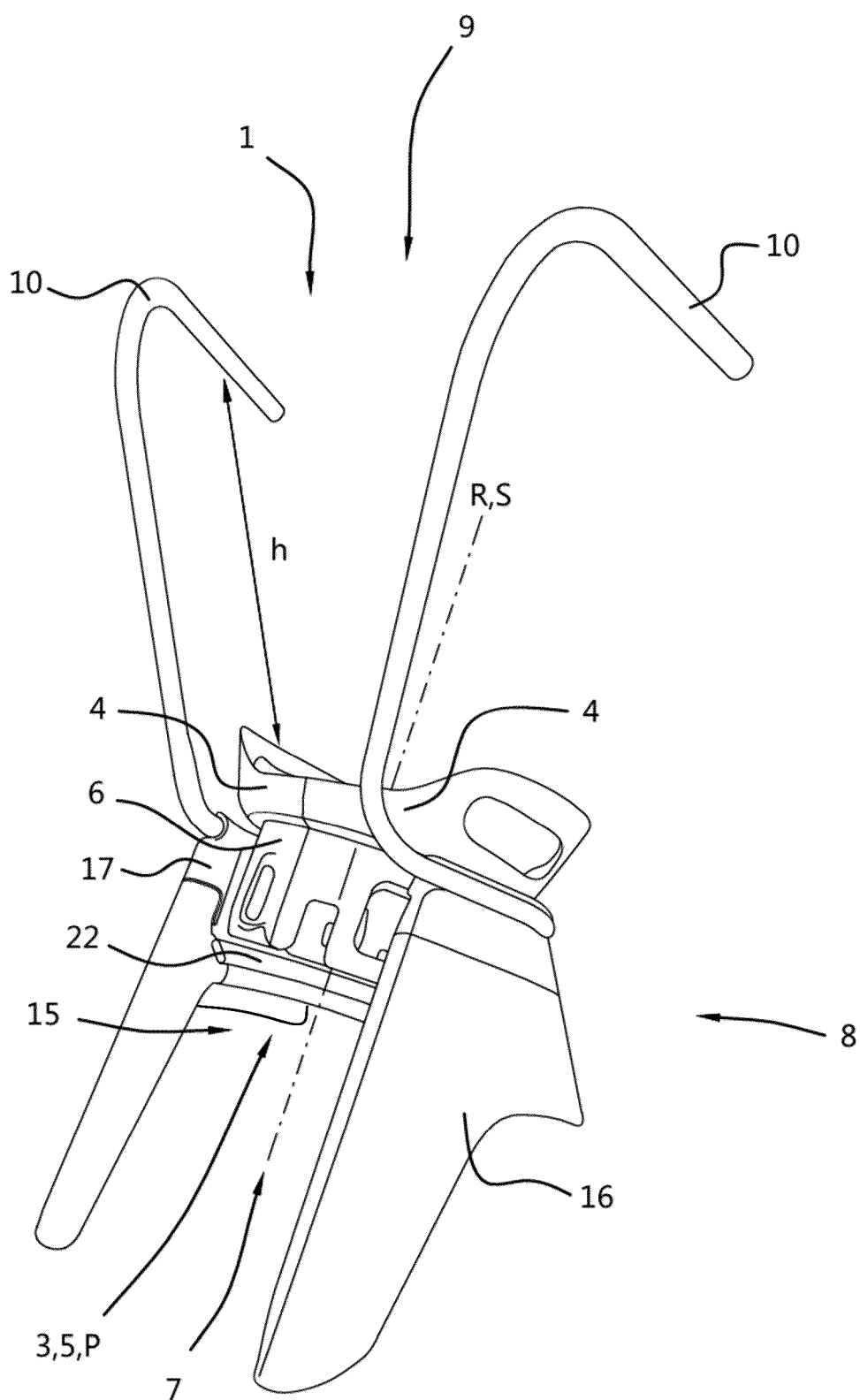


Fig. 9

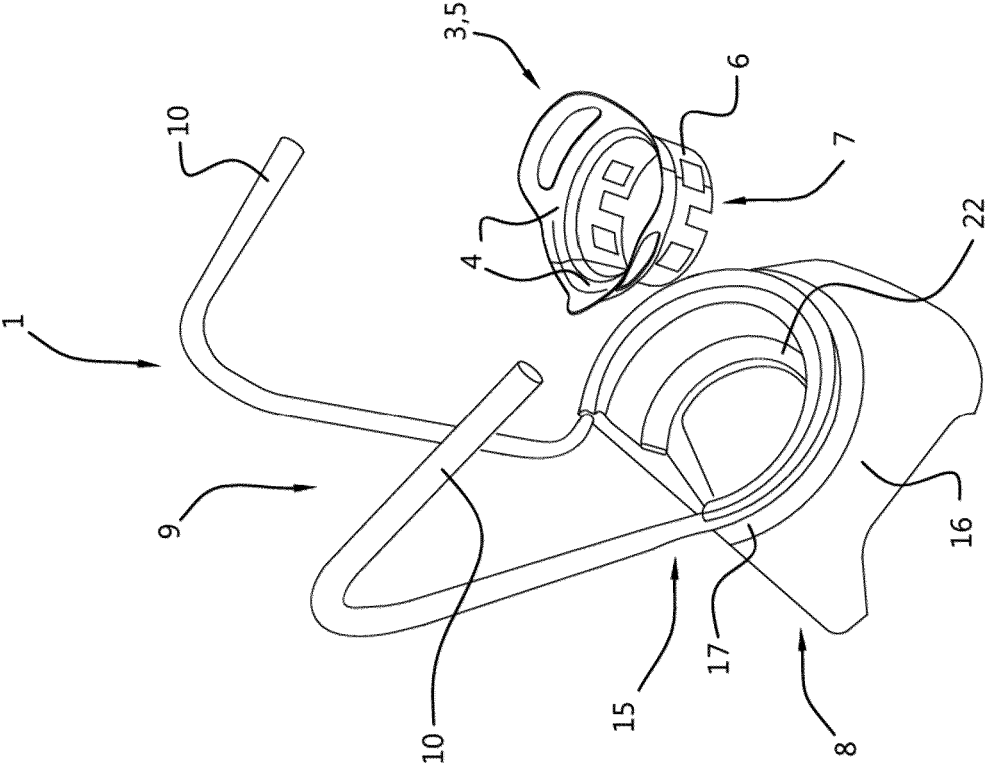


Fig. 11

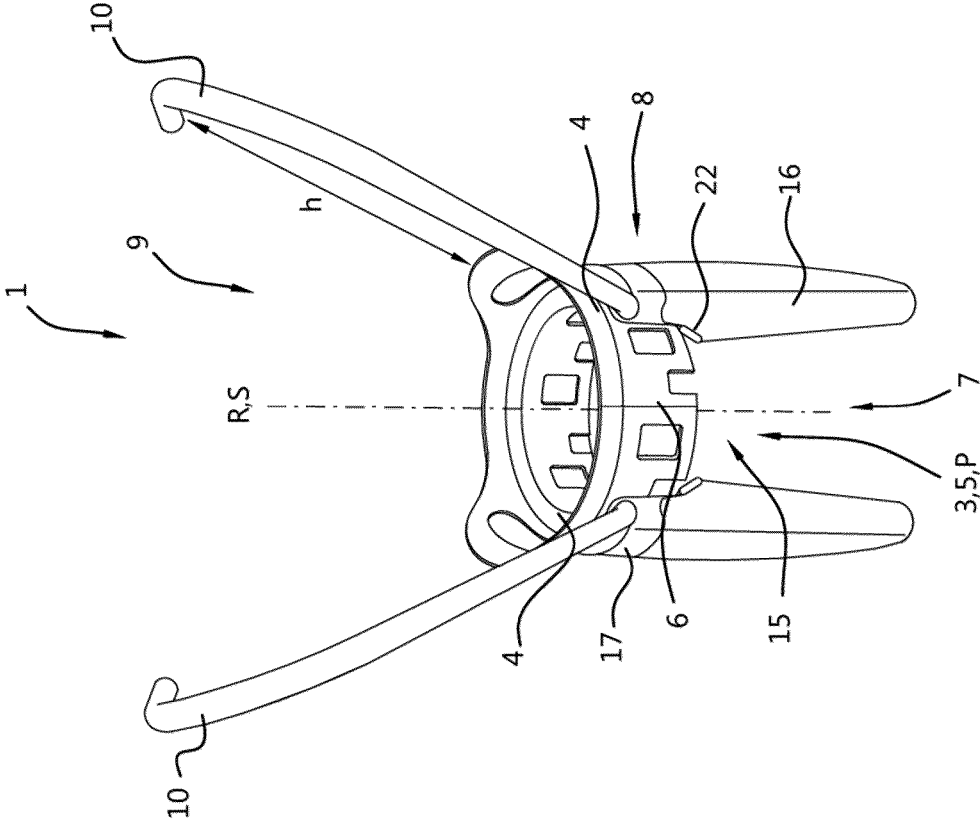


Fig. 10

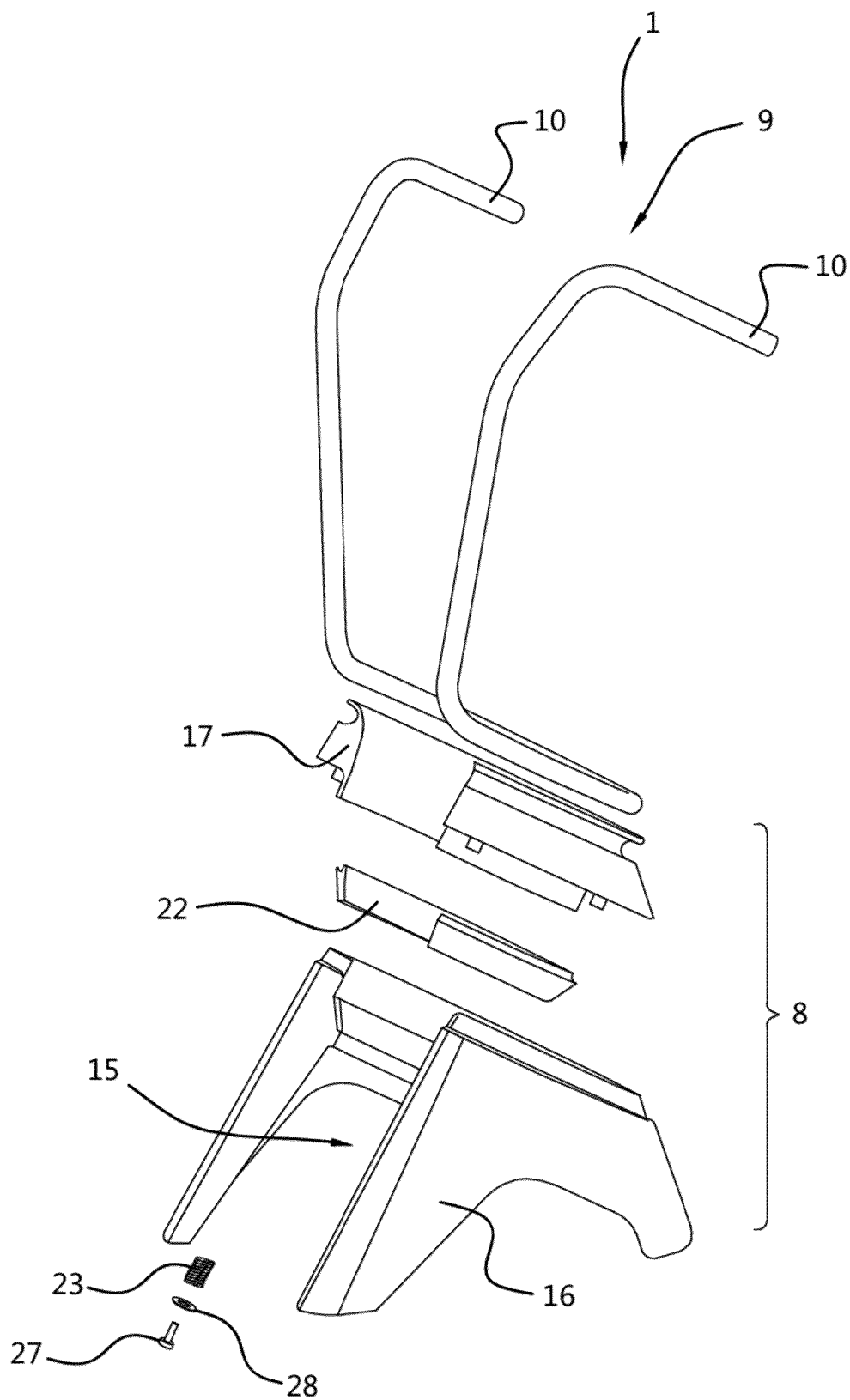


Fig. 12

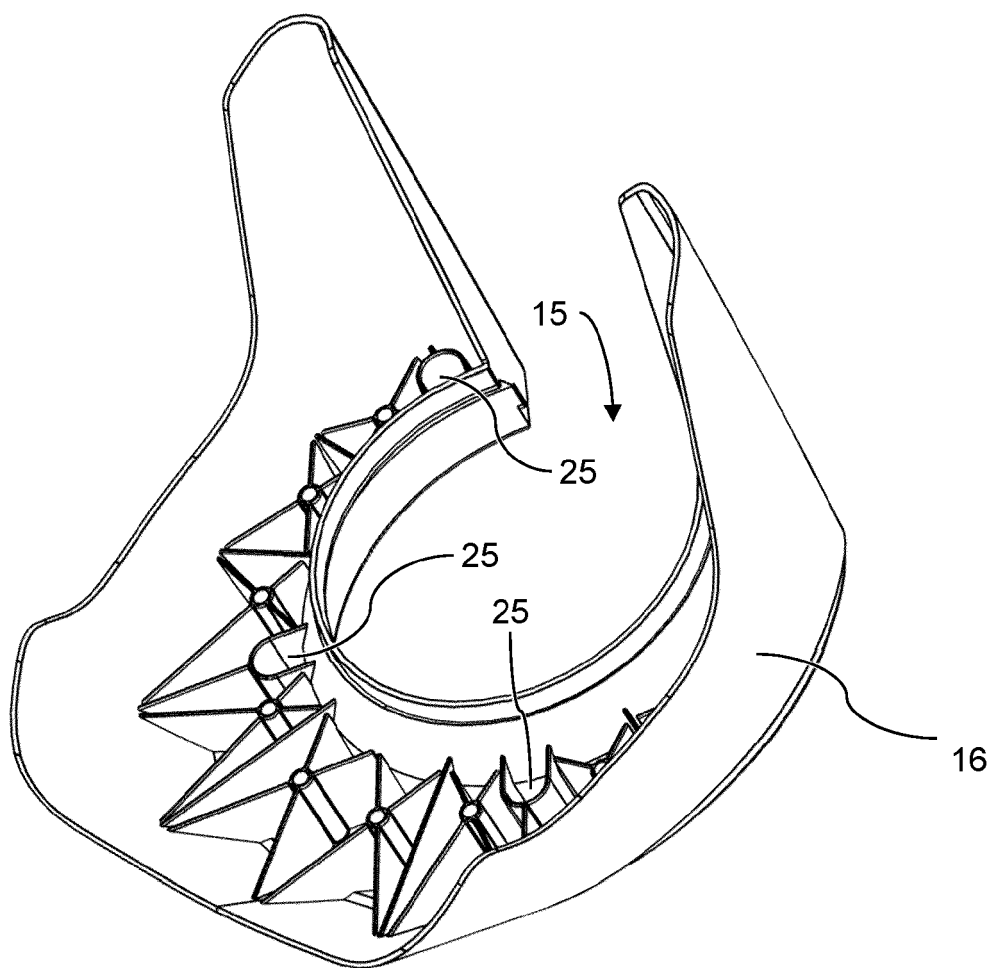


Fig. 13

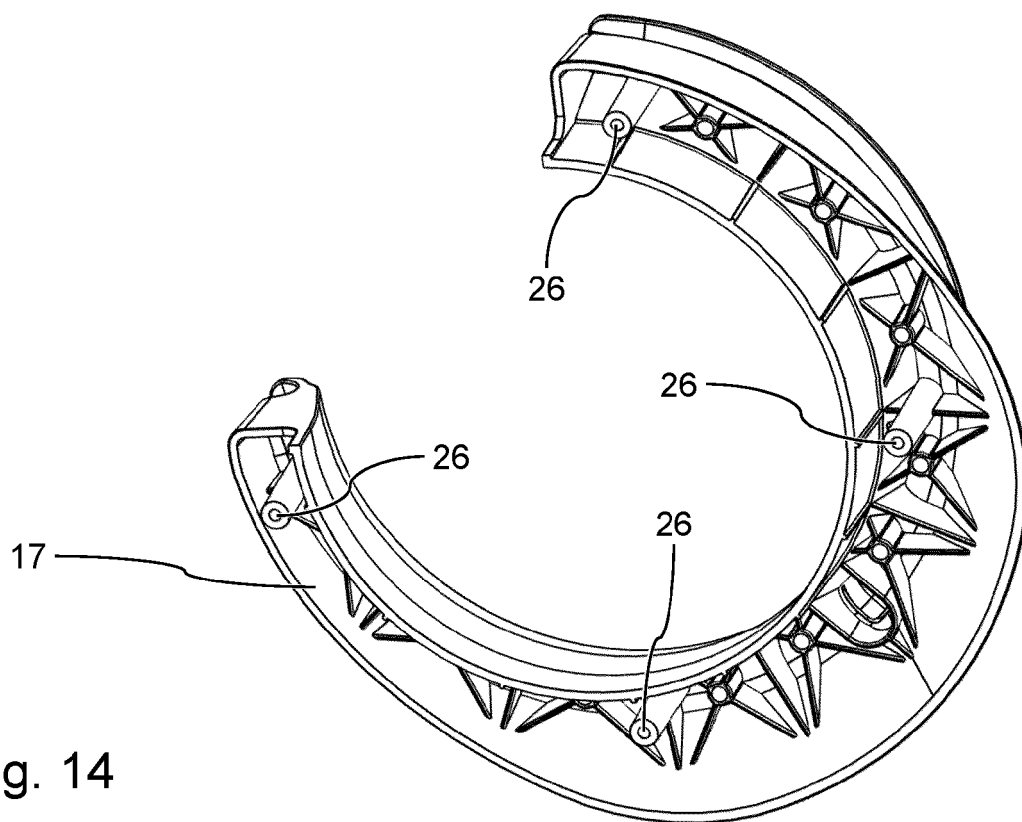


Fig. 14

