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(54) Aid for pulling off elastic stockings

(57) The invention relates to an aid for pulling off elastic stockings, particularly in the health care sector. The aid comprises a flexible, tube-like peripheral body of a smooth material, which in use can be slid round a leg provided with elastic stockings. The peripheral body is provided on its side remote from the leg with fixation means for arranging the aid at least temporarily round the leg.

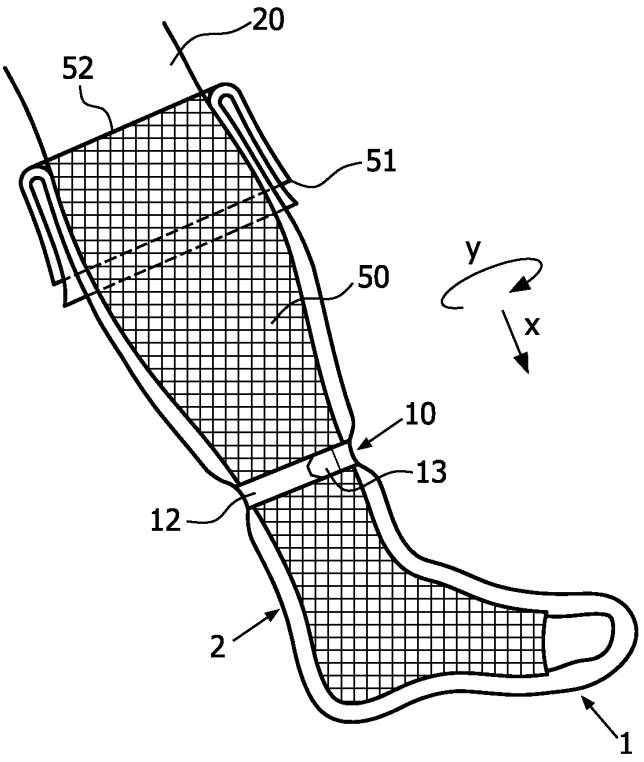

FIG. 4

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Description

[0001] The invention relates to an aid for pulling off elastic stockings.

[0002] An elastic stocking or support stocking is an article of clothing usually applied as medical aid for users with varicose veins and other vascular problems. Because the support stocking fits tightly round the leg of the user, it exerts a relatively high tension on this leg. It is precisely because of this high tension that the user encounters problems when putting on the stocking, but also when pulling off the stocking. When putting on the stocking, the user first brings the stocking into "rolled-up" position, subsequently places his/her foot into the opening of the stocking and unrolls the stocking along the foot and leg until the stocking fits tightly round the leg. The elastic stocking must be removed daily. Because the stocking fits so tightly onto the leg, pulling off the stocking also requires relatively great force, among other reasons because the stocking has to be pulled off the leg and along the heel of the foot, thereby encountering relatively high friction. The biggest problem for the user is when the stocking has to be moved along the heel, since at the position of the heel the body periphery is quite large and the stocking has to be pulled from the body with great force by hand. This problem is so serious in practice that it may be that the user is not capable of pulling off the stockings independently. Also a frequent occurrence is that the stockings are damaged when being pulled off because for instance they hook behind a fingernail. It must also be borne in mind that the category of persons who need support stocking are generally the disabled or elderly, who have reduced strength in their hands and arms.

[0003] The invention has for its object to provide an aid for the purpose of pulling off elastic stockings with which the above-mentioned problems can be alleviated. The invention has for its particular object to provide an aid for the purpose of pulling off elastic stockings, wherein the force required for pulling off the stockings is small.