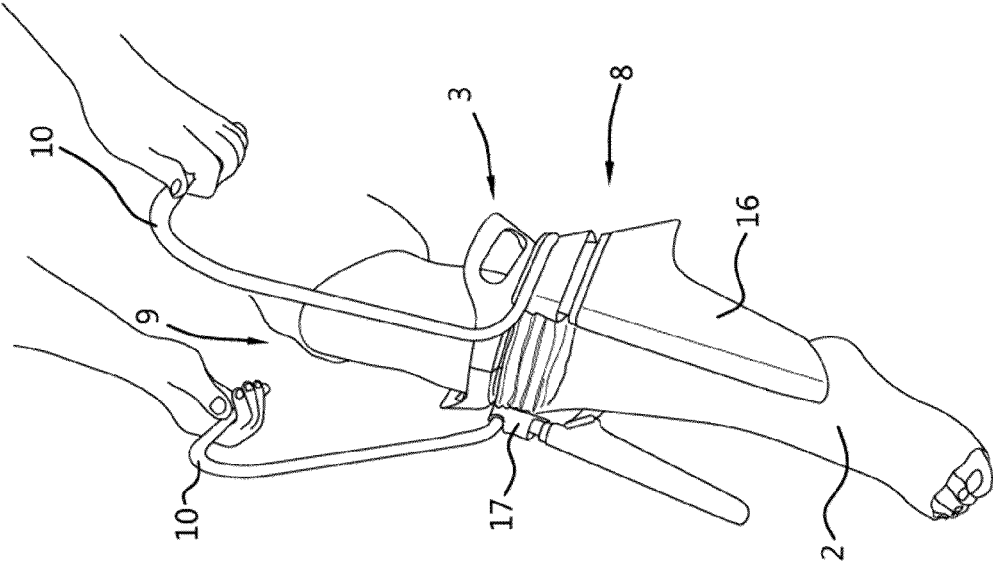


Fig. 15

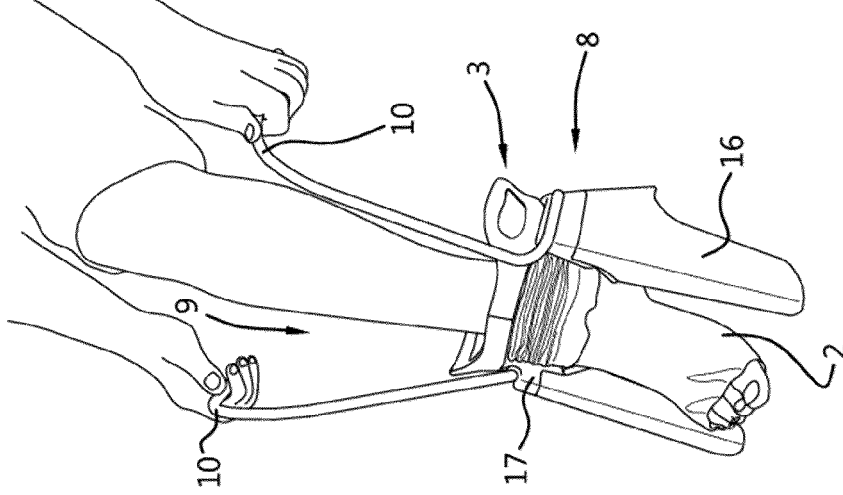


Fig. 16

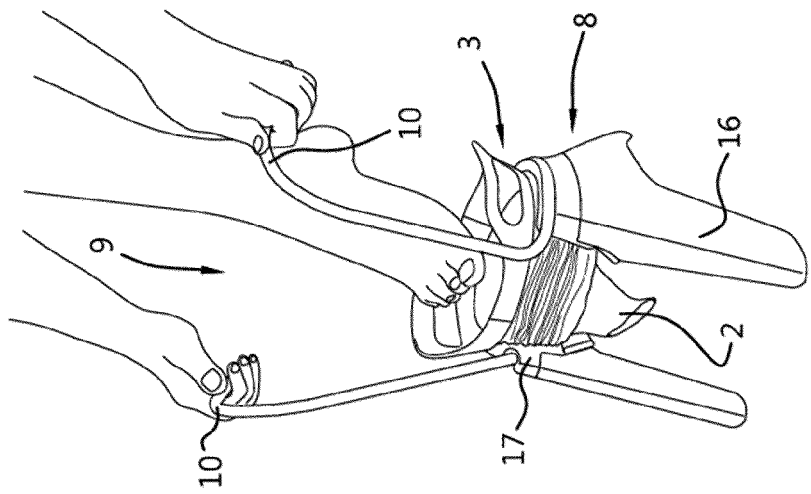


Fig. 17

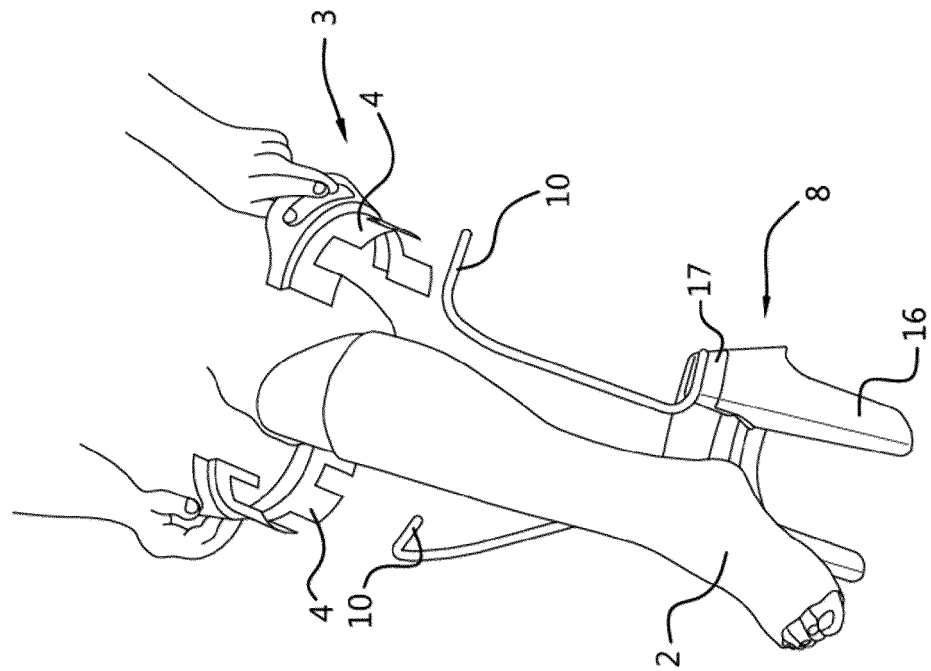


Fig. 18

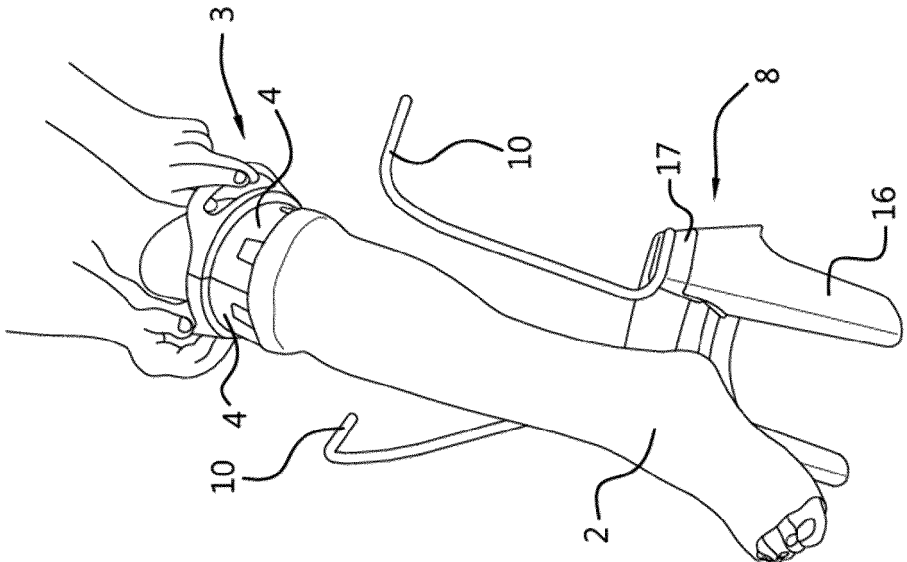


Fig. 19

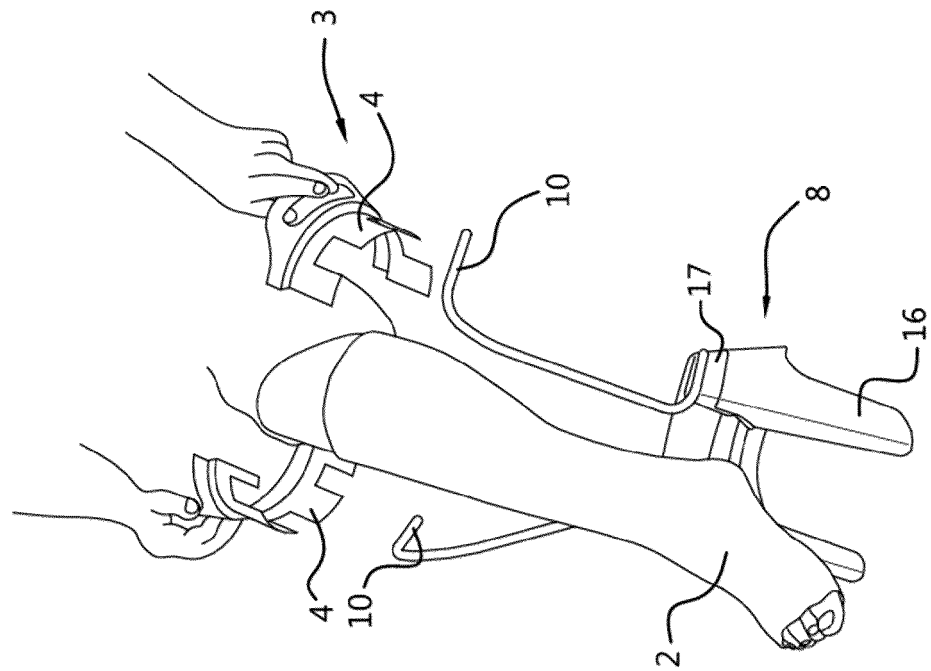


Fig. 20

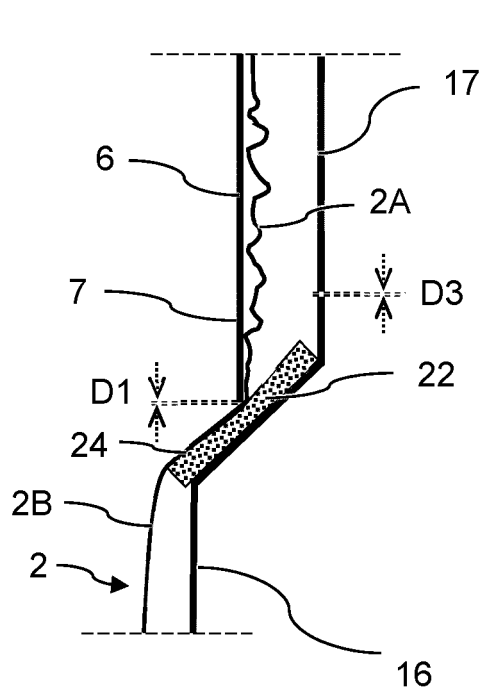


Fig. 21

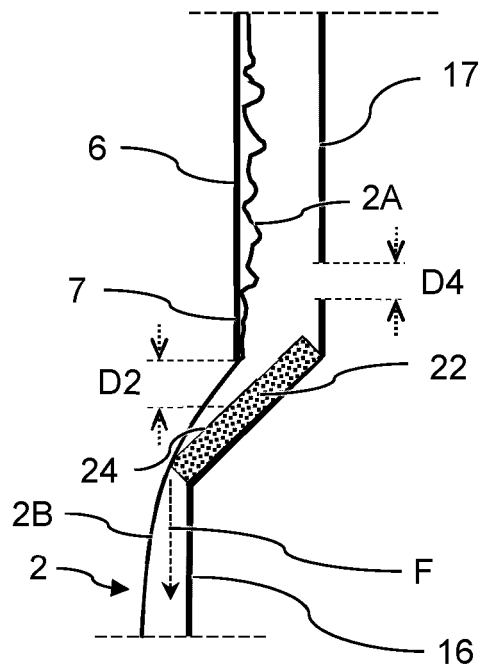


Fig. 22

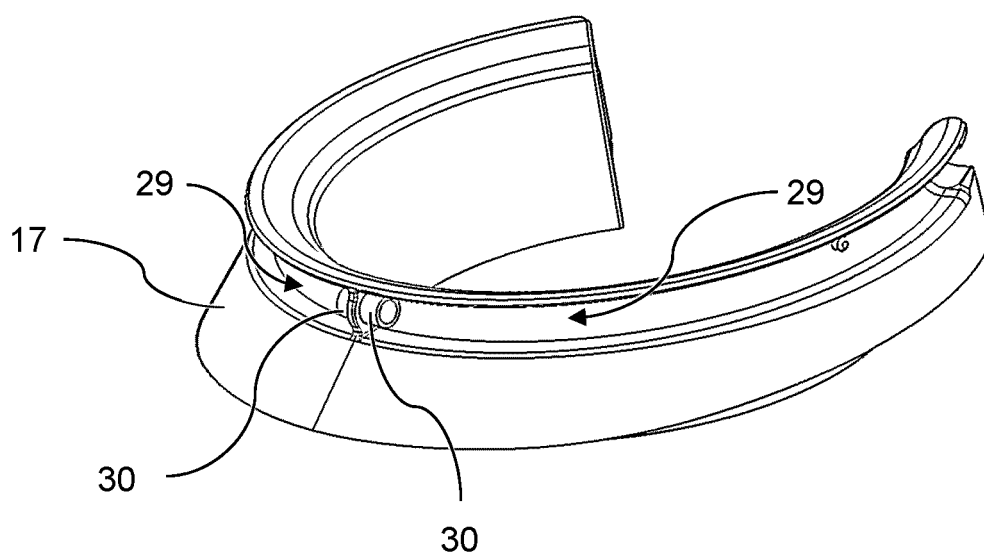


Fig. 23

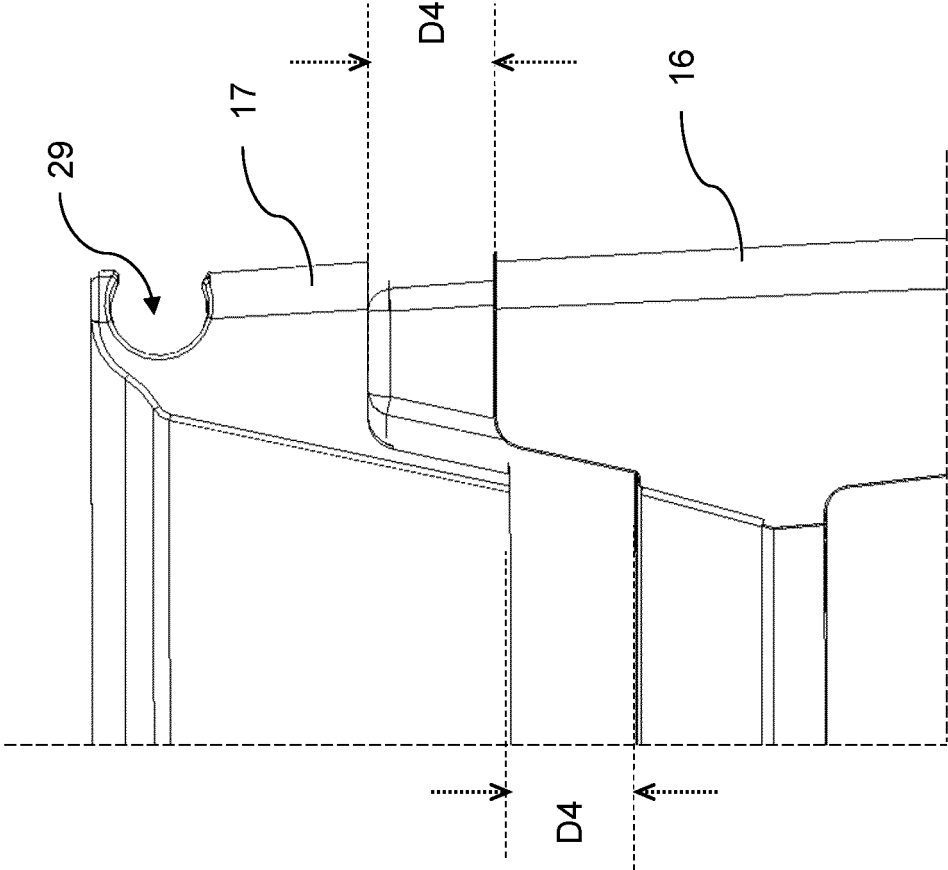


Fig. 24

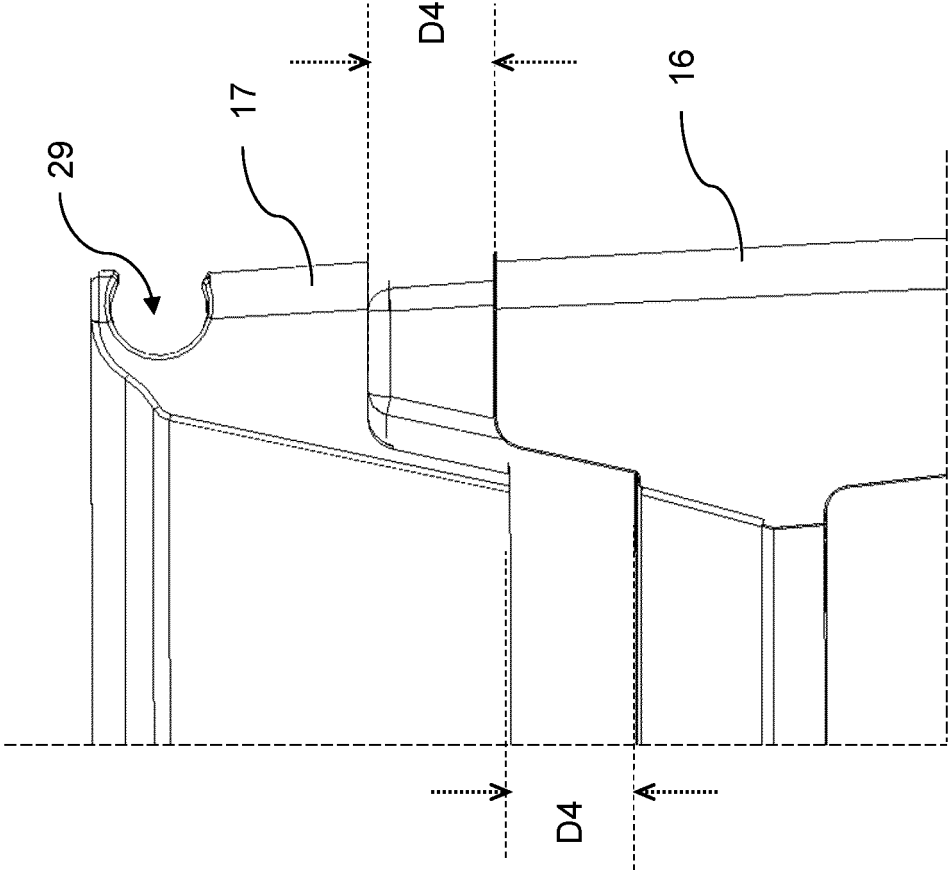


Fig. 25



EUROPEAN SEARCH REPORT

Application Number

EP 24 20 2598