[0004] This object is achieved according to the invention with an aid according to claim 1. According to the invention, the aid for pulling off elastic stockings comprises a flexible, tube-like peripheral body of a smooth material, which in use can be slid round a leg provided with an elastic stocking, wherein the peripheral body is provided on its side remote from the leg with fixation means with which the aid can be arranged at least temporarily round the leg. This achieves that pulling off an elastic stocking can take place without exerting considerable force. In order to enable an elastic stocking to be taken off, the foot is first placed into the opening of the aid and the aid arranged round the leg provided with the elastic stocking. The aid is subsequently fitted round the leg, or lower leg, using fixation means. The upper edges of the elastic stocking and the aid are then jointly grasped and folded back a small distance in the direction of the foot, such that the folded part of the peripheral body of the aid makes contact with a non-folded part of the same peripheral body. By now further unrolling the elastic stocking by hand in the direction of the foot, the parts of the peripheral body of the aid will slide over each other. Although both parts of the peripheral body will be held against each other under the pressure of the elastic stocking, the sliding can take place practically without friction, among other reasons due to the properties of the material from which the aid is manufactured. The part of the elastic stocking that is in contact with the leg, which contact could in principle cause quite a high friction force, substantially remains stationary. The fixation means ensure among other things that the aid and the stocking do not slide prematurely from the foot during unrolling of the elastic stocking. During further combined unrolling of stocking and aid in the direction of the foot, the fixation means will at a given moment be reached. In order to enable complete unrolling of the stocking, the fixation by these fixation means has to be ended. This can be done by hand, but preferably takes place automatically. This latter preferred option will be further described below. After the elastic stocking has thus been removed from the leg, the aid is in inside-out position inside the elastic stocking. The aid can be removed easily from the stocking and restored to its original form for re-use by once again turning the aid inside-out.

[0005] In a preferred embodiment the aid according to the invention is characterized in that the fixation means comprise an elastic band which can be arranged round the leg in peripheral direction and which is further provided with closing means, with which the band can be secured at least temporarily onto itself. After the aid has been arranged round the leg at the desired height, the free ends of the elastic band according to the invention is grasped and trained round the leg in peripheral direction and secured to itself using the closing means. Because the band is elastic, the band can be arranged with a certain tension round the leg. This ensures that, in any case at the height of the position of the band, the aid will be held relatively tightly against the leg. The aid can be held more loosely against the leg at other positions, if desired. The aid can be in principle be arranged at any desired height. Preferably however, the aid is arranged at a height extending to just below the level of the elastic stocking. Because the elastic stocking is thus left free on the upper side thereof, it can easily be grasped and folded back over only a small height. The fixation means can in principle also be arranged at any desired height. The fixation means are preferably arranged at the height of the lower leg. A further advantage of the aid according to the invention is that during unrolling of the elastic stocking the fixation means are hidden under the stocking, and are thus not accessible to the user. This prevents the user performing undesirable actions with the fixation means during unrolling of the stocking.

[0006] During combined unrolling of the stocking and the aid along the leg the fixation means will at a given point have to be released, so as not to impede further

unrolling. In this respect it is advantageous to characterize the aid in that the closing means in a preferred embodiment comprise a Velcro system of co-acting primary and secondary Velcro strips. As is generally known, a Velcro system consists of a combination of two Velcro strips, which are provided with mutually gripping members. In the context of the present application such mutually engaging Velcro strips will be referred to as primary and secondary Velcro strips. In an illustrative example the primary Velcro strip has primary gripping members in the form of loops and the secondary tape has gripping members in the form of gripping hooks. When the primary and secondary Velcro strips are pressed onto each other, the hooks grip into the loops, thereby creating a temporary connection. This connection can be easily broken by pulling apart the two Velcro strips. Although a Velcro tape system is generally known per se, its application in the present preferred embodiment is advantageous. A user can fix the aid around the leg quickly and easily with a certain tension. The combined application of the Velcro system and a certain tension in the elastic band furthermore achieves that the fixation means will 'automatically' come loose using only a small force during unrolling of stocking and aid. The user does not therefore need to perform any additional action to unroll the elastic stocking beyond the fixation means, nor is a separate pulling construction necessary for this purpose. Due to the specific construction of the aid no danger at all will occur when the elastic band comes loose, since the fixation means are arranged according to the invention on the side of the aid remote from the leg. During unrolling the fixation means - in this case the elastic band - will therefore be situated between those peripheral surface parts which are folded back and not folded back. If the elastic band comes loose, the elastic band will be restrained by a folded-down part of the elastic stocking.

[0007] It is advantageous if the elastic band is provided on one side with primary Velcro strip and on the other side with secondary Velcro strip, wherein the secondary Velcro strip still more preferably extends along a relatively small part of the free outer end of the band. Secondary Velcro tape has a rougher surface than primary Velcro tape and can therefore more easily cause damage to the elastic stocking. By limiting the surface area of the secondary Velcro tape according to the present preferred variant, the risk of damage is decreased.

[0008] The aid can in principle be manufactured in any way. According to a preferred variant, the aid is characterized in that the peripheral body is formed by bringing together and at least partially connecting to each other two opposite free edge portions of a flat sheet of the material, thereby forming a shared edge portion. This makes arranging of the aid easier and results in improved functionality thereof. How the fixation is performed does not matter here. It is thus possible to connect both free edge portions by means of a 'permanent' connection, such as for instance a stitch connection and/or an adhesive connection. Another option consists of connecting the two sheets to each other by means of a releasable connection, such as for instance with Velcro tape. If desired, both edge portions can then be connected to each other only when in use.

[0009] The shared edge portions preferably extend in longitudinal direction of the aid and the fixation means are attached to the shared edge portions. It is further advantageous if the connection is a stitched connection, which is formed by a felled seam. A further reduced friction between aid and contact surface can be achieved by arranging the connection in the form of a felled seam. It has moreover been found that the use of a felled seam prolongs the lifespan of the aid without this having adverse effects on the operation thereof.

[0010] The aid according to the invention can in principle be manufactured from any material, as long as it is sufficiently flexible and smooth. In a preferred embodiment, the aid is characterized in that the smooth material comprises a material structure coated with a low-friction plastic. Such materials are known per se, though not in the present use. The low-friction plastic more preferably comprises a polyolefin, such as for instance polyethylene, polypropylene and co-polymers thereof. The low-friction plastic most preferably comprises a polytetrafluoroethylene.

[0011] Suitable material structures comprise any fabric, non-woven, knit, stitch, film, perforated film, unidirectional film and so on known to the skilled person, provided the textile structure is preferably relatively thin. Within the scope of the present invention this is understood to mean that the weight per unit area of the textile structure is relatively limited. Suitable weights per unit area range between 10 and 200 g/m^2, preferably between 25 and 100 g/m^2, more preferably between 30 and 60 g/m^2. A particularly suitable glass fiber cloth with a polytetrafluoroethylene coating is commercially available from Eriks B.V. under the product name Chemglas PTFE glass fabric 100-3.

[0012] The material from which the textile structure is manufactured can also be selected within wide limits. Suitable materials comprise glass fibers, carbon fibers, organic fibers such as for instance polyaramid fibers, polyethylene fibers, polyamide fibers, polyester fibers and so on. A particularly suitable aid comprises a textile structure manufactured from a plastic selected from the group of polyesters and/or polyamides. The frictional resistance of the materials moving against each other during the "unrolling" can further be reduced by using a thermoplastic plastic and/or low-friction plastic to which an anti-block agent such as for instance hydrotalcite has been added. The above stated materials have a very low coefficient of friction, are generally highly anti-adhesive and moreover weather and sunlight-resistant. The materials are further sufficiently strong to withstand, with negligible elongation, the tensile stresses occurring while pulling off elastic stockings.

[0013] The invention will now be further elucidated on the basis of the exemplary embodiments shown in the

figures, without however being limited thereto.

[0014] Herein:

Fig. 1 shows a schematic top view of a first embodiment of the aid according to the invention;
Fig. 2 is a schematic bottom view of the exemplary embodiment shown in fig. 1;
Fig. 3 is a schematic perspective view of the peripheral body of an aid according to the invention with the method of longitudinal connection;
Fig. 4 is a schematic view of the aid according to the invention in the situation arranged on a leg; and finally
Fig. 5 shows a schematic detail view of a part of an aid according to the invention during removal thereof.

[0015] With reference to figures 1 and 2 an aid 1 is shown intended for pulling off elastic stockings. Aid 1 comprises a flexible tubular peripheral body 2 of a smooth material. Peripheral body 2 is provided on the outer side thereof (during use this is the side remote from leg 20) with fixation means 10 with which aid 1 can be arranged at least temporarily round leg 20.