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,D A	WO 2021/221494 A1 (WOUTERS HARPERT JUST [NL]) 4 November 2021 (2021-11-04) * page 8, lines 15-19 - page 9, lines 1-2,9-11; figures 1a,1b,2a-2c,6,3a,3b,4a,4b * * page 11, lines 19,20,25,26 - page 17, lines 23-28 *	1,8, 10-15 2-7,9	INV. A47G25/90
A	NL 9 000 361 A (GROL BEHEER B V) 2 September 1991 (1991-09-02) * figures 3a,3b,3c,4c,4d *	1	
A	JP 2011 004875 A (JOSHO GAKUEN) 13 January 2011 (2011-01-13) * figures 1-8 *	1	
A	US 2010/147908 A1 (SKERMAN ROBERT GRAHAM MITCHELL [AU]) 17 June 2010 (2010-06-17) * figure 15 *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			A47G
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		24 January 2025	Longo dit Operti, T
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)

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

EP 24 20 2598

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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24 - 01 - 2025

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2021221494 A1	04-11-2021	AU 2021264375 A1	01-12-2022
		CA 3176501 A1	04-11-2021
		EP 4142548 A1	08-03-2023
		ES 2984569 T3	29-10-2024
		JP 2023524470 A	12-06-2023
		KR 20230020972 A	13-02-2023
		NL 2025439 B1	09-11-2021
		US 2023172378 A1	08-06-2023
		WO 2021221494 A1	04-11-2021

NL 9000361 A	02-09-1991	NONE	

JP 2011004875 A	13-01-2011	JP 5545934 B2	09-07-2014
		JP 2011004875 A	13-01-2011

US 2010147908 A1	17-06-2010	AU 2006100070 A4	23-02-2006
		AU 2007209776 A1	02-08-2007
		EP 2111200 A1	28-10-2009
		US 2010147908 A1	17-06-2010
		WO 2007085061 A1	02-08-2007

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2021221494 A1 [0004] [0007] [0009] [0020]
[0021]