[0016] The lateral sides 5 and 6 of peripheral body 2 can both be open according to the invention. In the preferred embodiment as shown in figures 1 and 2, lateral side 5 forms an opening through which the leg can be inserted during use. Lateral side 6 forms a closed edge obtained by stitching together contacting peripheral edges along stitched seam 7. The shown tube-like aid 1 is easy to manufacture and is preferably more or less conical, wherein the open edge portion 5 is wider than the closed edge portion 6. In order to facilitate putting on aid 1, the edge portion 5 comprises a substantially straight first edge portion 5a and a second edge portion 5b in the form of a somewhat protruding triangle.

[0017] Peripheral body 2 is further provided with fixation means 10, preferably attached to the shared edge portion 3, with which aid 1 can be at least temporarily fixed round leg 20. In the shown embodiment the fixation means 10 comprise an elastic band which can be arranged round leg 20 in peripheral direction Y. Elastic band 10 is provided with closing means 11 with which the band 10 can be secured at least temporarily onto itself. Closing means 10 comprise a Velcro system of a co-acting primary Velcro strip 12 and a secondary Velcro strip 13. The primary Velcro strip 12 is arranged on one side of elastic band 10 and the secondary Velcro strip 13 on the other side, wherein secondary Velcro strip 13 extends over a relatively small part of the free outer end of band 10, as shown in the hatched part 13 in figure 1.

[0018] Elastic band 10 can be made from any strong elastic material, such as for example a fabric-reinforced plastic rubber. Peripheral body 2 of aid 1 is preferably made from a fabric coated with a polytetrafluoroethylene (PTFE), such as a nylon fabric or a glass fiber cloth. A particularly suitable fabric is the so-called rib-stop fabric.

[0019] Peripheral body 10 is for instance formed from a sheet of a smooth material cut in the shape of a parallelogram. This sheet is then folded by bringing together two opposite free edge portions (30,31) thereof, thereby creating a hat-shaped whole as shown in figure 3. The free edge portions (30, 31) which are thus brought together are then connected to each other in the longitudinal direction X by means of stitched connection 4, thereby creating a shared edge portion 3. Shared edge portion 3 is also stitched together, wherein elastic band 10 is co-stitched at the same time if desired (as shown in the inset of figure 3). It is advantageous if stitched connection 4 is formed by a felled seam. Such a seam is shown in detail in the inset of figure 3 and comprises two free edge portions (30, 31) which are connected in the longitudinal direction at their base by means of a stitched seam 4 and which are folded over a certain length 32 and then connected again in the longitudinal direction at the position of the other outer end 204 by means of a stitched seam 33.

[0020] The operation of aid 1 according to the invention when pulling off an elastic stocking is elucidated with reference to figures 4 and 5. In order to use aid 1 when pulling off an elastic stocking 50 arranged round a leg 20, the foot will first be placed into the opening of aid 1 formed by peripheral edges (5a,5b), wherein the foot is inserted into aid 1 to a depth such that peripheral edge 5 thereof reaches the position of upper edge 51 of the elastic stocking. In this situation the aid 1 forms more or less a relatively loose-fitting sheath for the leg provided with the elastic stocking. Aid 1 is then fixed with a certain tension round leg 20 by training the elastic band 10 round the leg (in peripheral direction Y) and fixing it onto itself with a certain tension. In a preferred variant the fixation of band 10 onto itself takes place by pressing the secondary Velcro strip 13, which extends over a relatively small part of the free outer end of band 10, fixedly onto the primary Velcro strip 12 situated on the other side of elastic band 10. The position of elastic band 10 along leg 20 can in principle be chosen freely. In figure 4 the elastic band 10 is thus arranged below the calf muscle. Elastic band 10 is preferably arranged at ankle height. Once aid 1 has thus been fixed, upper edges 51 and 5 of elastic stocking 50 and aid 1 respectively are together grasped and folded over a short distance in the direction of the foot. The folded-back part here extends between edge 51 and the thus formed upper edge 52 (see figure 4), and also provides for an additional fixation of aid 1 around leg 20. As shown in detail in figure 5, the folded-back part of the peripheral surface 2 of aid 1 makes contact with a non-folded part 21 of the same peripheral surface 2. By now exerting a downward force F by hand on elastic stocking 50, this latter will be unrolled further in the direction of the foot. The parts (20,21) of peripheral surface 2 of aid 1 will hereby slide over each other. Although both parts (21,22) of the peripheral surface are held against each other under the pressure of elastic stocking 50, the sliding will take place practically without friction, among

other reasons because of the properties of the material from which the aid is manufactured. Because the coefficient of friction of the teflon-coated peripheral body 2 is low, the force required to unroll the aid in the direction of the foot is also relatively small. The part 53 of elastic stocking 50 that is in contact with leg 20, which contact could in principle cause a relatively great friction force, remains substantially stationary. As the combined unrolling of stocking 50 and aid 1 in the direction of the foot continues, the fixation means, in the form of elastic band 10 arranged under a certain tension round the leg, will be reached at a certain point of time. The fixation by elastic band 10 has to be removed in order to allow stocking 50 to be fully unrolled from the leg and the foot. In the shown variant this will occur automatically during unrolling of stocking 50. When reaching the elastic band 10, the upper edge 52 (which is then at a lower position along the leg 20 than shown in figure 4) engages the upper edge of elastic band 10. By now unrolling the folded part of stocking 50 further in the direction of force F, the Velcro closing system (12, 13) of elastic band 10 will be loaded, whereby the primary and secondary Velcro strips (12, 13) will come loose, thereby ending the fixation. Stocking 50 can now further be freely unrolled, after which aid 1 can be removed easily from the stocking.

[0021] The invention is not limited to the above described exemplary embodiment. It will be apparent that within the scope of the invention different modifications can be made which will be self-evident to the skilled person.

Claims

1. Aid for pulling off elastic stockings, comprising a flexible, tube-like peripheral body of a smooth material, which in use can be slid round a leg provided with an elastic stocking, wherein the peripheral body is provided on its side remote from the leg with fixation means with which the aid can be arranged at least temporarily round the leg.

2. Aid according to claim 1, **characterized in that** the fixation means comprise an elastic band which can be arranged round the leg in peripheral direction and which is further provided with closing means, with which the band can be secured at least temporarily onto itself.

3. Aid according to claim 2, **characterized in that** the closing means comprise a Velcro system of co-acting primary and secondary Velcro strips.

4. Aid according to claim 3, **characterized in that** the elastic band is provided on one side with primary Velcro strip and on the other side with secondary Velcro strip.

5. Aid according to claim 4, **characterized in that** the secondary Velcro strip extends along a relatively small part of the free outer end of the band.

6. Aid according to any of the preceding claims, **characterized in that** the peripheral body is formed by bringing together and at least partially connecting to each other two opposite free edge portions of a flat sheet of the material, thereby forming a shared edge portion.

7. Aid according to claim 6, **characterized in that** the shared edge portions extend in longitudinal direction of the aid and the fixation means are attached to the shared edge portions.

8. Aid according to claim 7, **characterized in that** the connection is a stitched connection and is formed by a felled seam.

9. Aid according to any of the preceding claims, **characterized in that** the smooth material comprises a material structure coated with a low-friction plastic.

10. Aid according to claim 9, **characterized in that** the low-friction plastic comprises a polyolefin.

11. Aid according to claim 10, **characterized in that** the polyolefin comprises a polytetrafluoroethylene.

12. Aid according to any of the claims 9 - 11, **characterized in that** the material structure comprises a thin fabric, a non-woven and/or a film of a thermoplastic plastic and/or glass fiber.

13. Aid according to claim 12, **characterized in that** the material structure is manufactured from a plastic selected from the group of polyesters and/or polyamides.

14. Aid according to any of the claims 9 - 13, **characterized in that** the thermoplastic plastic and/or the low-friction plastic comprises an anti-block agent.

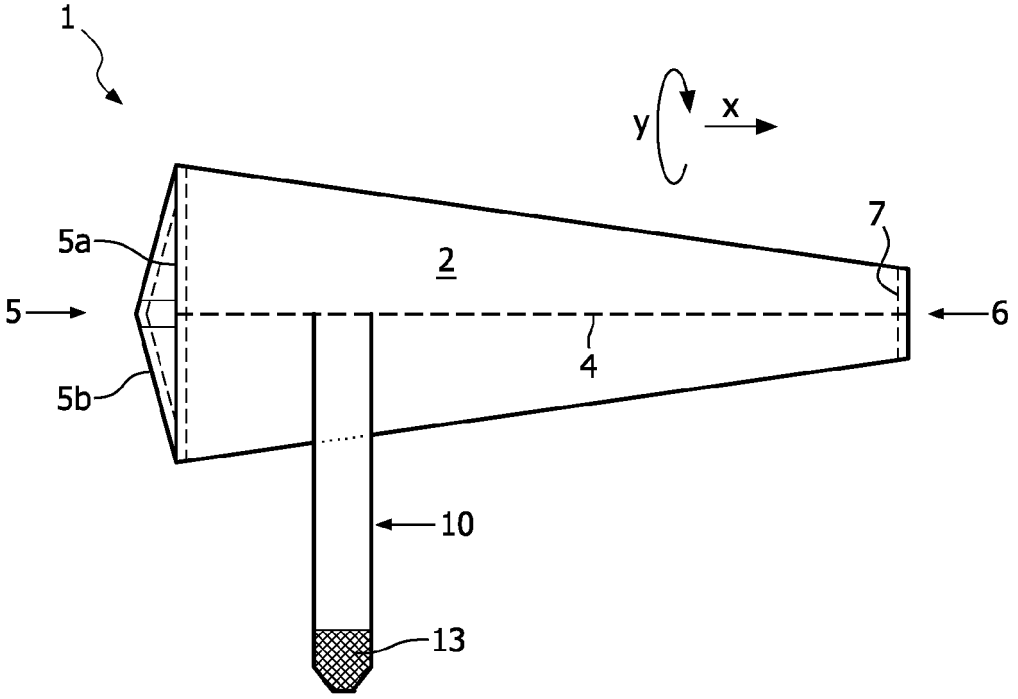

FIG. 1

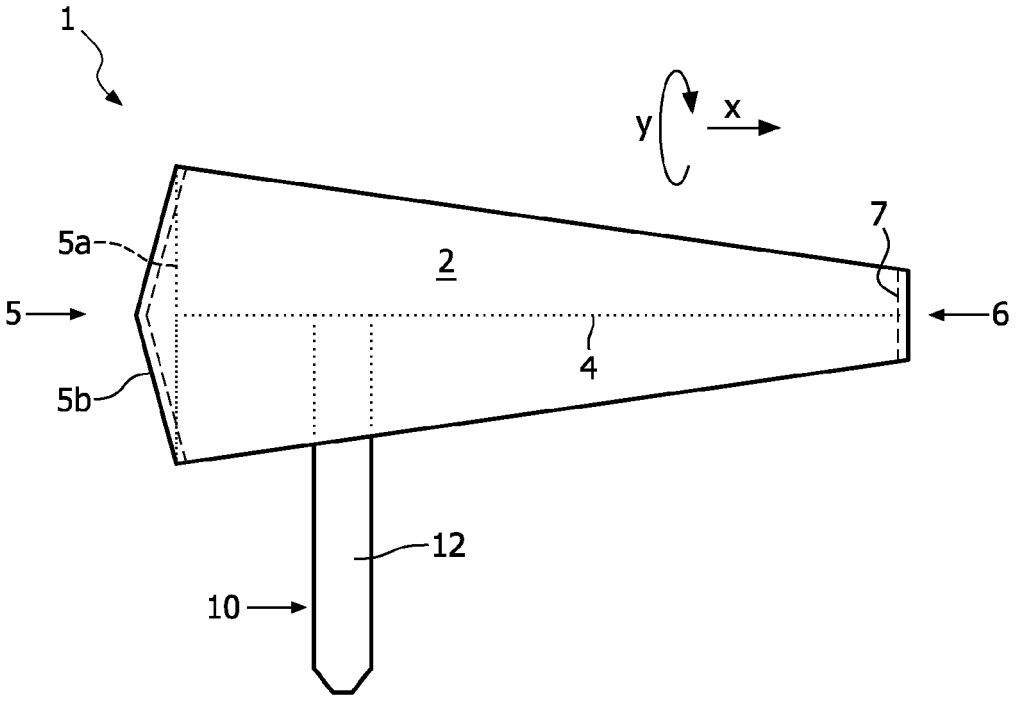

FIG. 2

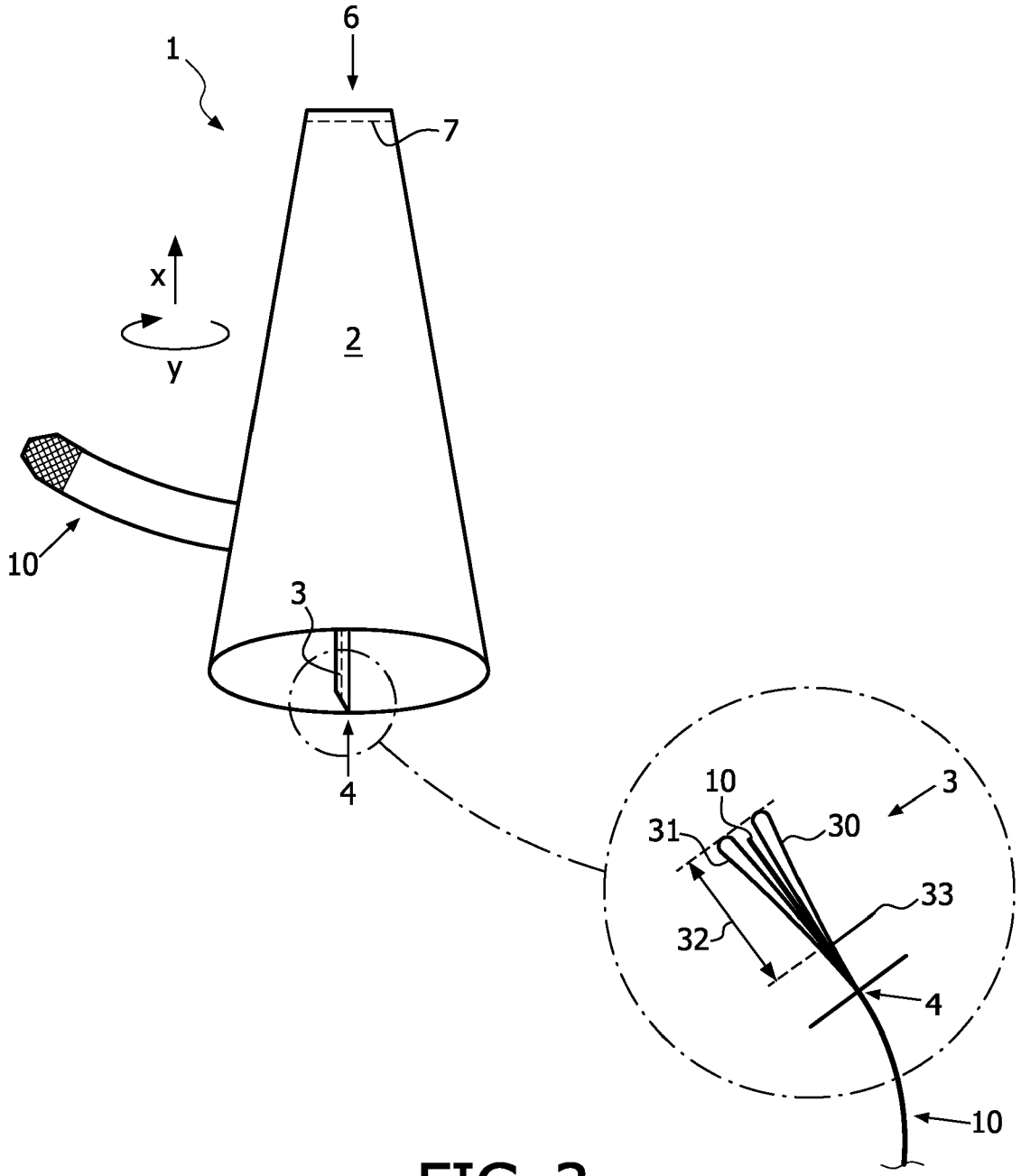

FIG. 3

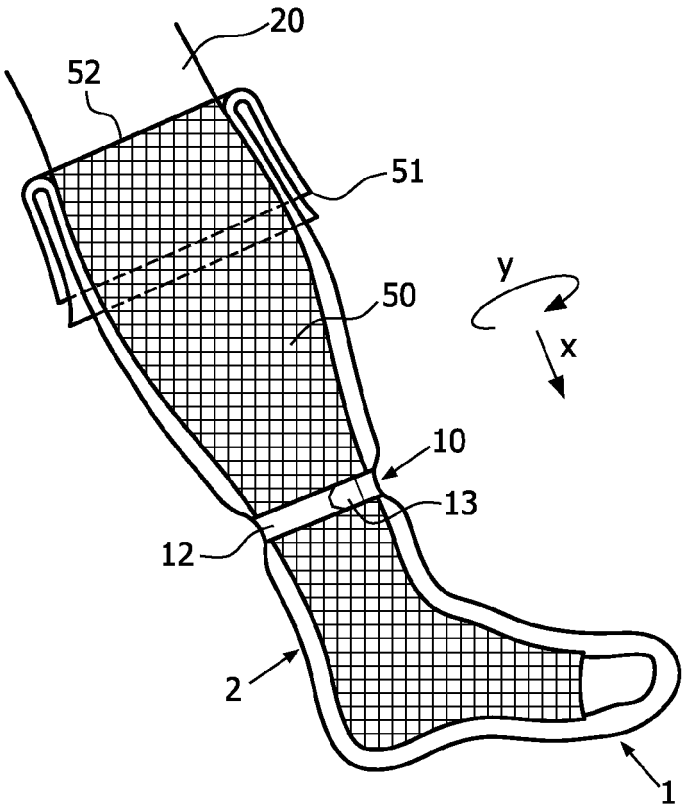

FIG. 4

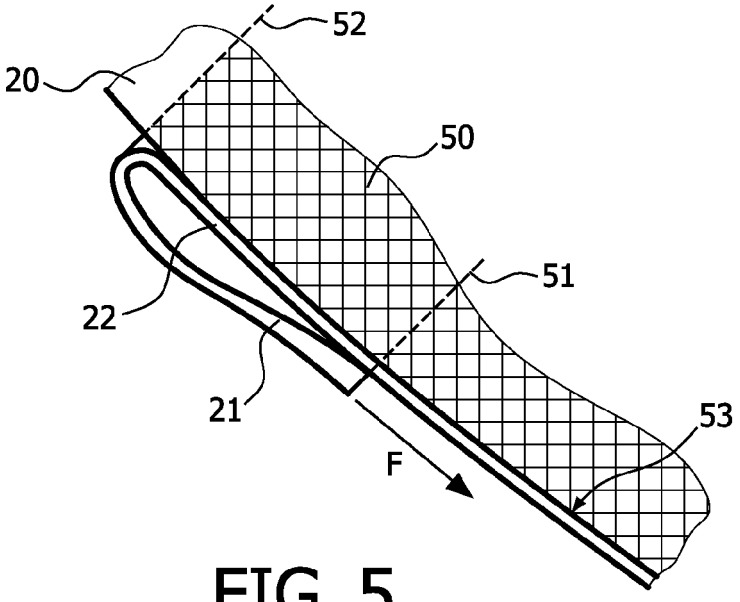

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 09 15 6084

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	DE 94 01 036 U1 (HEYMANN) 24 May 1995 (1995-05-24) * claims 1,3,6-8; figures * -----	1-5,9-14	INV. A47G25/90
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X	WO 03/094648 A (ARION INTERNATIONAL B.V.) 20 November 2003 (2003-11-20) * page 11, line 16 - line 28; claim 10; figures 3a,3b * -----	1,6-7	

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	25 September 2009	Beugeling, Leo

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